

Borrego Water District Board of Directors
Regular Meeting
January 26, 2021 @ 9:00 a.m.
806 Palm Canyon Drive
Borrego Springs, CA 92004

COVID-19 UPDATE: The Borrego Water District Board of Directors meeting as scheduled in an electronic format. BWD will be providing public access to the Meeting thru electronic means only to minimize the spread of the COVID-19 virus, based upon direction from the California Department of Public Health, the California Governor's Office and the County Public Health Office. Anyone who wants to listen to or participate in the meeting is encouraged to observe the GO TO MEETING at:

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I. OPENING PROCEDURES -

- A.** Call to Order:
- B.** Pledge of Allegiance
- C.** Roll Call
- D.** Approval of Agenda
- E.** Approval of Minutes
 - 1. December 8, 2020 Special Board Meeting (3-5)
 - 2. December 22, 2020 Regular Board Meeting (6-8)
- F.** Comments from the Public & Requests for Future Agenda Items (may be limited to 3 min)
- G.** Comments from Directors
- H.** Correspondence Received from the Public- None

II. ITEMS FOR BOARD CONSIDERATION AND POSSIBLE ACTION –

- A.** Water and Sewer Financing Plan Update – Fieldman/Rolapp and Associates: R Porr and L Carpenter (9-10)
- B.** Approval of Plans/Specifications and Bid Documents for the Bending Elbow, Weather Vane, Rocking Chair, Walking H and Double O Pipeline Project – Capital Improvement Projects Number 1 and 3A (11-265)
- C.** Approval of Plans/Specifications and Bid Documents for the Wastewater Treatment Plant Rehabilitation Project (Grant Funded)- D Dale (266-660)
- D.** Policy Statement 2021-01-01, Lien of Property for Delinquent Charges – D Del Bono (661-662)
- E.** BWD Board Committee Assignments – K Dice (663)
- F.** Interim Borrego Springs Subbasin Watermaster Board – D Duncan/K Dice (664-666)
 - 1. Update on Board Activities – VERBAL D Duncan/K Dice

AGENDA: January 26, 2021

All Documents for public review on file with the District's secretary located at 806 Palm Canyon Drive, Borrego Springs CA 92004. Any public record provided to a majority of the Board of Directors less than 72 hours prior to the meeting, regarding any item on the open session portion of this agenda, is available for public inspection during normal business hours at the Office of the Board Secretary, located at 806 Palm Canyon Drive, Borrego Springs CA 92004.

The Borrego Springs Water District complies with the Americans with Disabilities Act. Persons with special needs should call Geoff Poole – Board Secretary at (760) 767 – 5806 at least 48 hours in advance of the start of this meeting, in order to enable the District to make reasonable arrangements to ensure accessibility.

If you challenge any action of the Board of Directors in court, you may be limited to raising only those issues you or someone else raised at the public hearing, or in written correspondence delivered to the Board of Directors (c/o the Board Secretary) at, or prior to, the public hearing.

III. STANDING AND AD-HOC BOARD COMMITTEE REPORTS –

A. STANDING:

1. Operations and Infrastructure – Duncan/Baker
2. AD HOC:
 - a. Stipulated Judgment Implementation – Brecht/Duncan
 - b. Risk Management/Pandemic – Brecht/Dice
 - i. Updated Risk Management Brief- L Brecht
 - c. Grant Funding – Dice/Johnson
 - i. Discussions with Potential Grant Consultant(s) – D Johnson - VERBAL
 - d. Association of California Water Agencies/Joint Powers Authority – Dice/Johnson
 - e. Organizational Staffing - Dice/Duncan
 - f. Prop 218 and BWD Developers’ Policy – Brecht
 - g. Public Outreach – Dice/Baker

IV. MONTHLY FINANCIAL & OPERATIONS REPORTS

- A. Financial Reports: December 2020 (667-681)
- B. Water and Wastewater Operations Report: December 2020 (682-688)
- C. Water Production/Use Records: December 2020 (689-690)

V. STAFF REPORTS - VERBAL

1. Administration – Diana Del Bono
 - a. Future Agenda Items: Policy Clarifications Relating to Charges for Undeveloped Lots with Meters Already Installed & Fees and Charges for Meter Upsizing
2. Water Operations – Alan Asche
3. Waste Water Operations – Roy Martinez
4. Engineering – David Dale

VI. CLOSED SESSION:

- A. Conference with Legal Counsel - Significant exposure to litigation pursuant to paragraph (3) of subdivision (d) of Section 54956.9: (Two (2) potential cases)
- B. Conference with Legal Counsel – Existing Litigation (BWD v. All Persons Who Claim a Right to Extract Groundwater, et al. (San Diego Superior Court case no. 37-2020-00005776)

- VII. CLOSING PROCEDURE:** The next Board Meeting is scheduled for February 9, 2021 to be available online. See Board Agenda at BorregoWD.org for details, available at least 72 hours before the meeting.

AGENDA: January 26, 2021

All Documents for public review on file with the District’s secretary located at 806 Palm Canyon Drive, Borrego Springs CA 92004. Any public record provided to a majority of the Board of Directors less than 72 hours prior to the meeting, regarding any item on the open session portion of this agenda, is available for public inspection during normal business hours at the Office of the Board Secretary, located at 806 Palm Canyon Drive, Borrego Springs CA 92004.

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Borrego Water District Board of Directors

MINUTES

Special Meeting

December 8, 2020 @ 9:00 a.m.

806 Palm Canyon Drive

Borrego Springs, CA 92004

I. OPENING PROCEDURES

A. Call to Order: President Dice called the meeting to order at 9:00 a.m.

B. Pledge of Allegiance: Those present stood for the Pledge of Allegiance.

C. Oath of Officers for Directors Tammy Baker and Diane Johnson & Roll Call: President Dice administered the oath of office to Directors Baker and Johnson.

Directors: Present: President Dice, Vice-President

Brecht, Secretary/Treasurer Duncan,

Baker, Johnson

Staff:

Geoff Poole, General Manager

Jessica Clabaugh, Finance Officer

David Dale, District Engineer

Alan Asche, Operations Manager

Diana Del Bono, Administration Manager

Esmeralda Garcia, Administrative Assistant

Wendy Quinn, Recording Secretary

Public:

Lauren Demine, Raftelis

Kevin Kostiuk, Raftelis

D. Approval of Agenda: *MSC: Brecht/Johnson approving the Agenda as corrected (Item II.A should be 2020-21 budget). The roll call vote was unanimous.*

E. Approval of Minutes: None

F. Comments from the Public and Requests for Future Agenda Items: None

G. Comments from Directors: Director Johnson noted that she had been called a politician, and she preferred the term “elected official.” Director Brecht and President Dice agreed. Director Baker announced that she had been coming to Borrego Springs since 2008 for vacations and eventually left her home in San Francisco and moved here. She worked in the high tech field and enjoys bicycling.

H. Correspondence Received from the Public: None

II. ITEMS FOR BOARD CONSIDERATION AND POSSIBLE ACTION

A. Publication and Dissemination of Amended FY 2020-21 Budget and Capital Improvement Plan: Jessica Clabaugh reported that all suggested changes to the budget and CIP had been incorporated. The final version will be posted on the District website and sent to BWD’s banks.

B. Update on Cost of Service Study for BWD Water and Wastewater Functions: Kevin Kostiuk of Raftelis presented slides outlining the cost of service and rate study. He included background information on the study process and financial planning. There are four main components: the rate-setting framework, financial plan, cost of service and rate design, and the final rate adoption. He explained the Proposition 218 process for setting water and sewer rates. Mr. Kostiuk explained that the study included review of all revenues, expenses and financial policies, as well as identification of long-term revenue needs. The financial plan includes proposed debt (bond issue).

CIP projections were made through 2025. Raftelis continues to work with BWD staff to finalize the figures. Public outreach will be included in the 218 process. Plans and COS analysis should be complete in January, and the schedule provides for new rates to be effective on July 1, 2021. Director Brecht asked how other districts differentiate between 218 cash reserves and non-218 cash reserves (ad valorem taxes).

Mr. Kostiuk explained that property tax revenue is generally at the district's discretion. There are Government Code requirements for segregating developers' fees and other revenue. Mr. Kostiuk agreed to discuss the issue with staff.

Geoff Poole pointed out that the COS study would be an important topic at the Town Hall meeting, if it occurs. He will discuss outreach plans with President Dice and Director Johnson and present more detailed suggestions at the next meeting. There will also be information in the water bills, newspaper and social media. Mr. Poole will work on a narrative for the Town Hall and present a draft at the next meeting, including information from Mr. Kostiuk. President Dice will help.

C. Agreement with Fredericks Services Inc. for Emergency Sewerline Repairs near La Casa Del Zorro: Mr. Poole reported he had met with the owners and site managers at La Casa Del Zorro and they were fully supportive of the proposed sewerline repairs. David Dale explained that he had been working to resolve the odor problems in the area and found there was root intrusion in the pipeline on La Casa property. He proposed bypassing that line with a smaller, more appropriately sized line which will ensure continual flow. The new line will be in the public right-of-way, making maintenance easier. Mr. Dale reported he obtained two proposals for the project, and Fredericks Services was the lower, and within budget. He recommended awarding the contract for \$378,000. ***MSC: Brecht/Duncan approving the agreement with Fredericks Services Inc. for emergency sewerline repairs near La Casa Del Zorro. The roll call vote was unanimous.***

D. Agreement with SDGE for Pipeline Extension in Borrego Valley Rd.: Mr. Poole reported that SDG&E had contacted him because they expect a need for water at the solar farm. They asked BWD to extend a water line about a mile, and SDG&E will reimburse the District. Mr. Dale showed the location on a map, near the airport. He explained that SDG&E will make a down payment to cover engineering, then half the estimated cost, and then BWD will put the project out to bid. Alan Ashe outlined the components of the work. Mr. Dale will do the design in house, and then use an outside contractor for the construction. Best Best & Krieger has prepared a reimbursement agreement providing that SDG&E will cover whatever BWD spends plus ten percent. ***MSC: Brecht/Johnson approving the reimbursement agreement between SDG&E and BWD. The roll call vote was unanimous.***

E. Borrego Springs Basin Interim Watermaster:

1. Update on Activities. Director Duncan reported that the next WMB meeting was scheduled for December 10 at 4:30 p.m. The WMB is moving ahead with establishment of an Environmental Working Group. Wildermuth Environmental, employer of the Executive Director and Technical Consultant, has been purchased by West Yost.

III. STAFF REPORTS

A. Water Sales and Revenues Update: Ms. Clabaugh presented a graph showing total water revenues for November of \$314,000, in line with expectations. Units sold totaled 51,175, down 1.89 percent from last year. The three-year average was consistent, as were the sewer revenues. The aging accounts increased slightly, with \$249,000 past due in November, a \$108,000 increase since February. Esmeralda Garcia is contacting past due account holders. Director Duncan asked what percentage of past due moneys was being collected. Ms. Clabaugh replied that collections are now eight percent over the arrears total, because people are starting to catch up on old bills.

B. Discussion of Public Outreach Needs: Mr. Poole reported that Director Baker had expressed concern about some continued confusion among members of the public. Staff will continue to discuss public misconceptions during the Town Hall meeting and 218 process.

C. Publication of Materials from 11-24 Board Meeting: Air Quality Monitoring by Dr. Charles Zender: Mr. Poole invited the Board's attention to Dr. Zender's presentation at the last meeting, included in today's Board package. Mr. Kostiuk's presentation will be included in the next package.

Mr. Poole reported that bids for construction of replacement Well ID 5-X will be opened this afternoon.

IV. CLOSED SESSION:

A. Conference with Legal Counsel – Significant exposure to litigation pursuant to paragraph (3) of subdivision (d) of Government Code Section 54956.9: (Two (2) potential cases):

B. Conference with Legal Counsel – Existing Litigation (*BWD v. All Persons Who Claim a Right to Extract Groundwater, et al.*, San Diego Superior Court case no. 37-2020-00005776):

The Board adjourned to closed session at 10.50 a.m., and thereafter, the open session reconvened. There was no reportable action.

V. CLOSING PROCEDURE

The next Board Meeting is scheduled for December 22, 2020 at Borrego Water District, 806 Palm Canyon Drive, Borrego Springs, CA 92004. There being no further business, the Board adjourned.

Borrego Water District Board of Directors
MINUTES
Regular Meeting
December 22, 2020 @ 9:00 a.m.
806 Palm Canyon Drive
Borrego Springs, CA 92004

I. OPENING PROCEDURES

- A. Call to Order:** President Dice called the meeting to order at 9:00 a.m.
- B. Pledge of Allegiance:** Those present stood for the Pledge of Allegiance.
- C. Roll Call: Directors: Present: President Dice, Vice President
Brecht, Secretary/Treasurer
Duncan, Baker, Johnson

Staff: Geoff Poole, General Manager
David Dale, District Engineer
Jessica Clabaugh, Finance Officer
Esmeralda Garcia, Administrative Assistant
Wendy Quinn, Recording Secretary**

D. Approval of Agenda: *MSC: Johnson/Brecht approving the Agenda as written. The roll call vote was unanimous.*

- E. Approval of Minutes:**
 - 1. November 10, 2020 Special Board Meeting.
 - 2. November 24, 2020 Regular Board Meeting.

MSC: Johnson/Brecht approving the Minutes of the Special Board Meeting of November 10, 2020 and the Regular Board Meeting of November 24, 2020 as written. The roll call vote was unanimous.

F. Comments from the Public and Requests for Future Agenda Items: None

G. Comments from Directors: Director Brecht asked whether the School District charges developers' fees. Geoff Poole agreed to ask Mark Stevens.

H. Correspondence Received from the Public: None

II. ITEMS FOR BOARD CONSIDERATION AND POSSIBLE ACTION

A. RESOLUTION NO. 2020-12-01 OF THE BOARD OF DIRECTORS OF BORREGO WATER DISTRICT AWARDING A CONSTRUCTION CONTRACT TO AND AUTHORIZING THE DISTRICT PRESIDENT OR HER DESIGNEE TO EXECUTE THE CONTRACT WITH THE LOWEST RESPONSIBLE AND RESPONSIVE BIDDER SUBMITTING A RESPONSIVE BID, SOUTHWEST DRILLING, IN THE AMOUNT OF \$857,250 FOR THE ID-5X WELL PROJECT; MAKING CEQA-RELATED FINDINGS AND AUTHORIZING STAFF TO FILE NOTICE OF EXEMPTION: David Dale reported that four bids were submitted for construction of the ID 5-X well. The lowest responsible bidder was Southwest Drilling, the same contractor who recently constructed Well 4-9, for \$822,250 plus \$35,000 for a sound wall, \$857,250 total. He recommended that the contract be awarded to Southwest Drilling. Mr. Poole noted that a Notice of Exemption would be filed in accordance with the CEQA findings. ***MSC: Brecht/Duncan adopting Resolution No. 2020-12-01 of the Board of Directors of Borrego Water District Awarding a Construction Contract to and Authorizing the District President or her Designee to Execute the Contract with the Lowest Responsible and Responsive Bidder Submitting a Responsive Bid, Southwest Drilling, in the Amount of \$857,250 for the ID-5X Well Project; Making CEQA-related Findings and Authorizing Staff to File Notice of Exemption. The roll call vote was unanimous.***

B. Bi-Ennial Conflict of Interest Code Review and Approval of RESOLUTION 2020-12-02 RESOLUTION OF THE BOARD OF DIRECTORS OF THE BORREGO WATER DISTRICT AMENDING THE CONFLICT OF INTEREST CODE PURSUANT TO THE POLITICAL REFORM ACT OF 1974: Mr. Poole reported that Esmeralda Garcia had been working with Best Best & Krieger on changes to the BWD Conflict of Interest Code. This is done every two years, and staff recommends acceptance. Ms. Garcia invited the Board’s attention to the red-lined version of the Code in the Board package. The major change was to add the District Engineer to those who need to file a statement of economic interests. Discussion followed regarding whether the Finance Officer needs to file, and Ms. Garcia agreed to double check with Best Best & Krieger. ***MSC: Brecht/Duncan adopting Resolution 2020-12-02, Resolution of the Board of Directors of the Borrego Water District Amending the Conflict of Interest Code Pursuant to the Political Reform Act of 1974, subject to confirmation from legal counsel as to inclusion of the Finance Officer. The roll call vote was unanimous.***

C. Interim Borrego Springs Subbasin Watermaster Board:

1. Update on Board Activities. Director Duncan announced the next meeting, January 14. Mr. Poole reported that WM Executive Director Samantha Adams and an associate visited Borrego Springs last week, met with him and did some water sampling.

III. STANDING AND AD-HOC BOARD COMMITTEE REPORTS

A. STANDING:

1. Operations and Infrastructure. No report.

B. AD-HOC:

a. Stipulated Judgment Implementation. No report.

b. Risk Management/Pandemic. Director Brecht recommended a review of the Risk Management Policy sometime in January.

c. Grant Funding. Mr. Poole reported he was pretty sure the District would be receiving the \$500,000 grant for work on the wastewater treatment plant soon. BWD will also be replacing three reservoirs. Rick Alexander is continuing to look for grant opportunities and has suggested enlisting the help of a second consultant. Mr. Poole will discuss it with Director Johnson and perhaps ask the other consultant to speak to the Board in January. Director Johnson reported that the Borrego Art Institute is considering hiring a grant writer, and it would be nice if he/she could serve the whole community. She also suggested that someone go to Sacramento in an effort to get SGMA grants for adjudicated basins. Mr. Poole noted that Best Best & Krieger is working on that.

d. Association of California Water Agencies/Joint Powers Authority. No report.

e. Organizational Staffing. No report.

f. Prop 218 and BWD Developers’ Policy. No report.

g. Public Outreach.

i. Proposition 218 Update and Outreach Schedule. President Dice reported that she, Director Baker and Mr. Poole had begun discussing plans for Prop 218 outreach. Mr. Poole invited the Board’s attention to a proposed schedule in the Board package. Information was disseminated in the newsletter and *Borrego Sun* articles are planned for February and March. A Town Hall meeting will be held in March and a public hearing in May, with the new rates to be adopted in June. President Dice added that information will also be available on social media.

Director Baker explained that the themes for outreach throughout the year will be, “What has the Water District done for you?” and “Why approve increased rates, and what will happen if we don’t?” Director Johnson asked whether Raftelis had a short brochure, hopefully free, that explains Proposition 218. Mr. Poole will look into it.

IV. MONTHLY FINANCIAL & OPERATIONS REPORTS

A. Financial Reports: November 2020: Jessica Clabaugh reported \$7.2 million in cash and cash equivalents at the end of November. The cash flow is \$379,000+, and reserves have increased. Expenses were as usual, and included a \$20,000 payment for the air quality study and the State Water Resources

Control Board permit renewal for a total operating expense of \$401,000+. Operating income was \$199,000. There were two small main breaks in the Lazy S area, and they were quickly repaired. Bond funds are being expended on the De Anza pipeline and new well. A \$232,398 check was received from a Proposition 1 grant, which will be used to reimburse the District for expenses related to the sewer system. The bond fund had a remaining balance of \$1.1 million at the end of November. Watermaster expenses included payments to Best Best & Krieger, Dudek and Jerry Rolwing.

B. Water and Wastewater Operations Report: November 2020: The Water and Wastewater Operations Report was included in the Board package.

C. Water Production/Use Records: November 2020: The Water Production/Use Records were included in the Board package.

V. STAFF REPORTS

1. Deferred to January Meeting.

VI. CLOSED SESSION

A. Conference with Legal Counsel – Significant exposure to litigation pursuant to Government Code paragraph (3) of subdivision (d) of Section 54956.9 (Two (2) potential cases):

B. Conference with Legal Counsel – Existing Litigation (*BWD v. All Persons Who Claim a right to Extract Groundwater, et al.* (San Diego Superior Court case no. 37-2020-00005776)):

The Board adjourned to closed session at 10:10 p.m., and thereafter, the open session reconvened. There was no reportable action.

VII. CLOSING PROCEDURE

The next Board Meeting is scheduled for January 12, 2021, to be available on line. See Board Agenda at BorregoWD.org for details, available at least 72 hours before the meeting. There being no further business, the meeting adjourned.

BORREGO WATER DISTRICT
BOARD OF DIRECTORS MEETING
JANUARY 26, 2021
AGENDA ITEM II.A

January 20, 2021

TO: Board of Directors

FROM: Geoffrey Poole, General Manager

SUBJECT: Water and Sewer Financing Plan Update – Fieldman/Rolapp and Associates: R Porr and L Carpenter

RECOMMENDED ACTION:

Receive Update from Consultants on Financing Plan and discuss related issues

ITEM EXPLANATION:

Robert Porr and Lora Carpenter will be presenting an update on BWD Financing Plan. The Financing Plan will provide the latest projections on debt issuance size and timing to fund construction of BWD Capital Improvement Plan. During development of the Financing Plan, a few Policy decisions surfaced and Robert/Lora will let the Board know about these issues to begin the discussions. Staff will not be asking for Board action on these issues, just a discussion of the issues at this point.

Raftelis Consulting is continuing its work on the water and sewer rate modeling. The information presented on Tuesday by FRA has been sent to Raftelis for inclusion in its model.

NEXT STEPS:

1. Continue with Prop 218 process

ATTACHMENTS

1. Summary of FRA Model

BORREGO WATER DISTRICT
BOARD OF DIRECTORS MEETING
JANUARY 26, 2021
AGENDA ITEM II.B

January 21, 2021

TO: Board of Directors

FROM: Geoffrey Poole, General Manager/David Dale, PE District Engineer

SUBJECT: Approval of Plans/Specifications and Bid Documents for the Bending Elbow, Weather Vane, Rocking Chair, Walking H and Double O Pipeline Project – Capital Improvement Projects Number 1 and 3A

RECOMMENDED ACTION:

Staff is requesting approval of plans/specifications and bid documents for the Bending Elbow, Weather Vane, Rocking Chair, Walking H and Bending Elbow Project.

ITEM EXPLANATION:

The District's water distribution system is aging. Some parts of the distribution system were installed in the 1960's and are starting to reach their life expectancy. The pressure in the system is over 100psi in many areas.

Each year there are costly water pipe breaks that the District repairs. The CIP has included these costs as routine repairs each year.

The District's water distribution system was piecemealed together over time as the District took over smaller Districts in the area. The smaller pipelines were interconnected to the BWD system at the time of the mergers.

This project was identified by Staff as the most pressing water pipeline replacement project because of the lack of proper fire flow and frequent water pipeline breaks in these locations. The project will include six- and eight-inch diameter pipelines, new fire hydrants and service laterals to existing homes. The fire hydrants were strategically located within 500 feet of existing structures.

The project was designed and the contract documents were prepared by BWD Staff and are ready to be advertised for public bidding.

NEXT STEPS

Upon approval, the project will be advertised for public bidding.

FISCAL IMPACT

The CIP has budgeted \$580,000 for this project - \$380,000 for CIP project number 1 (Bending Elbow) and \$200,000 for the Walking H/Double O project.

ATTACHMENTS

1. Plans/Specifications and Bid Documents

BORREGO WATER DISTRICT

CONTRACT DOCUMENTS AND SPECIFICATIONS FOR

BENDING ELBOW, WEATHER VANE, ROCKING CHAIR DRIVE, ROCKING H AND DOUBLE O PIPELINES PROJECT

(BWD Capital Improvements Projects)

February 2021

**Borrego Water District
806 Palm Canyon Drive
Borrego Springs, California 92004**

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00 11 16 – NOTICE INVITING BIDS

NOTICE IS HEREBY GIVEN that the Borrego Water District (“DISTRICT”) invites and will receive sealed Bids up to but not later than **2:00 p.m. on Tuesday, March 2, 2021** at 806 Palm Canyon Drive, Borrego Springs, California 92004, for the furnishing to DISTRICT of all labor, equipment, materials, tools, services, transportation, permits, utilities, and all other items necessary for the **BENDING ELBOW, WEATHER VANE AND ROCKING CHAIR DRIVE PIPELINES Project** (the “Project”). At said time, Bids will be publicly opened and read aloud at the DISTRICT Office. Bids received after said time shall be returned unopened. Bids shall be valid for a period of 90 calendar days after the Bid opening date.

The work shall include the procurement of materials and the installation of a new 8-inch and 6-inch diameter water main pipeline along Bending Elbow, Weather Vane and Rocking Chair Drive, with new service laterals, valves, and fittings. The work also includes the tie-ins to the existing water distribution system. The work also includes the installation of new fire hydrants in various places. Construction staking and Geotechnical Testing will be provided by the DISTRICT.

Bids must be submitted on the DISTRICT’s Bid Forms. Bidders may obtain a copy of the Contract Documents from the DISTRICT at: 806 Palm Canyon Dr, Borrego Springs CA or Geoff@BorregoWD.org or 760-767-5806 for \$30 (Thirty Dollars)**]. A non-refundable charge \$50 (Fifty) will be required of any bidder who requests that the Contract Documents be mailed within California (costs for out-of-state mailings will be higher). To the extent required by section 20103.7 of the Public Contract Code, upon request from a contractor plan room service, the DISTRICT shall provide an electronic copy of the Contract Documents at no charge to the

Bids must be submitted on the DISTRICT’s Bid Forms. Bidders may obtain a copy of the Contract Documents from the Borrego Water District Websire (BorregoWD.org) on the BULLETIN BOARD located on the Home Page. To the extent required by section 20103.7 of the Public Contract Code, upon request from a contractor plan room service, the DISTRICT shall provide an electronic copy of the Contract Documents at no charge to the contractor plan room.

It is the responsibility of each prospective bidder to download and print all Bid Documents for review and to verify the completeness of Bid Documents before submitting a bid. Any Addenda will be posted on BorregoWD.org. It is the responsibility of each prospective bidder to check BorregoWD.org on a daily basis through the close of bids for any applicable addenda or updates. The DISTRICT does not assume any liability or responsibility based on any defective or incomplete copying, excerpting, scanning, faxing, downloading or printing of the Bid Documents. Information on BorregoWD.org may change without notice to prospective bidders. The Contract Documents shall supersede any information posted or transmitted by BorregoWD.org

Each Bid shall be accompanied by cash, a certified or cashier’s check, or Bid Bond secured from a surety company satisfactory to the General Manager, the amount of which shall not be less than ten percent (10%) of the submitted Total Bid Price, made payable to Borrego Water District as bid security. The bid security shall be provided as a guarantee that within five (5) working days after the DISTRICT provides the successful bidder the Notice of Award, the successful Bidder will enter into a contract and provide the necessary bonds and certificates of

insurance. The bid security will be declared forfeited if the successful Bidder fails to comply within said time. No interest will be paid on funds deposited with DISTRICT.

A non-mandatory Pre-Bid Conference is scheduled for February 9th, 2021 at 1:30 PM to review the Project's existing conditions at BWD Office (806 Palm Canyon Dr.). Representatives of the DISTRICT and consulting engineers, if any, will be present or participate via webinar. Questions asked by Bidders at the Pre-Bid Conference not specifically addressed within the Contract Documents shall be answered in writing, and shall be sent to all Bidders present at the Pre-Bid Conference. Bids will not be accepted from any bidder who did not attend the mandatory Pre-Bid Conference.

The successful Bidder will be required to furnish a Faithful Performance Bond and a Labor and Material Payment Bond each in an amount equal to one hundred percent (100%) of the Contract Price. Each bond shall be in the forms set forth herein, shall be secured from a surety company that meets all State of California bonding requirements, as defined in California Code of Civil Procedure Section 995.120, and that is a California admitted surety insurer.

Pursuant to Section 22300 of the Public Contract Code of the State of California, the successful Bidder may substitute certain securities for funds withheld by DISTRICT to ensure its performance under the contract.

Pursuant to Labor Code Section 1773, DISTRICT has obtained the prevailing rate of per diem wages and the prevailing wage rate for holiday and overtime work applicable in San Diego County from the Director of the Department of Industrial Relations for each craft, classification, or type of worker needed to execute this contract. A copy of these prevailing wage rates may be obtained via the internet at: www.dir.ca.gov/dlsr/

In addition, a copy of the prevailing rate of per diem wages is available at the DISTRICT's office and shall be made available to interested parties upon request. The successful bidder shall post a copy of the prevailing wage rates at each job site. It shall be mandatory upon the Bidder to whom the Contract is awarded, and upon any subcontractors, to comply with all Labor Code provisions, which include but are not limited to the payment of not less than the said specified prevailing wage 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.

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. No Bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work. If awarded a contract, the Bidder and its subcontractors, of any tier, shall maintain active registration with the Department of Industrial Relations for the duration of the Project. Notwithstanding the foregoing, the contractor registration requirements mandated by Labor Code Sections 1725.5 and 1771.1 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code Sections 1725.5 and 1771.1.

This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. In bidding on this Project, it shall be the Bidder's sole responsibility to evaluate and include the cost of complying with all labor compliance requirements under this contract and applicable law in its Bid.

Unless otherwise provided in the Instructions for Bidders, each Bidder shall be a licensed contractor pursuant to sections 7000 et seq. of the Business and Professions Code in the following classification(s) throughout the time it submits its Bid and for the duration of the contract:

Class A (General).

Substitution requests shall be made within 35 calendar days after the award of the contract. Pursuant to Public Contract Code Section 3400(b), the DISTRICT may make findings designating that certain additional materials, methods or services by specific brand or trade name other than those listed in the Standard Specifications be used for the Project. Such findings, if any, as well as the materials, methods or services and their specific brand or trade names that must be used for the Project may be found in the Special Conditions.

DISTRICT shall award the contract for the Project to the responsible bidder offering the best value to the District as determined by the DISTRICT from the **BASE BID AND CONTRACT DOCUMENTS**. DISTRICT reserves the right to reject any or all bids or to waive any irregularities or informalities in any bids or in the bidding process.

For further information, contact Geoff Poole, General Manager at Geoff@BorregoWD.Org or 760-767-5806.

END OF NOTICE INVITING BIDS

00 21 13 – INSTRUCTIONS TO BIDDERS

ARTICLE 1. SECURING DOCUMENTS

Bids must be submitted to the DISTRICT on the Bid Forms which are a part of the Bid Package for the Project. Bid and Contract Documents may be obtained from the DISTRICT at the location(s) and at the time(s) indicated in the Notice Inviting Bids. Prospective bidders are encouraged to telephone in advance to determine the availability of Contract Documents. Any charge for the Contract Documents is stated in the Notice Inviting Bids.

The DISTRICT may also make the Contract Documents available for review at one or more plan rooms, as indicated in the Notice Inviting Bids. Please Note: Prospective Bidders who choose to review the Contract Documents at a plan room must contact the DISTRICT to obtain the required Contract Documents if they decide to submit a bid for the Project.

Addenda, if any, issued during the bid period will be sent only to those contractors who have obtained documents from the DISTRICT.” Failure to acknowledge addenda may make a bid nonresponsive and not eligible for award of the contract.

ARTICLE 2. EXAMINATION OF SITE AND CONTRACT DOCUMENTS

At its own expense and prior to submitting its Bid, each Bidder shall visit the site of the proposed work and fully acquaint itself with the conditions relating to the construction and labor required so that the Bidder may fully understand the work, including but not limited to difficulties and restrictions attending the execution of the work under the contract. Each Bidder shall carefully examine the Drawings, and shall read the Specifications, Contract, and all other documents referenced herein. Each Bidder shall also determine the local conditions which may in any way affect the performance of the work, including local tax structure, contractors’ licensing requirements, availability of required insurance, the prevailing wages and other relevant cost factors, shall familiarize itself with all federal, state and local laws, ordinances, rules, regulations and codes affecting the performance of the work, including the cost of permits and licenses required for the work, and shall make such surveys and investigations, including investigations of subsurface or latent physical conditions at the site or where work is to be performed as may be required. Bidders are responsible for consulting the standards referenced in the Contract. The failure or omission of any Bidder to receive or examine any contract documents, forms, instruments, addenda, or other documents, or to visit the site and acquaint itself with conditions there existing shall in no way relieve any Bidder from any obligation with respect to its Bid or to the contract and no relief for error or omission will be given except as required under State law. The submission of a Bid shall be taken as conclusive evidence of compliance with this Article.

ARTICLE 3. INTERPRETATION OF DRAWINGS AND DOCUMENTS

Prospective Bidders unclear as to the true meaning of any part of the Drawings, Specifications or other proposed contract documents may submit to the Engineer of the DISTRICT a written request for interpretation. The prospective Bidder submitting the request is responsible for prompt delivery. Interpretation of the Drawings, Specifications or other proposed contract documents will be made only by a written addendum duly issued and a copy of such addenda will be mailed or delivered to each prospective Bidder who has purchased a set of Drawings and Specifications. The DISTRICT will not be responsible for any other explanation or interpretations of the proposed documents. If a Prospective Bidders becomes aware of any errors or omissions in any part of the Contract Documents, it is the obligation of the Prospective

Bidder to promptly bring it to the attention of the DISTRICT.

ARTICLE 4. PRE-BID CONFERENCE

A NON-MANDATORY Pre-Bid Conference is scheduled for January 28, 2020 at 1:30 PM at 806 Palm Canyon Dr, Borrego Springs CA to review the Project's existing conditions. Representatives of the DISTRICT and consulting engineers, if any, will be present. Questions asked by Bidders at the Pre-Bid Conference not specifically addressed within the Contract Documents shall be answered in writing, and shall be sent to all Bidders present at the Pre-Bid Conference. Bids will not be accepted from any bidder who did not attend the mandatory Pre-Bid Conference.

ARTICLE 5. ADDENDA

The DISTRICT reserves the right to revise the Contract Documents prior to the Bid opening date. Revisions, if any, shall be made by written Addenda. All Addenda issued by the DISTRICT shall be included in the Bid and made part of the Contract Documents. Pursuant to Public Contract Code Section 4104.5, if the DISTRICT issues an Addendum which includes material changes to the Project less than 72 hours prior to the deadline for submission of Bids, the DISTRICT will extend the deadline for submission of Bids. The DISTRICT may determine, in its sole discretion, whether an Addendum warrants postponement of the Bid submission date. Each prospective Bidder shall provide DISTRICT a name, address, email address, and facsimile number to which Addenda may be sent, as well as a telephone number by which the DISTRICT can contact the Bidder. Copies of Addenda will be furnished by email, facsimile, first class mail, express mail or other proper means of delivery without charge to all parties who have obtained a copy of the Contract Documents and provided such current information. Please Note: Bidders are responsible for ensuring that they have received any and all Addenda. To this end, each Bidder should contact Geoff Poole to verify that it has received all Addenda issued, if any, prior to the Bid opening. The Bidder shall indicate the Addenda received prior to bidding in the space provided in the Bid Form. Failure to indicate all Addenda may be sufficient cause for rejecting the Bid.

ARTICLE 6. ALTERNATE BIDS

If alternate bid items are called for in the Contract Documents, the time required for completion of the alternate bid items has already been factored into the Contract duration and no additional Contract time will be awarded for any of the alternate bid items. The DISTRICT may elect to include one or more of the alternate bid items, or to otherwise remove certain work from the Project scope of work. Accordingly, each bidder must ensure that each bid item contains a proportionate share of profit, overhead, and other costs or expenses which will be incurred by the bidder.

ARTICLE 7. COMPLETION OF BID FORMS

Bids shall only be prepared using copies of the Bid Forms which are included in the Contract Documents. The use of substitute Bid Forms other than clear and correct photocopies of those provided by the DISTRICT will not be permitted. Bids shall be executed by an authorized signatory as described in these Instructions to Bidders. In addition, Bidders shall fill in all blank spaces (including inserting "N/A" where applicable), and initial all interlineations, alterations, or erasures to the Bid Forms. Bidders shall neither delete, modify, nor supplement the printed matter on the Bid Forms nor make substitutions thereon. **USE OF BLACK OR BLUE INK,**

INDELIBLE PENCIL, OR A TYPEWRITER IS REQUIRED. Deviations in the Bid Forms may result in the Bid being deemed non-responsive.

ARTICLE 8. MODIFICATIONS OF BIDS

Each Bidder shall submit its Bid in strict conformity with the requirements of the Contract Documents. Unauthorized additions, modifications, revisions, conditions, limitations, exclusions or provisions attached to a Bid may render it non-responsive and may cause its rejection. Bidders shall not delete, modify, or supplement the printed matter on the Bid Forms, or make substitutions thereon. Oral, telephonic and electronic modifications will not be considered.

ARTICLE 9. SUBCONTRACTORS

Bidder shall set forth the name, address of the place of business, and contractor license number of each subcontractor who will perform work, labor, furnish materials or render services to the bidder on said contract and each subcontractor licensed by the State of California who, under subcontract to bidder, specially fabricates and installs a portion of the Work described in the Drawings and Specifications in an amount in excess of one half of one percent (0.5%) of the total bid price, and shall indicate the portion of the work to be done by such subcontractor in accordance with Public Contract Code Section 4104.

ARTICLE 10. LICENSING REQUIREMENTS

Pursuant to Business and Professions Code Section 7028.15 and Public Contract Code Section 3300, all bidders must possess proper licenses for performance of this Contract. Subcontractors must possess the appropriate licenses for each specialty subcontracted. Pursuant to Business and Professions Code Section 7028.5, the DISTRICT shall consider any bid submitted by a contractor not currently licensed in accordance with state law and pursuant to the requirements found in the Contract Documents to be nonresponsive, and the DISTRICT shall reject the Bid. The DISTRICT shall have the right to request, and Bidders shall provide within ten (10) calendar days, evidence satisfactory to the DISTRICT of all valid license(s) currently held by that Bidder and each of the Bidder's subcontractors, before awarding the Contract.

Notwithstanding anything contained herein, if the Work involves federal funds, the Contractor shall be properly licensed by the time the Contract is awarded, pursuant to the provisions of Public Contract Code section 20103.5.

ARTICLE 11. BID GUARANTEE (BOND)

Each bid shall be accompanied by: (a) cash; (b) a certified or cashier's check made payable to Borrego Water District; or (c) a Bid Bond secured from a surety company satisfactory to the General Manager, the amount of which shall not be less than ten percent (10%) of the Total Bid Price, made payable to Borrego Water District as bid security. Personal sureties and unregistered surety companies are unacceptable. The surety insurer shall be California admitted surety insurer, as defined in Code of Civil Procedure Section 995.120. The bid security shall be provided as a guarantee that within ten (10) working days after the DISTRICT provides the successful bidder the Notice of Award, the successful bidder will enter into a contract and provide the necessary bonds and certificates of insurance. The bid security will be declared forfeited if the successful bidder fails to comply within said time, and DISTRICT may enter into a contract with the next lowest responsive responsible bidder, or may call for new

bids. No interest shall be paid on funds deposited with the DISTRICT. DISTRICT will return the security accompanying the bids of all unsuccessful bidders no later than 60 calendar days after award of the contract.

ARTICLE 12. IRAN CONTRACTING ACT OF 2010

In accordance with Public Contract Code Section 2200 *et seq.*, the DISTRICT requires that any person that submits a bid or proposal or otherwise proposes to enter into or renew a contract with the DISTRICT with respect to goods or services of one million dollars (\$1,000,000) or more, certify at the time the bid is submitted or the contract is renewed, that the person is not identified on a list created pursuant to subdivision (b) of Public Contract Code Section 2203 as a person engaging in investment activities in Iran described in subdivision (a) of Public Contract Code Section 2202.5, or as a person described in subdivision (b) of Public Contract Code Section 2202.5, as applicable.

The form of such Iran Contracting Certificate is included with the bid package and must be signed and dated under penalty of perjury.

ARTICLE 13. NONCOLLUSION DECLARATION

Bidders on all public works contracts are required to submit a declaration of noncollusion with their bid. This form is included with the bid package and must be signed and dated under penalty of perjury.

ARTICLE 14. PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work. If awarded a contract, the bidder and its subcontractors, of any tier, shall maintain active registration with the Department of Industrial Relations for the duration of the Project. To this end, Bidder shall sign and submit with its Bid the Public Works Contractor Registration Certification on the form provided, attesting to the facts contained therein. Failure to submit this form may render the bid non-responsive. In addition, each Bidder shall provide the registration number for each listed subcontractor in the space provided in the Designation of Subcontractors form.

ARTICLE 15. BIDDER INFORMATION AND EXPERIENCE FORM

Each Bidder shall complete the questionnaire provided herein and shall submit the questionnaire along with its Bid. Failure to provide all information requested within the questionnaire along with the Bid may cause the bid to be rejected as non-responsive. The DISTRICT reserves the right to reject any Bid if an investigation of the information submitted does not satisfy the Engineer that the Bidder is qualified to properly carry out the terms of the contract.

ARTICLE 16. WORKERS' COMPENSATION CERTIFICATION

In accordance with the provisions of Labor Code Section 3700, Contractor shall secure the payment of compensation to its employees. Contractor shall sign and file with the DISTRICT

the following certificate prior to performing the work under this Contract:

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 that code, and I will comply with such provisions before commencing the performance of the work of this contract.

The form of such Workers' Compensation Certificate is included as part of this document.

ARTICLE 17. SIGNING OF BIDS

All Bids submitted shall be executed by the Bidder or its authorized representative. Bidders may be asked to provide evidence in the form of an authenticated resolution of its Board of Directors or a Power of Attorney evidencing the capacity of the person signing the Bid to bind the Bidder to each Bid and to any Contract arising therefrom.

If a Bidder is a joint venture or partnership, it may be asked to submit an authenticated Power of Attorney executed by each joint venturer or partner appointing and designating one of the joint venturers or partners as a management sponsor to execute the Bid on behalf of Bidder. Only that joint venturer or partner shall execute the Bid. The Power of Attorney shall also: (1) authorize that particular joint venturer or partner to act for and bind Bidder in all matters relating to the Bid; and (2) provide that each venturer or partner shall be jointly and severally liable for any and all of the duties and obligations of Bidder assumed under the Bid and under any Contract arising therefrom. The Bid shall be executed by the designated joint venturer or partner on behalf of the joint venture or partnership in its legal name.

ARTICLE 18. SUBMISSION OF SEALED BIDS

Once the Bid and supporting documents have been completed and signed as set forth herein, they shall be placed, along with the Bid Guarantee and other required materials, in a sealed envelope, addressed and delivered or mailed, postage prepaid, to the Engineering Department of the DISTRICT before the time and day set for the receipt of bids. The envelope shall bear the title of the work and the name of the bidder. No oral or telephonic bids will be considered. No forms transmitted via the internet, e-mail, facsimile, or any other electronic means will be considered unless specifically authorized by the DISTRICT as provided herein. Bids received after the time and day set for the receipt of bids shall be returned to the bidder unopened. The envelope shall also contain the following in the lower left-hand corner thereof:

Bid of _____ (Bidder's Name)
for the BENDING ELBOW, WEATHER VANE AND ROCKING CHAIR DRIVE
PIPELINES Project

Only where expressly permitted in the Notice Inviting Bids may bidders submit their bids via electronic transmission pursuant to Public Contract Code sections 1600 and 1601. Any acceptable method(s) of electronic transmission shall be stated in the Notice Inviting Bids. DISTRICT may reject any bid not strictly complying with DISTRICT's designated methods for delivery.

ARTICLE 19. OPENING OF BIDS

At the time and place set for the opening and reading of bids, or any time thereafter, each and

every bid received prior to the time and day set for the receipt of bids will be publicly opened and read. The DISTRICT will leave unopened any Bid received after the specified date and time, and any such unopened Bid will be returned to the bidder. It is the bidder's sole responsibility to ensure that its Bid is received as specified. Bids may be submitted earlier than the date(s) and time(s) indicated.

The public reading of each bid will include the following information:

- A. The name and business location of the bidder.
- B. The nature and amount of the bid security furnished by bidder.
- C. The bid amount.

Bidders or their representatives and other interested persons may be present at the opening of the bids. The DISTRICT may, in its sole discretion, elect to postpone the opening of the submitted Bids. The DISTRICT reserves the right to reject any or all Bids and to waive any informality or irregularity in any Bid.

ARTICLE 20. WITHDRAWAL OF BID

Any bid may be withdrawn either personally or by written request, incurring no penalty, at any time prior to the scheduled closing time for receipt of bids. Requests to withdraw bids shall be worded so as not to reveal the amount of the original bid. Withdrawn bids may be resubmitted until the time and day set for the receipt of bids, provided that resubmitted bids are in conformance with the instructions herein.

Bids may be withdrawn after bid opening only by providing written notice to DISTRICT within five (5) working days of the bid opening and in compliance with Public Contract Code Section 5100 *et seq.*, or as otherwise may be allowed with the consent of the DISTRICT.

ARTICLE 21. BIDDERS INTERESTED IN MORE THAN ONE BID

No Bidder shall be allowed to make, file or be interested in more than one bid for the same work unless alternate bids are specifically called for. A person, firm or corporation that has submitted a sub-proposal to a Bidder, or that has quoted prices of materials to a Bidder, is not thereby disqualified from submitting a sub-proposal or quoting prices to other bidders. No person, firm, corporation, or other entity may submit a sub-proposal to a Bidder, or quote prices of materials to a Bidder, when also submitting a prime Bid on the same Project.

ARTICLE 22. SUBSTITUTION OF SECURITY

The Contract Documents call for monthly progress payments based upon the percentage of the Work completed. The DISTRICT will retain a percentage of each progress payment as provided by the Contract Documents. At the request and expense of the successful Bidder, the DISTRICT will substitute securities for the amount so retained in accordance with Public Contract Code Section 22300.

ARTICLE 23. PREVAILING WAGES

The DISTRICT has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages in the locality in which this work is to be performed for each craft or type of worker needed to execute the Contract. These rates are available at the DISTRICT or may be obtained online at <http://www.dir.ca.gov>. Bidders are advised that a copy of these rates must be posted by the successful Bidder at the job site(s).

ARTICLE 24. DEBARMENT OF CONTRACTORS AND SUBCONTRACTORS

In accordance with the provisions of the Labor Code, contractors or subcontractors may not perform work on a public works project with a subcontractor who is ineligible to perform work on a public project pursuant to Labor Code Sections 1777.1 or 1777.7. Any contract on a public works project entered into between a contractor and a debarred subcontractor is void as a matter of law. A debarred subcontractor may not receive any public money for performing work as a subcontractor on a public works contract. Any public money that is paid to a debarred subcontractor by the Contractor for the Project shall be returned to the DISTRICT. The Contractor shall be responsible for the payment of wages to workers of a debarred subcontractor who has been allowed to work on the Project.

ARTICLE 25. INSURANCE REQUIREMENTS

Prior to commencing work, the successful bidder shall purchase and maintain insurance as set forth in the General Conditions.

ARTICLE 26. PERFORMANCE BOND AND PAYMENT BOND REQUIREMENTS

The successful bidder will be required to furnish a Labor and Material Payment Bond and a Faithful Performance Bond each in an amount equal to one hundred percent (100%) of the contract price. Each bond shall be secured from a surety company that meets all State of California bonding requirements, as defined in California Code of Civil Procedure Section 995.120 and is admitted by the State of California. Each bond shall be accompanied, upon the request of DISTRICT, with all documents required by California Code of Civil Procedure Section 995.660 to the extent required by law. All bonding and insurance requirements shall be completed and submitted to DISTRICT within ten (10) working days from the date the DISTRICT provides the successful bidder with the Notice of Award.

ARTICLE 27. SALES AND OTHER APPLICABLE TAXES, PERMITS, LICENSES AND FEES

Contractor and its subcontractors performing work under this Contract will be required to pay California sales tax and other applicable taxes, and to pay for permits, licenses and fees required by the agencies with authority in the jurisdiction in which the Work will be located, unless otherwise expressly provided by the Contract Documents.

ARTICLE 28. PERMIT ALLOWANCE

Notwithstanding anything contained herein, the Bid Form contains an allowance for the Contractor's cost of acquiring a San Diego County Encroachment Permit. The allowance is included within the Bid Form to eliminate the need by bidders to research or estimate the costs of the San Diego County Encroachment Permit prior to submitting a bid. The allowance is specifically intended to account for the actual cost of the San Diego County Encroachment

Permit only. No other costs payable by Contractor are included within the allowance. A change order, either additive or deductive, will be issued in accordance with Article 44 of the General Conditions for the actual cost of the San Diego County Encroachment Permit.

ARTICLE 29. FILING OF BID PROTESTS

Bidders may file a “protest” of a Bid with the DISTRICT’s General Manager. In order for a Bidder’s protest to be considered valid, the protest must:

- A. Be filed in writing within five (5) calendar days after the bid opening date;
- B. Clearly identify the specific irregularity or accusation;
- C. Clearly identify the specific DISTRICT staff determination or recommendation being protested;
- D. Specify in detail the grounds for protest and the facts supporting the protest; and
- E. Include all relevant, supporting documentation with the protest at time of filing.

If the protest does not comply with each of these requirements, the DISTRICT may reject the protest without further review.

If the protest is timely and complies with the above requirements, the DISTRICT’s General Manager, or other designated DISTRICT staff member, shall review the protest, any response from the challenged Bidder(s), and all other relevant information. The General Manager will provide a written decision to the protestor.

The procedure and time limits set forth in this Article are mandatory and are the sole and exclusive remedy in the event of a Bid protest. Failure to comply with these procedures shall constitute a failure to exhaust administrative remedies and a waiver of any right to further pursue the Bid protest, including filing a Government Code Claim or legal proceedings.

ARTICLE 30. BASIS OF AWARD; BALANCED BID

The DISTRICT shall award the Contract to the lowest responsible Bidder submitting a responsive Bid. The lowest Bid will be determined on the basis of the Total Bid Price. **AWARD WILL BE ON THE BASIS OF THE TOTAL BASE BID ALONE, NOT INCLUDING ALTERNATIVE BID ITEMS.**

The DISTRICT may reject any Bid which, in its opinion when compared to other Bids received or to the DISTRICT’s internal estimates, does not accurately reflect the cost to perform the Work. The DISTRICT may reject as non-responsive any Bid which unevenly weights or allocates costs, including but not limited to overhead and profit to one or more particular bid items.

ARTICLE 31. AWARD PROCESS

Once all Bids are opened and reviewed to determine the lowest responsive and responsible Bidder, the DISTRICT may award the contract. The apparent successful Bidder should begin to prepare the following documents: (1) the Performance Bond; (2) the Payment Bond; and (3) the

required insurance certificates and endorsements. Once the DISTRICT notifies the Bidder of the award, the Bidder will have ten (10) working days from the date of this notification to execute the Contract and supply the DISTRICT with all of the required documents and certifications. Once the DISTRICT receives all of the properly drafted and executed documents and certifications from the Bidder, the DISTRICT shall issue a Notice to Proceed to that Bidder. The Contractor shall begin work within ten (10) days after receiving the Notice to Proceed.

ARTICLE 32. EXECUTION OF CONTRACT

As required herein the Bidder to whom an award is made shall execute the Contract in the amount determined by the Contract Documents. The DISTRICT may require appropriate evidence that the persons executing the Contract are duly empowered to do so. The Contract and bond forms to be executed by the successful Bidder are included within these Specifications and shall not be detached.

ARTICLE 33. QUESTIONS

Questions regarding this Notice Inviting Bids may be directed to the General Manager at 760-767-5806 or email at Geoff@BorregoWD.Org. No other members of the DISTRICT's staff or Board of Directors should be contacted about this procurement during the bidding process. Any and all inquiries and comments regarding this Bid must be communicated in writing, unless otherwise instructed by the DISTRICT. The DISTRICT may, in its sole discretion, disqualify any Bidder who engages in any prohibited communications.

00 41 43 – BID FORMS

1.1 Bid.

Bids will be received at the Office of the Borrego Water District, located at 806 Palm Canyon Drive, Borrego Springs, California 92004 until **2:00 p.m. on Tuesday, March 2, 2021.**

NAME OF BIDDER: _____

To the General Manager
of the Borrego Water District
806 Palm Canyon Drive
Borrego Springs, California 92004

The undersigned hereby declare that we have carefully examined the location of the proposed Work, and have read and examined the Contract Documents, including all plans, specifications, and all addenda, if any for the following Project:

BENDING ELBOW, WEATHER VANE AND ROCKING CHAIR DRIVE PIPELINES Project

We hereby propose to furnish all labor, materials, equipment, tools, transportation, and services, and to discharge all duties and obligations necessary and required to perform and complete the Project, as described and in strict conformity with the Drawings, and these Specifications for TOTAL BID PRICE indicated herein.

The undersigned acknowledges receipt, understanding, and full consideration of the following addenda to the Contract Documents:

Addenda No. _____

1. Attached is the required Bid Guarantee in the amount of not less than 10% of the Total Bid Price.
2. Attached is the completed Designation of Subcontractors form.
3. Attached is the fully executed Noncollusion Declaration form.
4. Attached is the completed Iran Contracting Act Certification form.
5. Attached is the completed Public Works Contractor Registration Certification form.
6. Attached is the completed Contractor's Certificate Regarding Workers' Compensation form.
7. Attached is the completed Bidder Information and Experience form.

A. BID SCHEDULE

ITEM	QUAN	UNIT	ITEM	UNIT COST	AMOUNT
1	1	LS	Mobilization of equipment and material, Performance Bond, Payment Bond, General Liability Insurance, Workman's Compensation Insurance, Construction water, freight, project signs, Air pollution control district requirements and fees, Restroom Facilities, Vehicle Insurance, Taxes, Permits, Business license, and Similar expenses and other costs not specifically addressed within this bid item list.	\$	\$
2	1	LS	Preparation and Implementation of Dust Control Plan Per San Diego County Air Pollution Control District	\$	\$
3	1	LS	Preparation of Traffic Control Plan, Implementation of Traffic Control and Construction Area Signs	\$	\$
4	1	LS	Potholing of the Existing Underground Utilities and Pipelines as indicated on Improvement Plans.	\$	\$
5	1,075	LF	Sawcut/grind out Existing AC Pavement	\$	\$
6	1,350	SF	Remove and Dispose of AC Pavement and Underlying Base Material	\$	\$
7	1,440	LF	Furnish and Install New 6-inch Dia. AWWA C-900 DR 18 - Pressure Class 150 PVC Water Pipeline, Including Backfill and Compaction.	\$	\$
8	3,400	LF	Furnish and Install New 8-inch Dia. AWWA C-900 DR 18 - Pressure Class 150 PVC Water Pipeline, Including Backfill and Compaction.	\$	\$
9	500	CYS	Furnish and install Import sand material for backfilling the water pipe.	\$	\$

10	13	EA	Install 1 inch Water Lateral including Connection to 8" Water Main, 1 Inch Copper Pipe to Property Line and 1 inch Bronze Angle Meter Stop with Lockwing. (Do not include Water Meter, Meter box and Shut Off Valve).	\$	\$
11	11	LS	Install 1 inch Water Lateral (Via Directional Drill under Paved Road) including Connection to 8" Water Main, 1 Inch Copper Pipe to Property Line and 1 inch Bronze Angle Meter Stop with Lockwing. (Do not include Water Meter, Meter box and Shut Off Valve).	\$	\$
12	12	EA	Furnish and Install New 8-Dia. Ductile Iron Resilient Wedge Gate Valve with Valve Cover and Riser.	\$	\$
13	7	EA	Furnish and Install New 6-Dia. Ductile Iron Resilient Wedge Gate Valve with Valve Cover and Riser.	\$	\$
14	2	EA	Install New 8-Inch x 8-inch x 8-inch x 8-inch Dia. Cross Including Thrust Block.	\$	\$
15	2	EA	Furnish and Install New 8 inch x 8 inch x 8-Inch Dia. Epoxy-Coated Ductile Iron Tee and thrust block	\$	\$
16	1	EA	Furnish and Install New 8 inch x 8 inch x 6-Inch Dia. Epoxy-Coated Ductile Iron Tee and thrust block	\$	\$
17	3	EA	Furnish and Install 6-inch x 4-inch DI Reducer Fitting	\$	\$
18	1	EA	Furnish and Install 2-inch Blow-Off Assembly	\$	\$
19	7	EA	Furnish and Install 6-inch MJxMJ 22.5 DI Degree Bend	\$	\$
20	3	EA	Furnsh and Install 6-inch MJxMJ 11.25 DI Degree Bend	\$	\$

21	1	EA	Furnish and Install 6x6x6x6 DI Cross	\$	\$
22	1	LS	Connect New 6-inch PVC Pipe to Existing 2-inch Service Pipe with a 2-inch Stainless Steel Saddle, Approximately 30 feet of 2-inch Sch. 40 PVC Pipe and fittings.	\$	\$
23	2	EA	Furnish and Install 6-inch Blind Flange and Thrust Block	\$	\$
24	1	EA	Furnish and Install 8-inch Blind Flange and Thrust Block	\$	\$
25	6	EA	Furnish and Install New Fire Hydrant Assembly Including 6" Lateral, 6" Gate Valve and Valve Can	\$	\$
26	5	EA	Furnish and Install New 4-Inch Dia. Epoxy-Coated Ductile Iron Transition Coupling Adapter with Stainless Steel Hardware	\$	\$
27	40	Tons	Install 4 Inches of AC Pavement 3/4" Type III Class B3 (Per San Diego County Standards and Specifications)	\$	\$
28	40	CYS	Install 9 Inches of Class II Base	\$	\$
29	1	LS	Contractor to Complete Hydrostatic Pressure Testing per Specifications.	\$	\$
30	1	LS	Contractor to Complete Disinfection of the New Pipeline per Specifications	\$	\$
31	1	LS	San Diego County Encroachment Permit Fee Allowance. Contractor to obtain encroachment permit. If permit fees exceed or are less than the allowance fee, a change order or deductive change order based on the actual cost of the permit fees only will be processed to cover the difference.	\$	\$

The costs for any Work shown or required in the Contract Documents, but not specifically identified as a line item are to be included in the related line items and no additional compensation shall be due to Contractor for the performance of the Work.

In case of discrepancy between the Unit Price and the Item Cost set forth for a unit basis item, the unit price shall prevail and shall be utilized as the basis for determining the lowest responsive, responsible Bidder. However, if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any cause, or is omitted, or is the same amount as the entry in the "Item Cost" column, then the amount set forth in the "Item Cost" column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the Unit Price.

For purposes of evaluating Bids, the DISTRICT will correct any apparent errors in the extension of unit prices and any apparent errors in the addition of lump sum and extended prices.

The estimated quantities for Unit Price items are for purposes of comparing Bids only and the DISTRICT makes no representation that the actual quantities of work performed will not vary from the estimates. Final payment shall be determined by the Engineer from measured quantities of work performed based upon the Unit Price.

B. TOTAL BID PRICE FOR BID SCHEDULE:

TOTAL BID PRICE BASED ON BID SCHEDULE (BID ITEMS 1 – 31) TOTAL OF UNIT PRICES	
FOR: BENDING ELBOW, WEATHER VANE AND ROCKING CHAIR DRIVE PIPELINES Project	
\$ _____	Total Bid Price (Numerical)
\$ _____	Total Bid Price (Written Word)
In case of discrepancy between the written price and the numerical price, the written price shall prevail.	

The undersigned agrees that this Bid Form constitutes a firm offer to the DISTRICT which cannot be withdrawn for the number of calendar days indicated in the Notice Inviting Bids from and after the Bid opening, or until a Contract for the Work is fully executed by the DISTRICT and a third party, whichever is earlier.

The DISTRICT can choose to include any, all, or none of the Alternate Bid items in the Work. If the DISTRICT selects any of the Alternate Bid items, the corresponding Alternate Bid prices shall be added to Base Bid Price for the Work. The DISTRICT can award/select Alternate Bid items at any time(s).

The successful bidder hereby agrees to sign the contract and furnish the necessary bonds and certificates of insurance within ten (10) working days after the DISTRICT provides the successful bidder with the Notice of Award.

Upon receipt of the signed contract and other required documents, the contract will be executed by the DISTRICT, after which the DISTRICT will prepare a letter giving Contractor Notice to Proceed. The official starting date shall be the date of the Notice to Proceed, unless otherwise specified. The undersigned agrees to begin the Work within ten (10) working days of the date of the Notice to Proceed, unless otherwise specified.

The undersigned has examined the location of the proposed work and is familiar with the Drawings and Specifications and the local conditions at the place where work is to be done.

If awarded the contract, the undersigned agrees that there shall be paid by the undersigned and by all subcontractors to all laborers, workers and mechanics employed in the execution of such contract no less than the prevailing wage rate within San Diego County for each craft, classification, or type of worker needed to complete the Work contemplated by this contract as established by the Director of the Department of Industrial Relations. A copy of the prevailing rate of per diem wages are on file at the DISTRICT's Administration Office and shall be made available to interested parties upon request.

Enclosed find cash, bidder's bond, or cashier's or certified check No. _____ from the _____ Bank in the amount of _____, which is not less than ten percent (10%) of this bid, payable to Borrego Water District as bid security and which is given as a guarantee that the undersigned will enter into a contract and provide the necessary bonds and certificates of insurance if awarded the Work.

The bidder furthermore agrees that in case of bidder's default in executing said contract and furnishing required bonds and certificates of insurance, the cash, bidder's bond, or cashier's or certified check accompanying this proposal and the money payable thereon shall become and shall remain the property of the Borrego Water District.

Bidder is an individual _____, or corporation _____, or partnership _____, organized under the laws of the State of _____.

Bidder confirms license(s) required by California State Contractor's License Law for the performance of the subject project are in full effect and proper order. The following are the Bidder's applicable license number(s), with their expiration date(s) and class of license(s):

If the Bidder is a joint venture, each member of the joint venture must include the required licensing information.

Sureties that will furnish the Faithful Performance Bond and the Labor and Material Payment Bond, in the form specified herein, in an amount equal to one hundred percent (100%) of the contract price within ten (10) working days from the date the DISTRICT provides the successful bidder the Notice of Award. Sureties must meet all of the State of California bonding requirements, as defined in California Code of Civil Procedure Section 995.120 and must be authorized by the State of California.

The insurance company or companies to provide the insurance required in the contract documents must have a Financial Strength Rating of not less than "A-" and a Financial Size Category of not less than "Class VII" according to the latest Best Key Rating Guide. At the sole discretion of the DISTRICT, the DISTRICT may waive the Financial Strength Rating and the Financial Size Category classifications for Workers' Compensation insurance.

(signatures continued on next page)

I hereby certify under penalty of perjury under the laws of the State of California that all of the information submitted in connection with this Bid and all of the representations made herein are true and correct.

Executed at _____, on this ____ day of _____, _____.

(Bidders Name – Print or Type)

(Name and Title)

(Corporate Seal)

(Signature)

Names of individual members of firm or names and titles of all officers of corporation and their addresses are listed below:

Name _____ Title _____

Complete Address _____

Phone _____ FAX _____

Name _____ Title _____

Complete Address _____

Phone _____ FAX _____

Name _____ Title _____

Complete Address _____

Phone _____ FAX _____

Name _____ Title _____

Complete Address _____

Phone _____ FAX _____

1.2 Bid Bond

[Note: Not required when other form of Bidder's Security, e.g. cash, certified check or cashier's check, accompanies bid.]

The makers of this bond are, _____, as Principal, and _____, as Surety and are held and firmly bound unto the Borrego Water District, hereinafter called the DISTRICT, in the penal sum of TEN PERCENT (10%) OF THE TOTAL BID PRICE of the Principal submitted to DISTRICT for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, 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 the accompanying bid dated _____, 20____, for Bending Elbow, Weather Vane and Rocking Chair Pipeline Project

If the Principal does not withdraw its Bid within the time specified in the Contract Documents; and if the Principal is awarded the Contract and provides all documents to the DISTRICT as required by the Contract Documents; then this obligation shall be null and void. Otherwise, this bond will remain in full force and effect.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents shall affect its obligation under this bond, and Surety does hereby waive notice of any such changes.

In the event a lawsuit is brought upon this bond by the DISTRICT and judgment is recovered, the Surety shall pay all litigation expenses incurred by the DISTRICT in such suit, including reasonable attorneys' fees, court costs, expert witness fees and expenses.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this _____ day of _____, 20____, the name and corporate seal of each corporation.

(Corporate Seal)

Contractor/ Principal

By _____

Title _____

(Corporate Seal)

Surety

By _____
Attorney-in-Fact

(Attach Attorney-in-Fact Certificate)

Title _____

Notary Acknowledgment

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 _____, 20____, before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory

Name(s) of Signer(s)

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 of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

DESCRIPTION OF ATTACHED DOCUMENT

- Individual
- Corporate Officer

Title(s)

Title or Type of Document

- Partner(s)
 - Limited
 - General

Number of Pages

- Attorney-In-Fact
- Trustee(s)
- Guardian/Conservator
- Other:

Date of Document

Signer is representing:
 Name Of Person(s) Or Entity(ies)

Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for Contractor/Principal.

Notary Acknowledgment

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 _____, 20____, before me, _____, Notary Public, personally appeared _____, 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 of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

DESCRIPTION OF ATTACHED DOCUMENT

- Individual
- Corporate Officer

_____ Title(s)

_____ Title or Type of Document

- Partner(s)
 - Limited
 - General

_____ Number of Pages

- Attorney-In-Fact
- Trustee(s)
- Guardian/Conservator
- Other:

_____ Date of Document

Signer is representing:
 Name Of Person(s) Or Entity(ies)

_____ Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Attorney-in-Fact. The Power-of-Attorney to local representatives of the bonding company must also be attached.

END OF BID BOND

1.3 List of Subcontractors

In compliance with the Subletting and Subcontracting Fair Practices Act Chapter 4 (commencing at Section 4100), Part 1, Division 2 of the Public Contract Code of the State of California and any amendments thereof, Bidder shall set forth below: (a) the name and the location of the place of business, (b) the California contractor license number, (c) the DIR public works contractor registration number unless exempt pursuant to Labor Code Sections 1725.5 and 1771.1, and (d) the portion of the work which will be done by each subcontractor who will perform work or labor or render service to the Bidder in or about the construction of the work or improvement to be performed under this Contract in an amount in excess of one-half of one percent (0.5%) of the Bidder's Total Bid Price. Notwithstanding the foregoing, if the work involves the construction of streets and highways, then the Bidder shall list each subcontractor who will perform work or labor or render service to the Bidder in or about the work in an amount in excess of one-half of one percent (0.5%) of the Bidder's Total Bid Price or \$10,000, whichever is greater. No additional time shall be granted to provide the below requested information.

If a Bidder fails to specify a subcontractor or if a contractor specifies more than one subcontractor for the same portion of work, then the Bidder shall be deemed to have agreed that it is fully qualified to perform that portion of work and that it shall perform that portion itself.

Work to be done by Subcontractor	Name of Subcontractor	Location of Business	CSLB Contractor License No.	DIR Registration Number	% of Work

Work to be done by Subcontractor	Name of Subcontractor	Location of Business	CSLB Contractor License No.	DIR Registration Number	% of Work

(Attach additional sheets if necessary)

Name of Bidder _____

Signature _____

Name and Title _____

Dated _____

1.4 Bidder Information and Experience Form

ARTICLE 1. INFORMATION ABOUT BIDDER

(Indicate not applicable (“N/A”) where appropriate.)

NOTE: Where Bidder is a joint venture, pages shall be duplicated and information provided for all parties to the joint venture.

1.0 Name of Bidder: _____

2.0 Type, if Entity: _____

3.0 Bidder Address: _____

Facsimile Number

Telephone Number

Email Address

4.0 How many years has Bidder’s organization been in business as a Contractor?

5.0 How many years has Bidder’s organization been in business under its present name? _____

5.1 Under what other or former names has Bidder’s organization operated? _____

6.0 If Bidder’s organization is a corporation, answer the following:

6.1 Date of Incorporation: _____

6.2 State of Incorporation: _____

6.3 President’s Name: _____

6.4 Vice-President’s Name(s): _____

6.5 Secretary’s Name: _____

6.6 Treasurer’s Name: _____

7.0 If an individual or a partnership, answer the following:

7.1 Date of Organization: _____

7.2 Name and address of all partners (state whether general or limited partnership):

8.0 If other than a corporation or partnership, describe organization and name principals:

9.0 List other states in which Bidder's organization is legally qualified to do business.

10.0 What type of work does the Bidder normally perform with its own forces?

11.0 Has Bidder ever failed to complete any work awarded to it? If so, note when, where, and why:

12.0 Within the last five years, has any officer or partner of Bidder's organization ever been an officer or partner of another organization when it failed to complete a contract? If so, attach a separate sheet of explanation:

13.0 List Trade References:

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ARTICLE 2. LIST OF CURRENT PROJECTS (BACKLOG)

[**Duplicate Page if needed for listing additional current projects.**]

Project (Including Owner's Name)	Description of Bidder's Work	Completion Date	Cost of Bidder's Work

ARTICLE 3. LIST OF COMPLETED PROJECTS – LAST THREE YEARS

[**Duplicate Page if needed for listing additional completed projects.**]

Please include only those projects which are similar enough to demonstrate Bidder’s ability to perform the required Work.

Project (Including Owner’s Name)	Description of Bidder’s Work	Completion Date	Cost of Bidder’s Work

ARTICLE 4. EXPERIENCE AND TECHNICAL QUALIFICATIONS QUESTIONNAIRE

Personnel:

The Bidder shall identify the key personnel to be assigned to this project in a management, construction supervision or engineering capacity.

1. List each person's job title, name and percent of time to be allocated to this project:

2. Summarize each person's specialized education:

3. List each person's years of construction experience relevant to the project:

4. Summarize such experience:

Bidder agrees that personnel named in this Bid will remain on this Project until completion of all relevant Work, unless substituted by personnel of equivalent experience and qualifications approved in advance by the DISTRICT.

Additional Bidder's Statements:

If the Bidder feels that there is additional information which has not been included in the questionnaire above, and which would contribute to the qualification review, it may add that information in a statement here or on an attached sheet, appropriately marked:

ARTICLE 5. VERIFICATION AND EXECUTION

These Bid Forms shall be executed only by a duly authorized official of the Bidder:

I declare under penalty of perjury under the laws of the State of California that the foregoing information is true and correct:

Name of Bidder_____

Signature_____

Name_____

Title_____

Date_____

1.5 Non-Collusion Declaration

The undersigned declares:

I am the _____ of _____, the party making the foregoing Bid.

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

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

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

Name of Bidder _____

Signature _____

Name _____

Title _____

1.6 Iran Contracting Act Certification.
(Public Contract Code section 2200 et seq.)

As required by California Public Contract Code Section 2204, the Contractor certifies subject to penalty for perjury that the option checked below relating to the Contractor's status in regard to the Iran Contracting Act of 2010 (Public Contract Code Section 2200 *et seq.*) is true and correct:

The Contractor is not:

(1) identified on the current list of person and entities engaged in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203; or

(2) a financial instruction that extends, for 45 days or more, credit in the amount of \$20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.

The DISTRICT has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, the DISTRICT will be unable to obtain the goods and/or services to be provided pursuant to the Contract.

The amount of the Contract payable to the Contractor for the Project does not exceed \$1,000,000.

Signature: _____

Printed Name: _____

Title: _____

Firm Name: _____

Date: _____

Note: In accordance with Public Contract Code Section 2205, false certification of this form shall be reported to the California Attorney General and may result in civil penalties equal to the greater of \$250,000 or twice the Contract amount, termination of the Contract and/or ineligibility to bid on contracts for three years.

1.7 Public Works Contractor Registration Certification

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. See <http://www.dir.ca.gov/PublicWorks/PublicWorks.html> for additional information.

No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work.

Bidder hereby certifies that it is aware of the registration requirements set forth in Labor Code sections 1725.5 and 1771.1 and is currently registered as a contractor with the Department of Industrial Relations.¹

Name of Bidder: _____

DIR Registration Number: _____

DIR Registration Expiration: _____

Small Project Exemption: _____ Yes or _____ No

Unless Bidder is exempt pursuant to the small project exemption, Bidder further acknowledges:

1. Bidder shall maintain a current DIR registration for the duration of the project.
2. Bidder shall include the requirements of Labor Code sections 1725.5 and 1771.1 in its contract with subcontractors and ensure that all subcontractors are registered at the time of bid opening and maintain registration status for the duration of the project.
3. Failure to submit this form or comply with any of the above requirements may result in a finding that the bid is non-responsive.

Name of Bidder _____

Signature _____

Name and Title _____

Dated _____

¹ If the Project is exempt from the contractor registration requirements pursuant to the small project exemption under Labor Code Sections 1725.5 and 1771.1, please mark "Yes" in response to "Small Project Exemption."

1.8 Contractor's Certificate Regarding Workers' Compensation.

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 that code, and I will comply with such provisions before commencing the performance of the work of this Contract.

Name of Bidder _____

Signature _____

Name _____

Title _____

Dated _____

00 52 13 – CONTRACT

This CONTRACT, No. _____ is made and entered into this ____ day of _____, _____, by and between Borrego Water District, sometimes hereinafter called "DISTRICT," and _____, sometimes hereinafter called "Contractor."

WITNESSETH: That the parties hereto have mutually covenanted and agreed, and by these presents do covenant and agree with each other as follows:

a. **SCOPE OF WORK.** The Contractor shall perform all Work within the time stipulated in the Contract, and shall provide all labor, materials, equipment, tools, utility services, and transportation to complete all of the Work required in strict compliance with the Contract Documents as specified in Article 5, below, for the following Project:

BENDING ELBOW, WEATHER VANE AND ROCKING CHAIR DRIVE PIPELINES Project

The Contractor and its surety shall be liable to the DISTRICT for any damages arising as a result of the Contractor's failure to comply with this obligation.

b. **TIME FOR COMPLETION.** Time is of the essence in the performance of the Work. The Work shall be commenced on the date stated in the DISTRICT's Notice to Proceed. The Contractor shall complete all Work required by the Contract Documents within **SIXTY (60) CALENDAR DAYS** from the commencement date stated in the Notice to Proceed. By its signature hereunder, Contractor agrees the time for completion set forth above is adequate and reasonable to complete the Work.

c. **CONTRACT PRICE.** The DISTRICT shall pay to the Contractor as full compensation for the performance of the Contract, subject to any additions or deductions as provided in the Contract Documents, and including all applicable taxes and costs, the sum of _____ Dollars (\$ _____). Payment shall be made as set forth in the General Conditions.

d. **LIQUIDATED DAMAGES.** In accordance with Government Code section 53069.85, it is agreed that the Contractor will pay the DISTRICT the sum set forth in Section 00 73 13, Article 1.11 for each and every calendar day of delay beyond the time prescribed in the Contract Documents for finishing the Work, as Liquidated Damages and not as a penalty or forfeiture. In the event this is not paid, the Contractor agrees the DISTRICT may deduct that amount from any money due or that may become due the Contractor under the Contract. This Article does not exclude recovery of other damages specified in the Contract Documents.

e. **COMPONENT PARTS OF THE CONTRACT.** The "Contract Documents" include the following:

- Notice Inviting Bids
- Instructions to Bidders
- Bid Form
- Bid Bond
- Designation of Subcontractors

Information Required of Bidders
Non-Collusion Declaration Form
Iran Contracting Act Certification
Public Works Contractor Registration Certification
Performance Bond
Payment (Labor and Materials) Bond
General Conditions
Special Conditions
General Requirements
Technical Specifications
Addenda
Plans and Drawings
Standard Specifications for Public Works Construction "Greenbook", latest edition,
Except Sections 1-9
Applicable Local Agency Standards and Specifications, as last revised
Approved and fully executed change orders
Any other documents contained in or incorporated into the Contract

The Contractor shall complete the Work in strict accordance with all of the Contract Documents.

All of the Contract Documents are intended to be complementary. Work required by one of the Contract Documents and not by others shall be done as if required by all. This Contract shall supersede any prior agreement of the parties.

f. **PROVISIONS REQUIRED BY LAW AND CONTRACTOR COMPLIANCE.** Each and every provision of law required to be included in these Contract Documents shall be deemed to be included in these Contract Documents. The Contractor shall comply with all requirements of applicable federal, state and local laws, rules and regulations, including, but not limited to, the provisions of the California Labor Code and California Public Contract Code which are applicable to this Work.

g. **INDEMNIFICATION.** Contractor shall provide indemnification and defense as set forth in the General Conditions.

h. **PREVAILING WAGES.** Contractor shall be required to pay the prevailing rate of wages in accordance with the Labor Code which such rates shall be made available at the DISTRICT's Administrative Office or may be obtained online at <http://www.dir.ca.gov> and which must be posted at the job site.

[REMAINDER OF PAGE LEFT INTENTIONALLY BLANK]

IN WITNESS WHEREOF, this Contract has been duly executed by the above-named parties, on the day and year above written.

Name of Contractor

BORREGO WATER DISTRICT

By _____

By _____
General Manager

Name and Title: _____

Date: _____

License No. _____

Date: _____

**(CONTRACTOR'S SIGNATURE MUST BE
NOTARIZED AND CORPORATE
SEAL AFFIXED, IF APPLICABLE)**

Approved as to form this _____ day of _____ 20____.

Attorney for Borrego Water District

END OF CONTRACT

Notary Acknowledgment

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 _____, 20____, before me, _____, Notary Public, personally appeared _____, 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 of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

- Individual
- Corporate Officer

_____ Title(s)

- Partner(s) Limited
- General

- Attorney-In-Fact
- Trustee(s)
- Guardian/Conservator
- Other:

Signer is representing:
 Name Of Person(s) Or Entity(ies)

DESCRIPTION OF ATTACHED DOCUMENT

_____ Title or Type of Document

_____ Number of Pages

_____ Date of Document

_____ Signer(s) Other Than Named Above

00 61 13 – BOND FORMS

1.1 Performance Bond.

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, the Borrego Water District, (hereinafter referred to as "DISTRICT") has awarded to _____, (hereinafter referred to as the "Contractor") an agreement for **Contract No.** _____, (hereinafter referred to as the "Project").

WHEREAS, the work to be performed by the Contractor is more particularly set forth in the Contract Documents for the Project dated _____, (hereinafter referred to as "Contract Documents"), the terms and conditions of which are expressly incorporated herein by reference; and

WHEREAS, the Contractor is required by said Contract Documents to perform the terms thereof and to furnish a bond for the faithful performance of said Contract Documents.

NOW, THEREFORE, we, _____, the undersigned Contractor and _____ as Surety, a corporation organized and duly authorized to transact business under the laws of the State of California, are held and firmly bound unto the DISTRICT in the sum of _____ DOLLARS, (\$_____), said sum being not less than one hundred percent (100%) of the total amount of the Contract, for which amount well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the Contractor, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the Contract Documents and any alteration thereof made as therein provided, on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning; and shall faithfully fulfill all obligations including the one (1) year guarantee of all materials and workmanship; and shall indemnify and save harmless the DISTRICT, its officials, officers, employees, and authorized volunteers, as stipulated in said Contract Documents, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees including reasonable attorney's fees, incurred by DISTRICT in enforcing such obligation.

As a condition precedent to the satisfactory completion of the Contract Documents, unless otherwise provided for in the Contract Documents, the above obligation shall hold good for a period of one (1) year after the acceptance of the work by DISTRICT, during which time if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the DISTRICT from loss or damage resulting from or caused by defective materials or faulty workmanship. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the DISTRICT's rights or the

Contractor or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure Section 337.15.

Whenever Contractor shall be, and is declared by the DISTRICT to be, in default under the Contract Documents, the Surety shall remedy the default pursuant to the Contract Documents, or shall promptly, at the DISTRICT's option:

- i. Take over and complete the Project in accordance with all terms and conditions in the Contract Documents; or
- ii. Obtain a bid or bids for completing the Project in accordance with all terms and conditions in the Contract Documents and upon determination by Surety of the lowest responsive and responsible bidder, arrange for a Contract between such bidder, the Surety and the DISTRICT, and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the DISTRICT under the Contract and any modification thereto, less any amount previously paid by the DISTRICT to the Contractor and any other set offs pursuant to the Contract Documents.
- iii. Permit the DISTRICT to complete the Project in any manner consistent with California law and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the DISTRICT under the Contract and any modification thereto, less any amount previously paid by the DISTRICT to the Contractor and any other set offs pursuant to the Contract Documents.

Surety expressly agrees that the DISTRICT may reject any contractor or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Contractor.

Surety shall not utilize Contractor in completing the Project nor shall Surety accept a bid from Contractor for completion of the Project if the DISTRICT, when declaring the Contractor in default, notifies Surety of the DISTRICT's objection to Contractor's further participation in the completion of the Project.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project to be performed thereunder shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project.

[REMAINDER OF PAGE LEFT INTENTIONALLY BLANK]

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20__.

(Corporate Seal)

Contractor/ Principal

By _____

Title _____

(Corporate Seal)

Surety

By _____
Attorney-in-Fact

Title _____

(Attach Attorney-in-Fact Certificate)

The rate of premium on this bond is _____ per thousand. The total amount of premium charges is \$_____.
(The above must be filled in by corporate attorney.)

THIS IS A REQUIRED FORM

Any claims under this bond may be addressed to:

(Name and Address of Surety)

(Name and Address of Agent or Representative for service of process in California, if different from above)

(Telephone number of Surety and Agent or Representative for service of process in California)

Notary Acknowledgment

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 _____, 20____, before me, _____, Notary Public, personally appeared _____, 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 of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

- Individual
- Corporate Officer

_____ Title(s)

- Partner(s) Limited
- General

- Attorney-In-Fact
- Trustee(s)
- Guardian/Conservator
- Other:

Signer is representing:
 Name Of Person(s) Or Entity(ies)

DESCRIPTION OF ATTACHED DOCUMENT

_____ Title or Type of Document

_____ Number of Pages

_____ Date of Document

_____ Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for Contractor/Principal.

Notary Acknowledgment

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 _____, 20____, before me, _____, Notary Public, personally appeared _____, 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 of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

DESCRIPTION OF ATTACHED DOCUMENT

- Individual
- Corporate Officer

_____ Title(s)

_____ Title or Type of Document

- Partner(s) Limited
- Attorney-In-Fact General

_____ Number of Pages

- Trustee(s)
- Guardian/Conservator
- Other:

_____ Date of Document

Signer is representing:
 Name Of Person(s) Or Entity(ies)

_____ Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Attorney-in-Fact. The Power-of Attorney to local representatives of the bonding company must also be attached.

END OF PERFORMANCE BOND

1.2 Payment Bond (Labor and Materials).

KNOW ALL MEN BY THESE PRESENTS That

WHEREAS, the Borrego Water District (hereinafter designated as the "DISTRICT"), by action taken or a resolution passed _____, 20____, has awarded to _____ hereinafter designated as the "Principal," a contract for the work described as follows: **Contract No.** _____ (the "Project"); and

WHEREAS, said Principal is required to furnish a bond in connection with said contract; providing that if said Principal or any of its Subcontractors shall fail to pay for any materials, provisions, provender, equipment, or other supplies used in, upon, for or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, or for amounts due under the Unemployment Insurance Code or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of said Principal and its Subcontractors with respect to such work or labor the Surety on this bond will pay for the same to the extent hereinafter set forth.

NOW THEREFORE, we, the Principal and _____ as Surety, are held and firmly bound unto the DISTRICT in the penal sum of _____ Dollars (\$_____) lawful money of the United States of America, for the payment of which sum well and truly to be made, 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 if said Principal, his or its subcontractors, heirs, executors, administrators, successors or assigns, shall fail to pay any of the persons named in Civil Code Section 9100, fail to pay for any materials, provisions or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department or Franchise Tax Board from the wages of employees of the contractor and his subcontractors pursuant to Revenue and Taxation Code Section 18663, with respect to such work and labor the Surety or Sureties will pay for the same, in an amount not exceeding the sum herein above specified, and also, in case suit is brought upon this bond, all litigation expenses incurred by the DISTRICT in such suit, including reasonable attorneys' fees, court costs, expert witness fees and investigation expenses.

This bond shall inure to the benefit of any of the persons named in Civil Code Section 9100 so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

It is further stipulated and agreed that the Surety on this bond shall not be exonerated or released from the obligation of this bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described, or pertaining or relating to the furnishing of labor, materials, or equipment therefore, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement herein above described, nor by any rescission or attempted rescission or attempted rescission of the contract, agreement or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of

recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the owner or DISTRICT and original contractor or on the part of any obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Civil Code Section 9100, and has not been paid the full amount of his claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned, including but not limited to the provisions of sections 2819 and 2845 of the California Civil Code.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20__.

(Corporate Seal)

Contractor/ Principal

By _____

Title _____

(Corporate Seal)

Surety

By _____

Attorney-in-Fact

(Attach Attorney-in-Fact Certificate)

Title _____

Notary Acknowledgment

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 _____, 20____, before me, _____, Notary Public, personally appeared _____, 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 of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

- Individual
- Corporate Officer

_____ Title(s)

- | | |
|---|----------------------------------|
| <input type="checkbox"/> Partner(s) | <input type="checkbox"/> Limited |
| <input type="checkbox"/> Attorney-In-Fact | <input type="checkbox"/> General |

- Trustee(s)
- Guardian/Conservator
- Other:

Signer is representing:
 Name Of Person(s) Or Entity(ies)

DESCRIPTION OF ATTACHED DOCUMENT

_____ Title or Type of Document

_____ Number of Pages

_____ Date of Document

_____ Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for Contractor/Principal.

Notary Acknowledgment

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 _____, 20____, before me, _____, Notary Public, personally appeared _____, 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 of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

DESCRIPTION OF ATTACHED DOCUMENT

- Individual
- Corporate Officer

_____ Title(s)

_____ Title or Type of Document

- Partner(s) Limited
- General

_____ Number of Pages

- Attorney-In-Fact
- Trustee(s)
- Guardian/Conservator
- Other:

_____ Date of Document

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____ Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Attorney-in-Fact. The Power-of-Attorney to local representatives of the bonding company must also be attached.

END OF PAYMENT BOND

00 72 13 – GENERAL CONDITIONS

ARTICLE 1. DEFINED TERMS

Whenever used in the Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined below, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

- A. Act of God – An earthquake of magnitude of 3.5 or higher on the Richter scale or a tidal wave.
- B. Addenda -- Written or graphic instruments issued prior to the submission of Bids which clarify, correct, or change the Contract Documents.
- C. Additional Work -- New or unforeseen work will be classified as “Additional Work” when the DISTRICT’s Representative determines that it is not covered by the Contract.
- D. Applicable Laws -- The laws, statutes, ordinances, rules, codes, regulations, permits, and licenses of any kind, issued by local, state or federal governmental authorities or private authorities with jurisdiction (including utilities), to the extent they apply to the Work.
- E. Bid -- The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices and other terms for the Work to be performed.
- F. Bidder -- The individual or entity who submits a Bid directly to the DISTRICT.
- G. Board; Board of Directors – Borrego Water District Board of Directors.
- H. Change Order (“CO”) -- A document that authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Contract, in accordance with the Contract Documents and in the form contained in the Contract Documents.
- I. Change Order Request (“COR”) -- A request made by the Contractor for an adjustment in the Contract Price and/or Contract Times as the result of a Contractor-claimed change to the Work. This term may also be referred to as a Change Order Proposal (“COP”), or Request for Change (“RFC”).
- J. Claim -- A demand or assertion by the DISTRICT or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
- K. Contract -- The entire integrated written agreement between the DISTRICT and Contractor concerning the Work. “Contract” may be used interchangeably with “Agreement” in the Contract Documents. The Contract supersedes prior

negotiations, representations, or agreements, whether written or oral, and includes all Contract Documents.

- L. Contract Documents -- The documents listed in Section 00 52 13, Article 5. Some documents provided by the DISTRICT to the Bidders and Contractor, including but not limited to reports and drawings of subsurface and physical conditions are not Contract Documents.
- M. Contract Price -- Amount to be paid by the DISTRICT to the Contractor as full compensation for the performance of the Contract and completion of the Work, subject to any additions or deductions as provided in the Contract Documents, and including all applicable taxes and costs.
- N. Contract Times -- The number of days or the dates stated in the Contract Documents to: achieve defined Milestones, if any; and to complete the Work so that it is ready for final payment.
- O. Contractor -- The individual or entity with which the DISTRICT has contracted for performance of the Work.
- P. Contractor's Designated On-Site Representative -- The Contractor's Designated On-Site Representative will be as identified in Section 00 72 13, Article 3 and shall not be changed without prior written consent of the DISTRICT.
- Q. Daily Rate -- The Daily Rate stipulated in the Contract Documents as full compensation to the Contractor due to the DISTRICT's unreasonable delay to the Project that was not contemplated by the parties.
- R. Day -- A calendar day of 24 hours measured from midnight to the next midnight.
- S. Defective Work -- Work that is unsatisfactory, faulty, or deficient; or that does not conform to the Contract Documents; or that does not meet the requirements of any inspection, reference standard, test, or approval referenced in the Contract Documents.
- T. Demobilization -- The complete dismantling and removal by the Contractor of all of the Contractor's temporary facilities, equipment, and personnel at the Site.
- U. District -- Borrego Water District.
- V. District's Representative -- The individual or entity as identified in the Special Conditions to act as the DISTRICT's Representative.
- W. Drawings -- That part of the Contract Documents prepared by of the Engineer of Record which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

- X. Effective Date of the Contract -- The date indicated in the Contract on which it becomes effective, but if no such date is indicated, it means the date on which the Contract is signed and delivered by the last of the two parties to sign and deliver.
- Y. Engineer, whenever not qualified, shall mean the General Manger of the DISTRICT, acting either directly or through properly authorized agents, such agents acting severally within the scope of the particular duties entrusted to them. On all questions concerning the acceptance of materials, machinery, the classifications of material, the execution of work, conflicting interest of the contractors performing related work and the determination of costs, the decision of the Engineer, duly authorized by the Board of Directors, shall be binding and final upon both parties.
- Z. Engineer of Record -- The individual, partnership, corporation, joint venture, or other legal entity named as such in Section 00 73 13, Article 1.1. or any succeeding entity designated by the DISTRICT.
- AA. General Manager – Borrego Water District’s General Manager/Engineer, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.
- BB. Green Book -- The current edition of the Standard Specifications for Public Works Construction promulgated by the Joint Cooperative Committee of the Southern California Chapter American Public Works Association and the Southern California Districts of the Associated General Contractors of California.
- CC. Hazardous Waste -- The term “Hazardous Waste” shall have the meaning provided in Section 104 of the Solid Waste Disposal Act (42 U.S.C. § 6903) as amended from time to time or, 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, whichever is more restrictive.
- DD. Holiday – The Holidays occur on:
 - New Year’s Day - January 1
 - President’s Day – Third Monday in February
 - Memorial Day - Last Monday in May
 - Independence Day - July 4
 - Labor Day - First Monday in September
 - Veteran’s Day - November 11
 - Thanksgiving Day - Fourth Thursday in November
 - Friday after Thanksgiving
 - Christmas Eve – December 24
 - Christmas Day - December 25
 - Day After Christmas – December 26
 - New Year’s Eve – December 31

If any Holiday listed above falls on a Saturday, Saturday and the preceding Friday are both Holidays. If the Holiday should fall on a Sunday, Sunday and the following Monday are both Holidays.

- EE. Notice of Award -- The written notice by the DISTRICT to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, the DISTRICT will sign and deliver the Contract.
- FF. Notice of Completion -- The form which may be executed by the DISTRICT and recorded by the county where the Project is located constituting final acceptance of the Project.
- GG. Notice to Proceed -- A written notice given by the DISTRICT to Contractor fixing the date on which the Contractor may proceed with the Work and when Contract Times will commence to run.
- HH. Project -- The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
- II. Recyclable Waste Materials -- Materials removed from the Site which are required to be diverted to a recycling center rather than an area landfill. Recyclable Waste Materials include asphalt, concrete, brick, concrete block, and rock.
- JJ. Schedule of Submittals -- A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to facilitate scheduled performance of related construction activities.
- KK. Shop Drawings -- All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
- LL. Specifications -- That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
- MM. Stop Payment Notice -- A written notice as defined in Civil Code section 8044.
- NN. Subcontractor -- An individual or entity other than a Contractor having a contract with any other entity than the DISTRICT for performance of any portion of the Work at the Site.
- OO. Submittal -- Written and graphic information and physical samples prepared and supplied by the Contractor demonstrating various portions of the Work.
- PP. Successful Bidder -- The Bidder submitting a responsive Bid to whom the DISTRICT makes an award.
- QQ. Supplier -- A manufacturer, fabricator, supplier, distributor, material man, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment used in the performance of the Work or to be incorporated in the Work.

RR. Underground Facilities -- All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

SS. Unit Price Work -- Work to be paid for on the basis of unit prices as provided by the Contractor in its bid or as adjusted in accordance with the Contract Documents.

TT. Warranty -- A written guarantee provided to the DISTRICT by the Contractor that the Work will remain free of defects and suitable for its intended use for the period required by the Contract Documents or the longest period permitted by the law of this State, whichever is longer.

UU. Work -- The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

ARTICLE 2. CONTRACT DOCUMENTS

A. **Contract Documents.** The Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all.

B. **Interpretations.** The Contract Documents are intended to be fully cooperative and complementary. If the Contractor observes that any documents are in conflict, the Contractor shall promptly notify the Engineer in writing. In case of conflicts between the Contract Documents, the order of precedence shall be as follows:

1. Change Orders
2. Addenda
3. Special Conditions
4. Technical Specifications
5. General Requirements
6. Plans (Contract Drawings)
7. Contract
8. General Conditions
9. Instructions to Bidders
10. Notice Inviting Bids
11. Contractor's Bid Forms
12. Standard Specifications for Public Works Construction (Sections 1-9 Excluded), Latest Edition.
13. Applicable Local Agency Standards and Specifications
14. Standard Drawings
15. Reference Documents

With reference to the Drawings, the order of precedence shall be as follows:

1. Figures govern over scaled dimensions
 2. Detail drawings govern over general drawings
 3. Addenda or Change Order drawings govern over Contract Drawings
 4. Contract Drawings govern over Standard Drawings
 5. Contract Drawings govern over Shop Drawings
- C. **Conflicts in Contract Documents.** Notwithstanding the orders of precedence established above, in the event of conflicts, the higher standard, higher quality, and most expensive shall always apply.
- D. **Organization of Contract Documents.** Organization of the Contract Documents into divisions, sections, and articles, and arrangement of drawings shall not control the Contractor in dividing Project Work among subcontractors or in establishing the extent of Work to be performed by any trade.

ARTICLE 3. PRECONSTRUCTION AND CONSTRUCTION COMMUNICATION

Before any Work at the site is started, a conference attended by the DISTRICT, Contractor, DISTRICT’s Representative, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to herein, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

At this conference the DISTRICT and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

At the discretion of the Engineer, periodic meetings involving project personnel (the Contractor, utility and others) will be held for the purpose of coordinating project activities.

ARTICLE 4. CONTRACT DOCUMENTS: COPIES & MAINTENANCE

Contractor will be furnished, free of charge, **five (5)** copies of the Contract Documents. Additional copies may be obtained at cost of reproduction.

Contractor shall maintain a clean, undamaged set of Contract Documents, including submittals, at the Project site.

ARTICLE 5. EXAMINATION OF DRAWINGS, SPECIFICATIONS AND SITE OF WORK

- A. **Examination of Contract Documents.** Before commencing any portion of the Work, Contractor shall again carefully examine all applicable Contract Documents, the Project site, and other information given to Contractor as to materials and methods of construction and other Project requirements. Contractor shall immediately notify the Engineer of any potential error, inconsistency, ambiguity, conflict, or lack of detail or explanation. If Contractor performs, permits, or causes the performance of any Work which is in error, inconsistent or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all resulting costs,

including, without limitation, the cost of correction. In no case shall the Contractor or any subcontractor proceed with Work if uncertain as to the applicable requirements.

- B. **Additional Instructions.** After notification of any error, inconsistency, ambiguity, conflict, or lack of detail or explanation, the Engineer will provide any required additional instructions, by means of drawings or other written direction, necessary for proper execution of Work.
- C. **Quality of Parts, Construction and Finish.** All parts of the Work shall be of the best quality of their respective kinds and the Contractor must use all diligence to inform itself fully as to the required construction and finish.
- D. **Contractor's Variation from Contract Document Requirements.** If it is found that the Contractor has varied from the requirements of the Contract Documents including the requirement to comply with all applicable laws, ordinances, rules and regulations, the Engineer may at any time, before or after completion of the Work, order the improper Work removed, remade or replaced by the Contractor at the Contractor's expense.

ARTICLE 6. MOBILIZATION

- A. When a bid item is included in the Bid Form for mobilization, the costs of Work in advance of construction operations and not directly attributable to any specific bid item will be included in the progress estimate ("Initial Mobilization"). When no bid item is provided for "Initial Mobilization," payment for such costs will be deemed to be included in the other items of the Work.
- B. Payment for Initial Mobilization based on the lump sum provided in the Bid Form, which shall constitute full compensation for all such Work. No payment for Initial Mobilization will be made until all of the listed items have been completed to the satisfaction of the Engineer. The scope of the Work included under Initial Mobilization shall include, but shall not be limited to, the following principal items:
 - 1. Obtaining and paying for all bonds, insurance, and permits.
 - 2. Moving on to the Project site of all Contractor's plant and equipment required for the first month's operations.
 - 3. Installing temporary construction power, wiring, and lighting facilities, as applicable.
 - 4. Establishing fire protection system, as applicable.
 - 5. Developing and installing a construction water supply, if applicable.
 - 6. Providing and maintaining the field office trailers for the Contractor, if necessary, and the Engineer (if specified), complete, with all specified furnishings and utility services.

7. Providing on-site sanitary facilities and potable water facilities as specified per Cal-OSHA and these Contract Documents.
8. Furnishing, installing, and maintaining all storage buildings or sheds required for temporary storage of products, equipment, or materials that have not yet been installed in the Work. All such storage shall meet manufacturer's specified storage requirements, and the specific provisions of the specifications, including temperature and humidity control, if recommended by the manufacturer, and for all security.
9. Arranging for and erection of Contractor's work and storage yard.
10. Posting all OSHA required notices and establishment of safety programs per Cal-OSHA.
11. Full-time presence of Contractor's superintendent at the job site as required herein.
12. Providing on-site Contractor's sanitary facilities.
13. Install project sign, if required.
14. Submittal of Schedule of Values.
15. Submittal of Construction Schedule as required by the Contract Documents.

ARTICLE 7. EXISTENCE OF UTILITIES AT THE WORK SITE

- A. The DISTRICT has endeavored to determine the existence of utilities at the Project site from the records of the owners of known utilities in the vicinity of the Project. The positions of these utilities as derived from such records are shown on the Plans.
- B. Unless indicated otherwise on the Plans and Specifications, no excavations were made to verify the locations shown for underground utilities. The service connections to these utilities are not shown on the Plans. Water service connections may be shown on the Plans showing general locations of such connections. It shall be the responsibility of the Contractor to determine the exact location of all service connections. The Contractor shall make its own investigations, including exploratory excavations, to determine the locations and type of service connections, prior to commencing Work which could result in damage to such utilities. The Contractor shall immediately notify the DISTRICT in writing of any utility discovered in a different position than shown on the Plans or which is not shown on the Plans.
- C. If applicable, all water meters, water valves, fire hydrants, electrical utility vaults, telephone vaults, gas utility valves, and other subsurface structures shall be relocated or adjusted to final grade by the Contractor. Locations of existing utilities shown on the Plans are approximate and may not be complete. The Contractor shall be responsible for coordinating its Work with all utility companies during the construction of the Work.

- D. Notwithstanding the above, pursuant to section 4215 of the Government Code, the DISTRICT has the responsibility to identify, with reasonable accuracy, main or trunkline facilities on the plans and specifications. In the event that main or trunkline utility facilities are not identified with reasonable accuracy in the plans and specifications made a part of the invitation for Bids, the DISTRICT shall assume the responsibility for their timely removal, relocation, or protection.
- E. Contractor, except in an emergency, shall contact the appropriate regional notification center, **Southern California Underground Service Alert** at 811 or 1-800-227-2600 or on-line at www.digalert.org at least two working days prior to commencing any excavation if the excavation will be performed in an area which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the DISTRICT, and obtain an inquiry identification number from that notification center. No excavation shall be commenced or carried out by the Contractor unless such an inquiry identification number has been assigned to the Contractor or any subcontractor of the Contractor and the DISTRICT has been given the identification number by the Contractor.

ARTICLE 8. SOILS INVESTIGATIONS

- A. Reports and Drawings. The Special Conditions identify:
 - 1. those reports known to the DISTRICT of explorations and tests of subsurface conditions at or contiguous to the site; and
 - 2. those drawings known to the DISTRICT of physical conditions relating to existing surface or subsurface structures at the site (except Underground Facilities).
- B. Limited Reliance by Contractor on Technical Data Authorized. Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, which were expressly not created or obtained to evaluate or assist in the evaluation of constructability, and are not Contract Documents. Contractor shall make its own interpretation of the “technical data” and shall be solely responsible for any such interpretations. Except for reliance on the accuracy of such “technical data,” Contractor may not rely upon or make any claim against the DISTRICT, DISTRICT’s Representative, or Engineer of Record, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
 - 1. the completeness of such reports and drawings for Contractor’s purposes, including without limitation any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions, conclusions and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions, or information.

ARTICLE 9. CONTRACTOR'S SUPERVISION

Contractor shall continuously keep at the Project site, a competent and experienced full-time Project superintendent acceptable to the DISTRICT. Superintendent must be able to proficiently speak, read and write in English and shall have the authority to make decisions on behalf of the Contractor. Contractor shall continuously provide efficient supervision of the Project.

ARTICLE 10. WORKERS

- A. Contractor shall at all times enforce strict discipline and good order among its employees. Contractor shall not employ on the Project any unfit person or any one not skilled in the Work assigned to him or her.
- B. Any person in the employ of the Contractor whom the DISTRICT may deem incompetent or unfit shall be dismissed from the Work and shall not be employed on this Project.

ARTICLE 11. INDEPENDENT CONTRACTORS

Contractor shall be an independent contractor for the DISTRICT and not an employee. Contractor understands and agrees that it and all of its employees shall not be considered officers, employees, or agents of DISTRICT and are not entitled to benefits of any kind normally provided employees of DISTRICT, including but not limited to, state unemployment compensation or workers' compensation. Contractor assumes full responsibility for the acts and omissions of its employees or agents related to the Work.

ARTICLE 12. SUBCONTRACTS

- A. Contractor agrees to bind every subcontractor to the terms of the Contract Documents as far as such terms are applicable to subcontractor's portion of the Work. Contractor shall be as fully responsible to the DISTRICT for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by its subcontractors, as Contractor is for acts and omissions of persons directly employed by Contractor. Nothing contained in these Contract Documents shall create any contractual relationship between any subcontractor and the DISTRICT.
- B. The DISTRICT reserves the right to accept all subcontractors. The DISTRICT's acceptance of any subcontractor under this Contract shall not in any way relieve Contractor of its obligations in the Contract Documents.
- C. Prior to substituting any subcontractor listed in the Bid Forms, Contractor must comply with the requirements of the Subletting and Subcontracting Fair Practices Act pursuant to California Public Contract Code section 4100 et seq.

ARTICLE 13. VERIFICATION OF EMPLOYMENT ELIGIBILITY

By executing this Contract, Contractor verifies that it fully complies with all requirements and restrictions of state and federal law respecting the employment of undocumented aliens, including, but not limited to, the Immigration Reform and Control Act of 1986, as may be

amended from time to time, and shall require all subcontractors, sub-subcontractors and consultants to comply with the same. Each person executing this Contract on behalf of Contractor verifies that he or she is a duly authorized officer of Contractor and that any of the following shall be grounds for the DISTRICT to terminate the Contract for cause: (1) failure of the Contractor or its subcontractors, sub-subcontractors or consultants to meet any of the requirements provided for in this Article; (2) any misrepresentation or material omission concerning compliance with such requirements; or (3) failure to immediately remove from the Work any person found not to be in compliance with such requirements.

ARTICLE 14. REQUESTS FOR SUBSTITUTION

- A. For the purposes of this provision, the term “substitution” shall mean the substitution of any material, method or service substantially equal to or better in every respect to that indicated in the Standard Specifications or otherwise referenced herein.
- B. Pursuant to Public Contract Code section 3400(b), the DISTRICT may make a finding that is described in the Notice Inviting Bids that designates certain products, things, or services by specific brand or trade name.
- C. Unless specifically designated in the Special Conditions, whenever any material, process, or article is indicated or specified by grade, patent, or proprietary name or by name of manufacturer, such specifications shall be deemed to be used for the purpose of facilitating the description of the material, process, or article desired and shall be deemed to be followed by the words “or equal.” Contractor may, unless otherwise stated, offer for substitution any material, process, or article which may be substantially equal to or better in every respect to that so indicated or specified in the Contract Documents. However, the DISTRICT has adopted uniform standards for certain materials, processes, and articles.
- D. The Contractor shall submit substitution requests, together with substantiating data, for substitution of any “or equal” material, process, or article no later than thirty-five (35) calendar days after award of Contract. Provisions regarding submission of substitution requests shall not in any way authorize an extension of time for the performance of this Contract. If a substitution request is rejected by the DISTRICT, the Contractor shall provide the material, method or service specified herein. The DISTRICT shall not be responsible for any costs incurred by the Contractor associated with substitution requests. The burden of proof as to the equality of any material, process, or article shall rest with the Contractor. The Engineer has the complete and sole discretion to determine if a material, process, or article is substantially equal to or better than that specified and to approve or reject all substitution requests.
- E. Substantiating data as described above shall include, at a minimum, the following information:
 - 1. A signed affidavit from the Contractor stating that the material, process, or article proposed as a substitution is substantially equal to or better than that specified in every way except as may be listed on the affidavit.

2. Illustrations, specifications, catalog cut sheets, and any other relevant data required to prove that the material, process, or article is substantially equal to or better than that specified.
 3. A statement of the cost implications of the substitution being requested, indicating whether and why the proposed substitution will reduce or increase the amount of the contract.
 4. Information detailing the durability and lifecycle costs of the proposed substitution.
- F. Failure to submit all the required substantiating data detailed above in a timely manner so that the substitution request can be adequately reviewed may result in rejection of the substitution request. The Engineer is not obligated to review multiple submittals related the same substitution request resulting from the Contractor's failure to initially submit a complete package.
- G. Time limitations within this Article shall be strictly complied with and in no case will an extension of time for completion of the contract be granted because of Contractor's failure to provide substitution requests at the time and in the manner described herein.
- H. The Contractor shall bear the costs of all DISTRICT work associated with the review of substitution requests.
- I. If substitution requests approved by the Engineer require that Contractor furnish materials, methods or services more expensive than that specified, the increased costs shall be borne by Contractor.

ARTICLE 15. SHOP DRAWINGS

- A. Contractor shall check and verify all field measurements and shall submit with such promptness as to provide adequate time for review and cause no delay in its own Work or in that of any other contractor, subcontractor, or worker on the Project, six (6) copies of all shop drawings, calculations, schedules, and materials list, and all other provisions required by the Contract Documents. Contractor shall sign all submittals affirming that submittals have been reviewed and approved by Contractor prior to submission to Engineer. Each signed submittal shall affirm that the submittal meets all the requirements of the Contract Documents except as specifically and clearly noted and listed on the transmittal letter of the submittal.
- B. Contractor shall make any corrections required by the Engineer, and file with the Engineer six (6) corrected copies each, and furnish such other copies as may be needed for completion of the Work. Engineer's acceptance of shop drawings shall not relieve Contractor from responsibility for deviations from the Contract Documents unless Contractor has, in writing, called Engineer's attention to such deviations at time of submission and has secured the Engineer's written acceptance. Engineer's acceptance of shop drawings shall not relieve Contractor from responsibility for errors in shop drawings.

ARTICLE 16. SUBMITTALS

- A. Contractor shall furnish to the Engineer for approval, prior to purchasing or commencing any Work, a log of all samples, material lists and certifications, mix designs, schedules, and other submittals, as required in the Contract Documents. The log shall indicate whether samples will be provided in accordance with other provisions of this Contract.
- B. Contractor will provide samples and submittals, together with catalogs and supporting data required by the Engineer, to the Engineer within a reasonable time period to provide for adequate review and avoid delays in the Work.
- C. These requirements shall not authorize any extension of time for performance of this Contract. Engineer will check and approve such samples, but only for conformance with design concept of work and for compliance with information given in the Contract Documents. Work shall be in accordance with approved samples and submittals.

ARTICLE 17. MATERIALS

- A. Except as otherwise specifically stated in the Contract Documents, Contractor shall provide and pay for all materials, labor, tools, equipment, lights, power, transportation, superintendence, temporary constructions of every nature, and all other services and facilities of every nature whatsoever necessary to execute and complete this Contract within specified time.
- B. Unless otherwise specified, all materials shall be new and the best of their respective kinds and grades as noted and/or specified, and workmanship shall be of good quality.
- C. Materials shall be furnished in ample quantities and at such times as to ensure uninterrupted progress of the Work and shall be stored properly and protected as required by the Contract Documents. Contractor shall be entirely responsible for damage or loss by weather or other causes to materials or Work.
- D. No materials, supplies, or equipment for Work under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in the Work and agrees upon completion of all work to deliver the Project, to the DISTRICT free from any claims, liens, or charges.
- E. Materials shall be stored on the Project site in such manner so as not to interfere with any operations of the DISTRICT or any independent contractor.
- F. Contractor shall verify all measurements, dimensions, elevations, and quantities before ordering any materials or performing any Work, and the DISTRICT shall not be liable for Contractor's failure to do so. No additional compensation, over and above payment for the actual quantities at the prices set out in the Bid Form, will be allowed because of differences between actual measurements, dimension, elevations and

quantities and those indicated on the Plans and in the Specifications. Any difference therein shall be submitted to the Engineer for consideration before proceeding with the Work.

ARTICLE 18. PERMITS AND LICENSES

- A. DISTRICT will apply and pay for the review of necessary encroachment permits for Work within the public rights-of-way. Contractor shall obtain all other necessary permits and licenses for the construction of the Project, including encroachment permits, and shall pay all fees required by law and shall comply with all laws, ordinances, rules and regulations relating to the Work and to the preservation of public health and safety. Before acceptance of the Project, the Contractor shall submit all licenses, permits, certificates of inspection and required approvals to the DISTRICT.
- B. Notwithstanding the foregoing, Contractor shall obtain an encroachment permit with San Diego County ("County Permit") prior to the start of construction. The Bid Form contains an allowance for the Contractor's cost of acquiring the County Permit. The allowance is included within the Bid Form to eliminate the need by bidders to research or estimate the costs of the County Permit prior to submitting a Bid. The allowance is specifically intended to account for the actual cost of the County Permit only. No other costs payable by Contractor are included within the allowance. A change order, either additive or deductive, will be issued in accordance with Article 44 of the General Conditions for the actual cost of the County Permit.

ARTICLE 19. TRENCHES

- A. **Trenches Five Feet or More in Depth.** Contractor shall submit to the Engineer at the preconstruction meeting, a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from hazards of caving ground during the excavation of any trench or trenches five feet or more in depth. If such plan varies from shoring system standards established by the Construction Safety Orders of the California Code of Regulations, Department of Industrial Relations, the plan shall be prepared by a California registered civil or structural engineer. The plan shall not be less effective than the shoring, bracing, sloping, or other provisions of the Construction Safety Orders, as defined in the California Code of Regulations. The Contractor shall designate in writing the "competent person" as defined in Title 8, California Code of Regulations, who shall be present at the Work Site each day that trenching/excavation is in progress. The "competent person" shall prepare and provide daily trenching/excavation inspection reports to the Engineer. Contractor shall also submit a copy of its annual California Occupational Safety and Health Administration (Cal/OSHA) trench/excavation permit.
- B. **Excavations Deeper than Four Feet.** If the Work involves excavating trenches or other excavations that extend deeper than four feet below the surface, Contractor shall promptly, and before the excavation is further disturbed, notify the DISTRICT in writing of any of the following conditions:
 - 1. Material that the Contractor believes may be material that is 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 from those indicated.
3. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract

The DISTRICT shall promptly investigate the conditions, and if it finds that the conditions do so materially differ, or do involve hazardous waste, and cause a decrease or increase in Contractor's cost of, or the time required for, performance of any part of the Work, shall issue a change order under the procedures described in the Contract Documents.

In the event that a dispute arises between the DISTRICT and the Contractor as to whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all Work to be performed under the Contract. Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the parties.

ARTICLE 20. TRAFFIC CONTROL

- A. Traffic control plan(s) for the Work may be required by the Agency(s) of Jurisdiction. Traffic control plans, if required, shall be prepared at Contractor's expense, and traffic control shall be performed at Contractor's expense in accordance with the requirements of the Agency(s) of Jurisdiction. The Permit and Inspection Allowance included within the Bid Form includes the cost of required traffic control permit(s) and construction inspection by the Agency(s) of Jurisdiction only. The Permit and Inspection Allowance does not include costs for preparation of any required traffic control plans, implementation of any traffic control requirements or for any traffic signal services that may be required. Costs for traffic control plans, implementation of traffic control, or traffic signal services required by the Agency(s) of Jurisdiction shall be included in the Contractor's Bid.
- B. All warning signs and safety devices used by the Contractor to perform the Work shall conform to the requirements contained in the State of California, Department of Transportation's current edition of "Manual of Traffic Controls for Construction and Maintenance Work Zones" or to the requirements of the local agency. The Contractor shall also be responsible for all traffic control required by the agency having jurisdiction over the project on the intersecting streets. Contractor shall submit two (2) traffic control plans to the agency having jurisdiction over the project and the General Manager a minimum of forty-eight (48) hours prior to starting work for approval.
- C. The Contractor's representative on the site responsible for traffic control shall produce evidence that he/she has completed training acceptable to the California

Department of Transportation for safety through construction zones. All of the streets in which the Work will occur shall remain open to traffic and one lane of traffic maintained at all times unless otherwise directed by the agency of jurisdiction. Businesses and residences adjacent to the Work shall be notified forty-eight (48) hours in advance of closing of driveways. The Contractor shall make every effort to minimize the amount of public parking temporarily eliminated due to construction in areas fronting businesses. No stockpiles of pipe or other material will be allowed in traveled right-of-ways after working hours unless otherwise approved by the Engineer.

ARTICLE 21. DIVERSION OF RECYCLABLE WASTE MATERIALS

In compliance with the applicable DISTRICT's waste reduction and recycling efforts, Contractor shall divert all Recyclable Waste Materials to appropriate recycling centers as required for compliance with the local jurisdiction's waste diversion ordinances. Contractor will be required to submit weight tickets and written proof of diversion with its monthly progress payment requests. Contractor shall complete and execute any certification forms required by DISTRICT or other applicable agencies to document Contractor's compliance with these diversion requirements. All costs incurred for these waste diversion efforts shall be the responsibility of the Contractor.

ARTICLE 22. REMOVAL OF HAZARDOUS MATERIALS

Should Contractor encounter material reasonably believed to be polychlorinated biphenyl (PCB) or other toxic wastes and hazardous materials which have not been rendered harmless at the Project site, the Contractor shall immediately stop work at the affected Project site and shall report the condition to the DISTRICT in writing. The DISTRICT shall contract for any services required to directly remove and/or abate PCBs and other toxic wastes and hazardous materials, if required by the Project site(s), and shall not require the Contractor to subcontract for such services. The Work in the affected area shall not thereafter be resumed except by written agreement of the DISTRICT and Contractor.

ARTICLE 23. SANITARY FACILITIES

Contractor shall provide sanitary temporary toilet buildings and hand washing facilities for the use of all workers. All toilets and hand washing facilities shall comply with local codes and ordinances. Toilets shall be kept supplied with toilet paper and shall have workable door fasteners. Toilets and hand washing facilities shall be serviced no less than once weekly and shall be present in a quantity of not less than 1 per 20 workers as required by Cal/OSHA regulations. The toilets and hand washing facilities shall be maintained in a sanitary condition at all times. Use of toilet and hand washing facilities in the Work under construction shall not be permitted. Any other Sanitary Facilities required by Cal/OSHA shall be the responsibility of the Contractor.

ARTICLE 24. AIR POLLUTION CONTROL

Contractor shall comply with all air pollution control rules, regulations, ordinances and statutes, including, but not limited to, those required by the South Coast Air Quality Management District. All containers of paint, thinner, curing compound, solvent or liquid asphalt shall be labeled to indicate that the contents fully comply with the applicable material requirements.

ARTICLE 25. LAYOUT AND FIELD ENGINEERING

All field engineering required for laying out the Work and establishing grades for earthwork operations shall be furnished by the Contractor at its expense.

ARTICLE 26. TESTS AND INSPECTIONS

- A. If the Contract Documents, the Engineer, or any instructions, laws, ordinances, or public authority requires any part of the Work to be tested or Approved, Contractor shall provide the Engineer at least two (2) working days' notice of its readiness for observation or inspection. If inspection is by a public authority other than the DISTRICT, Contractor shall promptly inform the DISTRICT of the date fixed for such inspection. Required certificates of inspection (or similar) shall be secured by Contractor. Costs for DISTRICT testing and DISTRICT inspection shall be paid by the DISTRICT. Costs of tests for Work found not to be in compliance shall be paid by the Contractor.
- B. If any Work is done or covered up without the required testing or approval, the Contractor shall uncover or deconstruct the Work, and the Work shall be redone after completion of the testing at the Contractor's cost in compliance with the Contract Documents.
- C. Where inspection and testing are to be conducted by an independent laboratory or agency, materials or samples of materials to be inspected or tested shall be selected by such laboratory or agency, or by the DISTRICT, and not by Contractor. All tests or inspections of materials shall be made in accordance with the commonly recognized standards of national organizations.
- D. In advance of manufacture of materials to be supplied by Contractor which must be tested or inspected, Contractor shall notify the DISTRICT so that the DISTRICT may arrange for testing at the source of supply. Any materials which have not satisfactorily passed such testing and inspection shall not be incorporated into the Work.
- E. If the manufacture of materials to be inspected or tested will occur in a plant or location greater than sixty (60) miles from the DISTRICT, the Contractor shall pay for any excessive or unusual costs associated with such testing or inspection, including but not limited to excessive travel time, standby time and required lodging.
- F. Reexamination of Work may be ordered by the DISTRICT. If so ordered, Work must be uncovered or deconstructed by Contractor. If Work is found to be in accordance with the Contract Documents, the DISTRICT shall pay the costs of reexamination and reconstruction. If such work is found not to be in accordance with the Contract Documents, Contractor shall pay all costs.

ARTICLE 27. PROTECTION OF WORK AND PROPERTY

- A. The Contractor shall be responsible for all damages to persons or property that occurs as a result of the Work. Contractor shall be responsible for the proper care and protection of all materials delivered and Work performed until completion and

final Acceptance by the DISTRICT. All Work shall be solely at the Contractor's risk. Contractor shall adequately protect adjacent property from settlement or loss of lateral support as necessary. Contractor shall comply with all applicable safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the Project site where Work is being performed. Contractor shall erect and properly maintain at all times, as required by field conditions and progress of work, all necessary safeguards, signs, barriers, lights, and watchmen for protection of workers and the public, and shall post danger signs warning against hazards created in the course of construction.

- B. In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization from the Engineer, is hereby permitted to act to prevent such threatened loss or injury; and Contractor shall so act, without appeal, if so authorized or instructed by the Engineer or the DISTRICT. Any compensation claimed by Contractor on account of emergency work shall be determined by and agreed upon by the DISTRICT and the Contractor.

ARTICLE 28. CONTRACTOR'S MEANS AND METHODS

Contractor is solely responsible for the means and methods utilized to perform the Work. In no case shall the Contractor's means and methods deviate from commonly used industry standards.

ARTICLE 29. AUTHORIZED REPRESENTATIVES

The DISTRICT shall designate representatives, who shall have the right to be present at the Project site at all times. The DISTRICT may designate an inspector who shall have the right to observe all of the Contractor's Work. The inspector shall not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. Contractor shall provide safe and proper facilities for such access.

ARTICLE 30. HOURS OF WORK

- A. As provided in Article 3 (commencing at section 1810), Chapter 1, Part 7, Division 2 of the Labor Code, Contractor stipulates that eight (8) hours of labor shall constitute a legal day's work. The time of service of any worker employed at any time by the Contractor or by any subcontractor on any subcontract under this Contract upon the Work or upon any part of the Work contemplated by this Contract is limited and restricted to eight (8) hours during any one calendar day and 40 hours during any one calendar week, except as hereinafter provided. Notwithstanding the provisions herein above set forth, work performed by employees of Contractor in excess of eight (8) hours per day, and 40 hours during any one week, shall be permitted upon this public work upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half times the basic rate of pay.
- B. The Contractor and every subcontractor shall keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed in connection with the Work or any part of the Work contemplated by this Contract. The record shall be kept open at all reasonable

hours to the inspection of the DISTRICT and to the Division of Labor Law Enforcement, Department of Industrial Relations of the State of California.

- C. The Contractor shall pay to the DISTRICT a penalty of twenty-five dollars (\$25.00) for each worker employed in the execution of this Contract by the Contractor or by any subcontractor for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any calendar day and 40 hours in any one calendar week in violation of the provisions of Article 3 (commencing at section 1810), Chapter 1, Part 7, Division 2 of the Labor Code.
- D. Any work necessary to be performed after regular working hours, or on Saturdays and Sundays or other holidays, shall be performed without additional expense to the DISTRICT.
- E. DISTRICT will provide inspection during normal working hours from 7:00 a.m. to 3:30 p.m. Monday through Friday. Inspection before or after this time will be charged to the Contractor as reimbursable inspection time. Inspections on weekends requires two days' notice for review and approval. Upon written request and approval the 8.5 hour working day may be changed to other limits subject to city/county ordinance.
- F. It shall be unlawful for any person to operate, permit, use, or cause to operate any of the following at the Project site, other than between the hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, with no Work allowed on the DISTRICT-observed holidays, unless otherwise approved by the DISTRICT:
 - 1. Powered Vehicles
 - 2. Construction Equipment
 - 3. Loading and Unloading Vehicles
 - 4. Domestic Power Tools

ARTICLE 31. PAYROLL RECORDS; LABOR COMPLIANCE

- A. Pursuant to Labor Code section 1776, Contractor and all subcontractors shall maintain weekly certified payroll records, showing the names, addresses, Social Security numbers, work classifications, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by them in connection with the Work under this Contract. Contractor shall certify under penalty of perjury that records maintained and submitted by Contractor are true and accurate. Contractor shall also require subcontractor(s) to certify weekly payroll records under penalty of perjury.
- B. In accordance with Labor Code section 1771.4, the Contractor and each subcontractor shall furnish the certified payroll records directly to the Department of Industrial Relations ("DIR") on the specified interval and format prescribed by the DIR, which may include electronic submission. Contractor shall comply with all requirements and regulations from the DIR relating to labor compliance monitoring

and enforcement. The requirement to submit certified payroll records directly to the Labor Commissioner under Labor Code section 1771.4 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code Section 1771.4.

- C. Any stop orders issued by the Department of Industrial Relations against Contractor or any subcontractor that affect Contractor's performance of Work, including any delay, shall be Contractor's sole responsibility. Any delay arising out of or resulting from such stop orders shall be considered Contractor caused delay subject to any applicable liquidated damages and shall not be compensable by the DISTRICT. Contractor shall defend, indemnify and hold the DISTRICT, its officials, officers, employees and agents free and harmless from any claim or liability arising out of stop orders issued by the Department of Industrial Relations against Contractor or any subcontractor.
- D. The payroll records described herein shall be certified and submitted by the Contractor at a time designated by the DISTRICT. The Contractor shall also provide the following:
 - 1. A certified copy of the employee's payroll records shall be made available for inspection or furnished to such employee or his or her authorized representative on request.
 - 2. A certified copy of all payroll records described herein shall be made available for inspection or furnished upon request of the DIR.
- E. Unless submitted electronically, the certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement ("DLSE") of the DIR or shall contain the same information as the forms provided by the DLSE.
- F. Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency, the DISTRICT, the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address and social security number. The name and address of the Contractor awarded the Contract or performing the contract shall not be marked or obliterated.
- G. In the event of noncompliance with the requirements of this Article, the Contractor shall have ten (10) calendar days in which to comply subsequent to receipt of written notice specifying in what respects the Contractor must comply with this Article. Should noncompliance still be evident after such 10-day period, the Contractor shall pay a penalty of one hundred dollars (\$100.00) to the DISTRICT 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, such penalties shall be withheld from progress payment then due.
- H. The responsibility for compliance with this Article shall rest upon the Contractor.

ARTICLE 32. PREVAILING RATES OF WAGES

- A. The Contractor is aware of the requirements of Labor Code sections 1720 *et seq.* and 1770 *et seq.*, as well as California Code of Regulations, Title 8, Section 16000 *et seq.* (“Prevailing Wage Laws”), which require the payment of prevailing wage rates and the performance of other requirements on certain “public works” and “maintenance” projects. Since this Project involves an applicable “public works” or “maintenance” project, as defined by the Prevailing Wage Laws, and since the total compensation is \$1,000 or more, Contractor agrees to fully comply with such Prevailing Wage Laws. The Contractor shall obtain a copy of the prevailing rates of per diem wages at the commencement of this Contract from the website of the Division of Labor Statistics and Research of the Department of Industrial Relations located at www.dir.ca.gov. In the alternative, the Contractor may view a copy of the prevailing rate of per diem wages which are on file at the DISTRICT’s Administration Office and shall be made available to interested parties upon request. Contractor shall make copies of the prevailing rates of per diem wages for each craft, classification, or type of worker needed to perform work on the Project available to interested parties upon request, and shall post copies at the Contractor’s principal place of business and at the Project site. Contractor shall defend, indemnify and hold the DISTRICT, its officials, officers, employees and authorized volunteers free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or allege failure to comply with the Prevailing Wage Laws.
- B. The Contractor shall forfeit as a penalty to the DISTRICT not more than Two Hundred Dollars (\$200.00), pursuant to Labor Code section 1775, for each calendar day, or portion thereof, for each worker paid less than the prevailing wage rate as determined by the Director of the Department of Industrial Relations for such work or craft in which such worker is employed for any public work done under the Contract by it or by any subcontractor under it. The difference between such prevailing wage rate 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.
- C. Contractor shall post, at appropriate conspicuous points on the Project site, a schedule showing all determined general prevailing wage rates and all authorized deductions, if any, from unpaid wages actually earned.

ARTICLE 33. PUBLIC WORKS CONTRACTOR REGISTRATION

Pursuant to Labor Code sections 1725.5 and 1771.1, the Contractor and its subcontractors must be registered with the Department of Industrial Relations prior to the execution of a contract to perform public works. By entering into this Contract, Contractor represents that it is aware of the registration requirement and is currently registered with the DIR. Contractor shall maintain a current registration for the duration of the Project. Contractor shall further include the requirements of Labor Code sections 1725.5 and 1771.1 in any subcontract and ensure that all subcontractors are registered at the time this Contract is entered into and maintain registration for the duration of the Project. Notwithstanding the foregoing, the contractor registration requirements mandated by Labor Code Sections 1725.5 and 1771.1 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code Sections 1725.5 and 1771.1.

ARTICLE 34. EMPLOYMENT OF APPRENTICES

- A. Contractor and all subcontractors shall comply with the requirements of Labor Code sections 1777.5 and 1777.6 in the employment of apprentices.
- B. Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, ex officio the Administrator of Apprenticeship, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices.
- C. Knowing violations of Labor Code section 1777.5 will result in forfeiture not to exceed one hundred dollars (\$100.00) for each calendar day of non-compliance pursuant to Labor Code section 1777.7.
- D. The responsibility for compliance with this Article shall rest upon the Contractor.

ARTICLE 35. NONDISCRIMINATION/EQUAL EMPLOYMENT OPPORTUNITY

Pursuant to Labor Code section 1735 and other applicable provisions of law, the Contractor and its subcontractors shall not discriminate against any employee or applicant for employment because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sex, age, sexual orientation, or any other classifications protected by law on this Project. The Contractor will take affirmative action to insure that employees are treated during employment or training without regard to their race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sex, age, sexual orientation, or any other classifications protected by law.

Employment Eligibility; Contractor. By executing this Contract, Contractor verifies that it fully complies with all requirements and restrictions of state and federal law respecting the employment of undocumented aliens, including, but not limited to, the Immigration Reform and Control Act of 1986, as may be amended from time to time. Such requirements and restrictions include, but are not limited to, examination and retention of documentation confirming the identity and immigration status of each employee of the Contractor. Contractor also verifies that it has not committed a violation of any such law within the five (5) years immediately preceding the date of execution of this Contract, and shall not violate any such law at any time during the term of the Contract. Contractor shall avoid any violation of any such law during the term of this Contract by participating in an electronic verification of work authorization program operated by the United States Department of Homeland Security, by participating in an equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, or by some other legally acceptable method. Contractor shall maintain records of each such verification, and shall make them available to the DISTRICT or its representatives for inspection and copy at any time during normal business hours. The DISTRICT shall not be responsible for any costs or expenses related to Contractor's compliance with the requirements provided for or referred to herein.

Employment Eligibility; Subcontractors, Sub-subcontractors and Consultants. To the same extent and under the same conditions as Contractor, Contractor shall require all of its subcontractors, sub-subcontractors and consultants performing any part of the Work or of this

Contract to make the same verifications and comply with all requirements and restrictions provided for herein.

Employment Eligibility; Failure to Comply. Each person executing this Contract on behalf of Contractor verifies that he or she is a duly authorized officer of Contractor, and understands that any of the following shall be grounds for the DISTRICT to terminate the Contract for cause: (1) failure of Contractor or its subcontractors, sub-subcontractors or consultants to meet any of the requirements provided for herein; (2) any misrepresentation or material omission concerning compliance with such requirements; or (3) failure to immediately remove from the Work any person found not to be in compliance with such requirements.

ARTICLE 36. DEBARMENT OF CONTRACTORS AND SUBCONTRACTORS

Contractors or subcontractors may not perform work on a public works project with a subcontractor who is ineligible to perform work on a public project pursuant to Labor Code section 1777.1 or 1777.7. Any contract on a public works project entered into between a contractor and a debarred subcontractor is void as a matter of law. A debarred subcontractor may not receive any public money for performing work as a subcontractor on a public works contract. Any public money that is paid, or may have been paid to a debarred subcontractor by a contractor on the project shall be returned to the DISTRICT. The Contractor shall be responsible for the payment of wages to workers of a debarred subcontractor who has been allowed to work on the project.

ARTICLE 37. LABOR/EMPLOYMENT SAFETY

The Contractor shall comply with all applicable laws and regulations of the federal, state, and local government, including Cal/OSHA requirements and requirements for verification of employees' legal right to work in the United States.

The Contractor shall maintain emergency first aid treatment for his employees which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 *et seq.*), and California Code of Regulations, Title 8, Industrial Relations Division 1, Department of Industrial Relations, Chapter 4. The Contractor shall ensure the availability of emergency medical services for its employees in accordance with California Code of Regulations, Title 8, Section 1512.

The Contractor shall submit the Illness and Injury Prevention Program and a Project site specific safety program to the DISTRICT prior to beginning Work at the Project site. Contractor shall maintain a confined space program that meets or exceeds the DISTRICT Standards. Contractor shall adhere to the DISTRICT's lock out tag out program.

ARTICLE 38. INSURANCE

The Contractor shall obtain, and at all times during performance of the Contract, maintain, and for five (5) years thereafter, insurance described in this Article against claims for injuries or death to persons or damages to property, which may arise from or in connection with the performance of the Work hereunder by the Contractor, his agents, representatives, employees, or subcontractors. Contractor shall not commence Work under this Contract until it has provided evidence satisfactory to the DISTRICT that it has secured all insurance required hereunder. Contractor shall not allow any subcontractor to commence work on any subcontract

until it has provided evidence satisfactory to the DISTRICT that the subcontractor has secured all insurance required under this Article. Failure to provide and maintain all required insurance shall be grounds for the DISTRICT to terminate this Contract for cause. Contractor shall furnish DISTRICT with original certificates of insurance and endorsements effective coverage required by this Contract on forms satisfactory to the DISTRICT. The certificates and endorsements for each insurance policy shall be signed by a person authorized by that insurer to bind coverage on its behalf, and shall be on forms acceptable to the DISTRICT. All certificates and endorsements must be received and approved by the DISTRICT before Work commences.

- A. **Additional Insureds; Waiver of Subrogation.** The DISTRICT, its officials, officers, employees, agents and authorized volunteers shall be named as Additional Insureds on Contractor's All Risk policy and on Contractor's and its subcontractors' policies of Commercial General Liability and Automobile Liability insurance using, for Contractor's policy/ies of Commercial General Liability insurance, ISO CG form 20 10 11 85 or if not available, through the addition of **both** CG 20 10 10 01 and 20 37 10 01 (or endorsements providing the exact same coverage, including completed operations), and, for subcontractors' policies of Commercial General Liability insurance, ISO CG form 20 38 (or endorsements providing the exact same coverage). Notwithstanding the minimum limits set forth in this Contract for any type of insurance coverage, all available insurance proceeds in excess of the specified minimum limits of coverage shall be available to the parties required to be named as Additional Insureds hereunder. Contractor and its insurance carriers shall provide a Waiver of Subrogation in favor of those parties.
- B. **Workers' Compensation Insurance.** The Contractor shall provide workers' compensation insurance for all of the employees engaged in Work under this Contract, on or at the Site, and, in case of any sublet Work, the Contractor shall require the subcontractor similarly to provide workers' compensation insurance for all the latter's employees as prescribed by the state of California, with Statutory Limits. Any class of employee or employees not covered by a subcontractor's insurance shall be covered by the Contractor's insurance. In case any class of employees engaged in work under this Contract, on or at the Site, is not protected under the Workers' Compensation Statutes, the Contractor shall provide or shall cause a subcontractor to provide, adequate insurance coverage for the protection of such employees not otherwise protected. The Contractor is required to secure payment of compensation to his employees in accordance with the provisions of section 3700 of the Labor Code. The Contractor shall file with the DISTRICT certificates of his insurance protecting workers. Company or companies providing insurance coverage shall be acceptable to the DISTRICT, if in the form and coverage as set forth in the Contract Documents.
- C. **Employer's Liability Insurance.** Contractor shall provide Employer's Liability Insurance, including Occupational Disease, in the amount of at least one million dollars (\$1,000,000.00) per person per accident. Contractor shall provide DISTRICT with a certificate of Employer's Liability Insurance. Such insurance shall comply with the provisions of the Contract Documents. The Contractor hereby agrees to waive rights of subrogation to obtain endorsement necessary to affect this waiver of subrogation in favor of the DISTRICT, its directors, officers, employees, and authorized volunteers, for losses paid under the terms of this coverage which arise from Work performed by the Named Insured for the DISTRICT; this provision applies

regardless of whether or not the DISTRICT has received a waiver of subrogation from the insurer.

D. Commercial General Liability Insurance. Contractor shall provide “occurrence” form Commercial General Liability insurance coverage at least as broad as the most current ISO CGL Form 00 01, including but not limited to, premises liability, contractual liability, products/completed operations, personal and advertising injury which may arise from or out of Contractor’s operations, use, and management of the Site, or the performance of its obligations hereunder. The policy shall not contain any exclusion contrary to this Contract including but not limited to endorsements or provisions limiting coverage for (1) contractual liability (including but not limited to ISO CG 24 26 or 21 39); or (2) cross-liability for claims or suits against one insured against another. Policy limits shall not be less than \$5,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit. Defense costs shall be paid in addition to the limits.

1. Such policy shall comply with all the requirements of this Article. The limits set forth herein shall apply separately to each insured against whom claims are made or suits are brought, except with respect to the limits of liability. Further the limits set forth herein shall not be construed to relieve the Contractor from liability in excess of such coverage, nor shall it limit Contractor’s indemnification obligations to the DISTRICT, and shall not preclude the DISTRICT from taking such other actions available to the DISTRICT under other provisions of the Contract Documents or law.
2. All general liability policies provided pursuant to the provisions of this Article shall comply with the provisions of the Contract Documents.
3. All general liability policies shall be written to apply to all bodily injury, including death, property damage, personal injury, owned and non-owned equipment, blanket contractual liability, completed operations liability, explosion, collapse, under-ground excavation, removal of lateral support, and other covered loss, however occasioned, occurring during the policy term, and shall specifically insure the performance by Contractor of that part of the indemnification contained in these General Conditions relating to liability for injury to or death of persons and damage to property.
4. If the coverage contains one or more aggregate limits, a minimum of 50% of any such aggregate limit must remain available at all times; if over 50% of any aggregate limit has been paid or reserved, the DISTRICT may require additional coverage to be purchased by Contractor to restore the required limits. Contractor may combine primary, umbrella, and as broad as possible excess liability coverage to achieve the total limits indicated above. Any umbrella or excess liability policy shall include the additional insured endorsement described in the Contract Documents.

5. All policies of general liability insurance shall permit and Contractor does hereby waive any right of subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss.

E. Automobile Liability Insurance. Contractor shall provide “occurrence” form Automobile Liability Insurance at least as broad as ISO CA 00 01 (Any Auto) in the amount of, at least, one million dollars (\$1,000,000) per accident for bodily injury and property damage. Such insurance shall provide coverage with respect to the ownership, operation, maintenance, use, loading or unloading of any auto owned, leased, hired or borrowed by Contractor or for which Contractor is responsible, in a form and with insurance companies acceptable to the DISTRICT. All policies of automobile insurance shall permit and Contractor does hereby waive any right of subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss.

F. Builder’s Risk [“All Risk”]

1. It is the Contractor’s responsibility to maintain or cause to be maintained Builder’s Risk [“All Risk”] or an installation floater (for materials and equipment) extended coverage insurance on all work, material, equipment, appliances, tools, and structures that are or will become part of the Work and subject to loss or damage by fire, vandalism and malicious mischief, and collapse, in an amount to cover 100% of the replacement cost. The DISTRICT accepts no responsibility for the Work until the Work is formally accepted by the DISTRICT. The Contractor shall provide a certificate evidencing this coverage before commencing performance of the Work.
2. The Policy shall be endorsed with DISTRICT, its directors, officers, employees, and authorized volunteers named as loss payee, as their interest may appear.
3. Policy shall be provided for replacement value on an “all risk” basis. There shall be no coinsurance penalty provision in any such policy. Policy must include: (1) coverage for any ensuing loss from faulty workmanship, nonconforming work, omission or deficiency in design or specifications; (2) coverage against machinery accidents and operational testing; (3) coverage for removal of debris, and insuring the buildings, structures, machinery, equipment, materials, facilities, fixtures and all other properties constituting a part of the Project; (4) transit coverage, including ocean marine coverage (unless insured by the supplier), with sub-limits sufficient to insure the full replacement value of any key equipment item; and (5) coverage with sub-limits sufficient to insure the full replacement value of any property or equipment stored either on or off the Site. Such insurance shall be on a form acceptable to DISTRICT to ensure adequacy and sublimit.
4. In addition, the policy shall meet the following requirements:
 - a. Insurance policies shall be so conditioned as to cover the performance of any extra work performed under the Contract.
 - b. Coverage shall include all materials stored on site and in transit.

- c. Coverage shall include Contractor's tools and equipment.
 - d. Insurance shall include boiler, machinery and material hoist coverage.
- G. Contractor shall require all tiers of sub-contractors working under this Contract to provide the insurance required under this Article unless otherwise agreed to in writing by DISTRICT. Contractor shall make certain that any and all subcontractors hired by Contractor are insured in accordance with this Contract. If any subcontractor's coverage does not comply with the foregoing provisions, Contractor shall indemnify and hold the DISTRICT harmless from any damage, loss, cost, or expense, including attorneys' fees, incurred by the DISTRICT as a result thereof.

ARTICLE 39. FORM AND PROOF OF CARRIAGE OF INSURANCE

- A. Any insurance carrier providing insurance coverage required by the Contract Documents shall be admitted to and authorized to do business in the State of California unless waived, in writing, by the DISTRICT's Risk Manager. Carrier(s) shall have an A.M. Best rating of not less than an A:VII. Insurance deductibles or self-insured retentions must be declared by the Contractor. At the election of the DISTRICT the Contractor shall either 1) reduce or eliminate such deductibles or self-insured retentions, or 2) procure a bond which guarantees payment of losses and related investigations, claims administration, and defense costs and expenses. If umbrella or excess liability coverage is used to meet any required limit(s) specified herein, the Contractor shall provide a "follow form" endorsement satisfactory to the DISTRICT indicating that such coverage is subject to the same terms and conditions as the underlying liability policy.
- B. Each insurance policy required by this Contract shall be endorsed to state that: (1) coverage shall not be suspended, voided, reduced or cancelled except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the DISTRICT; and (2) any failure to comply with reporting or other provisions of the policies, including breaches of warranties, shall not affect coverage provided to the DISTRICT, its officials, officers, agents, employees, and volunteers.
- C. The Certificates(s) and policies of insurance shall contain or shall be endorsed to contain the covenant of the insurance carrier(s) that it shall provide no less than thirty (30) days written notice be given to the DISTRICT prior to any material modification or cancellation of such insurance. In the event of a material modification or cancellation of coverage, the DISTRICT may terminate the Contract or stop the Work in accordance with the Contract Documents, unless the DISTRICT receives, at least ten (10) days prior to such effective date, another properly executed original Certificate of Insurance and original copies of endorsements or certified original policies, including all endorsements and attachments thereto evidencing coverage's set forth herein and the insurance required herein is in full force and effect. Contractor shall not take possession, or use the Site, or commence operations under this Contract until the DISTRICT has been furnished original Certificate(s) of Insurance and certified original copies of endorsements or policies of insurance including all endorsements and any and all other attachments as required in this Article. The original endorsements for each policy and the Certificate of Insurance

shall be signed by an individual authorized by the insurance carrier to do so on its behalf.

- D. For any claims related to this Project, the Contractor's insurance coverage shall be primary at least as broad as ISO CG 20 01 04 13 as respects to the DISTRICT, its directors, officers, employees, and authorized volunteers. Any insurance or self-insurance maintained by the DISTRICT, its directors, officers, employees, and authorized volunteers shall be excess of the Contractor's insurance and shall not contribute with it.
- E. DISTRICT reserves the right to adjust the monetary limits of insurance coverages during the term of this Contract including any extension thereof if, in the DISTRICT's reasonable judgment, the amount or type of insurance carried by the Contractor becomes inadequate.
- F. Contractor shall report to the DISTRICT, in addition to the Contractor's insurer, any and all insurance claims submitted by the Contractor in connection with the Work under this Contract.

ARTICLE 40. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- A. **Time for Completion/Liquidated Damages.** Time is of the essence in the completion of the Work. Work shall be commenced within ten (10) Days of the date stated in the DISTRICT's Notice to Proceed and shall be completed by Contractor in the time specified in the Contract Documents. The DISTRICT is under no obligation to consider early completion of the Project; and the Contract completion date shall not be amended by the DISTRICT's receipt or acceptance of the Contractor's proposed earlier completion date. Furthermore, Contractor shall not, under any circumstances, receive additional compensation from the DISTRICT (including but not limited to indirect, general, administrative or other forms of overhead costs) for the period between the time of earlier completion proposed by the Contractor and the Contract completion date. If the Work is not completed as stated in the Contract Documents, it is understood that the DISTRICT will suffer damage. In accordance with Government Code section 53069.85, being impractical and infeasible to determine the amount of actual damage, it is agreed that Contractor shall pay to the DISTRICT as fixed and liquidated damages, and not as a penalty, the sum stipulated in the Contract for each calendar day of delay until the Work is fully completed. Contractor and its surety shall be liable for any liquidated damages. Any money due or to become due the Contractor may be retained to cover liquidated damages.
- B. **Inclement Weather.** Contractor shall abide by the Engineer's determination of what constitutes inclement weather. Time extensions for inclement weather shall only be granted when the Work stopped during inclement weather is on the critical path of the Project schedule.
- C. **Extension of Time.** Contractor shall not be charged liquidated damages because of any delays in completion of the Work due to unforeseeable causes beyond the control and without the fault or negligence of Contractor (or its subcontractors or suppliers). Contractor shall within five (5) Days of identifying any such delay notify the DISTRICT in writing of causes of delay. The DISTRICT shall ascertain the facts

and extent of delay and grant extension of time for completing the Work when, in its judgment, the facts justify such an extension. Time extensions to the Project shall be requested by the Contractor as they occur and without delay. No delay claims shall be permitted unless the event or occurrence delays the completion of the Project beyond the Contract completion date.

- D. **No Damages for Reasonable Delay.** The DISTRICT's liability to Contractor for delays for which the DISTRICT is responsible shall be limited to only an extension of time unless such delays were unreasonable under the circumstances. In no case shall the DISTRICT be liable for any costs which are borne by the Contractor in the regular course of business, including, but not limited to, home office overhead and other ongoing costs. Damages caused by unreasonable DISTRICT delay, including delays caused by items that are the responsibility of the DISTRICT pursuant to Government Code section 4215, shall be based on actual costs only, no proportions or formulas shall be used to calculate any delay damages.

ARTICLE 41. COST BREAKDOWN AND PERIODIC ESTIMATES

Contractor shall furnish on forms Approved by the DISTRICT:

- A. Within ten (10) Days of Notice to Proceed with the Contract, a detailed estimate giving a complete breakdown of the Contract price, if the Contract amount is a lump sum.
- B. A monthly itemized estimate of Work done for the purpose of making progress payments. In order for the DISTRICT to consider and evaluate each progress payment application, the Contractor shall submit a detailed measurement of Work performed and a progress estimate of the value thereof before the tenth (10th) Day of the following month.
- C. Contractor shall submit, with each of its payment requests, an adjusted list of actual quantities, verified by the Engineer, for unit price items listed, if any, in the Bid Form.
- D. Following the DISTRICT's Acceptance of the Work, the Contractor shall submit to the DISTRICT a written statement of the final quantities of unit price items for inclusion in the final payment request.
- E. The DISTRICT shall have the right to adjust any estimate of quantity and to subsequently correct any error made in any estimate for payment.

Contractor shall certify under penalty of perjury, that all cost breakdowns and periodic estimates accurately reflect the Work on the Project.

ARTICLE 42. PROGRESS ESTIMATES AND PAYMENT

- A. By the tenth (10th) Day of the following calendar month, Contractor shall submit to Engineer a payment request which shall set forth in detail the value of the Work done for the period beginning with the date work was first commenced and ending on the end of the calendar month for which the payment request is prepared. Contractor shall include any amount earned for authorized extra work. From the total thus

computed, a deduction shall be made in the amount of five percent (5%) for retention, except where the DISTRICT has adopted a finding that the Work done under the Contract is substantially complex, and then the amount withheld as retention shall be the percentage specified in the Notice Inviting Bids. From the remainder a further deduction may be made in accordance with Section B below. The amount computed, less the amount withheld for retention and any amounts withheld as set forth below, shall be the amount of the Contractor's payment request.

- B. The DISTRICT may withhold a sufficient amount or amounts of any payment or payments otherwise due to Contractor, as in his judgment may be necessary to cover:
1. Payments which may be past due and payable for just claims against Contractor or any subcontractors for labor or materials furnished in and about the performance of work on the Project under this Contract.
 2. Defective work not remedied.
 3. Failure of Contractor to make proper payments to his subcontractor or for material or labor.
 4. Completion of the Contract if there is a reasonable doubt that the Work can be completed for balance then unpaid.
 5. Damage to another contractor or a third party.
 6. Amounts which may be due the DISTRICT for claims against Contractor.
 7. Failure of Contractor to keep the record ("as-built") drawings up to date.
 8. Failure to provide update on construction schedule as required herein.
 9. Site cleanup.
 10. Failure to comply with Contract Documents.
 11. Liquidated damages.
 12. Legally permitted penalties.
- C. The DISTRICT may apply such withheld amount or amounts to payment of such claims or obligations at its discretion with the exception of subsections (B)(1), (3), and (5) of this Article, which must be retained or applied in accordance with applicable law. In so doing, the DISTRICT shall be deemed the agent of Contractor and any payment so made by the DISTRICT shall be considered as a payment made under contract by the DISTRICT to Contractor and the DISTRICT shall not be liable to Contractor for such payments made in good faith. Such payments may be made without prior judicial determination of claim or obligations. The DISTRICT will render Contractor a proper accounting of such funds disbursed on behalf of Contractor.

- D. Upon receipt, the Engineer shall review the payment request to determine whether it is undisputed and suitable for payment. If the payment request is determined to be unsuitable for payment, it shall be returned to Contractor as soon as practicable but not later than seven (7) Days after receipt, accompanied by a document setting forth in writing the reasons why the payment request is not proper. The DISTRICT shall make the progress payment within 30 calendar days after the receipt of an undisputed and properly submitted payment request from Contractor, provided that a release of liens and claims has been received from the Contractor pursuant to Civil Code section 8132. The number of days available to the DISTRICT to make a payment without incurring interest pursuant to this paragraph shall be reduced by the number of days by which the Engineer exceeds the seven (7) Day requirement.
- E. A payment request shall be considered properly executed if funds are available for payment of the payment request and payment is not delayed due to an audit inquiry by the financial officer of the DISTRICT.

ARTICLE 43. SECURITIES FOR MONEY WITHHELD

Pursuant to section 22300 of the Public Contract Code of the State of California, Contractor may request the DISTRICT to make retention payments directly to an escrow agent or may substitute securities for any money withheld by the DISTRICT to ensure performance under the contract. At the request and expense of Contractor, securities equivalent to the amount withheld shall be deposited with the DISTRICT or with a state or federally chartered bank as the escrow agent who shall return such securities to Contractor upon satisfactory completion of the contract. Deposit of securities with an escrow agent shall be subject to a written agreement substantially in the form provided in section 22300 of the Public Contract Code.

ARTICLE 44. CHANGES AND EXTRA WORK.

A. Contract Change Orders.

1. The DISTRICT, without invalidating the Contract, may order changes in the Work consisting of additions, deletions or other revisions, and the Contract Price and Contract Time shall be adjusted accordingly. Except as otherwise provided herein, all such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents. A Change Order signed by the Contractor indicates the Contractor's agreement therewith, including any adjustment in the Contract Price or the Contract Time, and the full and final settlement of all costs (direct, indirect and overhead) related to the Work authorized by the Change Order.
2. Contractor shall promptly execute changes in the Work as directed in writing by the DISTRICT even when the parties have not reached agreement on whether the change increases the scope of Work or affects the Contract Price or Contract Time. All claims for additional compensation to the Contractor shall be presented in writing. No claim will be considered after the Work in question has been done unless a written Change Order has been issued or a timely written notice of claim has been made by Contractor.

3. Whenever any change is made as provided for herein, such change shall be considered and treated as though originally included in the Contract, and shall be subject to all terms, conditions, and provisions of the original Contract.
4. Contractor shall not be entitled to claim or bring suit for damages, whether for loss of profits or otherwise, on account of any decrease or omission of any item or portion of Work to be done.
5. No dispute, disagreement, or failure of the parties to reach agreement on the terms of the Change Order shall relieve the Contractor from the obligation to proceed with performance of the work, including Additional Work, promptly and expeditiously.
6. Contractor shall make available to the DISTRICT any of the Contractor's documents related to the Project immediately upon request of the DISTRICT, as set forth in Article 52.
7. Any alterations, extensions of time, Additional Work, or any other changes may be made without securing consent of the Contractor's surety or sureties.

B. Contract Price Change.

1. Process for Determining Adjustments in Contract Price.
 - a. Owner Initiated Change. The Contractor must submit a complete cost proposal, including any change in the Contract Price or Contract Time, within seven (7) Days after receipt of a scope of a proposed change order initiated by the DISTRICT, unless the DISTRICT requests that proposals be submitted in less than seven (7) Days.
 - b. Contractor Initiated Change. The Contractor must give written notice of a proposed change order required for compliance with the Contract Documents within seven (7) Days of discovery of the facts giving rise to the proposed change order.
 - c. Whenever possible, any changes to the Contract amount shall be in a lump sum mutually agreed to by the Contractor and the DISTRICT.
 - d. Price quotations from the Contractor shall be accompanied by sufficiently detailed supporting documentation to permit verification by the DISTRICT, including but not limited to estimates and quotations from subcontractors or material suppliers, as the DISTRICT may reasonably request. Contractor shall certify the accuracy of all Change Order Requests under penalty of perjury.
 - e. If the Contractor fails to submit a complete cost proposal within the seven (7) Day period (or as requested), the DISTRICT has the right to order the Contractor in writing to commence the Work immediately on a time and materials basis and/or issue a lump sum change to the Contract Price and/or Contract Time in accordance with the DISTRICT's estimate. If the change is

issued based on the DISTRICT's estimate, the Contractor will waive its right to dispute the action unless within fifteen (15) Days following completion of the added/deleted work, the Contractor presents written proof that the DISTRICT's estimate was in error.

2. Unit Price Change Orders.

- a. When the actual quantity of a Unit Price item varies from the Bid Form, compensation for the change in quantity will be calculated by multiplying the actual quantity by the Unit Price. This calculation may result in either an additive or deductive Final Change Order pursuant to the Contract Documents.
- b. No Mark up for Overhead and Profit. Because the Contract Unit Prices provided in the Bid Form include Overhead and Profit as determined by Contractor at the time of Bid submission, no mark up or deduction for Overhead and Profit will be included in Unit Price Change Orders.
- c. Bid items included on the Bid Form may be deducted from the Work in their entirety without any negotiated extra costs.
- d. Contractor acknowledges that unit quantities are estimates and agrees that the estimated unit quantities listed on the Bid Form will be adjusted to reflect the actual unit quantities which may result in an adjustment to the Contract Unit Prices. Such an adjustment will be made by execution of a final additive or deductive Change Order following Contractor's completion of the Work. Upon notification, Contractor's failure to respond within seven (7) Days will result in DISTRICT's issuance of a unit quantity adjustment to the Contract Unit Prices and/or Contract Time in accordance with the Contract Documents.
- e. The DISTRICT or Contractor may make a Claim for an adjustment in the Unit Price in accordance with the Contract Documents if:
 - i. the quantity of any item of Unit Price Work performed by Contractor differs by twenty-five percent (25%) or more from the estimated quantity of such item indicated in the Contract; and
 - ii. there is no corresponding adjustment with respect to any other item of Work; and
 - iii. Contractor believes that Contractor is entitled to an increase in Unit Price as a result of having incurred additional expense or the DISTRICT believes that the DISTRICT is entitled to a decrease in Unit Price and the parties are unable to agree as to the amount of any such increase or decrease..

3. Lump Sum Change Orders. Contractor shall incorporate the provisions of this Section into all agreements with Subcontractors. Compensation for Lump Sum

Change Orders shall be limited to expenditures necessitated specifically by the Additional Work, and shall be according to the following:

- a. Overview. The Contractor will submit a properly itemized Lump Sum Change Order Proposal covering the Additional Work and/or the work to be deleted. This proposal will be itemized for the various components of the Additional Work and segregated by labor, material, and equipment in a detailed format satisfactory to the DISTRICT. The DISTRICT will require itemized change orders on all change order proposals from the Contractor, subcontractors, and sub-subcontractors regardless of tier. Details to be submitted will include detailed line item estimates showing detailed materials quantity take-offs, material prices by item and related labor hour pricing information and extensions (by line item or by drawing as applicable).
- b. Labor. The costs of labor will be the actual cost for wages prevailing locally for each craft or type of worker at the time the Additional Work is done, plus employer payments of payroll taxes and insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State or local laws, as well as assessment or benefits required by lawful collective bargaining agreements. The use of a labor classification which would increase the Additional Work cost will not be permitted unless the Contractor establishes the necessity for such new classifications. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.

Estimated labor hours must only include hours for those workmen and working foremen directly involved in performing the change order work. Supervision above the level of working foremen (such as general foremen, superintendent, project manager, etc.) is considered to be included in the markup percentages as outlined below. Note that no separate allowances for warranty expense will be allowed as a direct cost of a change order. Costs attributed to warranty expenses will be considered to be covered by the markup.

- c. Labor Burden. Labor burden allowable in change orders shall be defined as employer's net actual cost of payroll taxes (FICA, Medicare, SUTA, FUTA), net actual cost for employer's cost of union benefits (or other usual and customary fringe benefits if the employees are not union employees), and net actual cost to employer for worker's compensation insurance taking into consideration adjustments for experience modifiers, premium discounts, dividends, rebates, expense constants, assigned risk pool costs, net cost reductions due to policies with deductibles for self-insured losses, assigned risk rebates, etc. Contractor shall reduce their standard payroll tax percentages to properly reflect the effective cost reduction due to the estimated impact of the annual maximum wages subject to payroll taxes. An estimated percentage for labor burden may be used for pricing change orders. However, the percentage used for labor burden to price change orders will be examined at the conclusion of the Project and an adjustment to the approved change orders will be processed if it is determined that the

actual labor burden percentage should have been more or less than the estimated percentage used.

- d. Materials. The cost of materials reported shall be at invoice or lowest current price at which such materials are locally available in the quantities involved, plus sales tax, freight, and delivery. Materials costs shall be based upon supplier or manufacturer's invoice. If invoices or other satisfactory evidence of cost are not furnished within fifteen (15) Days of delivery, then the DISTRICT shall determine the materials cost, at its sole discretion. Estimated material change order costs shall reflect the Contractor's reasonably anticipated net actual cost for the purchase of the material needed for the change order work. Estimated material costs shall reflect cost reductions available to the Contractor due to "non-cash" discounts, trade discounts, free material credits, and/or volume rebates. "Cash" discounts (i.e., prompt payment discounts of 2% or less) available on material purchased for change order work shall be credited to the DISTRICT if the Contractor is provided the DISTRICT funds in time for Contractor to take advantage of any such "cash" discounts. The portion of any "cash" discounts greater than 2% will not be considered "non-cash" discount for purposes of this provision. Price quotations from material suppliers must be itemized with unit prices for each specific item to be purchased. "Lot pricing" quotations will not be considered sufficient substantiating detail.
- e. Tool and Equipment Use. Costs for the use of small tools, which are tools that have a replacement value of \$1,000 or less, shall be considered included in the Overhead and Profit mark-ups established below. Allowable change order estimated costs may include appropriate amounts for rental of major equipment specifically needed to perform the change order work (defined as tools and equipment with an individual purchase cost of more than \$750). For Contractor owned equipment, the "bare" equipment rental rates allowed to be used for pricing change order proposals shall be 75% of the monthly rate listed in the most current publication of The AED Green Book divided by 176 to arrive at a maximum hourly rate to be applied to the hours the equipment is used performing the change order work. Further, for Contractor owned equipment, the aggregate equipment rent charges for any single piece of equipment used in all change order work shall be limited to 50% of the fair market value of the piece of equipment when the first change order is priced involving usage of the piece of equipment. Fuel necessary to operate the equipment will be considered as a separate direct cost associated with the change order work.
- f. Maximum Markup Percentage Allowable on Self-Performed Work. With respect to pricing change orders, the maximum markup percentage to be paid to any Contractor or subcontractor (regardless of tier) on self-performed work shall be a single markup percentage not-to-exceed fifteen percent (15%) of the net direct cost of (1) direct labor and allowable labor burden costs applicable to the change in the Work; (2) the net cost of material and installed equipment incorporated into the change in the Work, and (3) net rental cost of major equipment and related fuel costs necessary to complete the change in the Work. The markup computed using the above formula shall

be considered to be allocated 2/3 to cover applicable overhead costs directly attributable to the field overhead costs related to processing, supervising and performing, the change order work, and the remaining 1/3 to cover home office overhead costs and profit

- g. Maximum Markup Percentages Allowable on Work Performed by Lower Tier Subcontractors. With respect to pricing the portion of change order proposals involving Work performed by lower tier contractors, the maximum markup percentage allowable to the Contractor or subcontractor supervising the lower tier subcontractor's work shall not exceed five percent (5%) of the net of all approved change order work performed by all subcontractors combined for any particular change order proposal. The markup computed using the above formula shall be considered to be allocated 2/3 to cover applicable overhead costs directly attributable to the field overhead costs related to processing, supervising and performing the change order work, and the remaining 1/3 to cover home office overhead costs and profit.
- h. No Markup on Bonds and Liability Insurance Costs. Change order cost adjustments due to increases or decreases in bond or insurance costs (if applicable) shall not be subject to any markup.
- i. Direct and Indirect Costs Covered by Markup Percentages. As a further clarification, the agreed upon markup percentage set forth above is intended to cover the Contractor's profit and all indirect costs associated with the change order work. Items intended to be covered by the markup percentage include, but are not limited to: home office expenses, branch office and field office overhead expense of any kind, project management, superintendents, general foremen, estimating, engineering, coordinating, expediting, purchasing, detailing, legal, accounting, data processing or other administrative expenses, shop drawings, permits, auto insurance and umbrella insurance, pick-up truck costs, and warranty expense costs. The cost for the use of small tools is also to be considered covered by the markup percentage established above. Small tools shall be defined as tools and equipment (power or non-power) with an individual purchase cost of less than \$750.
- j. Deduct Change Orders and Net Deduct Changes. The application of the markup percentages referenced above will apply to both additive and deductive change orders. In the case of a deductive change order, the credit will be computed by applying the sliding scale percentages as outlined above so that a deductive change order would be computed in the same manner as an additive change order. In those instances where a change involves both additive and deductive work, the additions and deductions will be netted and the markup percentage adjustments will be applied to the net amount.
- k. Contingency. In no event will any lump sum or percentage amounts for "contingency" be allowed to be added as a separate line item in change order estimates. Unknowns attributable to labor hours will be accounted for when estimating labor hours anticipated performing the work. Unknowns

attributable to material scrap and waste will be estimated as part of material costs.

- I. Insurance and Bonds. In the event the Contractor has been required to furnish insurance and/or bonds as part of the base contract price, a final contract change order will be processed to account for the Contractor's net increase or decrease in insurance costs and/or bond premium costs associated with change orders to Contractor's base Contract Price

4. Time and Materials Change Orders.

- a. General. The term Time and Materials means the sum of all costs reasonably and necessarily incurred and paid by Contractor for labor, materials, and equipment in the proper performance of Additional Work. Except as otherwise may be agreed to in writing by the DISTRICT, such costs shall be in amounts no higher than those prevailing in the locality of the Project, and shall include only the following items.

- b. Timely and Final Documentation.

- i. T&M Daily Sheets. Contractor must submit timesheets, materials invoices, records of equipment hours, and records of rental equipment hours to the DISTRICT's Representative for an approval signature **each day** Additional Work is performed. Failure to get the DISTRICT's Representative's approval signature each Day shall result in a waiver of Contractor's right to claim these costs. The DISTRICT's Representative's signature on time sheets only serves as verification that the Work was performed and is not indicative of DISTRICT's agreement to Contractor's entitlement to the cost.
- ii. T&M Daily Summary Sheets. All documentation of incurred costs ("T&M Daily Summary Sheets") shall be submitted by Contractor within **three (3) Days** of incurring the cost for labor, material, equipment, and special services as Additional Work is performed. Contractor's actual costs shall be presented in a summary table in an electronic spreadsheet file by labor, material, equipment, and special services. Each T&M Daily Summary Sheet shall include Contractor's actual costs incurred for the Additional Work performed that day and a cumulative total of Contractor's actual costs incurred for the Additional Work. Contractor's failure to provide a T&M Daily Summary Sheet showing a total cost summary within three (3) Days but within five (5) Days of performance of the Work will result in the Contractor's otherwise allowable overhead and profit being reduced by 50% for that portion of Additional Work which was not documented in a timely manner. Contractor's failure to submit the T&M Daily Summary Sheet within five (5) Days of performance of the Work will result in a total waiver of Contractor's right to claim these costs.
- iii. T&M Total Cost Summary Sheet. Contractor shall submit a T&M Total Cost Summary Sheet, which shall include total actual costs, within **seven (7) Days** following completion of DISTRICT approved Additional Work.

Contractor's total actual cost shall be presented in a summary table in an electronic spreadsheet file by labor, material, equipment, and special services. Contractor's failure to submit the T&M Total Cost Summary Sheet within seven (7) Days of completion of the Additional Work will result in Contractor's waiver for any reimbursement of any costs associated with the T&M Summary Sheets or the performance of the Additional Work.

- c. Labor. The Contractor will be paid the cost of labor for the workers used in the actual and direct performance of the Work. The cost of labor will be the sum of the actual wages paid (which shall include any employer payments to or on behalf of the workers for health and welfare, pension, vacation, and similar purposes) substantiated by timesheets and certified payroll for wages prevailing for each craft or type of workers performing the Additional Work at the time the Additional Work is done, and the labor surcharge set forth in the Department of Transportation publication entitled *Labor Surcharge and Equipment Rental Rates*, which is in effect on the date upon which the Work is accomplished and which is a part of the Contract. The labor surcharge shall constitute full compensation for all payments imposed by Federal, State, or local laws and for all other payments made to, or on behalf of, the workers, other than actual wages.
 - i. Equipment Operator Exception. Labor costs for equipment operators and helpers shall be paid only when such costs are not included in the invoice for equipment rental.
 - ii. Foreman Exception. The labor costs for foremen shall be proportioned to all of their assigned work and only that applicable to the Additional Work shall be paid. Indirect labor costs, including, without limitation, the superintendent, project manager, and other labor identified in the Contract Documents will be considered Overhead.
- d. Materials. The cost of materials reported shall be itemized at invoice or lowest current price at which materials are locally available and delivered to the Project site in the quantities involved, plus the cost of sales tax, freight, delivery, and storage.
 - i. Trade discounts available to the purchaser shall be credited to the DISTRICT notwithstanding the fact that such discounts may not have been taken by Contractor.
 - ii. For materials secured by other than a direct purchase and direct billing to the purchaser, the cost shall be deemed to be the price paid to the actual supplier as determined by the DISTRICT's Representative.
 - iii. Payment for materials from sources owned wholly or in part by the purchaser shall not exceed the price paid by the purchaser for similar materials from said sources on Additional Work items or the current wholesale price for such materials delivered to the Project site, whichever price is lower.

- iv. If, in the opinion of the DISTRICT's Representative, the cost of materials is excessive, or Contractor does not furnish satisfactory evidence of the cost of such materials, then the cost shall be deemed to be the lowest current wholesale price for the total quantity concerned delivered to the Project site less trade discounts.
 - v. The DISTRICT reserves the right to furnish materials for the Additional Work and no Claim shall be allowed by Contractor for costs of such materials or Indirect Costs or profit on DISTRICT furnished materials.
- e. Equipment.
- i. Rental Time. The rental time to be paid for equipment on the Project site shall be the time the equipment is in productive operation on the Additional Work being performed and, in addition, shall include the time required to move the equipment to the location of the Additional Work and return it to the original location or to another location requiring no more time than that required to return it to its original location; except that moving time will not be paid if the equipment is used on other than the Additional Work, even though located at the site of the Additional Work.
 - (a) Rental Time Not Allowed. Rental time will not be allowed while equipment is inoperative due to breakdowns.
 - (b) Computation Method. The following shall be used in computing the rental time of equipment on the Project site.
 - (i) When hourly rates are paid, any part of an hour less than 30 minutes of operation shall be considered to be 1/2-hour of operation, and any part of an hour in excess of 30 minutes will be considered one hour of operation.
 - (ii) When daily rates are paid, any part of a day less than 4 hours operation shall be considered to be 1/2-day of operation, and any part of an hour in excess of 4 hours will be considered one day of operation.
 - ii. Rental Rates. Contractor will be paid for the use of equipment at the lesser of (i) the actual rental rate, or (ii) the rental rate listed for that equipment in the California Department of Transportation publication entitled *Labor Surcharge and Equipment Rental Rates*, which is in effect on the date upon which the Contract was executed. Such rental rates will be used to compute payments for equipment whether the equipment is under Contractor's control through direct ownership, leasing, renting, or another method of acquisition. The rental rate to be applied for use of each item of equipment shall be the rate (i.e., daily, monthly) resulting in the least total cost to the DISTRICT for the total period of use. If it is deemed necessary by Contractor to use equipment not listed in the publication, an equitable rental rate for the equipment will be established by the DISTRICT's Representative. Contractor may furnish cost data

which might assist the DISTRICT's Representative in the establishment of the rental rate.

iii. Contractor-Owned Equipment.

(a) For Contractor-owned equipment, the allowed equipment rental rate will be limited to the monthly equipment rental rate using a utilization rate of 173 hours per month.

(b) For Contractor-owned equipment, the rental time to be paid for equipment on the Site shall be the time the equipment is in productive operation, unless, in the instance of standby time, the equipment could be actively used by Contractor on another project, then DISTRICT shall pay for the entirety of the time the equipment is on Site. It shall be Contractor's burden to demonstrate to the DISTRICT that the equipment could be actively used on another project.

iv. All equipment shall, in the opinion of the DISTRICT's Representative, be in good working condition and suitable for the purpose for which the equipment is to be used.

v. Before construction equipment is used on the Additional Work, Contractor shall plainly stencil or stamp an identifying number thereon at a conspicuous location, and shall furnish to the DISTRICT's Representative, in duplicate, a description of the equipment and its identifying number and the scheduled Additional Work activities planned.

vi. Unless otherwise specified, manufacturer's rating and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

f. Special Services. Special work or services are defined as that Additional Work characterized by extraordinary complexity, sophistication, or innovation or a combination of the foregoing attributes which are unique to the construction industry.

i. Invoices for Special Services. When the DISTRICT's Representative and Contractor determine that a special service is required which cannot be performed by the forces of Contractor or those of any of its Subcontractors, the special service may be performed by an entity especially skilled in the Additional Work. Invoices for special services based upon the current fair market value thereof may be accepted without complete itemization of labor, material, and equipment rental costs, after validation of market values by the DISTRICT's Representative.

ii. Discount and Allowance. All invoices for special services will be adjusted by deducting all trade discounts offered or available, whether the

discounts were taken or not. In lieu of Overhead and Profit specified herein, a total allowance not to exceed fifteen percent (15%) for Overhead and Profit will be added to invoices for Special Services.

- iii. When the DISTRICT determines, in its sole discretion, that competitive bidding is necessary for certain special services, Contractor shall solicit competitive bids for those special services.
- g. Excluded Costs. The term Time and Material shall not include any of the following costs or any other home or field office overhead costs, all of which are to be considered administrative costs covered by Contractor's allowance for Overhead and Profit.
 - i. Overhead Cost. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, timekeepers, clerks, and other personnel employed by Contractor whether at the Site or in Contractor's principal office or any branch office, material yard, or shop for general administration of the Additional Work;
 - ii. Office Expenses. Expenses of Contractor's principal and branch offices;
 - iii. Capital Expenses. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Additional Work and charges against Contractor for delinquent payments;
 - iv. Negligence. Costs due to the negligence of Contractor or any Subcontractor or Supplier, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including without limitation the correction of Defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property;
 - v. Other. Other overhead or general expense costs of any kind and the cost of any item not specifically and expressly included in the Contract Documents;
 - vi. Small Tools. Cost of small tools valued at less than \$1,000 and that remain the property of Contractor;
 - vii. Administrative Costs. Costs associated with the preparation of Change Orders (whether or not ultimately authorized), cost estimates, or the preparation or filing of Claims;
 - viii. Anticipated Lost Profits. Expenses of Contractor associated with anticipated lost profits or lost revenues, lost income or earnings, lost interest on earnings, or unpaid retention;

- ix. Home Office Overhead. Costs derived from the computation of a “home office overhead” rate by application of the *Eichleay, Allegheny*, burden fluctuation, or other similar methods;
 - x. Special Consultants and Attorneys. Costs of special consultants or attorneys, whether or not in the direct employ of Contractor, employed for services specifically related to the resolution of a Claim, dispute, or other matter arising out of or relating to the performance of the Additional Work.
- h. Overhead, Profit and Other Charges. The mark-up for overhead (including supervision) and profit on work added to the Contract shall be according to the following:
- i. “Net Cost” is defined as consisting of costs of labor, materials, and tools and equipment only excluding overhead and profit. The costs of applicable insurance and bond premium will be reimbursed to the Contractor and subcontractors at cost only, without mark-up. Contractor shall provide DISTRICT with documentation of the costs, including, but not limited to, payroll records, invoices, and such other information as DISTRICT may reasonably request.
 - ii. For Work performed by the Contractor’s forces, the added cost for overhead and profit shall not exceed fifteen percent (15%) of the Net Cost of the Work.
 - iii. For Work performed by a subcontractor, the added cost for overhead and profit shall not exceed fifteen percent (15%) of the subcontractor’s Net Cost of the Work to which the Contractor may add five percent (5%) of the subcontractor’s Net Cost.
 - iv. For Work performed by a sub-subcontractor, the added cost for overhead and profit shall not exceed fifteen percent (15%) of the sub-subcontractor’s Net Cost for Work to which the subcontractor and general contractor may each add an additional five percent (5%) of the Net Cost of the lower tier subcontractor.
 - v. No additional mark-up will be allowed for lower tier subcontractors, and in no case shall the added cost for overhead and profit payable by DISTRICT exceed twenty-five percent (25%) of the Net Cost as defined herein, of the party that performs the Work.
5. All of the following costs are included in the markups for overhead and profit described above, and Contractor shall not receive any additional compensation for: Submittals, drawings, field drawings, Shop Drawings, including submissions of drawings; field inspection; General Superintendence; General administration and preparation of cost proposals, schedule analysis, Change Orders, and other supporting documentation; computer services; reproduction services; Salaries of project engineer, superintendent, timekeeper, storekeeper, and secretaries; Janitorial services; Small tools, incidentals and consumables; Temporary On-Site facilities (Offices, Telephones, High Speed Internet Access, Plumbing, Electrical

Power, Lighting; Platforms, Fencing, Water), Jobsite and Home office overhead or other expenses; vehicles and fuel used for work otherwise included in the Contract Documents; Surveying; Estimating; Protection of Work; Handling and disposal fees; Final Cleanup; Other Incidental Work; Related Warranties; insurance and bond premiums.

6. For added or deducted Work by subcontractors, the Contractor shall furnish to the DISTRICT the subcontractor's signed detailed record of the cost of labor, material and equipment, including the subcontractor markup for overhead and profit. The same requirement shall apply to sub-subcontractors
7. For added or deducted work furnished by a vendor or supplier, the Contractor shall furnish to the DISTRICT a detailed record of the cost to the Contractor, signed by such vendor or supplier.
8. Any change in the Work involving both additions and deletions shall indicate a net total cost, including subcontracts and materials. Allowance for overhead and profit, as specified herein, shall be applied if the net total cost is an increase in the Contract Price; overhead and profit allowances shall not be applied if the net total cost is a deduction to the Contract Price. The estimated cost of deductions shall be based on labor and material prices on the date the Contract was executed.
9. Contractor shall not reserve a right to assert impact costs, extended job site costs, extended overhead, constructive acceleration and/or actual acceleration beyond what is stated in the Change Order for Work. No claims shall be allowed for impact, extended overhead costs, constructive acceleration and/or actual acceleration due to a multiplicity of changes and/or clarifications. The Contractor may not change or modify the DISTRICT's change order form in an attempt to reserve additional rights.
10. If the DISTRICT disagrees with the proposal submitted by Contractor, it will notify the Contractor and the DISTRICT will provide its opinion of the appropriate price and/or time extension. If the Contractor agrees with the DISTRICT, a Change Order will be issued by the DISTRICT. If no agreement can be reached, the DISTRICT shall have the right to issue a unilateral Change Order setting forth its determination of the reasonable additions or savings in costs and time attributable to the extra or deleted work. Such determination shall become final and binding if the Contractor fails to submit a claim in writing to the DISTRICT within fifteen (15) Days of the issuance of the unilateral Change Order, disputing the terms of the unilateral Change Order, and providing such supporting documentation for its position as the DISTRICT may require.

C. Change of Contract Times.

1. The Contract Times may only be changed by a Change Order.
2. All changes in the Contract Price and/or adjustments to the Contract Times related to each change shall be included in Contractor's COR pursuant to this Article. No cost or time will be allowed for cumulative effects of multiple changes.

All Change Orders must state that the Contract Time is not changed or is either increased or decreased by a specific number of days. Failure to include a change to time shall waive any change to the time unless the parties mutually agree in writing to postpone a determination of the change to time resulting from the Change Order.

3. Notice of the amount of the request for adjustment in the Contract Times with supporting data shall be delivered within seven (7) Days after such start of occurrence, unless DISTRICT's Representative allows an additional period of time to ascertain more accurate data in support of the request. No extension of time or additional compensation shall be given for a delay if the Contractor failed to give notice in the manner and within the time prescribed.
4. DISTRICT may elect, at DISTRICT's sole discretion, to grant an extension in Contract Times, without Contractor's request, because of delays or other factors.
5. Use of Float and Critical Path.
 - a. Float is for the benefit of the Project. Float shall not be considered for the exclusive use or benefit of either the DISTRICT or the Contractor.
 - b. Contractor shall not be entitled to compensation, and DISTRICT will not compensate Contractor, for delays which impact early completion. Any difference in time between the Contractor's early completion and the Contract Time shall be considered a part of the Project float.
6. Contractor's entitlement to an extension of the Contract Times is limited to a DISTRICT-caused extension of the critical path, reduced by the Contractor's concurrent delays, and established by a proper time impact analysis. No time extension shall be allowed unless, and then only to the extent that, the DISTRICT-caused delay extends the critical path beyond the previously approved Contract Time. If approved, the increase in time required to complete the Work shall be added to the Contract Time.
 - a. Contractor shall not be entitled to an adjustment in the Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.
 - b. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions (as determined by the DISTRICT), Acts of God, acts or failures to act of utility owners not under the control of DISTRICT, or other causes not the fault of and beyond control of DISTRICT and Contractor, then Contractor shall be entitled to an time extension when the Work stopped is on the critical path. Such a non-compensable adjustment shall be Contractor's sole and exclusive remedy for such delays. Contractor must submit a timely request in accordance with the requirements of this Article.
 - c. Utility-Related Delays.

- i. Contractor shall immediately notify in writing the utility owner and DISTRICT's Representative of its construction schedule and any subsequent changes in the construction schedule which will affect the time available for protection, removal, or relocation of utilities. Requests for extensions of time arising out of utility relocation or repair delays shall be filed in accordance with this Article.
 - ii. Contractor shall not be entitled to damages or additional payment for delays attributable to utility relocations or alterations if correctly located, as noted in the Contract Documents or by the Underground Service Alert survey.
- 7. Content for Requests for Contract Extension. Contractor's justification for entitlement shall be clear and complete citing specific Contract Document references and reasons on which Contractor's entitlement is based. At a minimum, each request for a time extension must include:
 - a. Each request for an extension of Contract Time must identify the impacting event, in narrative form, providing a description of the delay event and sufficient justification as to why the Contractor is entitled to a time extension. Contractor must demonstrate that the delay arises from unforeseeable causes beyond the control and without the fault or negligence of both Contractor and any Subcontractors or Suppliers, or any other persons or organizations employed by any of them or for whose acts any of them may be liable, and that such causes in fact lead to performance or completion of the Work, or specified part in question, beyond the corresponding Contract Times, despite Contractor's reasonable and diligent actions to guard against those effects.
 - b. Each request for an extension of Contract Time must include a time impact analysis in CPM format, using the Contemporaneous Impacted As-Planned Schedule Analysis to calculate the impact of the delay event.
- 8. No Damages for Reasonable Delay.
 - a. DISTRICT's liability to Contractor for delays for which DISTRICT is responsible shall be limited to only an extension of time unless such delays were unreasonable under the circumstances. In no case shall DISTRICT be liable for any costs which are borne by the Contractor in the regular course of business, including, but not limited to, home office overhead and other ongoing costs.
 - b. Damages caused by unreasonable DISTRICT delay that impact the critical path, including delays caused by items that are the responsibility of the DISTRICT pursuant to Government Code section 4215, shall be compensated at the Daily Rate established in the Special Conditions. No other calculations, proportions or formulas shall be used to calculate any delay damages.

- c. DISTRICT and DISTRICT's Representative, and the officers, members, partners, employees, agents, consultants, or subcontractors of each of them, shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
9. Contractor's failure, neglect, or refusal to comply with the requirements of the Contract Documents, or any portion thereof, shall bar Contractor's request for extensions of the Contract Times. Such failure, neglect, or refusal prejudices DISTRICT's and DISTRICT's Representative's ability to recognize and mitigate delay, and such failure, neglect, or refusal prevent the timely analysis of requests for extensions of Contract Times, and whether such extensions may be warranted. Contractor hereby waives all rights to extensions of Contract Times due to delays or accelerations that result from or occur during periods of time for which Contractor fails, neglects, or refuses to fully comply with the requirements of this Article.

ARTICLE 45. FINAL ACCEPTANCE AND PAYMENT

- A. The acceptance of the Work on behalf of the DISTRICT will be made by the Engineer. Such acceptance by the DISTRICT shall not constitute a waiver of defects. When the Work has been accepted there shall be paid to Contractor a sum equal to the contract price less any amounts previously paid Contractor and less any amounts withheld by the DISTRICT from Contractor under the terms of the contract. The final five percent (5%), or the percentage specified in the notice inviting bids where the DISTRICT has adopted a finding of substantially complete, shall not become due and payable until five (5) calendar days shall have elapsed after the expiration of the period within which all claims may be filed under the provisions of Civil Code section 9356. If the Contractor has placed securities with the DISTRICT as described herein, the Contractor shall be paid a sum equal to one hundred percent (100%) of the contract price less any amounts due the DISTRICT under the terms of the Contract.
- B. Unless Contractor advises the DISTRICT in writing prior to acceptance of the final five percent (5%) or the percentage specified in the notice inviting bids where the DISTRICT has adopted a finding of substantially complete, or the return of securities held as described herein, said acceptance shall operate as a release to the DISTRICT of all claims and all liability to Contractor for all things done or furnished in connection with this work and for every act of negligence of the DISTRICT and for all other claims relating to or arising out of this work. If Contractor advises the DISTRICT in writing prior to acceptance of final payment or return of the securities that there is a dispute regarding the amount due the Contractor, the DISTRICT may pay the undisputed amount contingent upon the Contractor furnishing a release of all undisputed claims against the DISTRICT with the disputed claims in stated amounts being specifically excluded by Contractor from the operation of the release. No payments, however, final or otherwise, shall operate to release Contractor or its sureties from the Faithful Performance Bond, Labor and Material Payment Bond, or from any other obligation under this contract.

- C. In case of suspension of the contract any unpaid balance shall be and become the sole and absolute property of the DISTRICT to the extent necessary to repay the DISTRICT any excess in the cost of the Work above the contract price.
- D. Final payment shall be made no later than 60 days after the date of acceptance of the Work by the DISTRICT or the date of occupation, beneficial use and enjoyment of the Work by the DISTRICT including any operation only for testing, start-up or commissioning accompanied by cessation of labor on the Work, provided that a release of liens and claims has been received from the Contractor pursuant to Civil Code section 8136. In the event of a dispute between the DISTRICT and the Contractor, the DISTRICT may withhold from the final payment an amount not to exceed 150% of the disputed amount.
- E. Within ten (10) calendar days from the time that all or any portion of the retention proceeds are received by Contractor, Contractor shall pay each of its subcontractors from whom retention has been withheld each subcontractor's share of the retention received. However, if a retention payment received by Contractor is specifically designated for a particular subcontractor, payment of the retention shall be made to the designated subcontractor if the payment is consistent with the terms of the subcontract.

ARTICLE 46. OCCUPANCY

The DISTRICT reserves the right to occupy or utilize any portion of the Work at any time before completion, and such occupancy or use shall not constitute acceptance of any part of Work covered by this Contract. This use shall not relieve the Contractor of its responsibilities under the Contract.

ARTICLE 47. INDEMNIFICATION

To the fullest extent permitted by law, Contractor shall immediately defend (with counsel of the DISTRICT's choosing), indemnify and hold harmless the DISTRICT, officials, officers, agents, employees, and representatives, and each of them from and against:

- A. Any and all claims, demands, causes of action, costs, expenses, injuries, losses or liabilities, in law or in equity, of every kind or nature whatsoever, but not limited to, injury to or death, including wrongful death, of any person, and damages to or destruction of property of any person, arising out of, related to, or in any manner directly or indirectly connected with the Work or this Contract, including claims made by subcontractors for nonpayment, including without limitation the payment of all consequential damages and attorney's fees and other related costs and expenses, however caused, regardless of whether the allegations are false, fraudulent, or groundless, and regardless of any negligence of the DISTRICT or its officers, employees, or authorized volunteers (including passive negligence), except the sole negligence or willful misconduct or active negligence of the DISTRICT or its officials, officers, employees, or authorized volunteers.
- B. Contractor's defense and indemnity obligation herein includes, but is not limited to damages, fines, penalties, attorney's fees and costs arising from claims under the Americans with Disabilities Act (ADA) or other federal or state disability access or

discrimination laws arising from Contractor's Work during the course of construction of the improvements or after the Work is complete, as the result of defects or negligence in Contractor's construction of the improvements.

- C. Any and all actions, proceedings, damages, costs, expenses, fines, penalties or liabilities, in law or equity, of every kind or nature whatsoever, arising out of, resulting from, or on account of the violation of any governmental law or regulation, compliance with which is the responsibility of Contractor;
- D. Any and all losses, expenses, damages (including damages to the Work itself), attorney's fees, and other costs, including all costs of defense which any of them may incur with respect to the failure, neglect, or refusal of Contractor to faithfully perform the Work and all of Contractor's obligations under the agreement. Such costs, expenses, and damages shall include all costs, including attorney's fees, incurred by the indemnified parties in any lawsuit to which they are a party.

Contractor shall immediately defend, at Contractor's own cost, expense and risk, with the DISTRICT Council's choosing, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against the DISTRICT, its officials, officers, agents, employees and representatives. Contractor shall pay and satisfy any judgment, award or decree that may be rendered against the DISTRICT, its officials, officers, employees, agents, employees and representatives, in any such suit, action or other legal proceeding. Contractor shall reimburse the DISTRICT, its officials, officers, agents, employees and representatives for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. The only limitations on this provision shall be those imposed by Civil Code section 2782.

ARTICLE 48. PROCEDURE FOR RESOLVING DISPUTES

Contractor shall timely comply with all notices and requests for changes to the Contract Time or Contract Price, including but not limited to all requirements of Article 44, Changes and Extra Work, as a prerequisite to filing any claim governed by this Article. The failure to timely submit a notice of delay or notice of change, or to timely request a change to the Contract Price or Contract Time, or to timely provide any other notice or request required herein shall constitute a waiver of the right to further pursue the claim under the Contract or at law.

- A. **Intent.** Effective January 1, 1991, Section 20104 et seq., of the California Public Contract Code prescribes a process utilizing informal conferences, non-binding judicial supervised mediation, and judicial arbitration to resolve disputes on construction claims of \$375,000 or less. Effective January 1, 2017, Section 9204 of the Public Contract Code prescribes a process for negotiation and mediation to resolve disputes on construction claims. The intent of this Article is to implement Sections 20104 et seq. and Section 9204 of the California Public Contract Code. This Article shall be construed to be consistent with said statutes.
- B. **Claims.** For purposes of this Article, "Claim" means a separate demand by the Contractor, after a change order duly requested in accordance with Article 44 "Changes and Extra Work" has been denied by the DISTRICT, for (A) a time extension, (B) payment of money or damages arising from Work done by or on behalf of the Contractor pursuant to the Contract, or (C) an amount the payment of

which is disputed by the DISTRICT. Claims governed by this Article may not be filed unless and until the Contractor completes all procedures for giving notice of delay or change and for the requesting of a time extension or change order, including but not necessarily limited to the procedures contained in Article 44, Changes and Extra Work, and Contractor's request for a change has been denied in whole or in part. Claims governed by this Article must be filed no later than the date of final payment. The claim shall be submitted in writing to the DISTRICT and shall include on its first page the following in 16 point capital font: "THIS IS A CLAIM." Furthermore, the claim shall include the documents necessary to substantiate the claim. Nothing herein is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims, including all requirements pertaining to compensation or payment for extra Work, disputed Work, and/or changed conditions. Failure to follow such contractual requirements shall bar any claims or subsequent lawsuits for compensation or payment thereon.

C. Supporting Documentation. The Contractor shall submit all claims in the following format:

1. Summary of claim merit and price, reference Contract Document provisions pursuant to which the claim is made
2. List of documents relating to claim:
 - a. Specifications
 - b. Drawings
 - c. Clarifications (Requests for Information)
 - d. Schedules
 - e. Other
3. Chronology of events and correspondence
4. Analysis of claim merit
5. Analysis of claim cost
6. Time impact analysis in CPM format

D. DISTRICT's Response. Upon receipt of a claim pursuant to this Article, DISTRICT shall conduct a reasonable review of the claim and, within a period not to exceed 45 Days, shall provide the Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. Any payment due on an undisputed portion of the claim will be processed and made within 60 Days after the DISTRICT issues its written statement.

1. If the DISTRICT needs approval from its governing body to provide the Contractor a written statement identifying the disputed portion and the

undisputed portion of the claim, and the DISTRICT's governing body does not meet within the 45 Days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the DISTRICT shall have up to three Days following the next duly publicly noticed meeting of the DISTRICT's governing body after the 45-Day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.

2. Within 30 Days of receipt of a claim, the DISTRICT may request in writing additional documentation supporting the claim or relating to defenses or claims the DISTRICT may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of DISTRICT and the Contractor. The DISTRICT's written response to the claim, as further documented, shall be submitted to the Contractor within 30 Days (if the claim is less than \$15,000, 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 or requested documentation, whichever is greater.
- E. **Meet and Confer.** If the Contractor disputes the DISTRICT's written response, or the DISTRICT fails to respond within the time prescribed, the Contractor may so notify the DISTRICT, in writing, either within 15 Days of receipt of the DISTRICT's response or within 15 Days of the DISTRICT's failure to respond within the time prescribed, respectively, and demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand, the DISTRICT shall schedule a meet and confer conference within 30 Days for settlement of the dispute.
- F. **Mediation.** Within 10 business Days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the public entity shall provide the Contractor a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 Days after the public entity issues its written statement. Any disputed portion of the claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the public entity and the Contractor sharing the associated costs equally. The public entity and Contractor shall mutually agree to a mediator within 10 business Days after the disputed portion of the claim has been identified in writing, unless the parties agree to select a mediator at a later time.
1. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.
 2. For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution

through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.

3. Unless otherwise agreed to by the public entity and the Contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.
4. The mediation shall be held no earlier than the date the Contractor completes the Work or the date that the Contractor last performs Work, whichever is earlier. All unresolved claims shall be considered jointly in a single mediation, unless a new unrelated claim arises after mediation is completed.

G. Procedures After Mediation. If following the mediation, the claim or any portion remains in dispute, the Contractor must 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 prior to initiating litigation. 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 his or her written claim pursuant to subdivision (a) until the time the claim is denied, including any period of time utilized by the meet and confer conference.

H. Civil Actions. The following procedures are established for all civil actions filed to resolve claims of \$375,000 or less:

1. Within 60 Days, but no earlier than 30 Days, following the filing or responsive pleadings, the court shall submit the matter to non-binding mediation unless waived by mutual stipulation of both parties or unless mediation was held prior to commencement of the action in accordance with Public Contract Code section 9204 and the terms of this Agreement. The mediation process shall provide for the selection within 15 Days by both parties of a disinterested third person as mediator, shall be commenced within 30 Days of the submittal, and shall be concluded within 15 Days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court.
2. If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1114.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration. In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, (A) arbitrators shall, when possible, be experienced in construction law, and (B) any party appealing an arbitration award who does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, also pay the attorney's fees on appeal of the other party.

I. Government Code Claims. In addition to any and all contract requirements pertaining to notices of and requests for compensation or payment for extra Work, disputed Work, construction claims and/or changed conditions, the Contractor must

comply with the claim procedures set forth in Government Code Sections 900, et seq. prior to filing any lawsuit against the DISTRICT. Such Government Code claims and any subsequent lawsuit based upon the Government Code claims shall be limited to those matters that remain unresolved after all procedures pertaining to extra Work, disputed Work, construction claims, and/or changed conditions have been followed by Contractor. If no such Government Code claim is submitted, or if the prerequisite contractual requirements are not satisfied, no action against the DISTRICT may be filed. **A Government Code claim must be filed no earlier than the date the Work is completed or the date the Contractor last performs Work on the Project, whichever occurs first. A Government Code claim shall be inclusive of all unresolved claims unless a new unrelated claim arises after the Government Code claim is submitted.**

- J. **Non-Waiver.** The DISTRICT's failure to respond to a claim from the Contractor within the time periods described in this Article or to otherwise meet the time requirements of this Article shall result in the claim being deemed rejected in its entirety.

ARTICLE 49. DISTRICT'S RIGHT TO TERMINATE CONTRACT

A. Termination for Cause by the DISTRICT:

1. In the sole estimation of the DISTRICT, if the Contractor refuses or fails to prosecute the Work or any separable part thereof with such diligence as will insure its completion within the time specified by the Contract Documents, or any extension thereof, or fails to complete such Work within such time, or if the Contractor should be adjudged a bankrupt, or if it should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of its insolvency, or the Contractor or any of its subcontractors should violate any of the provisions of this Contract, the DISTRICT may serve written notice upon the Contractor and its Surety of the DISTRICT's intention to terminate this Contract. This notice of intent to terminate shall contain the reasons for such intention to terminate this Contract, and a statement to the effect that the Contractor's right to perform this Contract shall cease and terminate upon the expiration of ten (10) calendar days unless such violations have ceased and arrangements satisfactory to the DISTRICT have been made for correction of said violations.
2. In the event that the DISTRICT serves such written notice of termination upon the Contractor and the Surety, the Surety shall have the right to take over and perform the Contract. If the Surety does not: (1) give the DISTRICT written notice of Surety's intention to take over and commence performance of the Contract within 15 calendar days of the DISTRICT's service of said notice of intent to terminate upon Surety; and (2) actually commence performance of the Contract within 30 calendar days of the DISTRICT's service of said notice upon Surety; then the DISTRICT may take over the Work and prosecute the same to completion by separate contract or by any other method it may deem advisable for the account and at the expense of the Contractor.

3. In the event that the DISTRICT elects to obtain an alternative performance of the Contract as specified above: (1) the DISTRICT may, without liability for so doing, take possession of and utilize in completion of the Work such materials, appliances, plants and other property belonging to the Contractor that are on the site and reasonably necessary for such completion (A special lien to secure the claims of the DISTRICT in the event of such suspension is hereby created against any property of Contractor taken into the possession of the DISTRICT under the terms hereof and such lien may be enforced by sale of such property under the direction of the Board without notice to Contractor. The proceeds of the sale after deducting all expenses thereof and connected therewith shall be credited to Contractor. If the net credits shall be in excess of the claims of the DISTRICT against Contractor, the balance will be paid to Contractor or Contractor's legal representatives.); and (2) Surety shall be liable to the DISTRICT for any cost or other damage to the DISTRICT necessitated by the DISTRICT securing an alternate performance pursuant to this Article.

B. Termination for Convenience by the DISTRICT:

1. The DISTRICT may terminate performance of the Work called for by the Contract Documents in whole or, from time to time, in part, if the DISTRICT determines that a termination is in the DISTRICT's interest.
2. The Contractor shall terminate all or any part of the Work upon delivery to the Contractor of a Notice of Termination specifying that the termination is for the convenience of the DISTRICT, the extent of termination, and the Effective Date of such termination.
3. After receipt of Notice of Termination, and except as directed by the DISTRICT's Representative, the Contractor shall, regardless of any delay in determining or adjusting any amounts due under this Termination for Convenience clause, immediately proceed with the following obligations:
 - a. Stop Work as specified in the Notice.
 - b. Complete any Work specified in the Notice of Termination in a least cost/shortest time manner while still maintaining the quality called for under the Contract Documents.
 - c. Leave the property upon which the Contractor was working and upon which the facility (or facilities) forming the basis of the Contract Document is situated in a safe and sanitary manner such that it does not pose any threat to the public health or safety.
 - d. Terminate all subcontracts to the extent that they relate to the portions of the Work terminated.
 - e. Place no further subcontracts or orders, except as necessary to complete the continued portion of the Contract.

- f. Submit to the DISTRICT's Representative, within ten (10) calendar days from the Effective Date of the Notice of Termination, all of the usual documentation called for by the Contract Documents to substantiate all costs incurred by the Contractor for labor, materials and equipment through the Effective Date of the Notice of Termination. Any documentation substantiating costs incurred by the Contractor solely as a result of the DISTRICT's exercise of its right to terminate this Contract pursuant to this clause, which costs the contractor is authorized under the Contract documents to incur, shall: (1) be submitted to and received by the Engineer no later than 30 calendar days after the Effective Date of the Notice of Termination; (2) describe the costs incurred with particularity; and (3) be conspicuously identified as "Termination Costs occasioned by the DISTRICT's Termination for Convenience."
4. Termination of the Contract shall not relieve Surety of its obligation for any just claims arising out of or relating to the Work performed.
5. In the event that the DISTRICT exercises its right to terminate this Contract pursuant to this clause, the DISTRICT shall pay the Contractor, upon the Contractor's submission of the documentation required by this clause and other applicable provisions of the Contract Documents, the following amounts:
 - a. All actual reimbursable costs incurred according to the provisions of this Contract.
 - b. A reasonable allowance for profit on the cost of the Work performed, provided Contractor establishes to the satisfaction of the DISTRICT's Representative that it is reasonably probable that Contractor would have made a profit had the Contract been completed and provided further, that the profit allowed shall in no event exceed fifteen (15%) percent of the costs.
 - c. A reasonable allowance for Contractor's administrative costs in determining the amount payable due to termination of the Contract under this Article.
- C. Notwithstanding any other provision of this Article, when immediate action is necessary to protect life and safety or to reduce significant exposure or liability, the DISTRICT may immediately order Contractor to cease Work on the Project until such safety or liability issues are addressed to the satisfaction of the DISTRICT or the Contract is terminated.

ARTICLE 50. WARRANTY AND GUARANTEE OF WORK

- A. Contractor hereby warrants that materials and Work shall be completed in conformance with the Contract Documents and that the materials and Work provided will fulfill the requirements of this Warranty. Contractor hereby agrees to repair or replace, at the discretion of the DISTRICT, any or all Work that may prove to be defective in its workmanship, materials furnished, methods of installation or fail to conform to the Contract Document requirements together with any other Work which may be damaged or displaced by such defect(s) within a period of one (1) year from the date of the Notice of Completion of the Project without any expense whatever to the DISTRICT, ordinary wear and tear and unusual abuse and neglect excepted. The

DISTRICT will perform an inspection before the warrant period expires. Contractor shall be required to promptly repair or replace defective equipment or materials, at Contractor's option. All costs associated with such corrective actions and testing, including the removal, replacement, and reinstatement of equipment and materials necessary to gain access, shall be the sole responsibility of the Contractor.

- B. For any Work so corrected, Contractor's obligation hereunder to correct defective Work shall be reinstated for an additional one (1) year period, commencing with the date of acceptance of such corrected Work. The reinstatement of the one (1) year warranty shall apply only to that portion of work that was corrected. Contractor shall perform such tests as DISTRICT may require to verify that any corrective actions, including, without limitation, redesign, repairs, and replacements comply with the requirements of the Contract. In the event of Contractor's failure to comply with the above-mentioned conditions within ten (10) calendar days after being notified in writing of required repairs, to the reasonable satisfaction of the DISTRICT, the DISTRICT shall have the right to correct and replace any defective or non-conforming Work and any work damaged by such work or the replacement or correction thereof at Contractor's sole expense. Contractor shall be obligated to fully reimburse the DISTRICT for any expenses incurred hereunder immediately upon demand.
- C. In addition to the warranty set forth in this Article, Contractor shall obtain for DISTRICT all warranties that would be given in normal commercial practice and assign to DISTRICT any and all manufacturer's or installer's warranties for equipment or materials not manufactured by Contractor and provided as part of the Work, to the extent that such third-party warranties are assignable and extend beyond the warranty period set forth in this Article. Contractor shall furnish the DISTRICT with all warranty and guarantee documents prior to final Acceptance of the Project by the DISTRICT as required.
- D. When specifically indicated in the Contract Documents or when directed by the Engineer, the DISTRICT may furnish materials or products to the Contractor for installation. In the event any act or failure to act by Contractor shall cause a warranty applicable to any materials or products purchased by the DISTRICT for installation by the Contractor to be voided or reduced, Contractor shall indemnify DISTRICT from and against any cost, expense, or other liability arising therefrom, and shall be responsible to the DISTRICT for the cost of any repairs, replacement or other costs that would have been covered by the warranty but for such act or failure to act by Contractor.
- E. The Contractor shall remedy at its expense any damage to DISTRICT-owned or controlled real or personal property.
- F. The DISTRICT shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage. The Contractor shall within ten (10) calendar days after being notified commence and perform with due diligence all necessary Work. If the Contractor fails to promptly remedy any defect, or damage; the DISTRICT shall have the right to replace, repair or otherwise remedy the defect, or damage at the Contractor's expense.

G. In the event of any emergency constituting an immediate hazard to health, safety, property, or licensees, when caused by Work of the Contractor not in accordance with the Contract requirements, the DISTRICT may undertake at Contractor's expense, and without prior notice, all Work necessary to correct such condition.

H. Acceptance of Defective Work.

1. If, instead of requiring correction or removal and replacement of Defective Work, the DISTRICT prefers to accept it, DISTRICT may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to DISTRICT's evaluation of and determination to accept such Defective Work and for the diminished value of the Work.
2. If any acceptance of defective work occurs prior to release of the Project Retention, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and DISTRICT shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work and all costs incurred by DISTRICT.
3. If the Project Retention is held in an escrow account as permitted by the Contract Documents, Contractor will promptly alert the escrow holder, in writing, of the amount of Retention to be paid to DISTRICT.
4. If the acceptance of Defective Work occurs after release of the Project Retention, an appropriate amount will be paid by Contractor to DISTRICT.

I. DISTRICT May Correct Defective Work.

1. If Contractor fails within a reasonable time after written notice from DISTRICT's Representative to correct Defective Work, or to remove and replace rejected Work as required by DISTRICT, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, DISTRICT may, after seven (7) Days' written notice to Contractor, correct, or remedy any such deficiency.
2. In connection with such corrective or remedial action, DISTRICT may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which DISTRICT has paid Contractor but which are stored elsewhere. Contractor shall allow DISTRICT and DISTRICT's Representative, and the agents, employees, other contractors, and consultants of each of them, access to the Site to enable DISTRICT to exercise the rights and remedies to correct the Defective Work.
3. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court

or arbitration or other dispute resolution costs) incurred or sustained by DISTRICT correcting the Defective Work will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions into the Contract Documents with respect to the Work; and DISTRICT shall be entitled to an appropriate decrease in the Contract Price.

4. Such claims, costs, losses and damages will include, but not be limited to, all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Defective Work.
 5. If the Change Order is executed after all payments under the Contract have been paid by DISTRICT and the Project Retention is held in an escrow account as permitted by the Contract Documents, Contractor will promptly alert the escrow holder, in writing, of the amount of Retention to be paid to DISTRICT.
 6. If the Change Order is executed after release of the Project Retention, an appropriate amount will be paid by Contractor to DISTRICT.
 7. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to DISTRICT correcting Defective work.
- J. Nothing in the Warranty or in the Contract Documents shall be construed to limit the rights and remedies available to DISTRICT at law or in equity, including, but not limited to, Code of Civil Procedure section 337.15.

ARTICLE 51. DOCUMENT RETENTION & EXAMINATION

- A. In accordance with Government Code section 8546.7, records of both the DISTRICT and the Contractor shall be subject to examination and audit by the State Auditor General for a period of three (3) years after final payment.
- B. Contractor shall make available to the DISTRICT any of the Contractor's other documents related to the Project immediately upon request of the DISTRICT.
- C. In addition to the State Auditor rights above, the DISTRICT shall have the right to examine and audit all books, estimates, records, contracts, documents, bid documents, subcontracts, and other data of the Contractor (including computations and projections) related to negotiating, pricing, or performing the modification in order to evaluate the accuracy and completeness of the cost or pricing data at no additional cost to the DISTRICT, for a period of four (4) years after final payment.

ARTICLE 52. SEPARATE CONTRACTS

- A. The DISTRICT reserves the right to let other contracts in connection with this Work or on the Project site. Contractor shall permit other contractors reasonable access and storage of their materials and execution of their work and shall properly connect and coordinate its Work with theirs.

- B. To ensure proper execution of its subsequent Work, Contractor shall immediately inspect work already in place and shall at once report to the Engineer any problems with the Work in place or discrepancies with the Contract Documents.
- C. Contractor shall ascertain to its own satisfaction the scope of the Project and nature of any other contracts that have been or may be awarded by the DISTRICT in prosecution of the Project to the end that Contractor may perform this Contract in the light of such other contracts, if any. Nothing herein contained shall be interpreted as granting to Contractor exclusive occupancy at site of the Project. Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on the Project. If simultaneous execution of any contract for the Project is likely to cause interference with performance of some other contract or contracts, the Engineer shall decide which Contractor shall cease Work temporarily and which contractor shall continue or whether work can be coordinated so that contractors may proceed simultaneously. The DISTRICT shall not be responsible for any damages suffered or for extra costs incurred by Contractor resulting directly or indirectly from award, performance, or attempted performance of any other contract or contracts on the Project site.

ARTICLE 53. NOTICE AND SERVICE THEREOF

All notices shall be in writing and either served by personal delivery or mailed to the other party as designated in the Bid Forms. Written notice to the Contractor shall be addressed to Contractor's principal place of business unless Contractor designates another address in writing for service of notice. Notice to DISTRICT shall be addressed to the DISTRICT as designated in the Notice Inviting Bids unless DISTRICT designates another address in writing for service of notice. Notice shall be effective upon receipt or five (5) calendar days after being sent by first class mail, whichever is earlier. Notice given by facsimile shall not be effective unless acknowledged in writing by the receiving party.

ARTICLE 54. NOTICE OF THIRD PARTY CLAIMS

Pursuant to Public Contract Code section 9201, the DISTRICT shall provide the Contractor with timely notification of the receipt of any third-party claims relating to the Contract. The DISTRICT is entitled to recover reasonable costs incurred in providing such notification.

ARTICLE 55. STATE LICENSE BOARD NOTICE

Contractors are required by law to be licensed and regulated by the Contractors' State License Board which has jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omission is filed within four (4) years of the date of the alleged violation. A complaint regarding a latent act or omission pertaining to structural defects must be filed within ten (10) years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, P.O. Box 26000, Sacramento, California 95826.

ARTICLE 56. INTEGRATION

- A. **Oral Modifications Ineffective.** No oral order, objection, direction, claim or notice by any party or person shall affect or modify any of the terms or obligations contained in the Contract Documents.
- B. **Contract Documents Represent Entire Contract.** The Contract Documents represent the entire agreement of the DISTRICT and Contractor.

ARTICLE 57. ASSIGNMENT OF CONTRACT

Contractor shall not assign, transfer, convey, sublet or otherwise dispose of the rights or title of interest of any or all of this contract without the prior written consent of the DISTRICT. Any assignment or change of Contractor's name or legal entity without the written consent of the DISTRICT shall be void. Any assignment of money due or to become due under this Contract shall be subject to a prior lien for services rendered or Material supplied for performance of Work called for under the Contract Documents in favor of all persons, firms, or corporations rendering such services or supplying such Materials to the extent that claims are filed pursuant to the Civil Code, the Code of Civil Procedure or the Government Code.

ARTICLE 58. CHANGE IN NAME AND NATURE OF CONTRACTOR'S LEGAL ENTITY

Should a change be contemplated in the name or nature of the Contractor's legal entity, the Contractor shall first notify the DISTRICT in order that proper steps may be taken to have the change reflected on the Contract and all related documents. No change of Contractor's name or nature will affect DISTRICT's rights under the Contract, including but not limited to the bonds.

ARTICLE 59. ASSIGNMENT OF ANTITRUST ACTIONS

Pursuant to Public Contract Code section 7103.5, in entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, Contractor or subcontractor offers and agrees to assign to the DISTRICT all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 USC, Section 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, services, or materials pursuant to this contract or any subcontract. This assignment shall be made and become effective at the time the DISTRICT tenders final payment to the Contractor, without further acknowledgment by the parties.

ARTICLE 60. PROHIBITED INTERESTS

No DISTRICT official or representative who is authorized in such capacity and on behalf of the DISTRICT to negotiate, supervise, make, accept, or approve, or to take part in negotiating, supervising, making, accepting or approving any engineering, inspection, construction or material supply contract or any subcontract in connection with construction of the project, shall be or become directly or indirectly interested financially in the Contract.

ARTICLE 61. CONTROLLING LAW

Notwithstanding any subcontract or other contract with any subcontractor, supplier, or other person or organization performing any part of the Work, this Contract shall be governed by the law of the State of California excluding any choice of law provisions.

ARTICLE 62. JURISDICTION; VENUE

Contractor and any subcontractor, supplier, or other person or organization performing any part of the Work agrees that any action or suits at law or in equity arising out of or related to the bidding, award, or performance of the Work shall be maintained in the Superior Court of San Diego County, California, and expressly consent to the jurisdiction of said court, regardless of residence or domicile, and agree that said court shall be a proper venue for any such action.

ARTICLE 63. LAWS AND REGULATIONS

- A. Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on conduct of work as indicated and specified. If Contractor observes that drawings and specifications are at variance therewith, it shall promptly notify the Engineer in writing and any necessary changes shall be adjusted as provided for in this Contract for changes in work. If Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, it shall bear all costs arising therefrom.
- B. Contractor shall be responsible for familiarity with the Americans with Disabilities Act ("ADA") (42 U.S.C. § 12101 et seq.). The Work will be performed in compliance with ADA regulations.

ARTICLE 64. PATENTS

Contractor shall hold and save the DISTRICT, officials, officers, employees, and authorized volunteers harmless from liability of any nature or kind of claim therefrom including costs and expenses for or on account of any patented or unpatented invention, article or appliance manufactured, furnished or used by Contractor in the performance of this contract.

ARTICLE 65. OWNERSHIP OF CONTRACT DOCUMENTS

All Contract Documents furnished by the DISTRICT are DISTRICT property. They are not to be used by Contractor or any subcontractor on other work nor shall Contractor claim any right to such documents. With exception of one complete set of Contract Documents, all documents shall be returned to the DISTRICT on request at completion of the Work.

ARTICLE 66. NOTICE OF TAXABLE POSSESSORY INTEREST

In accordance with Revenue and Taxation Code section 107.6, the Contract Documents may create a possessory interest subject to personal property taxation for which Contractor will be responsible.

ARTICLE 67. SURVIVAL OF OBLIGATIONS

All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

00 73 13 – SPECIAL CONDITIONS

1.1 Engineer of Record.

- A. For purposes of this Project, the Engineer of Record or Engineer is David Dale, PE, District Engineer.

1.2 Location of the Project.

- A. **The Project is located along Bending Elbow, Weather Vane and Rocking Chair Drive.**

1.3 Construction Area Signs.

- A. The Contractor shall furnish, install, maintain and remove all construction area signs in conformance with the plans and Sections 12-3.06 of the State of California Department of Transportation (Caltrans) Standard Specifications, latest edition.

1.4 Dust Control

- A. Dust control shall be performed in accordance with Subsection 7-8.1, "Clean up and Dust Control," of the Standard Specifications, San Diego County Air Pollution Control District (APCD) Rules, the General Conditions and the following provision.

Dust resulting from the Contractor's performance of the work, either inside or outside, the right-of-way shall be controlled by the Contractor. Dust control includes the action necessary to prevent, reduce or control dust within the work area as required to complete the work. The Contractor shall carry out proper and efficient measures to prevent his operations from producing dust in amounts damaging to property or causing a nuisance or harm to persons living nearby or occupying buildings in the vicinity of the work. The Contractor shall control dust twenty-four (24) hours a day, seven (7) days a week. The methods to be used for controlling dust in the construction area and along haul roads shall be approved by the Engineer prior to starting any work.

Dust or dirt accumulations generated by the Contractor's operations shall be cleaned and removed by the Contractor from all areas as designated by the Engineer. The cost for cleaning and removal of dust or dirt shall be at the Contractor's expense and no additional compensation will be made therefore.

Water for use in dust control shall, at the option of the Contractor, be potable or non-potable. Non-potable water shall consist of reclaimed waste water or non-potable water developed from other sources.

If the Contractor uses reclaimed waste water in the work, the sources and discharge of reclaimed waste water shall meet the California Department of Health Services Water Reclamation Criteria and the Regional Water Quality Control Board

requirements. The Contractor shall obtain either a waste water discharge permit or a waiver from the Regional Water Quality Control Board. Copies of permits or waivers from the Regional Water Quality Control Board shall be delivered to the engineer before using reclaimed waste water in the work.

Water shall be applied in the amounts, at the locations, and for the purposes designated in the Special Provision and these Specifications, and as order by the Engineer.

Water for compacting embankment material, sub-base, base and surfacing material and for laying dust, shall be applied by means of pressure-type distributors or pipe lines equipped with a spray system or hoses with nozzles that will ensure a uniform application of water.

All equipment used for the application of water shall be equipped with a positive means of shut-off.

Unless otherwise permitted by the Engineer or unless all the water is applied by means of pipe lines, at least one mobile unit with a minimum capacity of 3700 L (1,000 gallons) shall be available for applying water on the project at all times.

Chemical additives or binder may be used in water for compaction or dust palliative. If such additives are used, furnishing and applying the additives shall be at the Contractor's expense.

The right is reserved by the Engineer to prohibit the use of a particular type of additive, to designate the locations where a particular type of additive may not be used, or to limit the amount of a particular type of additive to be used at certain locations, all if the Engineer has reasonable ground for believing that such use will in any way be detrimental.

The additive or binder shall be either miscible in water or be some form of material that is directly applied to the surface without mixing with water.

Additives or binders that are miscible in water shall be either a resin emulsion, an SS1 type asphaltic emulsion, materials composed essentially of lignin sulfonate or any other binder that is miscible in water in the proportions provided herein is non-corrosive, and is effective as a dust palliative.

Resin emulsion shall be composed of from fifty-seven percent (57%) to sixty-three percent (63%) of semi-liquid petroleum resin and the remainder water to which a suitable emulsifying agent has been added. The resin emulsion shall be readily miscible with water and when diluted with any hard water in the proportions of one (1) part of emulsion to ten (10) parts water shall show no signs of breakdown or separation of the petroleum resin base. Resin emulsion, which has been stored in

closed containers at temperatures above freezing for a period up to three (3) months shall show no signs of separation. Any resin emulsion which has been stored for more than three (3) months shall not be used until tested and approved.

SS1 type asphaltic emulsion shall conform to the provisions in Subsection 203-3, "Emulsified Asphalt."

Additives or binders that are miscible in water shall be mixed with additional water at the rate of from four (4) to nineteen (19) parts of water to one (1) part of binder, the exact rate to be determined by the Engineer. Mixing shall be accomplished by placing the binder and water in the spreading equipment simultaneously or by some other mixing method that will produce equivalent results.

The resulting mixture shall be applied with pressure type water distributor trucks equipped with a spray system or pressure type asphalt distributors at an approximate rate of from 0.9- to 3.6 L/m². (0.2 to 0.8 gallon on per square yard)

Additives or binders that are directly applied to the surface without mixing with water shall be applied with equipment approved by the Engineer. The binder shall be applied at a rate of from 0.4- to 1.1L/m². (0.10 to 0.25 gallons per square yard)

The exact rate and number of applications of binders will be determined by the Engineer.

Dust control ordered by the Engineer to be applied on Saturdays, Sundays or holidays will be included in the Contract price for dust control and no additional compensation will be allowed therefore.

No adjustment of compensation will be made for any increase or decrease in the quantity of dust control required, regardless of the reason for such increase or decrease.

The full compensation for all direct and indirect costs incurred for work performed or materials used to control dust resulting from the Contractor's performance of the work and caused by public traffic, either inside or outside the right-of-way shall be considered as included in the Contract prices paid for the various items of work involved and no additional compensation will be allowed therefore.

1.5 Cooperation and Collateral Work

- A. The Contractor shall be responsible for ascertaining the nature and extent of any simultaneous, collateral and essential work by others and coordinating with the work by others. The DISTRICT, other contractors and utilities shall have the right to operate within or adjacent to the work site during the performance of such work.

Should construction be under way by other forces or by other contractors within or adjacent to the limits of the work specified or should work of any other nature be under way by other forces within or adjacent to those limits, the Contractor shall cooperate with all the other contractors or other forces to the end that any delay or hindrance to their work will be avoided. The right is reserved to perform other or additional work at or near the site (including material sources) at any time, by the use of other forces.

Each contractor shall be responsible to the other for all damage to work, to persons or property caused to the other by their operations, and for loss caused the other due to unnecessary delays or failure to finish the work within the time specified for completion.

The Contractor shall include in its proposal all costs involved as a result of coordinating its work with others. The Contractor will not be entitled to additional compensation from the DISTRICT for damages resulting from such simultaneous, collateral and essential work. If necessary to avoid or minimize such damage or delay, the Contractor shall re-deploy its work force to other parts of the work.

Should the Contractor be delayed by the DISTRICT, and such delay could not have been reasonably foreseen or prevented by the Contractor, the Engineer will determine the extent of the delay, the effect on the project and any extension of time. Should any agency or utility company's work result in delays to the Contractor's work schedule, the Contractor shall be entitled only to an equivalent extension of time for the completion of the contract, and shall not be entitled to damages due to downtime and idled equipment or additional payments over and above the agreed upon unit prices.

Compensation for compliance with all collateral work shall be considered as being included in the various Contract items in the proposal schedule and no additional compensation will be allowed therefore.

1.6 Existing Improvement

- A. The Contractor shall make every effort to protect all existing improvements and facilities from damage during the progress of his/her/its work. No trees, planters, walks, shrubs, signs, fences or other such facilities shall be removed except as shown or called for on the plans or unless specifically authorized in writing by the Engineer. The Contractor shall be held responsible for the care and preservation of the present premises and of adjacent premises and coterminous property. Any parts of them which are injured, damaged or disturbed because of his work shall be repaired, replaced or cleaned by him at his expense.

1.7 Existing Utilities

- A. The Contractor will be required to work around public utilities and other improvements that are to remain in place within the construction area. The Contractor will be held liable for any damage to existing improvements or interference with service resulting from his operations. The Contractor shall pothole and ascertain the exact location of all underground facilities and improvements within the construction area before using equipment that may damage such facilities.

1.8 Resident Access to Their Properties During Construction

- A. The Contractor shall provide access to local residents at all times. The contractor shall notify the residents of the construction schedule and when construction activities will take place in front of their properties. The Contractor shall install steel plates over open trench (for the width of a standard residential driveway) to provide vehicular access in and out of local residences. The compensation for providing steel plates for resident vehicular access shall be included (factored) in the unit price (LF) of the 6 inch diameter PVC pipe installation. No additional cost shall be incurred.

1.9 Status of the Project Area and Rights-of-Way.

- A. DISTRICT, at its expense, will provide all rights-of-way or permits, or both, covering the crossing of private property and public and private rights-of-way necessary for the permanent Work; provided, however, Contractor shall, at its expense, obtain any bonds or insurance policies or pay any fees and enter into any agreements required by a controlling authority, e.g., Caltrans or Southern Pacific Railroad Company, before Contractor enters upon any property or right-of-way under the jurisdiction of any such controlling authority for the purpose of performing Work.
- B. DISTRICT has acquired or is negotiating to acquire any rights-of-way, or both, necessary for the permanent Work.
- C. If such permits are required, all operations of Contractor shall conform to the restrictions, regulations, and requirements set forth in said permits, copies of which will be included in the Contract Documents.
- D. Contractor may be required, as a condition for receiving final payment, to obtain, and provide DISTRICT's Representative with copies of, executed damage releases from the owners of public and private property whose property has been damaged by the Work. The damage releases will be on a form provided by DISTRICT.
- E. Contractor shall, also, as a condition for receiving final payment, obtain, and provide DISTRICT's Representative with copies of, executed damage releases from the owners of certain public and private property or areas which have been crossed by the Work or otherwise affected by the Work. The damage releases will be on a form provided by DISTRICT.

1.10 Site Data.

NOT USED.

1.11 Pre-Purchased or Pre-Negotiated Material.

NOT USED.

1.12 Designation of DISTRICT's Representative.

A. Unless otherwise modified by DISTRICT, DISTRICT's Representative shall be its General Manager.

1.13 Project Retention

In accordance with Public Contract Code § 7201, DISTRICT will withhold 5% of each progress payment as retention on the Project.

1.14 Liquidated Damages Due to Contractor Delay.

A. Time is of the essence. Should Contractor fail to complete all or any part of the Work within the time specified in the Contract Documents, DISTRICT will suffer damage, the amount of which is difficult, if not impossible, to ascertain and, pursuant to the authority of Government Code section 53069.85, DISTRICT shall therefore be entitled to **\$1,000.00 per Day** as liquidated damages for each Day or part thereof that actual completion extends beyond the time specified.

B. Liquidated damages may be deducted from progress payments due Contractor, Project retention or may be collected directly from Contractor, or from Contractor's surety. These provisions for liquidated damages shall not prevent DISTRICT, in case of Contractor's default, from terminating the Contractor.

1.15 Utility Outages – Notices to Residents.

A. Should Contractor's operations require interruption of any utility service, Contractor shall notify DISTRICT at least ten (10) Days prior to the scheduled outage. Contractor will notify all impacted residents on a form provided by DISTRICT at least seven (7) Days prior to the scheduled outage.

B. Contractor shall be responsible for providing, at its cost, any temporary utility or facilities necessitated by the utility outage.

1.16 Schedule Constraints.

NOT USED.

1.17 Noise Restrictions

A. Contractor shall use only such equipment on the Work and in such state of repair so that the emission of sound therefrom is within the noise tolerance level of that equipment as established by Cal/OSHA.

1.18 Safety Programs.

- A. DISTRICT has considered these Safety Programs when determining the Contract Times and no additional time or compensation will be added to the Contract due to these Programs.]

END OF SPECIAL CONDITIONS

01 00 00 – GENERAL REQUIREMENTS

PART 1 -- GENERAL

1.1 DESCRIPTION

- A. The work shall include the procurement of materials and the installation of a new 8 and 6 inch diameter water main pipeline along Bending Elbow, Weather Vane and Rocking Chair Drive. The work also includes the tie-ins to the existing 8 inch water lines. The work also includes the installation of new fire hydrants along Bending Elbow and the replacement of existing fire hydrants in various places.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

PART 2 -- PRODUCTS (NOT USED)

PART 3 -- EXECUTION

3.1 LAYOUT OF WORK AND QUANTITY SURVEYS

- A. General. Construction staking will be provided by the DISTRICT.
- B. Quantity surveys. The Contractor shall perform such surveys and computations as are necessary to determine quantities of Work performed or placed during each progress payment period, and shall perform all surveys necessary for the DISTRICT Representative to determine final quantities of Work in place. The DISTRICT Representative will determine final quantities based upon the survey data provided by the Contractor, and the design lines and grades. If requested by the DISTRICT Representative, the Contractor shall provide an electronic copy of data used for quantity computations.

All surveys performed for measurement of final quantities of Work and material shall be subject to approval of DISTRICT's Representative. Unless waived by DISTRICT's Representative in each specific case, quantity surveys made by the Contractor shall be made in the presence of DISTRICT's Representative.

- C. Cost. Unless otherwise called for by the Contract Documents, the cost of all material, equipment, and labor required for quantity surveys shall be included in the Schedule of Pay Items for items of work requiring the surveys. No additional compensation shall be made to the Contractor for this Work.

3.2 SCHEDULE

- A. Estimated Schedule. Within ten (10) Days after the issuance of the Notice to Proceed, Contractor shall prepare a Project schedule and shall submit this to the Engineer for Approval. The receipt or Approval of any schedules by the Engineer or the DISTRICT shall not in any way relieve the Contractor of its obligations under the

Contract Documents. The Contractor is fully responsible to determine and provide for any and all staffing and resources at levels which allow for good quality and timely completion of the Project. Contractor's failure to incorporate all elements of Work required for the performance of the Contract or any inaccuracy in the schedule shall not excuse the Contractor from performing all Work required for a completed Project within the specified Contract time period. If the required schedule is not received by the time the first payment under the Contract is due, Contractor shall not be paid until the schedule is received, reviewed and accepted by the Engineer.

- B. Schedule Contents. The schedule shall indicate the beginning and completion dates of all phases of construction; critical path for all critical, sequential time related activities; and "float time" for all "slack" or "gaps" in the non-critical activities. The schedule shall clearly identify all staffing and other resources which in the Contractor's judgment are needed to complete the Project within the time specified for completion. The overall Project Schedule duration shall be within the Contract time.
- C. Schedule Updates. Contractor shall continuously update its construction schedule. Contractor shall submit an updated and accurate construction schedule to the Engineer monthly when requested to do so by Engineer. Contractor shall also submit schedules showing a three week detailed look-ahead at bi-weekly meetings conducted with the DISTRICT. The Engineer may withhold progress payments or other amounts due under the Contract Documents if Contractor fails to submit an updated and accurate construction schedule.

3.3 TEMPORARY FIELD OFFICE

NOT USED

3.4 PROTECTION OF WORK AND PROPERTY

- A. All traffic detector loops, fences, walls, culverts, property line monuments, or other obstructions (except property line monuments within five (5) feet of the centerline of the mains) which are removed, damaged, or destroyed in the course of the Work, shall be replaced or repaired to the original condition. If Contractor provides the DISTRICT with reasonable notice of the need for such repair or replacement, it shall be performed by the DISTRICT. If the Contractor fails to provide the DISTRICT with reasonable notice, the repair or replacement shall be performed by and at the expense of the Contractor to the satisfaction of the DISTRICT, whether or not those obstructions have been shown on the Plans, unless otherwise stated herein. It is then the Contractor's responsibility to employ at its expense a Licensed Land Surveyor to restore all property line monuments located more than five (5) feet from the centerline of the mains, which are destroyed or obliterated. Property line monuments located within five (5) feet of the centerline of the mains will be replaced by the DISTRICT at no expense to the Contractor, provided the DISTRICT is notified at least 48 hours before the property line monuments are damaged.
- B. Contractor shall provide such heat, covering, and enclosures as are necessary to protect all Work, materials, equipment, appliances, and tools against damage by weather conditions.

- C. Contractor shall take adequate precautions to protect existing sidewalks, curbs, pavements, utilities, and other adjoining property and structures, and to avoid damage thereto, and Contractor shall repair any damage thereto caused by the Work operations. Contractor shall:
1. Enclose the working area with a substantial barricade, and arrange work to cause minimum amount of inconvenience and danger to the public.
 2. Provide substantial barricades around any shrubs or trees indicated to be preserved.
 3. Deliver materials to the Project site over a route designated by the Engineer.
 4. Provide any and all dust control required and follow the Applicable air quality regulations as appropriate. If the Contractor does not comply, the DISTRICT shall have the immediate authority to provide dust control and deduct the cost from payments to the Contractor.
 5. Confine Contractor's apparatus, the storage of materials, and the operations of its workers to limits required by law, ordinances, permits, or directions of the Engineer. Contractor shall not unreasonably encumber the Project site with its materials.
 6. Take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed by accident, they shall be replaced by a civil engineer or land surveyor acceptable to the DISTRICT, at no cost to the DISTRICT.
 7. Ensure that existing facilities, fences and other structures are all adequately protected and that, upon completion of all Work, all facilities that may have been damaged are restored to a condition acceptable to the DISTRICT.
 8. Preserve and protect from injury all buildings, pole lines and all direction, warning and mileage signs that have been placed within the right-of-way.
 9. At the completion of work each day, leave the Project site in a clean, safe condition.
 10. Comply with any stage construction and traffic control plans. Access to residences and businesses shall be maintained at all times, unless otherwise permitted in writing by the DISTRICT.
- D. These precautionary measures will apply continuously and not be limited to normal working hours. Full compensation for the Work involved in the preservation of life, safety and property as above specified shall be considered as included in the prices paid for the various contract items of Work, and no additional allowance will be made therefore.
- E. Should damage to persons or property occur as a result of the Work, Contractor shall be responsible for proper investigation, documentation, including video or

photography, to adequately memorialize and make a record of what transpired. The DISTRICT shall be entitled to inspect and copy any such documentation, video, or photographs.

3.5 SITE CONDITIONS SURVEYS

A. Work Included.

Contractor shall conduct thorough pre-construction and post-construction site condition surveys of the entire project area. Site Conditions surveys shall include written documentation of the conditions found, as well as photographs and video recordings of the area within at least 80 feet of any construction area and staging area. The written notes, photographs, and video shall be suitable for forensic purposes to resolve any damage claims that may arise as a result of construction.

B. Submittals.

1. Written documentation of site condition survey at pre-construction and post-construction.
2. Photographs as described herein of pre-construction and post-construction conditions.
3. Video recordings as described herein of pre-construction and post-construction conditions.
4. Submittals shall be made within three days of the surveys. All post-construction data shall be submitted prior to the final project inspection.

C. Site Condition Written Documentation.

Written documentation shall include the time, date, and conditions under which the site survey was made. The documentation shall note the condition of structures, pavement, sidewalks, utilities, fences, and etc. within the work areas.

D. Photographs.

1. General – Contractor shall take enough photographs during each site survey to provide a record of conditions existing prior to construction and conditions after construction. Pre-construction photographs shall be taken prior to any construction or mobilization of equipment, but not more than one week prior to actual start of work. The pre-construction photographs may be staged at different times to match the progression of the Work.
2. The photographs shall document existing damage to public and private facilities, both prior to and after construction. Conditions to be documented include, but are not limited to: sidewalk cracks, broken curbs, separated property walls, improvements within public right-of-ways, access roads used, utility covers and markings, signs, pavement striping, pavement, unique or unusual conditions, adjacent driveways, landscaping, survey markers, and any feature directed by

the Engineer. Private property that is adjacent to the public right-of-way shall be documented to the extent visible from the public right-of-way.

3. Photographs shall include items to indicate scale, as needed. In particular, scales or other items shall be laid next to close ups of structural cracks and other damaged areas being recorded. Scaling shall also be used to document elevation differences, as needed.
4. One set of color prints shall be submitted. Additional sets shall be available for reviewing in settling any construction disputes. A set of photos shall also be furnished in electronic format. The resolution shall be at least equal to 7 megapixels. All photos shall be documented as to time and date taken, photographer, project number, location, and orientation. Documentation shall include a brief description of objects photographed.

E. Video Recording.

1. Video recordings shall document the conditions of the entire area affected by construction, as well as nearby structures and facilities. The general documentation requirements for videos are the same as for photographs. Video recorders shall accurately and continuously record the time and date.
2. Video recordings shall include an audio portion made simultaneously during the videoing. The audio recording shall describe the location, time, orientation, and objects being recorded. Special commentary shall be provided for unusual conditions or damage noted.
3. Video equipment shall be capable of producing high resolution images and shall have zoom capabilities.
4. Video recordings shall provide an overall picture of the sites and shall provide detailed images of damaged areas. Video shall extend to the maximum height of structures.
5. The Engineer shall have the right to reject any audio video recordings submitted with unintelligible audio, uncontrolled pan or zoom, or of poor quality. Video recordings shall be repeated when rejected.
6. Video recordings shall be submitted with labels indicating the project, date, recorder, and other pertinent information. Recordings shall be submitted on standard DVDs in a standard format.

F. Timing.

Contractor shall provide written notice of the time scheduled for the site conditions survey and the place it is to begin. Contractor shall obtain the Engineer's concurrence prior to beginning the condition survey. The Engineer reserves the right to cancel the survey due to weather conditions or other problems. Videoing shall be done during times of good visibility and no videoing or photography shall be done during periods of visible precipitation or when standing water obscures pavement.

Contractor shall provide the Engineer with an opportunity to have a representative present when taking the photos and provide guidance during photographing.

G. Site Surveyor.

The site condition surveyor(s) shall be experienced in construction and potential damage concerns. The site condition surveyor(s) shall be familiar with the photography and video equipment being used.

H. Field Quality Control.

Prior to submitting videos and photographs, the Contractor shall spot check the photos and videos in the field to insure they accurately reflect the actual conditions and to insure they are correctly labeled.

I. Soils Compaction Testing.

1. All soils compaction testing will be done by a licensed geotechnical engineer furnished by the Contractor.

3.6 SUBMITTAL REQUIREMENTS FOR MANUALS AND RECORD DRAWINGS

A. General. The Contractor shall furnish all materials and perform all Work required for furnishing submittals to DISTRICT in accordance with Contract Documents.

B. Technical Manuals.

1. The Contractor shall submit technical operation and maintenance information for each item of mechanical, electrical and instrumentation equipment in an organized manner in the Technical Manual. It shall be written so that it can be used and understood by DISTRICT's operation and maintenance staff.
2. The Technical Manual shall be subdivided first by specification section number; second, by equipment item; and last, by "Category." "Categories" shall conform to the following (as applicable):

(a) Category 1 - Equipment Summary:

- (1) Summary: A summary table shall indicate the equipment name, equipment number, and process area in which the equipment is installed.

(b) Category 2 - Operational Procedures:

- (1) Procedures: Manufacturer-recommended procedures on the following shall be included in Part 2:

- a. Installation
- b. Adjustment

- c. Startup
- d. Location of controls, special tools, equipment required, or related instrumentation needed for operation
- e. Operation procedures
- f. Load changes
- g. Calibration
- h. Shutdown
- i. Troubleshooting
- j. Disassembly
- k. Reassembly
- l. Realignment
- m. Testing to determine performance efficiency
- n. Tabulation of proper settings for all pressure relief valves, low and high pressure switches, and other protection devices
- o. List of all electrical relay settings including alarm and contact settings

(c) Category 3 - Preventive Maintenance Procedures:

- (1) Procedures: Preventive maintenance procedures shall include all manufacturer-recommended procedures to be performed on a periodic basis, both by removing and replacing the equipment or component, and by leaving the equipment in place.
- (2) Schedules: Recommended frequency of preventive maintenance procedures shall be included. Lubrication schedules, including lubricant SAE grade, type, and temperature ranges, shall be covered.

(d) Category 4 - Parts List:

- (1) Parts List: A complete parts list shall be furnished, including a generic description and manufacturer's identification number for each part. Addresses and telephone numbers of the nearest supplier and parts warehouse shall be included.
- (2) Drawings: Cross-sectional or exploded view drawings shall accompany the parts list.

(e) Category 5 - Wiring Diagrams:

- (1) Diagrams: Part 5 shall include complete internal and connection wiring diagrams for electrical equipment items.
 - (f) Category 6 - Shop Drawings:
 - (1) Drawings: This part shall include approved shop or fabrication drawings, complete with dimensions.
 - (g) Category 7 - Safety:
 - (1) Procedures: This part describes the safety precautions to be taken when operating and maintaining the equipment or working near it.
 - (h) Category 8 - Documentation:
 - (1) All equipment warranties, affidavits, and certifications required by the Technical Specifications shall be placed in this part.
3. The Contractor shall furnish to DISTRICT six (6) identical Technical Manuals. Each set shall consist of one or more volumes, each of which shall be bound in a standard binder.
- C. Spare Parts List - The Contractor shall furnish to DISTRICT six (6) identical sets of spare parts information for all mechanical, electrical, and instrumentation equipment. The spare parts list shall include the current list price of each spare part. The spare parts list shall include those spare parts which each manufacturer recommends be maintained by DISTRICT in inventory. Each manufacturer or supplier shall indicate the name, address, and telephone number of its nearest outlet of spare parts to assist DISTRICT in ordering. The Contractor shall cross-reference all spare parts lists to the equipment numbers designated in the Contract Documents. The spare parts lists shall be bound in standard size, 3-ring binder.
- D. Record Drawings
1. The Contractor shall maintain one record set of Drawings at the Site. On these, it shall mark all Project conditions, locations, configurations, and any other changes or deviations which may vary from the information represented in the original Contract Documents, including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated, or which were not indicated on the Contract Drawings. Said record drawings shall be supplemented by any detailed sketches as necessary or directed to fully indicate the Work as actually constructed. These master record drawings of the as-built conditions, including all revisions made necessary by Addenda and Change Orders shall be maintained up-to-date during the progress of the Project. Red ink shall be used for alterations and notes. Notes shall identify relevant Change Orders by number and date.
 2. For all Projects involving the installation of any pipeline, Contractor shall survey and record the top of the pipe at a minimum of every 100 linear feet, and at each bend, recording both the horizontal and vertical locations.

3. Record drawings shall be accessible to DISTRICT's Representative at all times during the construction period. Failure on the Contractor's part to keep record drawings current could result in withholding partial payment.
 4. Upon Completion of the Project and as a condition of final acceptance, the Contractor shall finalize and deliver a complete set of Record Drawings to DISTRICT's Representative. The information submitted by the Contractor will be assumed to be correct, and the Contractor shall be responsible for, and liable to DISTRICT, for the accuracy of such information, and for any errors or omissions which may or may not appear on the Record Drawings.
- E. Cost. Unless otherwise called for by the Contract Documents, the cost of all material, equipment, and labor required to complete the Manuals and Record Drawings shall be included in Contractor's bid and distributed in the Schedule of Pay. No additional compensation shall be made to the Contractor for this Work.

3.7 MATERIALS

A. Materials to be Furnished by the Contractor

1. Inspection of Materials. Materials furnished by the Contractor which will become a part of the Project shall be subject to inspection at any one or more of the following locations, as determined by DISTRICT's Representative: at the place of production or manufacture, at the shipping point, or at the site of the Work. To allow sufficient time to provide for inspection, the Contractor shall submit to DISTRICT's Representative, at the time of issuance, copies of purchase orders or other written instrument confirming procurement of the materials, including drawings and other pertinent information, covering materials on which inspection will be made.
2. No later than fourteen (14) Days prior to manufacture of material, Contractor shall inform DISTRICT's Representative, in writing, the date the material is to be manufactured.
3. Contractors Obligations. The inspection of materials at any of the locations specified above or the waiving of the inspection thereof shall not impact whether the materials and equipment conform to the Contract Documents. Contractor will not be relieved from furnishing materials meeting the requirements of the Contract Documents due to DISTRICT's inspection or lack of inspection of the equipment or materials. Acceptance of any materials will be made only after materials are installed in the Project.
4. Cost. Unless otherwise called for by the Contract Documents, the cost of all material, equipment, and labor required to accommodate DISTRICT's testing efforts, including any travel required by Contractor's forces, shall be included in Contractor's bid and distributed in the Schedule of Pay Items related to the materials requiring testing. No additional compensation shall be made to the Contractor for this Work.

3.8 LOCAL CONDITIONS AND REQUIREMENTS

A. Access to Work and Haul Routes

1. General. All work on the rights-of-way necessary for access to the Site shall be performed by the Contractor.
2. Access, Damage, Restoration. The Contractor shall make his own investigation of the condition of available public or private roads and of clearances, restrictions, bridge-load limits, permit or bond requirements, and other limitations that affect or may affect transportation and ingress or egress at the Site. Claims for changes in Contract Price or Contract Times arising out of the unavailability of transportation facilities or limitations thereon shall not be considered by DISTRICT.
3. The Contractor shall maintain and repair any damage arising out of Contractor's operations to all roads used during construction of the Project, and upon completion of all Work, but prior to final acceptance, the roads shall be restored to their original condition. Prior to using any road for access to the Site, the Contractor shall conduct a photograph and/or video survey of the roadway with a copy submitted to DISTRICT's Representative.
4. Cost. Unless otherwise called for by the Contract Documents, the cost of all material, equipment, and labor required to complete this Work, shall be included in Contractor's bid and distributed in the Schedule of Pay Items. No additional compensation shall be made to the Contractor for this Work.

B. Power. Contractor shall provide at its own expense all necessary power required for operations under the contract. The Contractor shall provide and maintain in good order such modern equipment and installations as shall be adequate in the opinion of the Engineer to perform in a safe and satisfactory manner the Work required by the contract.

C. Construction Water.

1. Construction water shall not be used for purposes other than those required to satisfactorily complete the contract.
2. All connections to the DISTRICT's water system used for the purposes of obtaining construction water shall utilize a temporary construction meter and backflow prevention device supplied by the DISTRICT. The DISTRICT-furnished backflow prevention device shall be tested immediately after installation and the construction meter and backflow prevention device shall not be placed into service until the backflow prevention device passes such tests. Backflow prevention device testing shall be performed in accordance with the most recent edition of the Manual of Cross-Connection Control as published by the University of Southern California by a person selected from Borrego Water District's "DISTRICT-Approved Certified Backflow Assembly Testers" list, and test results shall be provided to the Engineer. If the temporary construction meter and backflow prevention device are moved to alternate location(s) during

construction, the backflow prevention device shall again be tested as described above immediately after re-installation.

3. For each temporary construction meter requested by the Contractor for the performance of work under this contract, an amount equivalent to the deposit requirement for temporary construction meters listed in the current approved version of the DISTRICT's Policies and Procedures Manual shall be withheld from the final contract payment until the temporary construction meters are returned.

D. Operation of Existing Water Facilities

1. The Contractor shall not operate any of the existing water systems, including pumps, motors, and hydrants, but shall contact the DISTRICT two (2) working days in advance with a list and location of the water system facilities that will require operating, opening, stopping, or closure by the DISTRICT.
2. At the option of the Engineer, the Contractor may be permitted to operate valves for the purpose of making connections to existing mains. The DISTRICT will perform all notification to existing customers regarding temporary loss of service.
3. Contractor shall submit a request on DISTRICT's standard form for any shut-down of existing water facilities.

E. Construction at Existing Utilities

1. General. Where the Work to be performed crosses or otherwise interferes with water, sewer, gas, or oil pipelines; buried cable; or other public or private utilities, the Contractor shall perform construction in such a manner so that no damage will result to either public or private utilities. It shall be the responsibility of the Contractor to determine the actual locations of, and make accommodations to maintain, all utilities.
2. Permission, Notice and Liability. Before any utility is taken out of service, permission shall be obtained by the Contractor from the owner. The owner, any impacted resident or business owner and the DISTRICT Representative will be advised of the nature and duration of the utility outage as well as the Contractor's plan for providing temporary utilities if required by the owner. The Contractor shall be liable for all damage which may result from its failure to maintain utilities during the progress of the Work, and the Contractor shall indemnify DISTRICT as required by the Contract Documents from all claims arising out of or connected with damage to utilities encountered during construction; damages resulting from disruption of service; and injury to persons or damage to property resulting from the negligent, accidental, or intentional breaching of utilities.
3. Cost. Unless otherwise called for by the Contract Documents, the cost of all material, equipment, and labor required to complete this Work, shall be included in Contractor's bid and distributed in the Schedule of Pay Items. No additional compensation shall be made to the Contractor for this Work.

F. Traffic Control

1. General. Contractor shall abide by traffic control plans approved by the appropriate jurisdiction.
2. Protections. Roads subject to interference by the Work shall be kept open or suitable temporary passages through the Work shall be provided and maintained by the Contractor. The Contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient flasher lights, flag persons, danger signals, and signs, and shall take all necessary precautions for the protection of the Work and the safety of the public. No construction work along public or private roads may proceed until the Contractor has proper barricades, flasher lights, flag persons, signals, and signs in place at the construction site.
3. Cost. Unless otherwise called for by the Contract Documents, the cost of all material, equipment, and labor required to complete this Work, shall be included in Contractor's bid and distributed in the Schedule of Pay Items. No additional compensation shall be made to the Contractor for this Work.

G. Cleaning Up

1. Contractor at all times shall keep premises free from debris such as waste, rubbish, and excess materials and equipment. Contractor shall not store debris under, in, or about the premises. Contractor shall also clean all asphalt and concrete areas to the degree necessary to remove oil, grease, fuel, or other stains caused by Contractor operations or equipment. The use of water, resulting in mud on streets, will not be permitted as substitute for sweeping or other methods. Dust control may require having a water truck onsite for the duration of the project, and/or use of temporary hoses and pipelines to convey water.
2. Contractor shall fully clean up the site at the completion of the Work. If the Contractor fails to immediately clean up at the completion of the Work, the DISTRICT may do so and the cost of such clean up shall be charged back to the Contractor.

3.9 ENVIRONMENTAL QUALITY PROTECTION

A. Environmental Conditions

NOT USED.

B. Landscape and Vegetation Preservation

1. General. The Contractor shall exercise care to preserve the natural landscape and vegetation, and shall conduct operations so as to prevent unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the Work.

2. Damage and Restoration. Movement of crews and equipment within the rights-of-way and over routes provided for access to the Work shall be performed in a manner to prevent damage to property. When no longer required, construction roads shall be restored to original contours.
3. Upon completion of the Work, and following removal of construction facilities and required cleanup, land used for construction purposes and not required for the completed installation shall be scarified and regraded, as required, so that all surfaces are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.
4. Cost. Unless otherwise called for by the Contract Documents, the cost of all material, equipment, and labor required to complete this Work, shall be included in Contractor's bid and distributed in the Schedule of Pay Items. No additional compensation shall be made to the Contractor for this Work.

C. Protected Species

1. General. If, in the performance of the Work, evidence of the possible occurrence of any Federally listed threatened or endangered plant or animal is discovered, the Contractor shall notify the DISTRICT Representative immediately, giving the location and nature of the findings. Written confirmation of the evidence, location and nature of the findings shall be forwarded to DISTRICT within 2 Days.
2. Procedures. The Contractor shall immediately cease all construction activities in the immediate area of the discovery to the extent necessary to protect the endangered plant or animal.

If directed by the DISTRICT Representative, Contractor will refrain from working in the immediate area, suspend the Work in its entirety, or alter its performance to ensure full compliance with all applicable permits, laws and regulations. Any DISTRICT directed changes to the Work as a result of a siting will be pursuant to the Contract Documents.

3. False Siting. Any costs or delays incurred by DISTRICT or the Contractor due to unreasonable or false notification of an endangered plant or animal will be borne by the Contractor.
4. Cost. Unless otherwise called for by the Contract Documents, the cost of all material, equipment, and labor required to comply with this paragraph, shall be included in Contractor's bid and distributed in the Schedule of Pay Items. No additional compensation shall be made to the Contractor for this Work.

D. Preservation of Historical and Archeological Resources

1. General. If, in the performance of the Work, Contractor should unearth cultural resources (for example, human remains, animal bones, stone tools, artifacts and/or midden deposits) through excavation, grading, watering or other means, the Contractor notify the Construction/Archeological Monitor and/or the

DISTRICT Representative immediately, giving the location and nature of the findings. Written confirmation of the evidence, location and nature of the findings shall be forwarded to the Construction/Archeological Monitor and/or DISTRICT within 2 Days.

2. Procedures. The Contractor shall immediately cease all construction activities in the immediate area of the discovery to the extent necessary to protect the cultural resource.

If directed by the DISTRICT Representative, Contractor will refrain from working in the immediate area, suspend the Work in its entirety, or re-sequence and/or alter its performance to ensure full compliance with all applicable permits, laws and regulations. Should the presence of cultural resources be confirmed, the Contractor will assist the DISTRICT Representative and the Construction/Archeological Monitor in the preparation and implementation of a data recovery plan. The Contractor shall provide such cooperation and assistance as may be necessary to preserve the cultural resources for removal or other disposition. Any DISTRICT directed changes to the Work as a result of the cultural resource will be pursuant to the Contract Documents.

3. Contractor's Liability. Should Contractor, without permission, injure, destroy, excavate, appropriate, or remove any cultural resource on or adjacent to the Site, it will be subject to disciplinary action, arrest and penalty under applicable law. The Contractor shall be principally responsible for all costs of mitigation and/or restoration of cultural resources related to the unauthorized actions identified above. Contractor shall be required to pay for unauthorized damage and mitigation costs to cultural resources (historical and archeological resources) as a result of unauthorized activities that damage cultural resources and shall indemnify DISTRICT pursuant to the Contract Documents.
4. Cost. Unless otherwise called for by the Contract Documents, the cost of all material, equipment, and labor required to comply with this paragraph, shall be included in Contractor's bid and distributed in the Schedule of Pay Items. No additional compensation shall be made to the Contractor for this Work.

E. Dust and Pollution Control

1. Contractor shall provide all necessary material, equipment and labor to prevent and control the emission of dust and any other potential pollutant on site.
2. Contractor shall not discharge into the atmosphere from any source smoke, dust or other air contaminants in violation of the law, rules, and regulations of the governing agency.
3. Cost. Unless otherwise called for by the Contract Documents, the cost of all material, equipment, and labor required to comply with this paragraph, shall be included in Contractor's bid and distributed in the Schedule of Pay Items. No additional compensation shall be made to the Contractor for this Work.

F. Fugitive Dust

NOT USED.

G. Management of Storm, Surface and Other Waters

1. Storm water, surface water, groundwater, and nuisance, or other waters may be encountered at various times during construction of the Project. Federal and State laws require the DISTRICT and its contractors to manage such waters pursuant to the requirements of California State Water Resources Control Board Order Number 2009-0009-DWQ, the Federal Clean Water Act, and the California Porter Cologne Water Quality Control Act. Contractor acknowledges that it has investigated the risk arising from such waters in conjunction with the Project, and assumes any and all risks and liabilities arising therefrom.
2. The Contractor shall perform all construction operations in such a manner as to comply, and ensure all subcontractors to comply, with all applicable Federal, State, and local laws, orders, and regulations concerning the control and abatement of water pollution; and all terms and conditions of any applicable permits issued for the Project. In the event there is a conflict between Federal, State, and local laws, regulations, and requirements, the most stringent shall apply.
3. Contractor violations. If noncompliance should occur, the Contractor shall report this to the DISTRICT Representative immediately, with the specific information submitted in writing within 2 Days. Consistent violations of applicable Federal, State, or local laws, orders, regulations, or Water Quality Standards may result in DISTRICT stopping all site activity until compliance is ensured. The Contractor shall not be entitled to any change in Contract Price or Contract Times, claim for damage, or additional compensation by reason of such a work stoppage. Corrective measures required to bring activities into compliance shall be at the Contractor's expense.
4. Compliance with Construction General Storm water Permit. Contractor shall be required to comply with all aspects of the State Water Resources Control Board (State Board) Water Quality Order No. 2009-0009-DWQ, National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity (Permit) for all projects that involve construction on or disturbance of one acre or more of land or which are part of a larger common area of development.
 - (a) Contractor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for the Project site based on the appropriate Risk Level requirements, and draft and coordinate submittal of all Permit related documents with DISTRICT's Legally Responsible Person and/or Authorized Signatory as those terms are defined in the Permit. The Contractor shall submit the SWPPP to the DISTRICT Representative for review not less than fifteen (15) Days prior to the start of on- site construction work. DISTRICT will file the Notice of Intent and pay the filing fee.
 - (b) The SWPPP shall be developed by a Qualified SWPPP Developer and implemented by a Qualified SWPPP Practitioner as those terms are defined in

the Permit and shall include industry standard requirements for water quality control including but not be limited to the following:

- (1) Sediment and erosion control measures to manage sediment and erosion including vegetative practices, structural control, silt fences, straw dikes, sediment controls or operator controls as appropriate. Storm water management measures shall be instituted as required, including velocity dissipaters, and solid waste controls shall address controls for building materials and offsite tracking of sediment.
- (2) Wastewater and storm water management controls to divert offsite surface flows around the Project site and to divert surface flows within the Project area away from areas of open earth or stockpiles of building and other materials. Wastewater from general construction activities, such as drain water collection, aggregate processing, concrete batching, drilling, grouting, or other construction operations, shall not enter flowing or dry watercourses without having met the authorized non-storm water discharge requirements listed in State Board Water Quality Order No. 2009-0009-DWQ, Section III.C., including proper notification to the Regional Water Board.
- (3) Pollution prevention measures including methods of dewatering, unwatering, excavating, or stockpiling earth and rock materials which include prevention measures to control silting and erosion, and which will intercept and settle any runoff of sediment-laden waters.
- (4) Turbidity prevention measures for prevention of excess turbidity including, but are not restricted to, intercepting ditches, settling ponds, gravel filter entrapment dikes, flocculating processes, recirculation, combinations thereof, or other approved methods that are not harmful to aquatic life. All such wastewaters discharged into surface waters, shall contain the least concentration of settleable material possible, and shall meet all conditions of section 402, the National Pollutant Discharge Elimination System (NPDES) permit.
- (5) Overall construction site management measures to address changes at the Project site as the Project moves through different phases and changes that account for rainy and dry season management practices.
- (6) Pollution control measures and construction activity methods that will prevent entrance, or accidental spillage, of solid matter, contaminants, debris, or other pollutants or wastes, into streams, flowing or dry watercourses, lakes, wetlands, reservoirs, or underground water sources. Such pollutants and wastes include, but are not restricted to: refuse, garbage, cement, sanitary waste, industrial waste, hazardous materials, radioactive substances, oil and other petroleum products, aggregate processing, tailings, mineral salts, and thermal pollution.
- (7) Control measures for stockpiled or deposited materials prohibiting the stockpile or deposit of excavated materials, or other construction materials, near or on stream banks, lake shorelines, or other

- watercourse perimeters where they can be washed away by high water or storm runoff, or can, in any way, encroach upon the watercourse.
- (8) Develop and implement a Rain Event Action Plan (REAP), if required, that must be designed and implemented to protect all exposed portions of the site 48 hours prior to any likely precipitation event.
 - (9) Monitoring, reporting and record keeping, as necessary to achieve compliance with applicable Permit requirements, including but not limited to annual reports and rain event reports.
- (c) Before any Permit related documents, including the SWPPP, rain event reports, or annual reports may be submitted to the State Board or implemented on the Project site, they must first be reviewed and approved by DISTRICT.
 - (d) DISTRICT retains the right to procure and maintain coverage under the Permit for the Project site if the Contractor fails to draft a SWPPP or other Permit related document, or fails to proceed in a manner that is satisfactory to DISTRICT. DISTRICT reserves the right to implement its own SWPPP at the Project site, and hire additional contractors to maintain compliance. Whether Contractor has adequately maintained compliance with the Permit shall be DISTRICT's sole determination. In the event that Contractor has failed or is unable to maintain compliance with the Permit, any costs or fines incurred by DISTRICT in implementing a SWPPP, or otherwise maintaining compliance with the Construction General Permit shall be paid by the Contractor.
 - (e) Failure to implement the SWPPP or otherwise comply with the Permit is a violation of federal and state law. Contractor hereby agrees to indemnify DISTRICT as required by the Contract Documents for any noncompliance or alleged noncompliance with the Permit arising out of or in connection with the Project, except for liability resulting from the sole established negligence, willful misconduct or active negligence of DISTRICT. DISTRICT may seek damages from Contractor for delay in completing the Contract in accordance with the Contract Documents, caused by Contractor's failure to comply with the Permit.
- 5. In addition to compliance with the Permit, Contractor shall comply with the lawful requirements of any applicable municipality, district, drainage district, flood control district, and other local agencies regarding discharges of storm water, surface water, groundwater or other nuisance waters off of the Project site.
 - 6. Oil storage tanks management.
 - (a) Storage tank placement. All oil or other petroleum product (hereinafter referred to collectively as oil) storage tanks shall be placed at least 20 feet from streams, flowing or dry watercourses, lakes, wetlands, reservoirs, and any other water source.
 - (b) Storage area dikes. Storage areas shall be diked at least 12 inches high or graded and sloped to permit safe containment of leaks and spills equal to the

capacity of all tanks and/or containers located within each area, plus a sufficient amount of freeboard to contain the 25-year rainstorm.

- (c) Diked area barriers. Diked areas shall have an impermeable barrier at least 10 mils thick. Areas used for refueling operations shall have an impermeable liner at least 10 mils thick buried under 2 to 4 inches of soil.
 - (d) Spill Prevention Control and Countermeasure Plan (SPCC). Where the location of a construction site is such that oil from an accidental spillage could reasonably be expected to enter into or upon the navigable waters of the United States or adjoining shorelines, and the aggregate storage of oil at the site is over 1,320 gallons or a single container has a capacity in excess of 660 gallons, the Contractor shall prepare an SPCC Plan. The Contractor shall submit the SPCC Plan to the Engineer at least 30 days prior to delivery or storage of oil at the site. The Plan must have been reviewed and certified by a registered professional engineer in accordance with 40 C.F.R., part 112
- 7. Underground tank prohibition. The Contractor shall not use underground storage tanks.
 - 8. Construction safety standards. The Contractor shall comply with the sanitation and potable water requirements of Section 7 of United States Bureau of Reclamation's publication "Reclamation Safety And Health Standards."
 - 9. Other Permits.
 - (a) Other permits applicable to the Project are listed in the Special Conditions. The Contractor shall obtain all other necessary licenses and permits.
 - (b) Monitoring. The Contractor is required to conduct monitoring in order to meet the requirements of the permits, which may include sampling, testing and inspections.
 - (c) Recordkeeping. The Contractor shall retain all records and data required by the permits for the time specified in the contract.
 - 10. Cost. Except as specified herein, the cost of complying with this section shall be included in the Schedule of Pay Items for work which necessitate the water pollution prevention measures required by this paragraph.

END OF GENERAL REQUIREMENTS

TECHNICAL SPECIFICATIONS

1.01 STANDARD SPECIFICATIONS:

Unless indicated otherwise, the work embraced herein shall be done in accordance with the appropriate provisions of construction details as shown in the specifications entitled "GREENBOOK Standard Specifications for Public Works Construction," the latest edition, insofar as the same may apply, which specifications are hereinafter referred to as the Standard Specifications and in accordance with the following provisions.

Water main pipeline construction work shall be completed per the water improvement plans, technical specifications, and latest AWWA C900 and AWWA C651 standards.

In case of conflict between the Standard Specifications and these Technical Specifications, the Technical Specifications shall take precedence over and be used in lieu of such conflicting portions.

1.02 SCOPE OF WORK:

The work is generally described as follows:\

The work shall include the procurement of materials and the installation of a new 8 and 6 inch diameter water main pipeline along Bending Elbow, Weather Vand and Rocking Chair Drive. The work also includes the tie-ins to the existing 8 inch water lines. The work also includes the installation of new fire hydrants in various places. Construction staking will be provided by the DISTRICT.

TECHNICAL SPECIFICATIONS SECTIONS:

SECTION 01300 – CONTRACOR SUBMITTALS

SECTION 01505 - MOBILIZATION

SECTION 01520 - TEMPORARY FACILITIES

SECTION 01530 - PROTECTION OF EXISTING FACILITIES

SECTION 01550 - SITE ACCESS AND STORAGE

SECTION 01560 - PROJECT ENVIRONMENTAL CONTROLS

SECTION 01600 - MATERIALS AND EQUIPMENT PART 1 GENERAL

SECTION 02150 - SHEETING, SHORING AND BRACING

SECTION 02200 - EARTHWORK

SECTION 02221 - TRENCHING, BACKFILLING AND COMPACTING

SECTION 02640 - PVC PIPE

SECTION 02641 - PVC PRESSURE PIPE AWWA C900

SECTION 02650 - PIPE FITTINGS, TRANSITION COUPLINGS, MECHANICAL
RESTRAINED JOINT FITTINGS, FLANGED COUPLING
ADAPTERS AND HARDWARE

SECTION 02666 – PRESSURE PIPELINE WATER TESTING

SECTION 02670 - DISINFECTION OF POTABLE WATER PIPELINES

SECTION 15615 - RESILIENT GATE VALVES, BUTTERFLY VALVES,
OS&Y VALVES AND SWING CHECK VALVES

SECTION 15830 - MISCELLANEOUS VALVES

SECTION 01300 – CONTRACOR SUBMITTALS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. All This Section 01300 shall supersed and replace Article 16 of the General Condtions.
- B. Within ten (10) days after the date of Notice to Proceed, the Contractor shall submit the following items to the Resident Engineer or District Representative.:
 - 3. 1. A Construction Schedule providing the starting and completion dates of the various stages of the Work. The Contractor shall be prepared to discuss its construction schedule at the pre-construction conference.

1.02 SUBMITTAL REQUIREMENTS AND PROCESS

- A. Wherever called for in the Contract Documents or when requested by the Resident Engineer or District Representative the Contractor shall furnish to the Resident Project Representative for review, six (6) copies of each submittal.
- B. All submittals shall be accompanied by a submittal transmittal form. This form may be obtained from the Resident Engineer or District Representative. A separate transmittal form shall be used for each specific item for which a submittal is required. Each submittal should be referenced to the specification section requiring the submittal. All Contractor submittals shall be carefully reviewed by an authorized representative of the Contractor, prior to submission to the Resident Engineer or District Representative. Each submittal shall be dated, signed and certified by the Contractor as being correct and in strict conformance with the Contract Documents. In the case of shop drawings, each sheet shall be so dated, signed and certified. No consideration for review by the Engineer of any Contractor submittals will be made for any items which have not been so certified by the Contractor. All non-certified submittals will be returned to the Contractor without action taken by the Engineer and any delays caused thereby shall be the sole responsibility of the Contractor.

- C. Multiple-page submittals shall be collated into sets with each set stapled or bound.
- D. The Resident Engineer or District Representative will return copies of each submittal to the Contractor with review comments within fifteen (15) calendar days following their receipt by the Resident Project Representative. There will be three (3) copies of a submittal returned to the Contractor when marked either "NO EXCEPTIONS TAKEN" or "APPROVED AS NOTED", and no formal revision and re-submission of said submittal will be required. However, if one or more copies of the submittal are returned to the Contractor marked "REVISE AND RESUBMIT" or "REJECTED", the Contractor shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the Engineer.
- E. Fabrication of an item shall commence only after the Engineer has reviewed the submittal and returned copies to the Contractor marked either "NO EXCEPTIONS TAKEN" or "APPROVED AS NOTED". Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis of claims for extra work.
- F. The Engineer's review of Contractor's submittals shall not relieve the Contractor of the entire responsibility for the correctness of details and dimensions. The Contractor shall assume all responsibility and risk for any misfits due to any errors in the Contractor submittals. The Contractor shall be responsible for the dimensions and the design of adequate connections and details.

1.03 CONTRACTOR'S SCHEDULE SUBMITTAL

- A. The Contractor shall submit to the Resident Engineer or District Representative a construction schedule for the Work showing a general plan for orderly progression of the Work including mobilization of equipment and timing of procurement of major materials and equipment.
- B. The Resident Engineer or District Representative may request that the Contractor provide a revised or updated Construction Schedule if, at any time, the Engineer considers the completion date to be in jeopardy because of any portion of the Work falling behind schedule or the sequence of operations becomes different from the previous schedule.

1.04 PROPOSED SUBSTITUTES OR "OR EQUAL" ITEM SUBMITTAL

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance and quality required. Other items of material or equipment, or material or equipment of other Suppliers may be submitted to the Resident Engineer or District Representative for review under the circumstances described below
 - 1. The Contractor shall be responsible for resultant changes and all additional costs or credit to the Owner which the accepted substitution requires in the Contractor's work, the work of its subcontractors and of other contractors and shall effect such changes without cost to the Owner.
- B. The procedure for review by the Resident Engineer or District Representative will include the following:
 - 1. If proposed substitute material or equipment has been judged to be unacceptable by the Engineer, the Contractor shall provide the material or equipment named in the Contract Documents.

1.05 SAMPLES SUBMITTAL

- A. The Contractor shall submit not less than two (2) samples, unless noted otherwise in a material or equipment specification, to the District Engineer for acceptance at no additional cost to the Owner. Samples shall be submitted for acceptance a minimum of ten (10) days prior to ordering such material for delivery to the job site. If accepted by the District Engineer, one (1) set of samples will be returned to the Contractor and one (1) set of samples shall remain at the job site until completion of the Work.

1.06 N/A

1.07 AS-BUILT SUBMITTAL

- A. The Contractor shall maintain, during the progress of the Work, one (1) set of As-Built Drawings and shall neatly mark on them all project changes from the details shown on the original Contract Drawings. Special attention shall be given to recording on the drawings the horizontal and vertical location of all buried utilities that differ from the locations indicated or which were revealed during the construction.

- B. As-Built drawings shall be accessible to the Engineer at all times during the construction period and shall be delivered to the Engineer upon completion of the Work.
- C. Upon substantial completion of the Work and prior to final acceptance the Contractor shall deliver a complete set of As-Built drawings to the Engineer.

1.08 SUPERINTENDENT SUBMITTAL

- A. A letter designating the Project Superintendent shall be forwarded to the Engineer for his review. The letter shall also include emergency contact information for the Project Superintendent and other Contractor Representative.

1.09 MATERIAL AND EQUIPMENT SUBMITTAL LIST

- 1. General Requirements
 - 1.1 Construction Schedule
 - 1.2 Schedule of Values
 - 1.3 Letter Designation Project Superintendent
 - 1.4 Emergency Contact Number
 - 1.5 Operation and Maintenance Manuals
- 2. Sitework
 - 2.1 Sheeting, Shoring and Bracing PI
 - 2.2 Hot Mix Asphalt, 3/4-inch Type A, PG 70-10
 - 2.3 Class 2 Base Gradation, Maximum Density and Sand Equivalent
 - 2.4 3/4" Crushed Rock Gradation
 - 2.5 Granular Sand Gradation, Maximum Density and Sand Equivalent
 - 2.6 PVC Pipe

- A. AWWA C-900, DR 18 PVC Pipe
- 2.7 Copper Pipe
- 2.8 Pipe Fittings
 - A. Ductile Iron
 - B. Stainless Steel
 - C. Copper
 - D. Bronze
 - E. SCH 80 PVC
- 2.9 Ductile Iron Fittings
- 2.10 Magnetic Detector Tape
- 2.11 Fire Hydrant Assembly
- 2.12 Valve Riser, Frame and Cover
- 3. Mechanical and Miscellaneous
 - 3.1 Pipe Expansion Joints
 - 3.2 Resilient Gate Valves, Butterfly Valves, OS&Y Valves, Check Valves, Flapper Valves, Air Release Valves and Backflow Preventers
 - 3.3 Stainless Steel Pipe Fittings and Valves

END OF SECTION 01300

SECTION 01505 - MOBILIZATION

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section 01505 shall supersede and replace Article 6 of the General Conditions.
- B. Mobilization shall include obtaining all permits; moving plant equipment on-site; furnishing and erecting plants, temporary buildings and other construction facilities; all as required for the proper performance and completion of the Work. Mobilization shall include, but not be limited to, the following principal items:
 - 1. Moving on to the site of all Contractors' plant, equipment and materials required for first month operations.
 - 2. Installing temporary construction power, wiring and lighting facilities.
 - 3. Establishing fire protection equipment and instructing designated personnel in the operation of such apparatus.
 - 4. Providing field office trailer for the Contractor complete with furnishings and utility services when applicable. Contractor will furnish the temporary power, water, telephone, copier, facsimile machine and other items for the Contractor's field offices. Contractor to furnish and install necessary piping, wiring and disconnects.
 - 5. Providing all on-site Contractor communication facilities.
 - 6. Providing on-site Contractor's sanitary facilities.
 - 7. Arranging and setting up the Contractor's work and storage yard.
 - 8. Obtaining all required permits.

9. Posting all OSHA required notices and establishment of safety programs.
10. Have Contractor's superintendent at the jobsite full time.
11. Submittal of Construction Schedule.
12. Install project sign, if required.
13. Submittal of Schedule of Values.
14. Costs of Insurance, Payment Bond, Performance Bond, Taxes, Permits, Freight and similar expenses.

1.02 PAYMENT FOR MOBILIZATION

- A. A Mobilization Item is included in the Proposal forms. The Mobilization payment shall not be released to the Contractor unless all items in Paragraph "A" above have been satisfied.

END OF SECTION 01505

SECTION 01520 - TEMPORARY FACILITIES

PART 1 – GENERAL

1.01 DESCRIPTION

Except as otherwise provided, the Owner shall bear no costs of temporary facilities or their removal. It shall be the Contractor's responsibility to provide equipment that is adequate for the performance of the Work under this contract within the time specified. All equipment shall be kept in satisfactory operating condition, shall be capable of safely and efficiently performing the required Work and shall be subject to inspection and approval by the Owner's representative at any time within the duration of the Contract. All work hereunder shall conform to the applicable requirements of the OSHA Standards for Construction.

1.02 TEMPORARY POWER AND LIGHTING SERVICES

The Contractor shall provide all necessary temporary power connection, disconnects and distribution lines required for its operations under the Contract and shall provide and maintain all temporary power systems required to perform the Work in a safe and satisfactory manner. The Contractor shall make the arrangements with the SDG&E and pay all fees, and shall bear all costs for these temporary services and shall furnish and install all necessary transformers; metering facilities and distribution centers from branch circuits as may be required.

All temporary connections for electricity shall be subject to approval of the Engineer and shall be completely removed at the Contractor's expense prior to final acceptance of the Work. All wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. All electrical facilities shall conform to the requirements of the OSHA Safety and Health Standards for Construction and the governing agency and electrical purveyor.

The Contractor shall provide lighting and outlets in temporary structures throughout the project as may be required for safety, proper performance and inspection of the Work. If operations are performed during hours of darkness, or if natural lighting is deemed insufficient by Engineer, the Contractor shall provide adequate floodlights, clusters and spot illumination. The use of permanently installed lighting fixtures, lamps and tubes for work shall not be permitted except by special permission of Engineer. The Contractor shall make arrangements with Subcontractors for electrical services and lighting as may be necessary in the performance of their work.

1.03 TEMPORARY WATER SERVICES

A. G
eneral: Unless specifically specified for a specific scope of work or construction activity, the Owner shall furnish water for all testing and construction purposes. Utility water may be used for hydraulic structures and pipeline testing as approved by the Engineer and DISTRICT.

Temporary water service lines, if required, shall be installed and removed by the Contractor, who shall pay all charges for making the connections, running the temporary lines, removing the temporary lines at the completion of the Work and disconnecting the services. All relocations required to clear the work of others shall be performed by the Contractor when requested by the Owner.

B. P
otable Water: All drinking water on the site during construction shall be furnished by the Contractor and shall be bottled water or water furnished in approved dispensers. Notices shall be posted conspicuously throughout the site warning the Contractor's personnel that piped water for construction purposes may be contaminated and is not for human consumption.

C. Wat
er Connections: The Contractor shall not make connection to, or draw water from, any fire hydrant or pipeline without first obtaining permission of the authority having jurisdiction over the use of said fire hydrant or pipeline and from the agency owning the water system. For each such connection made the Contractor shall first attach to the fire hydrant or pipeline a valve, backflow preventer and a meter, if required by the said authority, of a size and type acceptable to said authority and agency.

D. Removal of Water Connections: Before final acceptance of the Work all temporary water connections and piping installed by the Contractor shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of the Engineer and to the agency owning the affected utility.

E. Fir
e Protection: The Contractor shall provide fire extinguishers and other fire protection equipment to adequately protect new and existing facilities and temporary facilities against damage by fire. Hose connections and hose, water casks, chemical equipment or other sufficient means shall be provided

for fighting fires in the new, existing and temporary structures and other portions of the Work and responsible persons shall be designed and instructed in the operation of such fire apparatus so as to prevent or minimize the hazard of fire. The Contractor's fire protection program shall conform to the requirements of the OSHA Standards for Construction. The Contractor shall employ every reasonable means to prevent the hazard of fire.

1.04 TEMPORARY STRUCTURES

Prior to starting work, the Contractor shall, as directed by Engineer, provide and maintain suitable temporary office facilities for the duration of the Project as required for the Contractor's project administration; and all necessary sheds and facilities for the proper storage of tools, materials and equipment employed in the performance of the Work.

1.05 CONTRACTOR'S WORK AND STAGING AREA

The Owner shall designate and arrange for the Contractor's use, a portion of the property adjacent to the Work for its exclusive use during the term of the Contract as an office, storage and shop area for its construction operations relative to this Contract. Contractor shall be solely responsible for the security of its tools, supplies and equipment at the site.

1.06 SANITATION

A. Res
troom Facilities: The Contractor shall provide and maintain a portable men's restroom facility and a separate portable women's restroom facility. The restroom facilities shall be placed at the job site prior to the start of construction within ten (10) days from the issuance of the Notice to Proceed and shall remain in service until the job has been completed. The Contractor shall position the restroom facilities, as required to maintain the facilities, near the location of daily work activity-and-near-the-Construction Office—Trailer. The restroom facilities shall be cleaned on a regular basis.

B. San
itary and Other Organic Wastes: The Contractor shall establish adequate and regular collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of in a manner satisfactory to the Engineer and in accordance with all laws and regulations pertaining thereto. Contractor may install temporary piping for toilet

facilities to discharge into an incoming sewer.

1.07 COMMUNICATIONS

- A. Telephone Services: The Contractor shall provide its own phone lines. The Owner's telephone system shall not be used by the Contractor's work force.
- B. Facsimile Services: The Contractor shall provide its own facsimile unit(s). The costs relative to the facsimile unit(s) shall be borne by the Contractor.

1.08 FENCE AND BARRICADES

The Contractor shall provide such protective fences and barricades as he/she may deem necessary for public safety and to protect his/her storage areas and the Work in place. The location and appearance of all fences shall be subject to approval of the Engineer.

1.09 CONTRACTOR PARKING

The Contractor shall not park his/her equipment, nor allow his/her personnel to park, in any area except those specifically designated by the Engineer.

1.10 TEMPORARY LIVING QUARTERS

Temporary living quarters shall not be allowed on the job site or on publicly-owned properties. In addition, all local zoning codes for the area in question shall be strictly adhered to.

1.11 REMOVAL OF TEMPORARY CONSTRUCTION

The Contractor shall remove temporary office facilities, toilets, storage sheds and other temporary construction from the site as soon as, in Engineer's opinion, the progress of work permits. Contractor shall recondition and restore those portions of the site occupied by the same to a condition equal to or better than it was prior to construction.

END OF SECTION 01520

SECTION 01530 - PROTECTION OF EXISTING FACILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall protect all existing utilities, piping and improvements not designated for removal and shall restore damaged or temporarily relocated utilities, piping and improvements to a condition equal to or better than they were prior to such damage or temporary relocation.
- B. The Contractor shall verify the exact locations and depths of all underground piping and utilities shown and not shown and shall make exploratory excavations of all piping and utilities that may interfere with the Work. It shall be the Contractor's responsibility to ascertain the actual location of all existing utilities, piping and other improvements that will be encountered during construction operations and verify that such utilities or other improvements are adequately protected from damage due to such operations.
- C. Maintaining in Service: All pipelines, electrical, power, telephone communication cables, gas and water mains shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Engineer are made with the Owner. Where the proper completion of the Work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement the Contractor, after necessary scheduling and approval, shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the Engineer and the Owner of the facility. In all cases of such temporary removal or relocation, the Work shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement to a new condition meeting the specification requirements.
- D. All repairs to a damaged utility or improvement are subject to inspection and approval by a Resident Project Representative before being concealed by backfill or other work.

1.02 RIGHTS-OF-WAY

- A. The Contractor shall refrain from commencing work or entering upon the rights-of-way of any oil, gas, sewer or water pipeline; any telephone or electric transmission line; any fence; or any other structure, until notified by the Engineer that the Owner has secured authority to do so. After

authority has been obtained, the Contractor shall give the governing utility proper advanced notice of its intention to begin work.

1.03 RESTORATION OF PAVEMENT AND SIDEWALKS

- A. All paved areas and sidewalks not designated for replacement, cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas unless otherwise noted. All sidewalks, curbs and gutters and pavements which are subject to partial removal shall be neatly saw-cut in straight lines. The sidewalk, curb and gutter and pavement shall be constructed in accordance with the Standard Details and Plans of the governing agency.

1.04 UNDERGROUND UTILITIES NOT SHOWN OR INDICATED

- A. If the Contractor damages existing utilities, piping or improvements that are not illustrated or the location of which was not made known to the Contractor prior to excavation and the damage was not due to failure of the Contractor to exercise reasonable care the Contractor shall immediately notify the Engineer.

1.05 NOTIFICATION BY THE CONTRACTOR

- A. Prior to any excavation in the vicinity of any existing underground facilities, including water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications or telecommunication cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way, the Contractor shall notify the respective utility purveyors or agencies or owners responsible for such facilities not less than three (3) working days prior to excavation so that a representative is afforded the opportunity to be present during the excavation work.

END OF SECTION 01530

SECTION 01550 - SITE ACCESS AND STORAGE

PART 1 – GENERAL

1.01 HIGHWAY AND STREET LIMITATIONS

- A. The Contractor shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits and other limitations affecting transportation and ingress and egress to the site of the Work. It shall be the Contractor's responsibility to construct and maintain any haul roads required for its construction operations or define any alternate routes to the project site due to roadway or bridge restrictions.

- B. Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street, utility right-of-way or the site of the Work during the performance of the Work hereunder. The Contractor shall conduct its operations so as not to interfere unnecessarily with the authorized work of utility companies, other agencies, or the Owner's plant personnel. No street or access shall be closed without first obtaining permission of the Engineer or proper governmental authority. Where excavation is being performed in primary streets or highways one (1) lane in each direction shall be kept open to traffic at all times unless otherwise provided or shown by the Contract Documents. Fire hydrants on or adjacent to the Work shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the Contractor to assure the use of sidewalks, access routes and the proper functioning of all gutters, sewer inlets and other drainage facilities.

- C. Traffic Control: For the protection of traffic in public streets and plant operating personnel at the site of the Work, the Contractor shall provide, place and maintain all necessary barricades, traffic cones, warning signs, lights and other approved safety devices. All barricades, traffic cones, warning signs, lights and other approved safety devices shall be placed according to the agency requirements maintaining jurisdiction, as applicable. The Contractor shall take all necessary precautions for the protection of the Work and the safety of the Owner's personnel and the public. All barricades and obstructions shall be illuminated at night.

END OF SECTION 01550

SECTION 01560 - PROJECT ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

EXPLOSIVES AND BLASTING

The use or storage of explosives on the Work or site shall not be permitted. As construction activities only include the replacement of an existing tank with no additional system capacity, an Environmental Assessment (EA) or Environmental Review is not deemed necessary for this project.

1.02 DUST ABATEMENT AND RUBBISH CONTROL

The Contractor shall provide under the Contract all necessary measures to prevent its operation from producing dust or air contaminants in amounts damaging to property or causing a nuisance to Owner's plant personnel and operations or to persons living in or occupying buildings in the vicinity. The Contractor shall be responsible for damage resulting from any dust and/or air contaminants originating from its operations. The dust and/or air contaminants abatement measures shall be continued throughout the length of the Contract.

During the progress of the Work the Contractor shall keep the site of the Work and other areas used by it in a neat and clean condition and free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the Work site, and shall establish regular intervals of collection and disposal of such materials- and waste.- The Contractor shall also keep its haul roads free from dirt, rubbish and unnecessary obstructions resulting from its operations. Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal and in conformance with all applicable Safety Laws and Health Standards for Construction. The Owner's dumpster shall not be used by the Contractor.

1.02 CHEMICALS

- 3) All chemicals used during project construction or furnished for project operation, whether soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval for use by either the U.S. Environmental Protection Agency, the U.S. Department of Agriculture or the local jurisdictional agency. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

END OF SECTION 01560

SECTION 01600 - MATERIALS AND EQUIPMENT PART 1 GENERAL

1.01 QUALITY ASSURANCE

- A. To the greatest extent possible for each unit of work, the Contractor shall provide products, materials or equipment from a single source.
- 4) Where more than one choice is available as options for Contractor's selection of a product, material or equipment, the Contractor shall select an option which is compatible with other products, materials or equipment already selected.

1.02 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. The Contractor shall transport, deliver, handle and store products in accordance with supplier's written recommendations and by methods and means which will prevent damage, deterioration and loss including theft. Delivery schedules shall be coordinated to minimize long-term storage of products at the Work site and overcrowding of construction spaces. The Contractor shall provide installation coordination to ensure minimum storage times for products recognized to be flammable, hazardous or easily damaged.
- B. Products shall be delivered in a dry, undamaged condition in the supplier's unopened packaging. The Engineer and Owner reserve the right to reject all damaged products, materials and equipment. Rejected products shall be immediately removed from the site of the Work.
- C. Products, materials and equipment shall be stored in accordance with the manufacturer's written instructions, with seals and labels intact and legible. Motors, electrical gear, mechanical equipment with open bearings or moving parts or any product sensitive to the environment shall be stored in weather-tight enclosures with necessary temperature and humidity ranges maintained within the manufacturer's instructions.
- D. Fabricated structural components shall be stored on supports above ground and in a manner to prevent accumulation of water and warping. Products subject to deterioration from atmospheric conditions shall be covered in a manner that will provide adequate ventilation to avoid condensation.
- E. Products, materials and equipment not stored in a manner that will insure the maintaining of a new condition will be rejected by the Engineer. Such rejected products, materials and equipment shall be immediately removed from the Work site.

1.03 SOAKING PERIOD AND TESTING FOR VOLATILE ORGANIC COMPOUNDS IN POTABLE WATER RESERVOIRS

- A. General: The Contractor shall provide the following services to ensure that the interior reservoir coatings or linings do not convey volatile organic compounds to the potable water.
- B. Selection of Coating or Lining Material: The Contractor shall provide a coating or lining system that has a successful record in meeting the national, regional, and local regulations and policies pertaining to leaching of volatile organic compounds into potable water.
- C. Before the coating or lining materials are used, the Contractor shall by letter notify the regulatory agency having jurisdiction. The letter shall describe the proposed materials, including brand names, catalog numbers, catalog technical data, application and curing instructions, and material safety data sheets.
- D. The Contractor shall provide curing time, temperature and ventilations as specified by the manufacturer or this Section, whichever is the highest requirement. In some cases, the Contractor may find it necessary to extend the curing time or ventilation time beyond the requirements in order to comply with the regulatory agency requirements or to reduce the leached organic compounds to the required levels. All costs in connection with any extended curing times shall be borne by the Contractor.
- E. Following the curing or ventilation period, the Contractor shall clean, disinfect and fill the reservoir to the overflow level.
- F. A seven (7) day soaking period shall follow the initial filling to determine the presence of any leached organics. If Bacteriological test is negative, then VOC testing time may be completed in conjunction. Before the tank is placed into service, samples of the water in the tank shall be taken by the Contractor, under the direct supervision of the Owner, and analyzed by a laboratory approved by the State or the EPA. Analyses shall be for volatile organic compounds by EPA Method 524.2 or equivalent (this test includes TCE, PCE, xylenes, toluene, ketones, carbon tetrachloride, similar compounds, or other organic chemicals from MSDS sheets). The costs of testing shall be borne by the Contractor.
- G. If the tests results are above the CDPH's Maximum Contaminant Level Limits, the Contractor shall drain the water from the tank and flush, refill, and retest at no additional cost to the Owner. The Contractor shall provide

as many curing, soaking, and flushing cycles as necessary to reduce the leached volatile organic compounds to levels below the requirements.

- H. The Owner will evaluate and determine acceptability as a condition of final acceptance of the work. Acceptance criteria will be in conformance with state and federal regulations.

1.04 TESTING FOR VOLATILE ORGANICS

- A. After successful completion of the Disinfection and Bacteriological Testing, the Contractor shall complete Volatile Organic Compound Testing per section 3.11 of the Technical Specification Section 09800 - PROTECTIVE COATINGS.

1.05 DISPOSAL OF TEST WATER

- A. Water used for testing and disinfection procedures shall be disposed of as required by the Contractor. The Contractor shall identify the point at which the water is to be disposed and provide all pumps, suction hoses, discharge hoses, fuel and labor to dispose of the test water.

1.06 PLACING TANK IN SERVICE

- A. The tank shall be placed in service after successful disinfection and volatile organic compound testing has been completed and after the Engineer determines that all rehabilitation and coating work has been satisfactorily completed.

END OF SECTION 01600

SECTION 02150 - SHEETING, SHORING AND BRACING

PART 1 - GENERAL

1.01 DESCRIPTION

This section provides requirements for sheeting, shoring, bracing, wales, posts, piling, anchorages and fastenings or other excavation supports, both temporary or permanent, for accomplishment and protection of Work.

1.02 QUALITY ASSURANCE

A. Design Requirements:

In accordance with Section 6500 of the California Labor Code, the Contractor is required to obtain a permit, for the excavation of trench which is five feet (5') or more in depth and into which a person is required to descend, from the Division of Industrial Safety.

The Contractor shall furnish all labor, equipment and materials required to design, construct and remove all sheeting, shoring and bracing or other equivalent method of support for the walls of open excavations required for the construction of this project.

Excavation of any trench, pad area, foundation area, or structure five feet (5') or more in depth shall not commence until the Contractor has received approval from the Engineer of the Contractor's detailed plan for worker protection from the hazards of trench or soil wall collapse/failure.

Such plan shall be submitted at least five (5) days before the Contractor intends to begin excavation and shall show the details of the design of shoring, bracing, sloping or other provisions to be made for worker protection during such excavation. No such plan shall allow the use of shoring, sloping or a protective system less effective than that required by the Construction Safety Orders of the Division of Industrial Safety. The plan shall be prepared and signed by an engineer who is registered as a Civil or Structural Engineer in the State of California.

Prior to the beginning of excavations requiring shoring, the Contractor shall designate in writing to the Engineer, the person responsible to supervise the project safety measures and the person responsible to supervise the installation and removal of sheeting, shoring and bracing.

In addition to shoring the excavations in accordance with minimum

requirements of the Industrial Safety Orders, it shall be the Contractor's responsibility to provide any and all additional shoring required to support the sides of the excavation against the effects of loads which may exceed those derived by using the criteria set forth in the Industrial Safety Orders. The Contractor shall be solely responsible for any damages which may result from his failure to provide adequate shoring to support the excavation under any or all of the conditions of grading which may exist, or which may arise during the construction of the project.

B. Material Standards:

Furnish lumber for shores, wales, and sheeting of grading required by the American Lumber Standards for the particular application.

1.03 SUBMITTALS

Contractor shall submit complete calculations of the sheeting system including sizing of sheeting wales, rakers, anchor system, struts, earth anchors, anchor piles, tie rods or any other components pertinent to the design prior to the start of any Work involving sheeting and bracing. All designs submitted shall be stamped and signed by an Engineer with a Civil or Structural designation with an active registration in the State of California.

1.04 JOB CONDITIONS

Buried debris may be found at some locations. Federal and local agency requirements for safety of job personnel and public will apply to work under the Section.

1.05 ALTERNATIVES

The use of application of alternative methods and materials, and the employment of proprietary systems under lease or franchise in lieu of that specified herein, may be allowed. Demonstration of suitability and compliance with these Specifications will be required. The application of alternative methods will be approved by the Engineer.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Lumber:

1. Temporary Shores, Wales and Sheeting: Furnish structural grade planks, beams and posts as defined and specified for stress-grade lumber in the American

Lumber Standards. Lumber may be rough, untreated, in random lengths, and shall be of standard dimensions.

2. Permanent Sheeting: When permanent sheeting is called for on the Drawings, provide and install planks, beams, posts and timers of unseasoned, rough, new southern yellow pine or Douglas Fir meeting the requirements of ASTM Standard D25, Class "C". In lieu of the above, lumber dressed to standard dimensions, dried and treated in accordance with Standard T-3 of the American Wood Preservers' Association may be utilized.

B. Fastenings:

Provide fastenings for permanent sheeting as recommended in the National Design Specification for stress-grade lumber and its fastening.

PART 3 - EXECUTION

3.01 INSTALLATION

Install sheeting and bracing for trench and structure excavation progressively as the removal of excavated material requires. Butt planks to exclude groundwater and fines, preventing the erosion of voids outside sheeting. In soft, wet ground drive sheeting to a lower level as excavation progresses to that sheeting is embedded in undisturbed earth. Bracing of sheet piling may be permitted to penetrate the structural concrete only as directed by the Owner. Install wales and struts at close intervals so as to prevent displacement of the surrounding earth and to maintain safe conditions in the Work area. Any damage proven to result from improper installations shall be the responsibility of the Contractor. Temporary sheeting for trench and structure excavation may be removed and reused. Withdraw individual planks alternately as the backfill is raised, maintaining sufficient sheeting and bracing to protect the Work and workmen. Remove bracing completely. Where unstable conditions occur in the underlying strata from any cause, and withdrawal of sheeting will endanger the Work, a portion of the sheeting, including bracing, may be left in place with the approval of the Owner. Remove all wood within a zone extending four feet (4') below finished grade. Leaving such material in place shall not be cause for an increase in the contract price. The use of horizontal strutting below the barrel of a pipe or the use of a pipe as support will not be permitted. Sheet piling and timers in trench excavations shall be withdrawn in a manner so as to prevent subsequent settlement of the pipe or additional backfill loadings which might overload the pipe. Trench sheeting below the top of the pipe shall be left in place.

END OF SECTION 02150

SECTION 02200 - EARTHWORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Work of this Section includes all earthwork required for construction of the Work. Earthwork shall include, but not be limited to the loosening, removing, loading, transporting, depositing and compacting in its final location of all materials wet and dry, as required for the purposes of completing the work specified in the Contract Documents which shall include, but not be limited to: the sawcutting, grinding and removal of A.C. pavement, removal of P.C.C. concrete and underlying material to a subbase design grade indicated on the Plans, the installation of subbase material to a subbase grade beneath A.C. pavement and concrete infrastructure, the excavation of pipeline trenches, the installation of backfill material within pipeline trenches, excavations for above-grade and below-grade structures, backfill requirements for material to be placed beneath above-grade and below-grade structures, backfill requirements for the areas surrounding above-grade and below-grade structures, backfilling of other infrastructures, construction of earth swales, backfilling of depressed areas resultant from demolition, the disposal of excess excavated materials, barrow of materials to make up deficiencies for fills; and all other incidental earthwork, all in accordance with the requirements of the Contract Documents.

Principal work items included in this Section are:

1. Site preparation, clearing and grubbing;
2. Preparation of fill areas;
3. Excavation and controlled fill construction;
4. Structural excavation and backfills;
5. Disposal of surplus and/or unsuitable materials;
6. Dust control and drainage control;
7. Grading; and
8. Clean-up.

1.02 REFERENCE STANDARDS

ASTM C 131 Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

ASTM D 75 Practice for Sampling Aggregates

ASTM D 422 Method for Particle-Size Analysis of Soils

ASTM D 698 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb (2.49-kg) Rammer and 12-in (304.8-mm) Drop

ASTM D 1556 Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

ASTM D 1557 Test Method for Moisture-Density Relations of Soils Using Remmer and Drop

ASTM D 1682 Test method for Breaking Load and Elongation of Textile Fabrics

ASTM D 2419 Test method for Sand Equivalent Values of Soil and Fine Aggregate

ASTM D 2487 Classification of Soils for Engineering Purposes

ASTM D 2922 Test Method for Density of Soil in Places by Nuclear Methods (Shallow Depth)

ASTM D 3017 Test method for Water Content of Soil and Rock in Place by Nuclear Methods

ASTM D 3776 Test Method for Mass Per Unit Area (Weight) of Woven Fabric

ASTM D 4253 Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Plate

ASTM D 4254 Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density

ASTM D 4751 Test Method for Determining the Apparent Opening Size of a

Geotextile

CAL-OSHA Title 8 General Industry Safety Orders

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02150 - Sheeting, Shoring and Bracing
- B. Section 02221 - Trenching, Backfilling and Compacting
- C. Section 02641 - PVC Pressure Pipe AWWA C900

1.04 DEFINITIONS

- A. Site: The site is located within the County of San Diego Right-of-Way. Refer to the Project Descriptions as included on Title Sheet of the Improvement Plans.
- B. Controlled Fill: Compacted suitable fill material in all areas of the site requiring filling to grade as shown on the Plans.
- C. Structural Fill: Compacted suitable fill material which will support a structure or some part of a structure. This includes support material for P.C.C. structures and pads
- D. Structural Backfill: Compacted suitable material placed between the wall of a structure and construction excavation slope up to finished grade.
- E. Suitable Material: As specified herein shall be any material imported or excavated from the cut areas that is, in the opinion of the Engineer, suitable for use in constructing fills.
- F. Waste Excavation: Also Surplus Material. Material from project excavations which is not suitable for use in backfill or compacted fills or is in excess of that required to be used for backfill or to construct fills.
- G. Pipe Zone Backfill: Material suitable for placement below or surrounding the pipe to a given vertical distance above the pipe as required by the pipe section.
- H. Pipe Trench Backfill: Material suitable for placement from the pipe zone to finish grade or to pavement subbase material.

1.05 SITE INVESTIGATION

- A. Soil Investigation Report: A Geotechnical Report has not been prepared for this project.
- B. Contractor's Responsibility: The Contractor shall carefully examine the site and make all inspections necessary in order to determine the full extent of the work required to make the completed Work conform to the Plans and Specifications. The Contractor shall satisfy himself/herself as to the nature and location of the Work, conditions, the conditions of the existing ground surface, and the character of equipment and facilities needed prior to and during prosecution of the Work. The Contractor shall satisfy himself/herself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered. The Contractor shall review water table conditions. Any inaccuracies or discrepancies between the actual field conditions and the Plans, or between the Plans and Specifications must be brought to the Engineer's attention in order to clarify the exact nature of the Work to be performed.
- C. Existing Elevations: All existing elevations illustrated on the Plans are approximate. The Contractor shall recognize and acknowledge the condition that the bid lump sum price shall include all earthwork activities irrespective of the possible localized difference in contour elevations and actual ground; and that there will be no additional compensation from the Owner for earthwork changes, engineering, or field staking in this regard.

1.06 SAFETY

The Contractor shall familiarize himself/herself with, and shall at all times conform to, the regulations of the "OSHA General Industry Occupational Safety and Health Standards", and "OSHA Safety and Health Regulations for Construction Safety Orders" and "Trench Construction Safety Orders" of the State of California, Department of Industrial Relations, Division of Occupational Health and Safety. A copy of these documents shall be kept on the job site.

1.07 ENVIRONMENTAL SAFEGUARDS AND REGULATIONS

The Contractor shall comply with regulations in force at all times to prevent pollution of air and water. The Contractor shall be responsible for the construction of the Erosion Control BMP facilities.

1.08 GEOTECHNICAL TESTING

The DISTRICT shall provide the services of a qualified Geotechnical Consultant to perform the required earthwork geotechnical testing specified within the contents of the Plans and Specifications except for the testing and inspections required for submittal phase. A copy of all tests shall be forwarded to the Engineer within four (4) days after the testing is complete. Geotechnical Earthwork Testing shall include in-situ native soil compaction testing, moisture-density soils testing, compaction testing, gradation testing, sand equivalent testing and similar testing. The Contractor shall bear the cost of retest and re-inspection of re-worked material due to faulty work.

1.09 STANDARDS FOR SOIL CLASSIFICATION, PROPERTIES AND TESTS

A. Earthwork and Embankment:

1. Classification - ASTM D 2487.
2. Physical Properties - ASTM D 854, D 2216.
3. Compaction - Modified Proctor ASTM D 1557-91.

B. Backfill for Trench:

1. Classification - ASTM D 2487.
2. Compaction - Modified Proctor ASTM D 1557-91.
3. Field Density Test - ASTM 1556-82; D 2937-83, D 2922-81 (as approved by Engineer).

C. Structural Fill and Backfill:

1. Classification - ASTM D 2487.
2. Attenberg Limits - PlastiOwner Index and Liquid Limit ASTM D 4318.

3. Compaction - Modified Proctor ASTM D 1557-91.
4. Physical Properties - ASTM D 854, D 2216.
5. Field Density Test - ASTM D 1556-82, D 2937-83, D 2922-81 (as approved by Engineer).

D. Controlled Fills:

1. Classification - ASTM D 2487.
2. Physical Properties - ASTM D 854, D 2216.
3. Compaction - Modified Proctor ASTM D 1557-91.
4. CBR - ASTM D 1883 (R-Value - ASTM 2844).
5. Field Density Test - ASTM D 1556-82, D 2937-83, D 2922-81 (as approved by Engineer).

E. Earth Embankments and Berms:

1. Classification - ASTM D 2487.
2. Physical Properties - ASTM D 854, D 2216.
3. Compaction - Modified Proctor ASTM D 1557-91
4. CBR - ASTM D 1883.
5. Field Density Test - ASTM D 1556-82, D 2937-83, D 2922-81 (as approved by Engineer).

F. Borrow:

1. Classification - ASTM D 2487.
2. Other properties - as determined by requirements at point of use.

G. Pipe Trenches:

1. Classification - ASTM D 2487.
2. Physical Properties - ASTM D 854, D 2216.

3. Compaction - Modified Proctor ASTM D 1557-91.
4. CBR - ASTM D 1883.
5. Field Density Test - ASTM D 1556-82, D 2937-83, D 2922-81 (as approved by Engineer).

1.10 COMPACTION

The maximum dry density, optimum moisture content and field density of each soil type used in the controlled compacted fill shall be determined as stated in Section 1.09 above.

1.11 INSPECTION

Observation and compaction tests shall be obtained by the Geotechnical Consultant engaged during the filling and compacting operations.

The Geotechnical Consultant shall be required to be present at the site as needed for several work activities and conduct intermittent testing for other work activities. The following chart indicates the earthwork items which will require full time or intermittent geotechnical testing.

<u>ITEM NO.</u>	<u>ITEM</u>	<u>GEOTECHNICAL TESTING</u>
1.	Installation of Granular Sand for Water Pipelines.	Intermittent Testing
2.	Installation of Backfill Native Material for Water Pipelines.	Intermittent Testing

1.12 GUARANTEE

Work required by this Section shall be subject to the guarantee requirements stated in the Conditions of the Contract and included in the Performance/Maintenance Bond.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Controlled Fill Material: Materials for controlled fill shall consist of any material imported or excavated from the *cut areas* that, in the opinion of the Engineer, is appropriate for use in constructing fills. The material shall contain no rocks or hard lumps greater than 12 inches in size and shall contain at least 40 percent of material smaller than 3/4-inch in size. Materials greater than 6 inches in size shall be placed by the Contractor in windrows on a clean, overexcavated or unyielding compacted fill or firm natural ground surface. Select native or imported granular soil (sand equivalent greater than 30) shall be placed and thoroughly flooded over and around all windrowed rock, such that voids are filled. Windrows of oversize material should be staggered so that successive strata of oversized material are not in the same vertical plane. No nesting or rocks shall be permitted. No material of a perishable, spongy, or otherwise of an improper nature shall be used in filling.

Material placed within 24 inches of rough grade shall be select material that contains no rocks or hard lumps greater than 6 inches in size and that swells less than 3 percent when compacted as hereinafter specified for compacted fill and when subjected to an axial pressure of 160 PSF, if not specified in the Geotechnical report.

Representative samples of material to be used for fill shall be tested in the laboratory by the Geotechnical Engineer in order to determine the maximum density, optimum moisture content, sand equivalent and classification of the soil. In addition, the Geotechnical Engineer shall determine the approximate bearing value of a recompacted saturated sample by direct shear tests or other tests applicable to the particular soil.

- B. Structural Fill Material: Materials shall consist of crushed rocks, Class 2 Base, granular sand, decomposed granite (crusher fines) or fine gravel either imported or manufactured from excavated onsite rocky material.

The crushed aggregate, granular sand, decomposed granite (crusher fines) or fine gravel shall be uniformly graded. The following gradations shall apply:

1. Granular Sand:

Clean granular sand free of clay, shale and deleterious material. Sand shall be compacted to 95 percent of maximum density at optimum water content per ASTM D 1557 unless otherwise noted on the Plans. The material shall conform to a sand equivalent of 30 or greater. The maximum amount of material passing the Number 200 sieve shall be 5 percent. The sand shall conform to the following gradation percentages:

<u>SIEVE SIZE</u>	<u>GRANULAR SAND % PASSING</u>
3/8"	100
No. 4	98-90
No. 8	90-75
No. 10	75-60
No. 16	60-50
No. 30	50-38
No. 40	38-29
No. 50	29-19
No. 100	19-7
No. 200	5-0

The Contractor shall supply a 5-gallon sample of sand material to the material testing laboratory within five (5) days after the Notice to Proceed is issued. The gradation, sand equivalent and maximum density of the sand material shall be determined. The test results shall be forwarded to the Engineer. The cost of testing shall be incurred by the Contractor. The gradation of the granular sand shall be determined and the test results forwarded to the Engineer prior to the delivery of the granular sand material to the Site. Prior to the placement of sand the native subbase grade shall be checked and approved by the Engineer.

Crusher fines shall be allowed to be utilized in lieu of sand if approved by the Engineer.

2. Crusher Fines:

Crusher fines shall consist of decomposed granite indigenous to the Imperial Valley. Crusher fines utilized for this project shall conform to the following gradation requirements:

<u>SIEVE SIZE</u>	<u>PERCENT PASSING</u>
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5/8"	100
No. 4	80-100
No. 8	50-85
No. 30	30-50
No. 200	4-15

The sand equivalent shall be 20 or greater.

The Contractor shall supply a five-gallon sample of crusher fines material to the material testing laboratory within five (5) days after the Notice to Proceed is issued. The Gradation and Maximum Density of the crusher fines material shall be determined. The test results shall be forwarded to the Engineer for approval prior to the delivery of the material to the Site. The cost of the testing shall be incurred by the Contractor.

3. Fine Gravel:

Clean fine gravel free of clay, shale and deleterious material. Fine gravel shall be compacted with a plate compactor with one pass in maximum 1 foot lifts. Additional lifts shall not be added until previous lifts shall have been passed over by the plate compactor. The maximum amount of material passing the 1/4" Sieve shall be 2 percent. The fine gravel shall conform to the following gradation percentages:

<u>SIEVE SIZE</u>	<u>PERCENT PASSING</u>
3/8"	100
1/4"	0-2

The Contractor shall supply a five-gallon sample of fine gravel material to the material testing laboratory within five (5) days after the Notice to Proceed is issued. The Gradation and Maximum Density of the fine gravel material shall be determined. The test results shall be forwarded to the Engineer for approval prior to the delivery of the material to the Site. The cost of the testing shall be incurred by the Contractor.

4. Class 2 Base:

The Class 2 Base material shall conform to Caltrans Section 26, Latest Edition, for 3/4-inch maximum base material. The gradation requirements are as follows:

<u>SIEVE SIZE</u>	<u>CLASS 2 BASE % PASSING</u>
1"	100
3/4"	87-100
No. 4	30-65
No. 30	5-35
No. 200	0-12

The sand equivalent shall be 25 or greater. An angular aggregate is to be used. Class 2 Base material shall be compacted to 95 percent of maximum density according to ASTM D 1557, unless otherwise noted on the Plans or Details. The tolerance for the Class 2 Base between design subgrade elevation and actual subgrade elevation as constructed in the field shall be plus or minus 0.02 feet as referenced from the design subgrade. Prior to the placement of Class 2 Base, the native subbase grade shall be checked and approved by the Engineer. The native subbase grade shall be within plus or minus 0.05 feet of native subbase design grade prior to the placement of Class 2 Base.

The Contractor shall supply a 5-gallon sample of the Class 2 Base to the material testing laboratory within four (4) days of the Notice to Proceed. The material shall be delivered to the testing laboratory to determine the maximum density, gradation, R-value, sand equivalent and durability index of the Class 2 Base. A copy of the test results shall be forwarded to the Engineer by the Geotechnical Consultant for review. The gradation of the Class 2 Base shall be determined and the test results forwarded to the Engineer for approval prior to the delivery of the Class 2 Base material to the Site.

- C. Structural Backfill Material: Structural Backfill Material shall consist of the same material listed with the Structural Fill Material item above.
- D. Special Crushed Rock Bedding and Structure Foundation: When groundwater is encountered in the excavation and/or where indicated on the Plans, the material in the bottom of the trench or excavation shall be removed to a depth directed by the Geotechnical Engineer and replaced with 3/4-inch maximum crushed rock bedding or 1" round rock bedding. The rock beddings shall be installed per these Specifications. The 3/4-inch maximum crushed rock and 1" round rock materials shall be approved by the Engineer before use.

The bottom and sidewalls of the trench shall be covered with a geotextile. The geotextile fabric shall extend to the top of the pipe zone material on both sides of the trench excavation, and cover the top of the crushed rock and or 1-inch round rock.

1. 3/4-Inch Maximum Crushed Rock

Crushed rock shall be the product of crushing rock or gravel. Fifty percent (50%) of the particles by weight retained on a 3/8-inch sieve shall have their entire surface area composed of faces resulting from fracture due to mechanical crushing. Not over 5% shall be particles that show no faces resulting from crushing. Less than 10% of the particles that pass the 3/8-inch sieve and are retained on the No. 4 sieve shall be waterworn particles. Gravel shall not be added to the crushed rock. Crushed rock (3/4") shall have the following gradation:

<u>SIEVE SIZES</u>	<u>3/4-INCH MAX. CRUSHED ROCK % PASSING</u>
1"	100
3/4"	90-100
1/2"	30-60
3/8"	0-20
No. 4	0-5
No. 8	-

The 3/4-inch maximum crushed rock shall be compacted with a plate compactor in one pass in maximum 1 foot lifts. Additional lifts shall not be added until previous lifts shall have been passed over by the plate compactor.

The Contractor shall supply a five-gallon sample of the 3/4-inch maximum crushed rock material to the material testing laboratory within four (4) days of the Notice to Proceed. The Gradation and Sand equivalent of the crushed rock shall be determined. The tests results shall be forwarded to the Engineer for approval prior to the delivery of the material to the Site. The cost of the testing shall be incurred by the Contractor.

2. 1" Round Rock

The 1-inch round rock material shall conform to the following gradation requirements:

<u>SIEVE SIZES</u>	<u>1-INCH ROUND ROCK % PASSING</u>
1-1/2"	100
1"	96
3/4"	79
1/2"	25
3/8"	1

The 1-inch round rock shall be compacted with a plate compactor in one pass in maximum 1 foot lifts. Additional lifts shall not be added until previous lifts shall have been passed over by the plate compactor.

The Contractor shall supply a five-gallon sample of the 1-inch round rock material to the material testing laboratory within four (4) days of the Notice to Proceed. The Gradation of the round rock shall be determined. The tests results shall be forwarded to the Engineer for approval prior to the delivery of the material to the Site. The cost of the testing shall be incurred by the Contractor.

- E. 3 Sack Slurry Cement Backfill: Slurry cement backfill must be a fluid workable mixture of aggregate, cement, and water. Cement must comply with Section 90-1.02B(2) of the 2010 Caltrans Standard Specifications except testing is not required. Water must be free from oil, salts, and other impurities that adversely affect the backfill. Aggregate must be one of the following:

1. Commercial-quality concrete sand
2. Excavated or imported material in any combination, free of organic material and other deleterious substances and complying with the grading requirements shown in the following table:

<u>SIEVE SIZES</u>	<u>% PASSING</u>
1-1/2"	100
1"	80-100
3/4"	60-100

3/8"	50-100
No. 4	40-80
No. 100	10-40

Proportion slurry cement backfill by weight or volume. Use at least 282 pounds of cement per cubic yard. Use sufficient water to produce a fluid workable mix that flows and can be pumped without segregation during placement.

Mix materials thoroughly by machine. Use a pugmill, rotary drum, or other authorized mixer. Mix until cement and water are thoroughly dispersed.

You may use slurry cement backfill as structure backfill for pipe culverts.

PART 3 - EXECUTION

3.01 GENERAL

The Work performed under this Specification shall be constructed to the lines, grades, elevations, slopes and cross-sections indicated on the Plans, specified herein, and/or directed by the Owner. Slopes, graded surfaces, and drainage features shall present a neat uniform appearance upon completion of the Work.

It shall be the Contractor's responsibility (1) to maintain adequate safety measures and working conditions; and (2) to take all measures necessary during the performance of the Work to protect the entire project area and adjacent properties which would be affected by this Work from storm damage, flood hazard, caving of trenches and embankments, and sloughing of material, until final acceptance by the Owner. It shall be the Contractor's responsibility to maintain completed areas until the entire project area is in satisfactory compliance with the job specification.

Utility lines and structures indicated on the Plans which are to remain in service shall be protected by the Contractor from any damage as a result of his/her operation. Where utility lines or structures not shown on the Plans are encountered, the Contractor shall report them to the Owner before proceeding with the Work. The Contractor shall bear the cost of repair or replacement of any utility lines or structures which are broken or damaged by his/her operations.

3.02 REMOVALS, CLEARING AND GRUBBING

- A. Clearing: Clearing consists of the complete removal of objectionable materials and obstructions above and below the ground surface including tree stumps, brush, grass, vegetative matter and other objectionable materials within the project limits. All brush and organic material shall be removed before placing any earth fills. It shall be the Contractor's responsibility to save and protect all trees that lie outside the construction area.
- B. Grubbing: Grubbing consists of the complete removal of stumps, including tap roots or lateral roots 1-1/2 inches or more in diameter, and the removal of brush, grass or weeds to depths below the natural ground as specified herein. Stumps shall be grubbed to a depth of 3 feet and grass or weeds shall be grubbed to a depth of 6 inches below the natural ground surface, or to the depths as determined in the field by the Engineer at the time of construction.
- C. Protection: Existing items not designated to be demolished or removed shall be protected from damage. Any such item damaged by the Contractor shall be restored or replaced immediately at the Contractor's expense.
- D. Debris and Waste Material: All debris and waste material resulting from demolition, clearing and grubbing shall be removed from the site and disposed of by the Contractor.

3.03 DUST CONTROL

The Contractor shall take all steps possible to prevent and reduce dust arising from the construction activity. Contractor shall prepare a dust control plan per San Diego County Air Pollution Control District requirements.

3.04 CARE OF DRAINAGE WATER

Contractor shall take care of drainage water from the construction operations, and of stormwater and/or wastewater reaching the construction area from any source, so that damage is not incurred to the excavation, pipe or structures. The Contractor shall be responsible for any damages to persons or property on or off the Site due to such drainage water or to the interruption or diversion of such stormwater or wastewater on account of his/her operation.

Such grading shall be done as may be necessary to prevent surface water from flowing into excavations, and any water accumulating therein shall be removed by pumping or by other reviewed methods.

Protection of the site during construction shall be the responsibility of the Contractor. Completion of a portion of the project shall not preclude that portion or adjacent areas from the requirements for site protection until such time as the entire project is complete.

3.05 EXCAVATION

- A. General: The Contractor shall perform all excavation necessary or required as illustrated on the Plans. The excavation shall include the removal and disposal of all earth materials of whatever nature encountered, which shall include both rock excavation and common excavation when both are present, and shall include the furnishing, placing and maintaining of shoring and bracing necessary to safely support the sides of the excavations. The Work shall also include all pumping, ditching and other required methods for the removal or exclusion of water. See Technical Specifications Section 02150 Sheeting, Shoring and Bracing, respectively.

3.06 CONTROLLED FILL

- A. General: Controlled fill shall consist of native material, granular sand, Class 2 Base, crusher fines or other material as indicated on the Plans. The subbase grade shall be excavated to within plus or minus 0.05 feet of design grade prior to the placement of controlled fill. The design subbase grade shall be field verified and approved by the Engineer prior to the placement of the controlled fill material. The Engineer shall determine the number and location of points to check for the subbase grade elevation compliance.

If the controlled fill consists of native material it shall be placed in maximum 1-foot lifts and compacted to 90 percent of maximum density at optimum water content per ASTM D 1557. Additional native soil lifts shall not be placed until previous lifts have attained the specified compaction requirement and are approved by both the on-site geotechnical representative and the Engineer.

Granular sand, Class 2 Base and crusher fine controlled fill material shall be placed in maximum 8-inch lifts and compacted to 95 percent of maximum density at optimum water content per ASTM D 1557. Additional

granular sand, Class 2 Base or crusher fine lifts shall not be placed until previous lifts have attained the specified compaction requirement and are approved by both the on-site geotechnical representative and the Engineer.

- B. Preparing Areas To Be Filled: All vegetation and objectionable material shall be removed by the Contractor from the surface upon which the fill is to be placed and any loose and porous soils shall be removed or compacted to a depth specified by the Geotechnical Engineer. The surface shall then be plowed or scarified to a minimum depth of 6 inches until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.

When placing fill in horizontal lifts adjacent to areas sloping steeper than 5:1 (horizontal:vertical), horizontal keys and vertical benches shall be excavated into the adjacent slope area. Keying and benching shall be sufficient to provide at least 6-foot wide benches and a minimum of 4 feet vertical bench height within the firm natural ground, firm bedrock or engineered compacted fill. No compacted fill shall be placed in an area subsequent to keying and benching until the area has been reviewed by the Geotechnical Engineer. Material generated by the benching operation shall be moved sufficiently away from the bench area to allow for the review of the horizontal bench prior to placement of fill.

After the foundation for the fill has been cleared, plowed or scarified, it shall be disced or bladed by the Contractor until it is uniform and free from large clods, brought to the proper moisture content and compacted as specified.

- C. Placing, Spreading and Compacting Fill Material: The fill material shall be placed by the Contractor in thin layers that when compacted shall not exceed 8 inches for granular sand, Class 2 Base and crusher fines and 12 inches deep for native material. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to obtain uniformity of material in each layer.

When the moisture content of the fill material is below that required by the Geotechnical Engineer, water shall be added by the Contractor until the moisture content is as required for the specified compaction.

When the moisture content of the fill material is above that required by the Geotechnical Engineer, the fill material shall be aerated by the Contractor by blading, mixing, or other satisfactory methods until the moisture content is as required for the specified compaction.

After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted by the Contractor to the specified density. Compaction shall be accomplished by sheepsfoot rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers or other types of acceptable compacting equipment. Equipment shall be of such design that it shall be able to compact the fill to the specified density. Compaction shall be continuous over the entire area and the equipment shall make sufficient passes over the material to ensure that the desired density has been obtained.

Compacted fill slopes shall be overbuilt and cut back to grade, exposing the firm, compacted inner core. The slopes shall be overbuilt a minimum of five feet (5'). If the desired compaction is not achieved, the existing slope shall be overexcavated and reconstructed. The amount of overbuilding shall be increased until the desired compaction is achieved on the slope. The Contractor shall provide thorough mechanical compaction to the outer edge of the overbuilt slope surface. There shall be no excessive loose soil on the slopes.

The Contractor shall provide and maintain adequate erosion control facilities during the construction of the fill areas. The erosion control facilities shall be maintained in optimum condition until the permanent drainage system and vegetation is complete. The facilities shall be inspected following significant rainfall, repairs made and excess sediment removed. It shall be the Contractor's responsibility to prevent the discharge of sediment off-site or to adjacent watercourses.

3.07. STRUCTURE FILL AND STRUCTURE BACKFILL MATERIAL

Not Applicable.

3.08 SUITABLE MATERIAL AND WASTE EXCAVATION

- A. General: Suitable material or waste excavation consists of native material. The subbase grade shall be excavated to within plus or minus 0.05 feet of design grade prior to the placement of suitable material or waste excavation material. The design subbase grade shall be field verified and approved by the Engineer prior to the placement of the suitable material or waste excavation material. The Engineer shall determine the number and location of points to check for the subbase grade elevation compliance.

The suitable material or waste excavation material shall be placed in maximum 1-foot lifts and compacted to 90 percent of maximum density at optimum water content per ASTM D 1557. Additional suitable material or waste excavation material lifts shall not be placed until previous lifts have attained the specified compaction requirement and are approved by both the on-site geotechnical representative and the Engineer.

- B. Placing, Spreading and Compacting Suitable Material and Waste Excavation Material: The suitable material and waste excavation material shall be placed by the Contractor in 1-foot lifts. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to obtain uniformity of material in each layer.

When the moisture content of the fill material is below that required by the Geotechnical Engineer, water shall be added by the Contractor until the moisture content is as required for the specified compaction.

When the moisture content of the fill material is above that required by the Geotechnical Engineer, the fill material shall be aerated by the Contractor by blading, mixing, or other satisfactory methods until the moisture content is as required for the specified compaction.

After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted by the Contractor to the specified density. Compaction shall be accomplished by sheepsfoot rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers or other types of acceptable compacting equipment. Equipment shall be of such design that it shall be able to compact the fill to the specified density. Compaction shall be continuous over the entire area and the equipment shall make sufficient passes over the material to ensure that the desired density has been obtained.

Compacted fill slopes shall be overbuilt and cut back to grade, exposing the firm, compacted inner core. The slopes shall be overbuilt a minimum of five feet (5'). If the desired compaction is not achieved, the existing slope shall be overexcavated and reconstructed. The amount of overbuilding shall be increased until the desired compaction is achieved on the slope. The Contractor shall provide thorough mechanical compaction to the outer edge of the overbuilt slope surface. There shall be no excessive loose soil on the slopes.

The Contractor shall provide and maintain adequate erosion control facilities during the construction of the fill areas. The erosion control

facilities shall be maintained in optimum condition until the permanent drainage system and vegetation is complete. The facilities shall be inspected following significant rainfall, repairs made and excess sediment removed. It shall be the Contractor's responsibility to prevent the discharge of sediment off-site or to adjacent watercourses.

3.09 ESTABLISHMENT OF SUBBASE GRADE, SUBGRADE OR FINISH GRADE

Finish Grade is defined as the finish surface grade. For instance, the top of an A.C. or P.C.C. paved surface is referred to as finish grade.

Subgrade is defined as the grade of the material beneath the finish surface. For instance, the top of Class 2 Base grade beneath an A.C. or P.C.C. paved surface is referred to as subgrade.

Subbase is defined as the grade of the material beneath the base material. For instance, the top of native material beneath the Class 2 Base subgrade material of an A.C. or P.C.C. paved roadway is the subbase grade.

Finish grade surfaces are to be graded to within plus or minus 0.02 feet from design grade as illustrated on the Plans. The Engineer shall obtain elevations across finish grade surfaces at locations determined by the Engineer prior to accepting and approving the finish grade surfaces. The Contractor shall rework areas not conforming to the finish surface grade tolerance as required. Work items to occur after the establishment of finish grade shall not occur until the Engineer has approved the finish grade.

Subgrade surfaces are to be graded to within plus or minus 0.02 feet from design grade as illustrated on the Plans. The Engineer shall obtain elevations across the subgrade surfaces at locations determined by the Engineer prior to accepting and approving the subgrade surfaces. The Contractor shall rework areas not conforming to the subgrade tolerance as required. Work items to occur after the establishment of subgrade shall not occur until the Engineer has approved the finish grade.

Subbase surfaces are to be graded to within plus or minus 0.05 feet of subbase design grade as illustrated on the Plans. The Engineer shall obtain elevations across the subbase surfaces at locations determined by the Engineer prior to accepting and approving the subbase surfaces. The Contractor shall rework areas not conforming to the subbase design grade tolerance as required. Work items to occur after the establishment of subbase grade shall not occur until the Engineer has approved the subbase grade.

3.10 COMPACTION TEST SCHEDULE

The following **compaction test(s)** shall apply to this project:

<u>NO.</u>	<u>ITEM</u>	<u>FREQUENCY</u>
1	Granular sand installed within the pipe zone	One (1) test at 95 % every 150 l.f. of each 12" lift
2	Native material installed within the pipe zone	One (1) test at 90 % (as specified on the Plans) every 150 l.f. of each 12" lift
3	Class 2 Base beneath Asphalt Pavement installation area	One (1) test at 95 % for every 2,500 s.f. of each 8" lift

3.11. CLEAN-UP

Upon completion of Work in this Section, all rubbish and debris shall be removed from the site. All construction equipment and implements of service shall be removed and the entire area involved shall be left in a clean, neat and acceptable condition.

END OF SECTION 02200

SECTION 02221 - TRENCHING, BACKFILLING AND COMPACTING

PART 1 - GENERAL

1.01 DESCRIPTION

4. Requirements specified in the Technical and Special Conditions form a part of this Section. The Work of this Section includes all labor, machinery, construction equipment and appliances to perform in a professional manner all trench excavation and backfill work illustrated on the Plans and herein specified.

A. Principal items included:

1. Trench excavation, backfill and compaction.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02150 – Sheeting, Shoring and Bracing

B. Piping & Conduit Work specified in other Sections

1.03 SAFETY

The Contractor shall be familiarized with, and shall at all times conform to all applicable regulations of “Excavations, Trenching, and Shoring” of CALOSHA Safety and Health Regulations for Construction, “General Construction Safety Orders” and “Trench Construction Safety Orders” of the State of California, Department of Industrial Relations, Division of Occupational Health and Safety.

1.04 GEOTECHNICAL TESTING

The DISTRICT shall provide testing by a Geotechnical Engineer. In this regard, a Geotechnical Engineer shall perform inspections of the removal and replacement of unsuitable materials, all excavations, and the placement and compaction of all fills and backfills within the limits of earthwork on this Project. Costs for all such inspections and tests will be paid by the Contractor, and Contractor shall bear the cost of retest and re-inspection of reworked fills and backfills due to compaction test failure.

1.05 REQUIREMENTS

A. General:

1. The Work performed under this Specification shall be constructed to the lines, grades, elevations, slopes and cross-sections indicated on the Plans, specified herein, and/or directed by the Engineer in writing. Slopes, graded surfaces, and drainage features shall present a neat, uniform appearance upon completion of the Work.
2. It shall be the Contractor's responsibility (1) to maintain adequate safety measures and working conditions; and (2) to take all measures necessary during the performance of the Work to protect the entire project area and adjacent properties which would be affected by this Work from storm damage, flood hazard, caving of trenches, caving of excavations, and embankments, and sloughing of material, until final acceptance by the Owner. It shall be the Contractor's responsibility to maintain completed areas in good condition until the entire project area is in satisfactory compliance with the Project Specifications.
3. Contractor shall be responsible for the excavation and disposition of unsuitable or surplus material by approved means of conveyance away from the working area.

B. Protection of Existing Utilities:

1. Utilities: Unless otherwise illustrated on the Plans or stated in the Specifications, all utilities, both underground or overhead, shall be maintained in continuous service throughout the entire contract period. The Contractor shall be responsible and liable for any damages to or interruption of service caused by the construction.

If the Contractor desires to simplify his/her operation by temporarily or permanently relocating or shutting down any utility or appurtenance, he/she shall make the necessary arrangements, agreements and approvals with the utility purveyor, Owner and Engineer and shall be completely responsible for all costs concerned with the relocation or shutdown and reconstruction. All property shall be reconstructed in its original or new location as soon as possible and to a condition at least as good as its previous condition. This cycle of relocation or shutdown and reconstruction shall be subject to inspection and approval by the Engineer, Owner and the utility purveyor.

The Contractor shall be entirely responsible for safeguarding and maintaining all conflicting utilities that are illustrated on the Plans.

This includes overhead wires and cables and their supporting poles whether they are inside or outside of the open trench. If, in the course of work, a conflicting utility line that was not illustrated on the Plans is discovered, it shall be brought to the immediate attention of the Engineer for a determination regarding alternatives to the conflict.

2. Building, Foundations and Structures: Where trenches are located adjacent to buildings, foundations and structures, the Contractor shall take all necessary precaution against damage to them. The Contractor shall be liable for any damage caused by the construction except where authorized in the Special Conditions or in writing by the Engineer. Water settling of backfill material in trenches adjacent to structures will not be permitted.
3. Electronic, Telephonic, Telegraphic, Electrical, Oil and Gas Lines: These underground facilities shall be adequately supported by the Contractor. Support for plastic pipe shall be continuous along the bottom of the pipe. Support for metal pipe and electrical conduit may be continuous or nylon webbing may be used for suspension at no greater than ten foot (10') intervals. The Contractor shall avoid damaging the plastic pipe, pipe ways or conduits during trench backfilling and during foundation and bedding placement.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Granular Sand Material: Granular sand material shall consist of imported granular sand complying with Section 02200, of the specifications.
- B. Crusher Fines: Crusher fines material shall consist of imported decomposed granite complying with Section 02200, of the specifications.
- C. Class 2 Base Material: Class 2 Base material shall comply with Section 02200, of the Specifications.
- D. Crushed Rock Bedding: Crushed rock bedding shall consist of imported rock complying with Section 02200, of the Specifications.
- E. 1-inch Round Rock: 1-inch Round Rock material shall consist of import rock material complying with Section 02200, of the Specifications.
- F. 3 Sack Cement Slurry: 3 Sack Cement Slurry shall comply with Section

02200, of the Specifications

- H. Pipelines: Use materials shown on the Plans and as specified in other pertinent Sections of the Specifications.

PART 3 - EXECUTION

3.01 TRENCH EXCAVATION

- A. Excavation for Trenches: Shall include the removal of all material of any nature for the installation of the pipe or facility and shall include the construction of trench shoring and stabilization measures, timbering and all necessary installations for dewatering.
- B. Minimum Width of Trench: The minimum width of pipe trenches, measured at the crown of the pipe, shall not be less than 12 inches greater than the exterior diameter of the pipe, exclusive of bells and the minimum base width of such trench shall be not less than 12 inches greater than the exterior diameter of the pipe, exclusive of special structures or connections, and such minimum width shall be exclusive of all trench supports.
- C. Maximum Width of Trench: The maximum allowable width of trench for all pipelines measured at the top of the pipe shall be the outside diameter of the pipe (exclusive of bells or collars) plus 16 inches, and such maximum shall be inclusive of all timbers. A trench wider than the outside diameter plus 16 inches may be used without special bedding if the Contractor, at his/her expense, furnishes pipe of the required strength to carry the additional trench load. Such modifications shall be submitted for the Engineer's review. Whenever such maximum allowable width of trench is exceeded for any reason, except as provided for on the Plans or in the Specifications, or by the written direction of the Engineer, the Engineer may, at its discretion, require that the Contractor, at his/her own expense for all labor and materials, cradle the pipe in 5,000 PSI compressive strength concrete, or other approved pipe bedding.
- D. Maximum Length of Open Trench: Except by special permission by the Engineer only that amount of open trench shall be permitted, which shall allow for that amount of pipeline construction, including excavation, construction of pipeline, and backfill in any one location, which can be completed in one day; however, maximum length of open trench shall never exceed 300 feet. This length includes open excavation, pipe laying and appurtenant construction and backfill which has not been temporarily

resurfaced.

E. Trench Side Slopes:

1. Temporary trench excavations shall at all times conform to the safety requirements hereinbefore specified in Section entitled "Safety".
2. Loose cobbles or boulders shall be removed from the sides of the trenches before allowing workmen into the excavation, or the trench slopes must be protected with screening or other methods. Trench side slopes shall be kept moist during construction to prevent local sloughing and raveling. Surcharge loads due to construction equipment shall not be permitted within 10 feet of the top of any excavated slope.
3. If the Contractor elects to shore or otherwise stabilize the trench sides, he shall file with the Engineer copies of drawings for same prepared, signed and stamped by a Civil Engineer duly registered in the State of California before commencing excavation.

F. Excess Trench Excavation: If any trench, through the neglect of the Contractor, is excavated below the bottom grade required, it shall be refilled to the bottom grade, at the Contractor's expense for all labor and material, with granular sand material compacted to a firm stable foundation.

3.02 BRACING TRENCHES

The sides of the trenches shall be supported with plank sheeting and bracing in such a manner as to prevent caving of the sides of the trench. Space left by withdrawal of sheeting or shoring shall be filled completely with dry granular material blown or rammed in place. Trench shoring shall be completed per the recommendations of the OSHA Standards.

3.03 PIPING BEDDING

The Contractor shall excavate to four inches (4") below the bells or couplings for the full width of the trench and shall place four inches (4") of granular material upon which the pipe is to be laid, unless indicated otherwise on the Plans. Construct pipe bedding as indicated on the Plans.

At pipe subgrade, if foundation soil in trench is soft, wet, spongy, unstable or does not afford solid foundation for pipe, the Contractor shall excavate as

directed by the Engineer and provide stable base by excavating any unsuitable material 18" minimum below the subgrade base or as the Engineer determines is necessary for placement of pipe bedding. A filter fabric shall be placed in the trench bottom and along the trench sidewalls in the pipe zone to the top of the pipe zone material. A crushed rock material shall be placed at the bottom of the trench and sidewalls of the pipe to a point 1 foot above the pipe. The crushed rock material shall be hand tamped in 16-inch lifts along the sidewalls. The crushed rock shall be compacted with a plate compactor in minimum 6 inch lifts beneath the pipe and over the top of the pipe.

Where rock is encountered in the trench, the Contractor shall excavate to a minimum 18 inch depth below subgrade or as the Engineer determines is necessary, and shall construct a base by placing crushed rock bedding upon which a subgrade can be prepared.

Before any pipe is lowered in place, the trench bottom shall be prepared so that each pipe shall be supported for the full length of the barrel with full bearing on the bottom segment of the pipe equal to a minimum of one-half (1/2) of the pipe OD, and a width equal to the trench width. All adjustments in line and grade shall be made by scraping away or filling and tamping in under the barrel of the pipe. Wedging or blocking is not permitted.

The pipe bedding shall be compacted to a minimum of 90 or 95 percent relative compaction as hereinafter specified or as required by the Plans.

3.04 BACKFILLING PIPE TRENCHES

A. Backfilling Pipe Zone: Backfill material for the pipe zone shall consist of imported granular material or three sack cement/sand slurry as required by the Plans. Place material in the trench simultaneously on each side of the pipe for the full width of the trench and the depth of the pipe zone in layers 6 inches in depth. Each layer shall be thoroughly compacted by tamping. In all cases, backfilling of the pipe zone must be accomplished by hand. Particular attention shall be given to underside of the pipe and fittings to provide a firm support along the full length of the pipe. The pipe zone shall be considered to extend 12 inches above the top of the pipe unless otherwise illustrated on the Plans, and shall be compacted in the trench to a relative compaction of not less than 90 or 95 percent of maximum density per ASTM D 1557 as illustrated on the Plans. Care shall be taken not to damage pipe and fittings or special coatings on the pipe and fittings.

1. Use of material other than those specified shall be reviewed by the Engineer prior to use. The Contractor shall bear all cost of removal

of rejected material, its hauling to an authorized disposal site, and cost of providing required material to complete the bedding and backfilling.

- B. Backfilling Pipe Trench: After the pipe has been laid in the trench and has been inspected and approved, and backfilling in the pipe zone is complete and compacted, the remainder of the trench may be backfilled. The backfill material shall be granular sand or Class 2 Base or 3 sack cement slurry as specified in Paragraph 2.01 or native material and illustrated on the Plans. Care shall be taken to ensure that no voids remain under, around or near the pipe.
1. The Contractor shall incur the expense to remove and dispose of the excess trench excavation material displaced by the trench import material and include the costs in the bid.
- C. Compaction: The maximum dry density and optimum moisture content of each soil type used in the controlled compacted fill shall be determined by ASTM D 1557-91. Field density tests shall be determined in accordance with ASTM D 1556-82, ASTM D 2937-83 and ASTM D 2922-81.
- D. Placement and Compaction of Trench Backfill: The placement and compaction of all trench backfill shall be as follows:
1. Mechanically Compacted Backfill: With approval of the Engineer, backfill shall be mechanically compacted by means of tamping rollers, sheepsfoot rollers, pneumatic tire rollers, vibrating rollers, or other mechanical tampers to 85 or 90 or 95 percent relative compaction as illustrated by the Plans. Impact-type pavement breakers (stompers or hydro-hammers) shall not be permitted over any pipe. Permission to use specific compaction equipment shall not be construed as guaranteeing or implying that the use of such equipment will not result in damage to adjacent ground, existing improvements or improvements installed under the Contract. The Contractor shall make his/her own determination in this regard. Backfill shall be placed in horizontal layers not exceeding eight inches (8"). Each layer shall be evenly spread, the moisture content brought to near optimum condition and then tamped or rolled until the specific relative compaction has been attained. Additional backfill lifts shall not be placed until previous lifts have been satisfactorily compacted and tested and approved by the Engineer.

3.05 WATER PIPELINE INSTALLATION REQUIREMENTS

- A. Depth of Pipe: Unless otherwise illustrated on the Plans, all pipelines shall have coverage of at least 36 inches between the top of the pipe and the finished surface. All new water pipeline elevations and locations illustrated on the Plans are intended to be exact and any change in alignment and grade shall be reviewed in accordance with the Contract Documents to the satisfaction of the Engineer. All force and gravity mains shall have 1 foot vertical clearance between themselves and all other utilities. At all water main, sewer and stormwater crossings, both gravity and force mains shall have 20 linear feet of concrete encasement centered at the crossing as required by the State of California Department of Health.
- B. Changes in Line and Grade: In the event obstructions not shown on the Plans, are encountered during the progress of the Work, which will require alterations to the Plans, the Engineer shall issue the necessary revisions to the Plans and order the necessary deviation from the line or grade. The Contractor shall not make any deviation from the specified line and grade without prior review and approval by the Engineer. Should any deviations in line and grade be permitted by the Engineer in order to reduce the amount of rock excavation or for other similar convenience to the Contractor, any additional costs for thrust blocks, valves, air and vacuum valve assemblies, blow-off assemblies, extra pipe footage, concrete, sewer structures, or other additional costs shall be borne by the Contractor.
1. Contractor shall include in his/her Bid provisions to cover any deviation from the invert grade shown on the Plans to facilitate the extra depth required to avoid possible conflicts between existing gravity pipelines and other utilities with new water, stormwater or sewer forcemains.

C. Pipe Installation:

All pipe and fittings, and accessories furnished by the Contractor shall be new material free from rust or corrosion. All piping and fittings shall be cleaned on the inside when installed and the Contractor shall take all necessary precautions to insure that the lines are kept free of any foreign matter and dirt until the work is completed. All pipes shall be carefully placed and supported at the proper lines and grades as shown on the Plans. Piping runs shown on the Plans shall be followed as closely as possible, except for minor adjustments as approved by the Engineer to avoid other piping or structural features. Bedding material shall first be placed so that the pipe is supported for the full length of the barrel with full

bearing on the bottom segment of the pipe. Hunching of the pipe shall not be allowed. Pipe will be carefully inspected in the field before and after laying. If any cause for rejection is discovered in a pipe after it has been laid, it shall be subject to rejection by the Engineer. Any corrective work shall be approved by the Engineer. Pipe shall be laid true to line and grade with uniform bearing under the full length of the barrel of the pipe. Suitable excavation shall be made to receive the bell or collar which shall not bear upon the subgrade or bedding. Any pipe which is not in true alignment or shows any undue settlement after laying shall be taken up and relaid at the Contractor's expense. Pipe shall be laid upgrade with the socket ends of the pipe upgrade unless otherwise authorized by the Engineer. Pipe sections shall be laid and joined in such a manner that the offset of the inside of the pipe at any joint will be held to a minimum at the invert. The vertical grade shall be ± 0.04 feet of the design elevations. In joining socket pipe, the spigot of each pipe shall be so seated in the socket of the adjacent pipe as to give a uniform annular space all around the pipe in the socket.

The following pipe installation items shall be required:

1. No pipe shall be laid which is damaged, cracked, checked or spalled or has any other defect deemed by the Engineer to make it unacceptable, and all such sections shall be permanently removed from the Work.
2. At all times when the Work of installing pipe is not in progress, all openings into the ends of the pipelines shall be kept tightly closed with suitable plywood or sheet metal bulkheads to prevent the entrance of animals and foreign materials and to prevent water from entering the pipe.
3. Keep the pipe trench free from water at all times and take all necessary precautions to prevent the pipe from floating due to water entering the trench from any sources. Any damage is the Contractor's full responsibility. Restore and replace the pipe to its specified conditions and grade if it is displaced due to floating.
4. All pipelines adjoining concrete structures (including manholes) shall have a flexible joint, such as sleeve transition couplings, within 36 inches from the face of such concrete structures. Flexible joints shall be installed on all pipe 4" and larger whether or not a flexible joint is illustrated on the Plans. Where the flexible joint is illustrated on the Plans, install the joint at the location indicated.

3.06 COMPACTION OF PIPE BEDDING AND BACKFILL

Unless specified in the Plans or Earthwork Specification (Section 02200), the following compaction test for piping shall be required.

- A. One (1) compaction test for the granular sand fill pipe bedding along each 150 lineal foot of water, sewer or stormwater pipe placed for each 1 foot lift of material installed.
- B. One (1) compaction test shall be obtained for each 1 foot lift of Class 2 Base material along each 150 foot section of water, sewer or stormwater pipeline installed.
- C. One (1) compaction test shall be required for each 1 foot of vertical sand fill material placed along each 150 feet of water, sewer or stormwater pipeline installed.
- D. One (1) compaction test shall be obtained for each 1 foot lift of native material along each 150 foot section of water, sewer or stormwater pipeline installed.

3.07 CLEAN-UP

Immediately upon completion of Work for this Section, all rubbish and debris shall be removed from the Site. All pipe trench areas shall be finish graded with a "blade" or "motor patrol". All construction equipment and implements of service shall be removed and the entire area involved shall be left in a neat, clean and acceptable condition.

END OF SECTION 02221

SECTION 02640 - PVC PIPE

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes materials and installation of polyvinyl chloride (PVC) pipe and fittings with iron pipe size outside diameters for miscellaneous applications. Size range is 1/2- to 6- inch nominal size.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02200 - Earthwork
- B. Section 02221 - Trenching, Backfilling and Compacting
- C. Section 02666 – Pressure Pipeline Water Testing

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM D 1784 and ASTM D 1785	Specifications for Polyvinyl Chloride (PVC) Plastic Pressure Pipe
ASTM D 3034	Specifications for Polyvinyl Chloride (PVC) Plastic Gravity Sewer Pipe
AWWA C900 and AWWA C 905	Specifications for Polyvinyl Chloride (PVC) Plastic Water Pressure Pipe
ASTM D 2321	Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe
NSF / ASNI 61	Drinking Water System Components – Health Effects

1.04 CONTRACTOR SUBMITTALS

- A. Contractor shall submit copies of the manufacturer's product specifications according to the requirements of Section 01300 - Contractor Submittals.

PART 2 - PRODUCTS

2.01 PVC (POLYVINYL CHLORIDE) PIPE

- A. PVC pipe shall be Schedule 40 or 80, Type I, Grade I (Class 12454-B), conforming to ASTM D 1784 and D 1785. Provide PVC pipe with the schedule as shown on the Drawings

2.02 NIPPLES

- 5. Short nipples shall be the same as the PVC pipe.

2.03 FITTINGS

Provide fittings that have the same schedule as the PVC pipe.

- A. Fittings shall be Schedule 40 conforming to ASTM D 2466 for socket-type.
- B. Fittings shall be Schedule 80 conforming to ASTM D 2464 for threaded type and ASTM D 2467 for socket type.

2.04 JOINTS

- A. Pipe and fitting joints shall be solvent welded except where threaded joints are required.
- B. Solvent cement for socket joints shall comply with ASTM D 2564 and F 656.

5) PART 3 - EXECUTION

3.01 INSTALLATION OF PIPE

- A. All pipe, fittings, etc., shall be carefully handling and protected against damage, impact shocks and free fall. All pipe handling equipment shall be acceptable to the Engineer. Pipe shall not be placed directly on rough ground, but shall be supported in a manner which will protect the pipe against injury whenever stored at the Site. All pipe damaged prior to Substantial Completion shall be repaired or replaced by the Contractor.
- B. The Contractor shall inspect each pipe and fitting prior to installation to ensure that there are no damaged portions of the pipe. Damaged pipe shall be replaced with new undamaged sections of pipe.
- C. Before placement of the pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance which may have collected

thereon and shall be kept clean at all times thereafter. For this purpose, the openings of all pipes and fittings in the trench shall be closed during any interruption to the Work. As pipe laying progresses, the Contractor shall keep the pipe interior free of all debris. The Contractor shall completely clean the interior of the pipe of all sand, dirt, rocks and any other debris following completion of pipe laying prior to testing, disinfecting and placing the completed pipeline in service.

- D. Pipe shall be laid directly on the imported bedding material. No blocking will be permitted and the bedding shall be such that it forms a continuous, solid bearing for the full length of the pipe. Bell holes shall be formed at the ends of the pipe to prevent joint loading at the bells or couplings.
- E. Where necessary to raise or lower the pipe grade due to unforeseen obstructions or other causes, the Engineer may change the alignment and/or the grades. Such change shall be made by the deflection of joints or by the use of additional fittings. However, in no case shall the deflection in the joint exceed the maximum deflection recommended by the pipe manufacturer.
- F. No pipe shall be installed upon a foundation into which frost has penetrated or any time that there is a danger of the formation of ice or penetration of frost at the bottom of the excavation. No pipe shall be laid unless it can be established that the trench will be backfilled before the formation of ice and frost occurs.
- G. Immediately before jointing bell and spigot pipe, both the bell and spigot end of the pipe shall be thoroughly cleaned and lubricated with an approved vegetable-based lubricant. The spigot end of the pipe section shall then be inserted into the bell of the previously laid joint and telescoped into its proper alignment. Tilting of the pipe to insert the spigot into the bell will not be permitted.
- H. Solvent-welded and heat-fused joints shall be carefully and thoroughly cleaned immediately before jointing the pipe. Particular care shall be taken in making solvent-welded joints to ensure a uniform, homogeneous and complete bond.
- I. Pipe installation shall conform with Technical Specification Section 02221 - Trenching, Backfilling and Compacting. If this installation of pipe section and Section 02221 conflict, the most stringent specification shall apply.

END OF SECTION 02640

SECTION 02641 - PVC PRESSURE PIPE AWWA C900

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes materials, installation, and testing of PVC pressure pipe conforming to AWWA C900. Size range is 4- to 12-inch nominal pipe size.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02200 - Earthwork
- B. Section 02221 - Trenching, Backfilling and Compacting
- C. Section 02666 – Pressure Pipeline Water Testing
- D. Section 02670 – Disinfection of Potable Water Pipelines

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards:

ASTM D 1784 and ASTM D 1785	Specifications for Polyvinyl Chloride (PVC) Plastic Pressure Pipe
ASTM D 3034	Specifications for Polyvinyl Chloride (PVC) Plastic Gravity Sewer Pipe
AWWA C900 and AWWA C 905	Specifications for Polyvinyl Chloride (PVC) Plastic Water Pressure Pipe
ASTM D 2321	Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe
NSF / ASNI 61	Drinking Water System Components – Health Effects

1.04 CONTRACTOR SUBMITTALS

- A. Contractor shall submit copies of the manufacturer's product specifications

according to the requirements of Section 01300 - Contractor Submittals.

- B. Provide affidavit of compliance with AWWA C900.
- C. Submit manufacturer's literature on ductile iron fittings including dimensions, thickness, weight, coating, lining, and a statement of inspection and compliance with the acceptance tests of AWWA C110 or C153. Submit copy of report of pressure tests for qualifying the designs of all sizes and types of AWWA C153 fittings that are being used in the project. The pressure test shall demonstrate a minimum safety factor of three times the rated working pressure as described in AWWA C153, Section 5.5.
- D. Submit manufacturer's catalog data and descriptive literature for high deflection couplings, repair couplings, service saddles, restrained joints, tracer wire, marking tape, and miscellaneous piping materials.
- E. Submit restrained joint system installation instructions. Include bolt torque limitations and assembly tolerances.

1.05 INSPECTIONS AND FIELD VERIFICATION

- A. The District Engineer or his authorized representative may inspect materials, productions, and testing at manufacturer's plant.
- B. Where new pipelines are to be connected to existing waterlines of the District, the Contractor shall verify in the field the location, elevation, pipe material, pipe outside diameter, and any other characteristics of the existing waterline before proceeding with the pipe installation. This field verification shall be performed in the presence of the District Engineer of the District's Representative. Adjust and align the new piping as necessary to meet the field conditions and provide all required material, labor, and equipment to make the connection

PART 2 - PRODUCTS

2.01 PVC (POLYVINYL CHLORIDE) PIPE

- A. Provide PVC pipe conforming to AWWA C900 with material cell classification 12454-B per ASTM D 1784. Provide standard pipe having integral bell and spigot with elastomeric gasket and cast iron equivalent outside diameter. Provide pipe in standard 20-foot laying lengths. Straight pipe sections with plain ends for use with high deflection couplings are not available. Random lengths will not be permitted. Provide either Class 150 or 200 pressure rating

as shown on the Drawings. Where PVC pipe is to be installed with restrained joints, provide Class 200 pipe.

2.02 HIGH DEFLECTION COUPLINGS

Provide PVC couplings with twin elastomeric gaskets which allows 2 degrees of deflection at each gasket for a total of 4 degrees per coupling. Provide couplings for cast iron equivalent outside diameter with 200 psi working pressure rating. Provide CertainTeed High Deflection (HD) Stop Couplings, or District approved equal.

2.03 CLOSURE/REPAIR COUPLINGS

Provide PVC couplings with twin elastomeric gaskets which are designed to connect plain ends of straight pipe. Provide couplings for cast iron equivalent outside diameter with 200 psi working pressure rating. Do not deflect pipe in these couplings. Provide CertainTeed Closure/Repair Couplings, or District approved equal.

2.04 FITTINGS

- A. Provide ductile iron fittings conforming to AWWA C110 with a minimum rated working pressure of 350 psi. Provide fittings with bells and gaskets specifically designed for cast iron equivalent outside diameter PVC pipe. Use mechanical joint fittings or fittings with bells and gasket ends.
- B. In lieu of paragraph 2.04, A., provide ductile iron fittings conforming to AWWA C153 with a minimum rated working pressure of 350 psi. Provide fittings constructed of Grade 70-50-05 ductile iron having a minimum weight equal to the weight tabulated in AWWA C153. Provide fittings with bells and gaskets specifically designed for cast iron equivalent outside diameter PVC pipe. Use mechanical joint fittings or fittings with bells and gasket ends conforming to the dimensional values of AWWA C111. Mechanical joint glands shall be Grade 70-50-05 ductile iron and cast in one continuous ring. Fittings with repaired defects are not acceptable and will be rejected.
- C. For mechanical joint fittings with glands, use tee-head or non-hex head bolts and hex head nuts for joint makeup and gasket seating. Bolts and nuts shall be carbon steel and coated with a corrosion inhibiting fluoropolymer composite material. Provide Tripac 200 Blue Coating System, or District

approved equal.

2.05 LINING AND COATING FOR FITTINGS

- A. Line interior of fittings for water pipelines with cement mortar per AWWA C104. Line interior of bells. Provide double thickness lining and use cement conforming to ASTM C150 Type II. Coating on interior bells shall be holiday free.
- B. Coat exterior of fittings for water pipelines with an asphalt material per AWWA C151.
- C. As an alternative to paragraph 2.05, A and B, line and coat fittings and bells with fusion-bonded epoxy. Coating shall be holiday free on the interior surfaces of the fittings, including the bells.

2.06 FLANGES

Flanges on ductile iron fittings shall conform to AWWA C110 or ASME B16.42 Class 150 with a minimum rated working pressure of 250 psi

2.07 RESTRAINED JOINTS

When the working pressure is less than 150 psi, provide restrained joints where indicated on the Drawings. Restrained joints shall be provided by restraining systems that incorporate a series of machined serrations on the inside diameter of a restraint ring to provide positive restraint. Restraining systems shall meet or exceed the requirements of UNI-B-13-94 or ASTM F 1674 and the following:

- A. Restraint devices for PVC bell-and-spigot joints shall consist of a split restraint ring installed on the spigot, connected to a solid backup ring seated behind the bell.
- B. Restraint devices for connection to ductile iron mechanical joints shall consist of a split restraint ring installed on the PVC pipe behind the ductile iron fitting follower gland and gasket and shall retain the full deflection capability of the joint.
- C. The split restraint ring shall be machined to match the cast iron equivalent outside diameter of the pipe, provide full 360-degree support around the barrel of the pipe, and shall incorporate a series of machined serrations for gripping the outside surface of the pipe. The serrations shall be uniform and extend the full circumference of the clamp. The ring shall also

incorporate a positive means of avoiding applying excessive clamping force to the pipe.

- D. Materials used in the restraint device shall be ductile iron conforming to ASTM A 536, Grade 65-45-12.
- E. T-bolts, studs, and connecting hardware shall be high strength, low alloy material in accordance with AWWA C111.

PART 3 - EXECUTION

3.01 DELIVERY AND TEMPORARY STORAGE OF PIPE

- A. Ship, store, and place pipe at the storage yard or installation site, supporting the pipe uniformly. Avoid scratching the pipe surface. Do not stack higher than 4 feet nor stack with weight on bells. Cover to protect from sunlight.
- B. Do not install pipe that is gouged or scratched forming a clear depression.
- C. Do not install pipe contaminated with a petroleum product (inside or outside).
- D. Do not install any pipe that shows evidence of exposure to sunlight, age, surface deterioration, or other physical damage. The decision of the District Engineer's Representative shall be final as to the acceptability of the pipe to be installed.

3.02 HANDLING OF PIPE

Lift pipes with mechanical equipment using wide belt slings or a continuous fiber rope which avoids scratching the pipe. Do not use cable slings or chains. Pipes up to 12 inches in diameter may be lowered by rolling on two ropes controlled by snubbing. Pipes up to 6 inches in diameter can be lifted by hand

3.03 SANITATION OF PIPE INTERIOR

- A. During laying operations, do not place tools, food, clothing, trash, or other materials in the pipe. Keep the interior of the pipe clean as the pipeline construction progresses. The purpose of maintaining a clean interior is to aid in the passage of the bacteriologic quality after disinfection.
- B. When pipe laying is not in progress, including the noon hour, close the

ends of the installed pipe with a plug to deter entry of vermin, children, dirt, storm water, or foreign material.

3.04 PIPE LAYOUT FOR STRAIGHT AND CURVED ALIGNMENTS

- A. Use integral bell end pipe for straight alignments and for radii greater than 1,150 feet.
- B. Use the following various combinations of plain end pipe lengths with high deflection couplings and integral bell end pipe for curved alignments in both horizontal and vertical directions. Do not bend pipe between couplings. Saw cut integral bell end of standard pipe and bevel end for use with deflection couplings. Pipe lengths shorter than 9 feet will not be used unless specifically authorized by the District Engineer.
 - 1. Use 9.5-foot plain end pipe lengths with deflection couplings for all radii between 140 feet to 270 feet.
 - 2. Use 19-foot plain end pipe lengths with deflection couplings for all radii between 270 feet to 560 feet.
 - 3. Use an integral bell end pipe length joined together with a 19-foot plain end pipe length to form a chord. Use deflection couplings on each end of the chord and continue this combination through the curved alignment for all radii between 560 feet to 1,150 feet

3.05 INSTALLATION OF PIPE

- A. All pipe, fittings, etc., shall be carefully handling and protected against damage, impact shocks and free fall. All pipe handling equipment shall be acceptable to the Engineer. Pipe shall not be placed directly on rough ground, but shall be supported in a manner which will protect the pipe against injury whenever stored at the Site. All pipe damaged prior to Substantial Completion shall be repaired or replaced by the Contractor. Handle pipe in a manner to avoid any damage to the pipe. Do not drag pipe over the ground, drop it onto the ground, or drop objects on it. Do not drop or allow pipe to fall into trenches.
- B. The Contractor shall inspect each pipe and fitting prior to installation to ensure that there are no damaged portions of the pipe. Damaged pipe shall be replaced with new undamaged sections of pipe.
- C. Before placement of the pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance which may have collected thereon and shall be kept clean at all times thereafter. For this purpose,

the openings of all pipes and fittings in the trench shall be closed during any interruption to the Work. As pipe laying progresses, the Contractor shall keep the pipe interior free of all debris. The Contractor shall completely clean the interior of the pipe of all sand, dirt, rocks and any other debris following completion of pipe laying prior to testing, disinfecting and placing the completed pipeline in service.

- D. Pipe shall be laid directly on the imported bedding material. No blocking will be permitted and the bedding shall be such that it forms a continuous, solid bearing for the full length of the pipe. Bell holes shall be formed at the ends of the pipe to prevent joint loading at the bells or couplings.
- E. Where necessary to raise or lower the pipe grade due to unforeseen obstructions or other causes, the Engineer may change the alignment and/or the grades. Such change shall be made by the deflection of joints or by the use of additional fittings. However, in no case shall the deflection in the joint exceed the maximum deflection recommended by the pipe manufacturer.
- F. No pipe shall be installed upon a foundation into which frost has penetrated or any time that there is a danger of the formation of ice or penetration of frost at the bottom of the excavation. No pipe shall be laid unless it can be established that the trench will be backfilled before the formation of ice and frost occurs.
- G. Immediately before jointing bell and spigot pipe, both the bell and spigot end of the pipe shall be thoroughly cleaned and lubricated with an approved vegetable-based lubricant. The spigot end of the pipe section shall then be inserted into the bell of the previously laid joint and telescoped into its proper alignment. Tilting of the pipe to insert the spigot into the bell will not be permitted.
- H. Solvent-welded and heat-fused joints shall be carefully and thoroughly cleaned immediately before jointing the pipe. Particular care shall be taken in making solvent-welded joints to ensure a uniform, homogeneous and complete bond.
- I. Pipe installation shall conform with Technical Specification Section 02221 - Trenching, Backfilling and Compacting. If this installation of pipe section and Section 02221 conflict, the most stringent specification shall apply.

3.06 ASSEMBLING PIPE JOINTS

- A. The spigot and integral bell or coupling shall be dirt free and slide together without displacing the rubber ring gasket. Lay the pipe section with the integral bell facing the direction of laying.
- B. Clean the groove of the bell or coupling of all foreign materials. If the gasket groove is dirty or contains debris, carefully remove the gasket and clean the groove. Insert the gasket back into the groove of the bell or coupling prior to installation. Observe the correct direction of the shaped gasket. Feel that the gasket is completely and evenly seated in the groove.
- C. Mark the full insertion depth on the spigot end of the pipe. This mark indicates when the pipe is fully inserted into the bell or coupling. Lubricate the exposed gasket surface and the beveled spigot up to the full insertion mark with the lubricant supplied by the pipe manufacturer. For repair couplings, lubricate pipe for the entire distance the coupling will travel on the pipe. If the lubricated pipe end touches dirt, clean the pipe end and reapply lubricant.
- D. Insert the spigot into the bell or coupling and force it slowly into position.
- E. Check that the rubber ring gasket has not left the groove during assembly by passing a feeler gage around the completed joint.

3.07 INSTALLING BURRIED FITTINGS

- A. The District's Representative will inspect all fittings prior to installation for damage to the interior protective coatings. Coating shall be holiday free on interior surfaces. Patch damaged areas in the field with material similar to the original.
- B. For mechanical joint fittings, clean the bell socket and the plain end of the pipe of all foreign material and dirt. Place the gland on the pipe spigot with the lip extension toward the plain end. Lubricate the pipe spigot and gasket. Use the same lubricant as supplied by the pipe manufacturer. Install the gasket on the pipe spigot with the narrow edge of the gasket toward the plain end. Insert the pipe into the bell socket and press the gasket firmly into the gasket recess. Keep the joint straight during assembly. Push the gland towards the socket and center it around the pipe with the gland lip against the gasket. Insert bolts and hand tighten nuts. Make joint deflection after assembly but before tightening nuts. Uniformly tighten bolts and nuts in a progressive diametrically opposite sequence, and torque nuts to 75- to 90-foot-pounds with a calibrated

torque wrench. Coat exposed surfaces of tee-head bolts and nuts after tightening with primer for wax tape coating.

- C. For push-on joint fittings, clean the bell ends of the fitting of all foreign material and dirt. Insert the gasket in the groove of the bell and make sure the gasket faces the correct direction. Feel that the gasket is completely and evenly seated in the groove. When pipe is cut in the field, bevel the plain end prior to installation. Lubricate the exposed gasket surface and the beveled pipe spigot with the same lubricant supplied by the pipe manufacturer. Insert the spigot into the bell and force it slowly into position. Keep the joint straight while pushing. Make joint deflection after the joint is assembled.
- D. When necessary to deflect pipe from a straight line in either the horizontal or vertical plane, do not exceed the following joint deflection angles for buried fittings. The angles shown are for each joint and are maximum deflections.

Nominal Pipe Size (inches)	Mechanical Joint (degrees)	Push-on Joint (degrees)
4	6-1/2	4
6	5-1/2	4
8	4	4
10	4	4
12	4	4

3.08 INSTALLING SERVICE SADDLES

- A. Place the service saddle on the pipe and hand tighten the nuts while positioning the saddle in its final location. Uniformly tighten the nuts in a progressive diametrically opposite sequence and torque with a calibrated torque wrench to the saddle manufacturer's recommended values.
- B. Connect a corporation stop to the saddle. Apply Teflon joint compound or tape to the male threads before installing the corporation stop. Make joints watertight.
- C. Mount a tapping machine on the corporation stop to cut a hole in the pipe with a shell type cutter made specifically for PVC pipe. Do not use other devices or hand equipment to bore through the pipe wall.

3.09 INSTALLING RESTRAINED JOINTS

- A. Follow the manufacturer's installation instructions for the restrained joint system. Tighten the clamping bolts on the restraint rings to the recommended torque. Do not over-tighten the retaining nuts behind the restrainer ears.
- B. Wrap restrained joint including bolts and nuts with wax tape coating.

END OF SECTION 02641

SECTION 02650 - PIPE FITTINGS, TRANSITION COUPLINGS, MECHANICAL RESTRAINED JOINT FITTINGS, FLANGED COUPLING ADAPTERS AND HARDWARE

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor shall provide and install pipe fittings, transition couplings, restrained joint fittings, flanged coupling adapters and hardware for the connection of PVC, ductile iron and other pipeline material. Other connecting items may also be required. This section includes the specifications and requirements for the prior listed pipe connection items. The hardware for this specification section shall include the hardware for pipe or any other fittings or items located along a pipeline. Material shall be new and free from defects.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02640 - PVC Pipe
- B. Section 02641 - PVC Pipe AWWA C900

1.03 REFERENCE DOCUMENTS

- A. Comply with the applicable reference specifications as specified in the General Requirements.
- B. Unless otherwise indicated, the current editions of the following reference standards and specifications apply to the Work described herein, and are considered part of this Specification.

C 104/A 21.4-03	American National Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
C 105/A 21.5-99	American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems
C 110/A 21.10-03	American National Standard for Ductile-Iron and Gray-Iron Fittings, 3-In. through 48-In. (76 mm through 1,219 mm), for Water
C 111/A 21.11-00	American National Standard for Rubber-

	Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
C 115/A 21.15-99	American National Standard for Flanged Ductile Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges
C 116/A 21.16-03	American National Standard for Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings for Water Supply Service
C 153/A 21.53-00	American National Standard for Ductile-Iron Compact Fittings, 3-In. (76 mm) through 64-In. (1,600 mm), for Water Service
ASTM A 536	American Standards for Testing and Materials - High Strength Ductile Iron for Sleeve and Flanges of Transition Coupling and Flanged Coupling Adapter
NSF / ANSI 61	Drinking Water System Components – Health Effects
ASTM A 536-80, Grade 65-45-12	American Standard Testing and Material - Ductile Iron Mechanical Joint Restraint Fitting
UNI-B-13-92	As listed Underwriters Laboratories - Restraining Glands for Mechanical Restrained Joint Fittings
ASTM B 117	American Standard Testing Materials - Salt Spray Testing for Bolts

1.04 CONTRACTOR SUBMITTALS

- A. The Contractor shall furnish a certified affidavit of compliance for all pipe and other products or materials furnished under this Section of the Specifications and as specified in the referenced standards. Certification shall include physical and chemical properties of pipe materials and hydrostatic test reports.

- B. All expenses incurred in sampling and testing for certifications shall be borne by the Contractor.

1.05 QUALITY ASSURANCE

- A. Ductile iron fittings shall be manufactured with the material, have the dimensions, be within the tolerances and meet the testing requirements set forth in ANSI A 21.53-00 and ANSI A 21.10-03.
- B. All fittings shall be subject to inspection at the place of manufacture in accordance with the provisions of the referenced standards, as supplemented by the requirements herein.
- C. In addition to those tests specifically required, the Engineer may request additional samples of any material including lining and coating samples for testing by the Owner. The additional samples shall be furnished at no additional cost to the Owner.

PART 2 - PRODUCTS

The Technical Requirements for Ductile Iron Fittings, Transition Couplings, Mechanical Restrained Joint Fittings, Flanged Coupling Adapters and Hardware follow:

2.01 DUCTILE IRON FITTINGS

Fittings and reducers for the water mains shall be composed of ductile iron. The ductile iron fittings shall conform to ASTM A 536. Mechanical joint fittings shall conform with AWWA C 153 C 350 PSI. Flanged fittings shall conform with AWWA C 110 C 250 PSI. Flange fittings shall have standard wall thickness not compact thickness. The fittings shall be cement-mortar lined in accordance with ANSI/AWWA C 104/A 21.4, Standard for Cement-Mortar Lining for Ductile Iron and Gray Iron Pipe Fittings for Water, latest revision. Asphaltic seal coating shall be applied to the interior and exterior of the below-grade fittings in accordance with ANSI/AWWA C 104/A 21.4, asphaltic seal coating shall be applied to the interior of the above-grade fittings. The exterior surfaces of above-grade ductile iron fittings shall be thoroughly cleaned and then given a shop coat of rust inhibitive primer. This exposed piping shall not be coated with the bituminous coating by the manufacturer prior to delivery.

2.02 FLANGED COUPLING ADAPTERS

Flanged coupling adapters shall be used to join plain end pipe with flanged ductile iron fittings and valves. Adapters shall conform to AWWA Specification C 153. Bodies shall be composed of ductile iron and conform with ASTM A 536. The flanged coupling adapter shall be cement lined in accordance with AWWA C 104 (ANSI A 21.4). The flanged coupling adapter shall withstand a working pressure of 350 PSI.

2.03 TRANSITION COUPLING

The transition couplings shall be installed as required. The center rings shall be constructed of ductile iron conforming to ASTM A 536-80, Grade 65-45-12. The end rings shall be constructed of ductile iron conforming to ASTM A 536, Grade 65-45-12. Gaskets shall be composed of virgin styrene butadiene rubber (SBR) compounded for water and sewer service in accordance with ASTM D 2000 MBA 810. The coating for the ductile iron transition coupling shall be fusion bonded epoxy. The transition coupling shall be capable of sustaining a working pressure of 250 PSI.

2.04 RESTRAINED JOINT FITTINGS

Mechanical joint restraint shall be incorporated into the design for the follower gland. The gripping or restraining mechanism shall transmit uniform restraining pressure around the circumference of the pipe, thus avoiding point loading or pipe distortion. This restraining process shall be kept separate from the mechanical joint sealing process and **not** a part of the sealing function. All components shall be manufactured of ductile iron conforming to ASTM A 536-80, Grade 65-45-12.

The restrained twist-off nut bolt system shall have a torque limiting feature designed to break off at 75 to 90 FT-LBS of torque to insure proper actuating of restraining devices. Both the twist-off nut and the removal nut shall be the same size as tee-bolt nut. Hardware shall be composed of 316 stainless steel.

The gland shall be such that it can replace the standardized mechanical joint gland and can be used with the standardized mechanical joint bell conforming to ANSI/AWWA C 111/A 21.11, C 110/A 21.10 and C 153/A 21.53 of the latest revision.

The device shall restrain all classes of ductile iron, C 900 PVC, C 905 PVC and high density polyethylene (HDPE) with the use of a standard mechanical joint gasket. The same device without any field modification shall additionally restrain IPS PVC, IPS steel and IPS HDPE with the use of a transition gasket.

The restraining glands shall have a pressure rating equal to twice (2:1) that of the pipe on which it is used. The restraining glands shall have been tested to UNI-B-13-92, be listed by Underwriters Laboratories and be approved by factory mutual. The mechanical joint restraint device shall be UNI-Bell, EBBA Series 2000, Sigma One-Lock or equal.

Restrained joint fittings shall be placed at termination points, tees, bends, angle points and connection points, or existing connection points as illustrated in the Plans. Pipeline-to-pipeline connections shall not be required to have restraint harness assemblies unless noted in the Plans.”

2.05 HARDWARE

Hardware for ductile iron fittings shall conform with ANSI/AWWA C 111/A 21.11-07, Appendix “C”, Section C.1 entitled “Bolts and Nuts”. The size, length and number of bolts are illustrated in Tables 2 and 3 of ANSI/AWWA C 115/A 21.15.

Hardware for transition couplings and mechanical restrained joint fittings shall comply with the manufacturer’s recommendation for steel or ductile iron bolts and nuts.

All steel or ductile iron nuts and bolts shall be coated with a flouropolymer using Xylan/014 as a primary coating. The coating shall be electrostatically applied to the hardware after all surfaces are chemically cleaned, abrasive blasted and primed with a nickel phosphate primer. Multiple coats of the Xylan/014 shall be applied to the steel or ductile iron hardware and baked at 425° F for one (1) hour. Hardware protected with this coating system shall exhibit no signs of corrosion after salt spray testing up to 3,000 hours. The coating system shall be a Tripac 2000 Blue or an approved equal.

316 stainless steel hardware shall be used if specified for a given pipe, valve, fitting or other component on the Plans or within the contents of this document.

2.06 POLYETHYLENE ENCASEMENT

All ductile iron or gray iron fittings, transition couplings, mechanical restrained joint fittings and coupling adapters shall be polyethylene encased at the time of installation. Polyethylene encasement and installation shall be in accordance with ANSI/AWWA C 105.

2.07 NSF / ANSI STANDARD 61

Piping, fittings, and appurtenances in contact with potable water or water that will be treated to become potable shall be listed in NSF / ANSI Standard 61 as being suitable for contact with potable water.

PART 3 - EXECUTION

3.01 INSTALLATION OF FITTINGS, TRANSITION COUPLINGS, MECHANICAL RESTRAINED JOINT FITTINGS, FLANGED COUPLING ADAPTERS AND HARDWARE

- A. All fittings, etc. shall be carefully handled and protected against damage, impact shocks and free fall. All fittings, etc. handling equipment shall be acceptable to the Engineer. Fittings, etc. shall not be placed directly on rough ground, but shall be supported in a manner which will protect the fittings, etc. against damage whenever stored at the trench site. All fittings, etc. damaged prior to Substantial Completion shall be repaired or replaced by the Contractor.

- B. If during the course of fastening and securing the hardware (nuts and bolts) for the fittings, etc., the flouropolymer coated is scratched, chipped or otherwise removed from the hardware surface, then a coating system supplied by the manufacturer shall be applied to the damaged hardware surface. The repair coating system shall be applied prior to the backfilling or covering of the fittings, etc. hardware.

END OF SECTION 02650

SECTION 02666 – PRESSURE PIPELINE WATER TESTING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall perform flushing and testing of all pipelines and appurtenant piping complete, including conveyance of test water from Engineer-designated source to point of use and disposal thereof after testing, in accordance with the requirements of the Contract Documents. The disposal method of the water shall be reviewed and approved by the Engineer prior to the commencement of the test.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02221 - Trenching, Backfilling and Compaction
- B. Section 02640 - PVC Pipe
- C. Section 02641 - PVC Pipe AWWA C900

PART 2 – PRODUCTS

2.01 MATERIAL REQUIREMENTS

- A. All test equipment, fuel, electrical connections, temporary valves, bulkheads, compressors, water pumps, water gauges and other water control equipment support systems and required materials for hydrostatic or pneumatic air testing shall be furnished by the Contractor subject to the Engineer's review.

PART 3 – EXECUTION

3.01 GENERAL

- A. The Contractor shall notify the Engineer at least four (4) days in advance of any planned testing and shall review the testing procedures with the Engineer. The source of testing water and disposal of the testing water shall be reviewed.
- B. Unless otherwise provided herein, water for testing pipelines shall be furnished by the Contractor; and, the Contractor shall make all necessary

provisions for conveying the water from the water source to the points of use. The Contractor shall provide inlet hoses, fittings, pressure gauges pumping equipment, meters, backflow preventers and other required items.

- C. The Contractor shall provide a double bronze service saddle, brass corporation stop, inlet pipeline and outlet pipeline at the beginning and end of the pipeline section to be tested to allow water to be directed into the pipeline and air to be purged from the pipeline while the pipeline is filling with water. The fittings and pipe shall be used during the chlorination and disinfection of the pipeline. After the hydrostatic pipe testing and disinfection of the pipeline are satisfactorily completed remove the corporation stop from the brass service saddle. Place a brass plug in the service saddle inlet.
- D. All pipelines shall be tested. All testing operations shall be performed in the presence of the Engineer or the District's Representative.
- E. The disposal or release of test water from pipelines, after testing, shall be acceptable to the Engineer. The conveyance items to dispose of the testing water and the disposal location shall be provided by the Contractor.

3.02 HYDROSTATIC TESTING OF PIPELINES

- A. Prior to hydrostatic testing, all pipelines shall be thoroughly flushed of all sand, dirt and material to the satisfaction of the Engineer. The Contractor shall test all pipelines either in sections or as a unit. The Contractor shall be responsible to insure all test bulkheads are suitably restrained to resist the thrust of the test pressure without damage to, or movement of, adjacent pipe or structures. Care shall be exercised to insure that all air vents are open during filling.
- B. The pipeline shall be filled at a rate which will not result in surges or exceed the rate at which the air can be released through the air valves at a reasonable velocity and all the air within the pipeline shall be properly purged. After the pipeline or section thereof has been filled it shall be allowed to stand under a slight pressure for at least 24 hours to allow the concrete or mortar lining, if applicable, to absorb water and allow the escape of air from the pipeline. During this period, bulkheads, valves and connections shall be examined for leaks. If leaks are found, corrective measures shall be initiated and completed to the satisfaction of the Engineer.

- C. The hydrostatic test shall consist of holding the test pressure within the pipeline for a period of 4 hours for pipes 18 inches in diameter or less and 8 hours for pipes 20 inches in diameter or greater. The test pressure for pipelines shall be 150 PSI or 1.5 times the rated pipe pressure class which ever is greater. All leaks shall be repaired. The hydrostatic pressure shall be relieved from the pipeline prior to initiating leak repair.
- D. Pipe leaks, as evidenced by water loss from the basin from which water is pumped into the pipeline, shall not be allowed after the test begins. Test pressures shall be held for at least two (2) hours after the test commences without additional pumping and observed for not less than four (4) hours. Approved gauges shall be provided by the Contractor. Gauge range shall not exceed 50 PSI above test pressure. In the event leaks occur after the hydrostatic test commences, the Contractor shall determine the cause of the leakage and take corrective measures necessary to repair the leaks. After the leaks are satisfactorily repaired the pipeline shall be re-tested.

3.03 LENGTH OF TEST SECTION

Test the pipeline in sections. In any one test, do not exceed more than 2,500 feet, the distance between closed valves, or as directed by the District's Representative.

3.04 TESTING NEW PIPE WHICH CONNECTS TO EXISTING PIPE

Prior to hydrostatic pressure testing new pipelines which are to be connected to existing pipelines, isolate the new pipeline from the existing pipeline by means of test bulkheads, spectacle flanges, or blind flanges. After the new pipeline has been successfully pressure tested, see Standard Specification Section 2760 for instructions to continue with the disinfection and connection work.

3.05 AIR TESTING OF WATER PIPELINE

N/A

END OF SECTION 02666

SECTION 02670 - DISINFECTION OF POTABLE WATER PIPELINES

PART 1 - GENERAL

1.01 DESCRIPTION

Potable pipelines within the water distribution system and other areas are to be disinfected prior to being connected to other existing active pipelines and placed in service. The new pipelines are to be isolated from the existing active pipelines (usually by means of a closed valve) until the pipeline has been satisfactorily hydrostatically tested, leak tested (if required) and disinfected. The pipelines shall be hydrostatically and leak tested as a separate procedure from the pipeline disinfection.

1.02 PURPOSE

The purpose of this standard is to define the minimum requirements for the disinfection of water mains, including the preparation of water mains, application of chlorine, and sampling and testing for the presence of coliform bacteria.

1.03 REFERENCE SECTIONS

Reference sections pertaining to the disinfection testing are as follows:

Section 02640	PVC Pipe
Section 02641	PVC Pipe AWWA C900
Section 02666	Pressure Pipeline Water Testing
ANSI/AWWA C 651-05	American National Standards Institute/ American Water Works Association
ANSI/AWWA B 300	Hypochlorites
ANSI/AWWA B 301	Liquid Chlorine
AWWA Manual M 12	<i>Simplified Procedures for Water Examination, AWWA: Denver, Colorado</i>

SECTION 2 - PRODUCTS

2.01 GENERAL

A. Construction of Pipeline, Associated Fittings, Valves and Components:

The Contractor shall train pipe crews to be aware of the need to maintain clean pipes, fittings, etc and avoid contamination. While bacteriological testing is used to verify the absence of coliform organisms and is generally accepted as verification that disinfection of the pipeline has been accomplished, following sanitary practices for handling and installation of pipe, valves, fittings, and accessories, coupled with adequate flushing of the line before disinfection, is necessary to ensure that the disinfected pipeline will be ready for connection to the water system. Failure to pass the bacteriological test shall require that the flushing or disinfection process be repeated. The final water quality test is not the primary means for certifying the sanitary condition of a main. The sanitary handling of materials, the practices during construction, and the continual inspection of the work are the primary means for ensuring the sanitary condition of the water main.

B. Methods of Disinfecting Newly Constructed Water Pipelines and the Acceptable Method of Disinfecting Pipelines:

The three methods of disinfecting newly constructed water mains are the tablet method, the continuous-feed method and the slug method. Factors considered when selecting a method include the length and diameter of the main, type of joints present, availability of materials, equipment required for disinfection, training of the personnel who will perform the disinfection, and safety concerns. This Project shall allow chlorination of pipelines by the continuous feed method. The tablet method and slug method shall not be allowed.

The tablet method shall not be used unless the main can be kept clean and dry. It shall not be used in large-diameter mains if it is necessary for a worker to enter the main to grout joints or perform inspection, because the tablets may release toxic fumes after exposure to moist air. When using the tablet method, the chlorine concentration is not uniform throughout the main, because the hypochlorite solution is dense and tends to concentrate at the bottom of the pipe. The use of the tablet method precludes preliminary flushing. The tablet method is convenient to use in mains having diameters up to 24 inches, and it requires no special equipment.

The continuous-feed method is suitable for general application.

Preliminary flushing removes light particulates from the main but not from the pipe-joint spaces. The chlorine concentration is uniform throughout the main.

The slug method is suitable for use in large-diameter mains where the volume of water makes the continuous-feed method impractical and difficult to achieve for short attachments. The slug method results in appreciable savings of chemicals used to disinfect long, large-diameter mains. Also, this method reduces the volume of heavily chlorinated water to be flushed to waste.

C. Forms of Chlorine for Disinfection:

The forms of chlorine that may be used in the disinfection operations are liquid chlorine, sodium hypochlorite solution, and calcium hypochlorite granules or tablets. For this Project, liquid chlorine shall be used unless otherwise approved by the Engineer.

1. **LIQUID CHLORINE:** Liquid chlorine conforming to ANSI/AWWA B301 contains 100 percent available chlorine and is packaged in steel containers usually of 100-lb., 150-lb., or 1-ton net chlorine weight. Liquid chlorine shall be used only (1) in combination with appropriate gas-flow chlorinators and ejectors to provide a controlled high-concentration solution feed to the water to be chlorinated; (2) under the direct supervision of personnel familiar with the biological, chemical and physical properties of liquid chlorine and who are trained and equipped to handle any emergency that may arise; and (3) when appropriate safety practices are observed to protect working personnel and the public.
2. **SODIUM HYPOCHLORITE:** Sodium hypochlorite conforming to ANSI/AWWA B300 is available in liquid form in glass, rubber-lined, or plastic containers typically ranging in size from 1 quart to 5 gallons. Containers of 30 gallons or larger may be available in some areas. Sodium hypochlorite contains approximately 5 percent to 15 percent available chlorine, and the storage conditions and time must be controlled to minimize its deterioration. (Available chlorine is expressed as a percent of weight when the concentration is 5 percent or less, and usually as a percent of volume for higher concentrations. Percent x 10 = grams of available chlorine per liter of hypochlorite.)
3. **CALCIUM HYPOCHLORITE:** Calcium hypochlorite conforming to

ANSI/AWWA B300 is available in granular form or in 5-g tablets, and must contain approximately 65 percent available chlorine by weight. The material should be stored in a cool, dry, and dark environment to minimize its deterioration.

CAUTION: Tablets dissolve in approximately 7 hours and must be given adequate contact time. Do not use calcium hypochlorite intended for swimming pool disinfection, as this material has been sequestered and is extremely difficult to eliminate from the pipe after the desired contact time has been achieved.

D. Preventative and Corrective Measures to be Implemented during the Construction of Pipelines:

Heavy particulates (dirt, soil, rocks, etc.) generally contain bacteria and prevent even very high chlorine concentrations from contacting and killing organisms. Therefore, the procedures of this Section shall be stringently implemented by the Contractor and enforced by the Engineer to ensure that water pipelines, fittings, etc., have been thoroughly cleaned before flushing the pipeline for the final disinfection by chlorination. Also, any connection of a new water main to the active distribution system prior to the receipt of satisfactory bacteriological samples constitute a cross-connection in violation of the California Health Department requirements. The new main shall be isolated until bacteriological tests described later in this Section are satisfactorily completed. The Contractor shall complete the following tasks or observe the following precautionary measures during the installation of the water pipeline:

1. The interiors of pipes, fittings and valves shall be protected from contamination by dirt, debris, rocks, concrete residue, water and similar items.
2. Openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the close of the day's work or for other reasons, such as rest breaks or meal periods. Rodent-proof plugs may be used when watertight plugs are not practicable and when thorough cleaning will be performed by flushing or other means.
3. Delay in placement of delivered pipe invites contamination. Pipe delivered to the site shall be covered with tarps. The tarps shall be placed over the pipes and end of the pipes to minimize the entrance of dirt, dust and construction debris.

4. Sealing Materials: No contaminated material or any material capable of supporting growth of microorganisms shall be used for sealing joints. Sealing material or gaskets shall be handled in a manner that avoids contamination. The lubricant used in the installation of sealing gaskets shall be suitable for use in potable water and shall not contribute odors. It shall be delivered to the job in closed containers and shall be kept clean and applied with dedicated, clean applicator brushes.
5. If dirt or other contaminants enter a pipeline, fitting, transition coupling, valve or any other pipeline, it shall be swept from the interior of the pipeline, fitting, etc. The contaminated area shall be wiped clean with an ammonia solution disinfectant. After each pipe section is installed the end of the pipe shall be inspected for the entrance of dirt and other contaminants. If dirt or contaminants are identified the dirt and contaminants shall be removed prior to the installation of the next pipe length. Correspondingly, the pipe end to be “stabbed” into the previously installed pipe segment shall be checked for dirt contamination and cleaned and disinfected accordingly.
6. Flooding by Storm or Accident during Construction: If the pipeline is flooded during construction, it shall be cleared of the floodwater by draining and flushing with potable water until the main is clean. The section exposed to the floodwater shall then be filled with a chlorinated potable water that, at the end of a 24 hour holding period, shall have a free chlorine residual of not less than 25 mg/L. The chlorinated water shall then be drained or flushed from the main. After construction is completed, the main shall be disinfected for a second time using the continuous-feed method.

PART 3 - EXECUTION

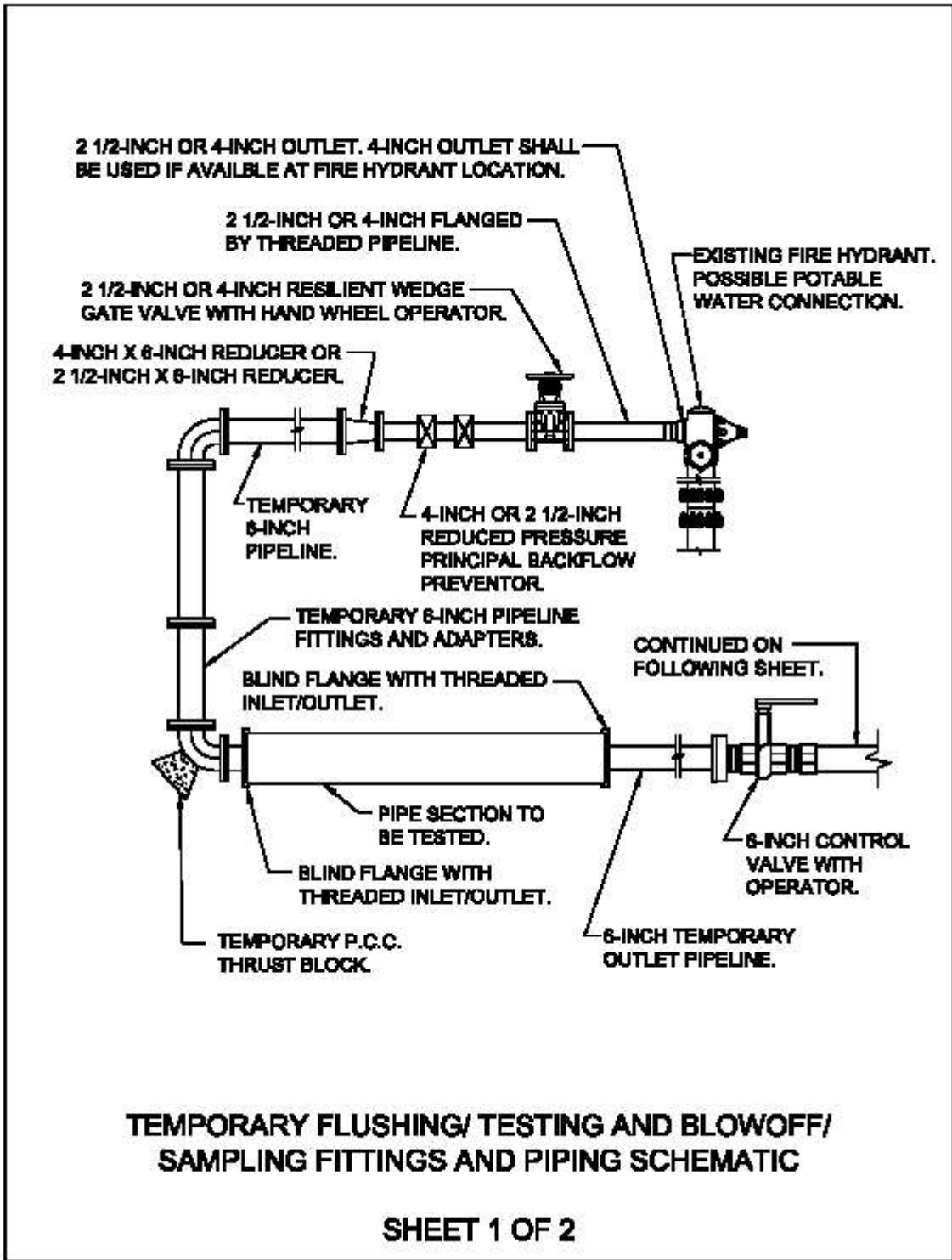
3.01 GENERAL

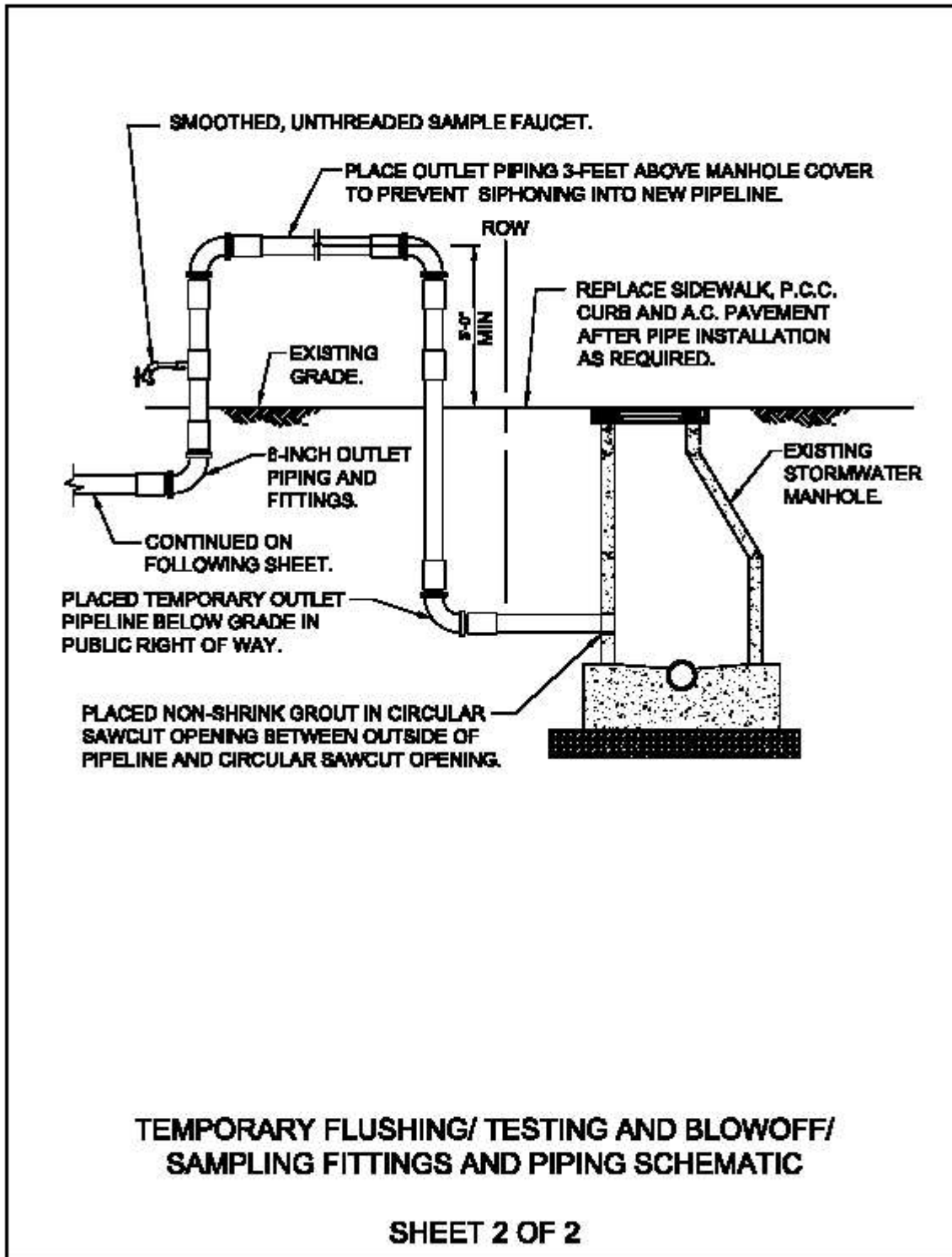
The water pipeline shall be thoroughly flushed with potable water prior to the chlorination of the pipeline. Prior to the flushing of the water pipeline it may be necessary to construct temporary flushing and testing connections at the upstream and downstream ends of the pipelines to be tested. If new pipelines are to be connected to existing in-service pipelines with new valves installed at the connection fittings between the new and existing pipelines which reliably isolate the new pipeline from the existing in-service pipeline, then blowoffs and properly positioned fire hydrants allow for the adequate flushing of the pipeline and allow for the dispersion of chlorine by the continuous-feed method. This method is particularly applicable to new commercial or residential developments which occur within an existing pipe distribution system.

If new pipelines are to be connected to existing in-service pipelines, concrete structures and reservoirs with no reliable valve at the connection point of the new pipeline to isolate the new pipeline from the existing in-service pipelines, concrete structures and reservoirs, then temporary caps or plugs (blind flanges), supply hoses, control valves, backflow devices, discharge/flushing lines and sampling faucets shall be constructed. This pipeline condition often occurs within water treatment plants. The pipelines within water treatment plants in the condition described within this paragraph shall be flushed, chlorinated and tested while physically separated from existing in-service pipelines, reservoirs and concrete structures. The physically separated pipeline section shall be hydrostatically tested prior to the flushing, chlorination and testing of the pipeline section. Potable water from an outside source shall be required to be conveyed to the new pipeline for flushing and disinfecting via a temporary connection supplied and installed by the Contractor. The temporary connection shall be disconnected (physically separated) from the new pipeline during the hydrostatic pressure test. The temporary connection shall include a reducer fitting from the fire hydrant, 4 inch control valve, 4 inch backflow preventer based upon a reduced pressure principal, 4 inch supply hose or pipeline, temporary testing block, blind flange with 4 inch threaded outlet, 4 inch discharge piping, 4 inch discharge control valve and smooth, unthreaded sampling faucet. It shall be necessary for the Contractor to provide all other necessary fittings, adapters, hardware and other components. The discharge pipeline shall extend to a discharge point acceptable to the Engineer. If the discharge pipeline extends through on-site roadways or into the public right of way then the Contractor shall place the temporary discharge pipeline below grade. The Contractor shall perform all cutting, demolition and replacement of A.C. pavement and P.C.C. infrastructure as required by Division 1 of the Technical Specifications. The Contractor shall core the side of manholes, install the discharge pipeline to the

interior wall face of the manhole and grout the annular space between the exterior circular core and the exterior of the pipeline for the full thickness of the manhole shaft with a non-shrink grout. At the conclusion of the pipeline disinfection all upstream and downstream pipelines, supply hoses, valves, check valves, fittings, blind flanges and components shall be removed from the Project Site. The interior of any discharge pipeline extending into manholes shall be plugged for the full width of the manhole shaft wall width with a non-shrink grout.

A schematic of the temporary flushing/testing connection and schematic of the discharge blowoff/sampling tap pipeline follows. The schematic drawings are intended to illustrate the concept and major components required for the disinfection of the pipeline. The schematics do not illustrate each fitting, adapter and component required for the flushing/testing connection pipeline or the discharge blowoff/sampling tap pipeline nor do the schematics illustrate the lengths of pipelines required, number of fittings, number of valves, etc. The schematics do not illustrate where the source of water is to be obtained or the discharge point the blowoff pipeline is to extend to. It is the responsibility of the Contractor to determine the source of the potable water, length of the connection pipeline, exact number and type of fittings, valves and adapters, length of the blowoff pipeline, exact number and type of fittings, valves and adapters, paving and concrete demolition and replacement requirements and similar logistical placement, pipe mechanic and civil infrastructure issues. Following are the Temporary Flushing/Testing Connection Schematic and Blowoff Sampling Point Discharge Pipeline Schematic Drawings:





3.02 CHLORINATION PROCEDURE

- A. Pipeline shall be thoroughly flushed prior to the commencement of the introduction of chlorine disinfectant.

Pipelines within a distribution system or a network of pipelines shall be flushed at each hydrant, blowoff, or service pipeline. It shall be necessary to install sampling/blowoff assemblies at the termination ends of pipe segments to allow the extremities of the pipeline to be flushed and for chlorinated water to be dispersed throughout the new water pipeline section in the event blowoffs or fire hydrants are not placed at the extremities of the pipeline to be tested. At least one (1) blowoff/sampling point assembly shall be placed at the extremities of the pipe section to be tested for sampling purposes. Sampling shall not be allowed through fire hydrants or water fittings with threaded ends. The Contractor shall install at least one (1) blowoff/sampling assembly at the end of each pipeline section to be tested; even if the blowoff/sampling assembly is not illustrated on the Plans. The Contractor shall be required to install the blowoff/sampling assembly as a requirement of this pipeline disinfection specification section. The Contractor shall not be compensated for the costs of the blowoff/sampling assembly. The cost of the installation of the blowoff/sampling assembly shall be incidental to the costs of disinfecting the pipeline.

Pipelines physically separated from existing in-service pipelines, reservoirs and concrete structures (as is often the case at Water Treatment Plants), shall be flushed with temporary pipeline connections upstream and downstream of the pipeline section to be disinfected as described in Section 3.01 of this specification.

Flushing of pipelines within a distribution system shall occur through fire hydrants, blowoffs, water services and blowoff/sampling points for a minimum of 10 minutes with the potable water source placed at maximum flow and maximum pressure. Flushing shall continue until no evidence of dirt is evident from the discharge water. Flushing shall be accomplished through fire hydrants or blowoffs if possible. Flushing of the water pipeline shall occur through a blowoff/sampling point assembly as a last resort. The pipeline contractor shall take necessary precautions to avoid damage to existing structures and utilities.

Flushing of physically separated pipelines shall be accomplished for a

minimum of 10 minutes with the potable water source placed at maximum flow and maximum pressure. Flushing of the pipeline shall continue until no evidence of dirt is visible from the discharge water entering the downstream deposition point. The pipeline contractor shall take necessary precautions to avoid damage to existing structures and utilities.

- B. After flushing of the water pipelines is satisfactorily accomplished and approved by the Engineer, chlorinated water shall be introduced to the pipeline. The pipelines shall be chlorinated in accordance with AWWA C 651.

The continuous-feed method of chlorine application shall be employed. The use of chlorine tablets or granules shall not be allowed.

Direct-feed chlorinators, which operate solely from gas pressure in the chlorine cylinder, shall not be used for the application of liquid chlorine. (The danger of using direct-feed chlorinators is that water pressure in the main can exceed gas pressure in the chlorine cylinder. This allows a backflow of water into the cylinder, resulting in severe cylinder corrosion and the escape of chlorine gas.) The preferred equipment for applying liquid chlorine is a solution-feed, vacuum-operated chlorinator and a booster pump. The vacuum-operated chlorinator mixes the chlorine gas in solution water; the booster pump injects the chlorine-gas solution into the main to be disinfected. Hypochlorite solutions may be applied to the water main with a fuel or electrically powered chemical-feed pump designed for feeding chlorine solutions. Feed lines shall be made of material capable of withstanding the corrosion caused by the concentrated chlorine solutions and the maximum pressures that may be created by the pumps. All connections shall be checked for tightness before the solution is applied to the pipeline.

Chlorine shall be dispersed through the pipeline at 100 ppm. Chlorine shall be flushed through all fire hydrants, blowoffs, water services and blowoff/sampling assemblies. Chlorine shall continue to be flushed through the above listed items until the chlorine concentration is measured at 100 ppm or greater.

The chlorinated water shall remain in the pipeline for a minimum 24-hour period and not longer than 48 hours. The chlorine residual shall be a minimum of 50 ppm after the 24 hour period; or prior to flushing the heavily chlorinated water from the pipeline. The heavily chlorinated water shall not remain in the pipeline over 48 hours as prolonged exposure to the heavily chlorinated water may damage (corrode) pipelines, fittings, valves and other piping components. The heavily chlorinated water shall

be flushed from the pipeline, pipeline fittings, water services, fire hydrants, blowoffs, blowoff/sampling assemblies and all other pipe connections. The heavily chlorinated water shall be flushed until chlorine samples of the flushed water confirm that the chlorine concentration is no higher than the water in the in-service distribution system or the water source used for the disinfection process.

The environment to which the heavily chlorinated water is to be discharged shall be inspected. In the opinion of the Engineer, if there is a possibility that the chlorinated water will result in damage to the environment, then the Engineer shall require a neutralizing chemical be applied to the water to be wasted (prior to discharge) by means of a neutralizing chemical. Neutralizing chemicals may be sulfur dioxide, sodium bisulfite, sodium sulfite, sodium thiosulfate or ascorbic acid. Appendix "C" of ANSI/AWWA C 651-05 lists the neutralizing chemicals and the suggested neutralizing chemical concentrations per 100,000 gallons of water.

The Contractor shall be responsible for the discharging of the heavily chlorinated water. The Contractor shall provide all piping, fittings, etc. to convey the heavily chlorinated water from the disinfected pipeline per Item 3.01 of this Specification.

- C. After final flushing and before the disinfected water pipeline is connected to the distribution system or in-service pipeline system, two (2) consecutive sets of acceptable samples, obtained a minimum of 24 hours apart, shall be collected from the disinfected pipeline.

One (1) set of samples shall be collected from every 1,200 feet of new water pipeline and one (1) set shall be obtained from the end point(s) of the disinfected water pipeline(s). If disinfected water pipelines terminate (dead-end) at cul-de-sacs, a sample shall be obtained from the termination point of the pipelines. As was noted by the previous sections, The Contractor shall install blowoff/sampling point assemblies at pipeline termination points as required.

Samples shall be tested for bacteriological (chemical and physical) quality in accordance with *Standard Methods for the Examination of Water and Wastewater* and shall show the absence of coliform organisms; and chlorine residual. Turbidity, pH, and a standard heterotrophic plate count (HPC) test shall be required. New pipeline does not typically contain coliforms but does typically contain HPC bacteria.

Samples for bacteriological analysis shall be collected in sterile bottles

treated with sodium thiosulfate, as required by *Standard Methods for the Examination of Water and Wastewater*. No hose, fire hydrant or threaded fitting outlet shall be used in the collection of samples. There should be no water in the trench up to the connection for sampling. The sampling pipe must be dedicated and clean and disinfected and flushed prior to sampling.

If sample results from the lab indicate a measured HPC greater than 500 colony-forming units (cfu) per ml, flushing should be resumed and another coliform and HPC set of samples shall be obtained until no coliforms are present and the HPC is less than 500 cfu/ml.

The record of disinfection compliance shall be the bacteriological test results certifying that the water sampled from the disinfected water main is free of coliform bacteria contamination and is equal to or better than the bacteriologic water quality in the distribution system.

If the initial disinfection fails to produce satisfactory bacteriological results or if other water quality is affected, the disinfected pipeline may be reflushed and shall be resampled. If succeeding samples also fail to produce acceptable results, the disinfected pipeline shall be rechlorinated by the continuous-feed method until satisfactory results are obtained, satisfactory results being derived from two (2) consecutive sets of acceptable samples taken 24 hours apart.

The Contractor shall be responsible for all expenses relative to the chlorination and disinfection of the pipelines. The costs of re-testing shall also be borne by the Contractor. The District shall coordinate obtaining the tests and select the testing laboratory to perform the tests. The Contractor shall be responsible for all expenses relative to the laboratory testing.

The disinfected pipeline shall not be placed in service until evidence that the bacteriological tests have proved negative and successfully met the testing requirements and are presented to the Engineer. The Engineer shall allow the disinfected pipeline(s) to be connected to the in-service pipeline after the evidence is presented to him/her by the Contractor. The evidence shall consist of the original laboratory report document certifying the laboratory test results comply with the disinfection requirements of this document.

3.03 FINAL CONNECTION PIPE SEGMENT DISINFECTION REQUIREMENTS

If approved by the Engineer, final connection pipe segments (measuring

18.5 feet or less) located between the existing in-service pipeline and the valve or temporary termination point of a successfully disinfected pipe section may be spray disinfected or swabbed with a minimum 1-5 percent solution of chlorine prior to final installation. The installation of the final connection pipe segment shall be witnessed by the Engineer. If dirt, debris or any contaminating substances enter the pipe section between the disinfection process and installation process the pipe section shall be removed and re-disinfected. The Contractor shall immediately remove the pipe section from the pipe trench and re-disinfect the pipe section if required by the Engineer. The disinfection of the pipeline shall require that all dirt, construction residue, dust and contaminants be thoroughly pressure washed from the interior of the pipeline, valve, fitting, transition coupling and other pipe component interior surfaces. The interior surfaces shall be dried clean with a cloth or paper towels. The interior surfaces shall then be disinfected with the minimum 1-5 percent solution of chlorine. The pipe section shall not be allowed to be set in place for connection to the existing in-service pipeline until the Engineer approves the witnessed disinfection of the pipeline section.

END OF SECTION 02670

SECTION 15615 - RESILIENT GATE VALVES, BUTTERFLY VALVES,
OS&Y VALVES AND SWING CHECK VALVES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall provide all tools, supplies, materials, equipment, and labor necessary for furnishing, epoxy coating, installing, adjusting, and testing of all valves, check valves, combination air and vacuum release valves and appurtenant work, complete and operable, in accordance with the requirements of the Contract Documents. Where buried valves are illustrated on the Plans, the Contractor shall furnish and install valve boxes to grade, with covers, extensions, and position indicators.
- B. The provisions of this Section shall apply to all valves and valve operators specified in the various Sections of Divisions 2 and 15 of these Specifications except where otherwise specified in the Contract Documents. Valves and operators in particular locations may require a combination of units, sensors, limit switches, and controls specified in other sections of these Specifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Divisions 2 and 15, applicable sections, Pipe, Fittings, and Valves

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Comply with the reference specifications of the General Requirements.
- B. Comply with the current provisions of the following Codes and Standards.

ANSI B 16.1	Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800
ANSI B 16.5	Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys
ANSI/ASME B 1.20.1	General Purpose Pipe Threads (inch)
ANSI/ASME B 31.1	Power Piping
ASTM A 36	Specification for Structural Steel

ASTM A 48	Specification for Gray Iron Castings
ASTM A 126	Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A 536	Specification for Ductile Iron Castings
ASTM B 61	Specification for Steam or Valve Bronze Castings
ASTM B 62	Specification for Composition Bronze or Ounce Metal Castings
ASTM B 148	Specification for Aluminum-Bronze Castings
ASTM B 584	Specification for Copper Alloy Sand Castings or General Applications
ANSI/AWWA C 500	Gate Valves for Water and Sewage Systems
ANSI/AWWA C 502	Dry-Barrel Fire Hydrants
ANSI/AWWA C 503	Wet-Barrel Fire Hydrants
ANSI/AWWA C 504	Rubber-Seated Butterfly Valves
ANSI/AWWA C 506	Backflow Prevention Devices - Reduced Pressure Principle and Double Check Valves Types
ANSI/AWWA C 507	Ball Valves 6 inches through 48 inches
AWWA C 508	Swing-Check Valves for Waterworks Service, 2 inches Through 24 inches NPS
ANSI/AWWA C 509	Resilient-Seated Gate Valves for Water and Sewage Systems
AWWA C 550	Protective Interior Coatings for Valves and Hydrants
SSPC-SP-5	White Metal Blast Cleaning
NSF / ANSI 61	Drinking Water System Components – Health

Effects

MSS-SP-70

Manufacturers Standardization Society of the Valve and Fitting Industry; Cast Iron Gate Valves. Flanged and Threaded Ends

1.04 CONTRACTOR SUBMITTALS

- A. Submittals shall be made in accordance with General Requirements. In addition to product information, the Contractor shall submit for approval lay-out drawings showing valve locations within the piping system, supports, and identification numbers.
- B. The following submittals and specific information shall be provided.
 - 1. Shop Drawings: Shop drawings of all valves and operators including associated wiring diagrams and electrical data, shall be furnished as specified in General Requirements. Submit for approval the following:
 - a. Manufacturer's literature, illustrations, paint certifications, specifications, detailed drawings, data and descriptive literature on all valves and appurtenances.
 - b. Deviations from Contract Documents
 - c. Engineering data including dimensions, materials, size and weight.
 - d. Fabrication, assembly and installation drawings.
 - e. CV values, head loss curves, and as required, calculations.
 - f. Special tools list.
 - 2. Valve Labeling: The Contractor shall submit a schedule of valves to be labeled indicating in each case the valve location and the proposed wording for the label. Complete nameplate data of valves and actuators is required.
 - 3. Operation and Maintenance Manuals:
 - a. Submit complete installation, operation and maintenance manuals including test reports, maintenance data and schedules, description of operation, and spare parts information.

- b. Furnish Operation and Maintenance Manuals in conformance with the requirements of the General Requirements.
4. Shop Tests: Hydrostatic tests shall be performed, when required by the valve specifications included herein.
5. Certificates: Where specified or otherwise required by Engineer, submit Test Certificates and Certificates of Compliance with AWWA standards and other specifications, especially where it concerns the suitability of the materials of construction for the particular application.

1.05 QUALITY ASSURANCE

- A. Valve Testing: Valves shall be shop tested per manufacturer's recommendations and applicable AWWA/ANSI specifications prior to shipment. Manufacturer's certification that valves have been shop tested shall be submitted for approval 30 days prior to scheduled shipment.
- B. Bronze Parts: Where specified, all interior bronze parts of valves shall conform to the requirements of ASTM B 62, or, where not subject to dezincification, to ASTM B 584.
- C. Shop Inspection: Shop inspection of valve construction, testing and coating shall be witnessed and approved by the ENGINEER. All valves will be shop inspected unless otherwise waived in writing by the Engineer.
- D. The Contractor shall demonstrate that each valve installed as a part of a piping system will operate under field conditions in a manner consistent with the design of the system. All testing of valves shall be witnessed and approved by the Engineer.
- E. For all pneumatic, hydraulic, and electric motor operators and controls, it shall be the responsibility of the Contractor to provide a qualified representative of the valve manufacturer to perform all field adjustments to set operator limit switches for the required functions. The cost of providing a qualified representative of the valve manufacturer for field adjustments shall be included in the Contractor's bid. All wiring of motor operators shall be identified with a unique number unlike any other wiring identification.
- F. All adjustments, calibration, and/or testing shall be done in the presence of the Engineer.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site to ensure uninterrupted progress of the Work. Deliver anchorage devices, which are to be embedded in cast-in-place concrete, in ample time to not delay the Work.
- B. All boxes, crates and packages shall be inspected by Contractor upon delivery to the site. Contractor shall notify Engineer if any loss or damage exists to equipment or components. Replace loss and repair damage to new condition, in accordance with manufacturer's instructions.
- C. Store materials to permit easy access for inspection and identification. Keep all material off the ground, using pallets, platforms or other supports. Protect steel members and packaged materials from corrosion and deterioration.
- D. Provide full-face protectors of waterproof material fastened to each side of the valve body to protect joints and the valve interior.

PART 2 - PRODUCTS

2.01 GENERAL VALVE REQUIREMENTS

- A. General: The Contractor shall furnish all valves, operators, actuators, valve-operating units, stem extensions, and other accessories as shown or specified. All valves shall have the name of the manufacturer and the site of the valve cast on the body or bonnet or shown on a permanently attached plate in raised letters. All valves shall be new and of current manufacture. All valves, 6 inch and larger, shall have operators with position indicators. Where buried, these valves shall be provided with valve boxes and covers containing position indicators, and valve extensions.
- B. Valve Flanges: The flanges of valves shall be in accordance with Divisions 2 and 15.
- C. Valve Stems: Except where otherwise specified, valves with motorized operators shall have stems conforming to ASTM A 276 Type 316 stainless steel with minimum tensile strength of 95,000 psi, and a minimum yield point of 75,000 PSI, and elongation of 25% in 2 inches. Manually operated valves shall have silicon-bronze stems conforming to ASTM B

584-875, having minimum tensile strength of 60,000 PSI, a minimum yield point of 24,000 PSI, and elongation of 16% in 2 inches. Where subject to dezincification, manually operated valve stems shall be of bronze conforming to ASTM B 62, containing no more than 5% zinc, nor more than 2% aluminum.

D. Protective Coating: Except where otherwise specified, ferrous surfaces, exclusive of stainless steel surfaces, in the water passages of all valves 4 inch and larger, as well as the exterior surfaces of all submerged, buried or aboveground valves and operators, shall be fusion bonded epoxy. Flange faces of valves shall not be coated. The valve manufacturer shall certify in writing that such coating has been applied and tested in the manufacturing plant prior to shipment, in accordance with these Specifications.

E. Valve Operators:

1. Where shown, certain valves shall be furnished with electric operators, provided by the valve manufacturer. All operators of a given type shall be furnished by the same manufacturer. Where these operators are supplied by different manufacturers, the Contractor shall coordinate their selection to provide uniformity of each type of electric operator. All valve operators, regardless of type, shall be installed, adjusted, and tested by the valve manufacturer at the manufacturing plant. Unless otherwise specified, all electric, pneumatic, and hydraulic valve operators shall be in accordance with Sections of Division 17: "Instrumentation and Controls."

2. All manual operators shall have levers or handwheels, unless otherwise shown. Where buried, the valves shall have extensions with square nuts or floor stands.

G. Nuts and Bolts: All nuts and bolts on valve flanges and supports shall be coated with a flouropolymer as manufactured by Tripac (Tripac 2000 Blue), or an approved equal. All bolts on valve bonnets and exterior valve hardware shall be Type 316 stainless steel.

2.02 RESILIENT SEATED GATE VALVES

Resilient seated gate valves shall conform to AWWA C 509, latest edition. The wedge shall be fully encapsulated in the elastomer, including the guides. The brass stem nut shall be rigidly enclosed in the wedge to maintain alignment. The valve body shall be composed of ductile iron.

The stem shall have two (2) O-rings and a wiper above the collar and one (1) O-ring below the collar. Stem seals must be replaceable with the valve under pressure.

The stem material shall be standard bronze. Stainless steel (ANSI-420) shall also be acceptable for use as an alternative.

The waterway shall be full size to allow for tapping use; no cavities or depressions shall be permitted in the seat area.

Valve body and bonnet shall be electrostatically applied, fusion bonded, epoxy coated both inside and out by the valve manufacturer. The coating shall meet the requirements of AWWA C 550, latest edition. Coating shall be applied only at the valve manufacturer's facilities. Exterior hardware shall be composed of Type 316 stainless steel.

The bonnet bolts shall not be exposed to the environment.

O-ring style seals shall be used as gaskets on the bonnet and on the stuffing box. The below grade valves shall be supplied with a standard 2 inch operating nut. All valves shall be wrapped with a polyethylene material.

The valves shall be an AFC, CLOW, AVK, Waterous, M&H Valve Company, or Mueller resilient wedge gate valve or an approved equal. All valves shall be resilient wedge gate valves.

2.03 BUTTERFLY VALVES

A. General:

All butterfly valves shall be of the rubber-seated tight-closing type. They shall meet or exceed AWWA Standard C 504. All valves shall be CLOW 4500, American AVK, Henry Pratt, Mueller Butterfly Valves or an approved equal.

Both valve ends shall be mechanical-joint (or other, as available) per AWWA Standard C 111. Accessories (bolts, glands and gaskets) shall be supplied by the valve manufacturer.

All valves must use full AWWA C 504 Class 150B valve shaft diameter, and full Class 150B underground-service-operator torque rating throughout entire travel, to provide capability for operation in emergency service. All valves shall be NSF approved.

B. Valve:

Valve body shall be composed of ductile iron with 18-8 Type 304 stainless steel body seat. Valve vane shall be ductile iron, having rubber seat mechanically secured with an integral 18-8 stainless steel clamp ring and 18-8 stainless steel self-locked screws.

Rubber seat shall be a full-circle 360 degree seat not penetrated by the valve shaft. For valves 4" - 12", the valve shaft shall be one piece, extending full size through the entire valve. Valve shaft shall be 304 stainless steel. Packing shall be O-ring cartridge designed for permanent duty in underground service. For 14 inches and larger valve shaft shall be 18-8 stainless steel stub shaft design keyed to the vane with stainless steel taper pins.

Body Type: All butterfly valves shall be of the rubber-seated tight-closing type. They shall meet or exceed AWWA Standard C 504. All valves shall be CLOW butterfly valves, or approved equal.

Valve ends shall be: (select desired).

Wafer type body suitable for installation between 125# or 150# ASA flanges (available 4 inch through 20 inch).

Flanged: Short body valves per Table 2 of AWWA Spec C 504. Flanges shall be 125# ANSI (available all sizes). Also flanged by MJ in 6 inch, 8 inch and 16 inch sizes.

Mechanical Joint: Both ends of valve shall be "MJ" per AWWA C 111. "MJ" accessories (bolts, glands, gaskets) must be supplied by valve manufacturer (available all sizes - also flanged by MJ in 6 inch, 8 inch, 12 inch and 16 inch sizes). Both ends of valve shall be "MJ" per AWWA C111. "MJ" accessories (bolts, glands, gaskets) shall be supplied by valve manufacturer (available all sizes - also flanged by MJ in 6 inch, 8 inch, 12 inch and 16 inch sizes).

C. Operator:

Valve operator shall be of the traveling-nut type, sealed, gasketed, and lubricated for underground service. It shall be capable of withstanding an overload input torque of 450 ft. lbs at full-open or full-closed position without damage to the valve or valve operator. It shall be designed for submergence in water to 25 feet head pressure for up to 72 hours.

Valve shall be capable of easy closure by one man using standard valve key, even under emergency line-break conditions as severe as those that would cause a valve maximum opening torque requirement of as much as two times AWWA Class 150B.

All valves shall open left (clockwise to close), and be equipped with 2 inch AWWA operating nut.

Crank, Handwheel or Chainwheel: All manual operators for service other than underground shall have position indicator and shall be totally enclosed and permanently lubricated. In any event, a maximum pull of 80 pounds on the crank or wheel shall produce full Table 1 output torque throughout entire travel. Operators shall full-closed positions without damage to valve or operator. Operators shall be of the "traveling-nut" type. All valves shall open left (clockwise to close).

Cylinder: Cylinder operator shall be of the base mounted configuration. Cylinder barrel shall be of molybdenum-disulfide lined glass fiber reinforced epoxy tubing, to provide a corrosion-free, self-lubricated high strength barrel. Rod seal shall be of urethane, molybdenum-disulfide filled, to provide a self-lubricated, long life seal.

Piston rod shall be of hard chromium plated 18-8 stainless steel, and shall be top and bottom guided in a heavy cast iron mechanism housing for positive alignment. Guiding shall be accomplished by bronze bearings at ends of housing straddling all side loads improved in operation. Entire operator including piston rod shall be fully enclosed. Operator shall produce full AWWA Standard C 504 Table 1 output torque throughout entire travel for Class (25A) (25B) (75B) (150B) with a minimum supply pressure of PSI (water) (air) (oil).

D. Coating:

Standard coating shall be universal primer. Coating shall be applied to entire valve body and vane before final assembly.

Valve body shall be electrostatically applied, fusion bonded, epoxy coated to all surfaces of valve body and vane to an average minimum film thickness of 5 mils, conforming to AWWA C 550 Standard. Coating shall be applied only at the valve manufacturer's facilities. Exterior valve hardware shall be composed of Type 316 stainless steel hardware for butterfly valve flanges shall consist of flouropolymer coated hardware as manufactured by Tripac (Tripac 2000 Blue) or an approved equal.

E. Tests:

All valves shall be tested bottle-tight at rated working pressure by the manufacturer as follows:

4" through 12"	200 PSI
14" Up	150 PSI

In addition, a hydrostatic test with vane partially open shall be given to the assembled valve as follows:

4"	400 PSI
14" Up	300 PSI

2.04 OS&Y GATE VALVES

Resilient seated gate valves shall conform to AWWA C 509, latest edition. The wedge gate valve shall be of the outside screw and yoke (OS&Y) type. The wedge shall be fully encapsulated in the elastomer, including the guides. The brass stem shall be rigidly attached to the wedge to maintain alignment. The elastomer shall be bonded to the wedge. The valve body shall be composed of ductile iron.

The stem shall have two (2) O-rings and a wiper above the collar and one (1) O-ring below the collar. Stem seals must be replaceable with the valve under pressure.

The stem material shall be bronze per Item 2.1.C. Stainless steel (ANSI-420) shall also be acceptable for use as an alternative.

The waterway shall be full size to allow for tapping use; no cavities or depressions shall be permitted in the seat area.

Valve body, bonnet and yoke shall be electrostatically applied, fusion bonded, epoxy coated both inside and out by the valve manufacturer. The coating shall meet the requirements of AWWA C 550, latest edition. Coating shall be applied only at the valve manufacturer's facilities. Exterior valve body, bonnet, etc. hardware shall be composed of Type 316 stainless steel.

O-ring style seals shall be used as gaskets on the bonnet and on the stuffing box.

2.05 VALVE RISER AND VALVE COVER

A 6 inch diameter cast iron valve riser and ductile iron cover shall be placed over each below grade valve. The 6 inch diameter cast iron valve riser and cover shall be manufactured by Star Pipe Products, or an approved equivalent of equal substance and function.

Place an 8 inch deep, 8 inch wide PCC collar concentric with the exterior of the valve extension riser. Place the top of the riser 0.10-feet above the finish grade.

Two (2) 6-foot valve keys for operating of gate valves shall be furnished by the Contractor to the Owner prior to completion of the project.

2.06 SWING CHECK VALVES

The check valves shall be manufactured of gray cast iron in conformance with ASTM A 126 Grade B. The swing check valves shall comply with AWWA C 508, latest revision. The check valve shall be provided with flanges in accordance with ANSI B 16.1, Class 125.

The valve design shall be full flow equal to nominal pipe diameter at all points through the valve. The valve shall be capable of passing 3 inch diameter sphere. The seating surface shall be on a 45 degree angle to minimize disc travel. A threaded port with pipe plug shall be provided on the bottom of the valve to allow for field installation of a backflow actuator, without special tools or removing the valve from the line.

The top access port shall be full size, allowing removal of the disc without removing the valve from the line. The access cover shall be domed in shape to provide flushing action over the disc for operating in lines containing high solids content. A threaded port with plug shall be provided in the access cover to allow for field installation of a mechanical, disc position indicator.

The disc shall be of one-piece construction, precision molded with an integral O-ring type sealing surface, and contain alloy steel and nylon reinforcement in the flexible hinge area. The flex portion of the disc shall be warranted for 25 years. Non-slam closing characteristics shall be provided through a short 35 degree disc stroke and a memory disc return action.

The valve body and cover shall be constructed of ductile iron per ASTM A 536 Grade 65-45-12.

The disc shall be precision molded Buna N (NBR), ASTM D 2000-BG.

The exterior and interior of the valve shall be coated with an ANSI/NSF 61

approved fusion bonded epoxy coating.

2.07 NSF / ANSI STANDARD 61

Piping, fittings, and appurtenances in contact with potable water or water that will be treated to become potable shall be listed in NSF / ANSI Standard 61 as being suitable for contact with potable water.

PART 3 - EXECUTION

3.01 VALVE INSTALLATION

- A. General: All valves, operating units, controls, stem extensions, valve boxes, and accessories shall be handled in a manner to prevent any injury to any part of the valve. Valves shall be installed in accordance with the manufacturer's written instructions and as shown and specified. All valves shall be adequately braced to prevent warpage and bending under the intended use. Valves shall be firmly supported to avoid undue stresses on the pipe. All valves shall be installed so that the valve stems are plumb.
- B. Access: All valves shall be installed to provide easy access for operation, removal, and maintenance and to avoid conflicts between valve operators and structural members or handrails.
- C. Valve Accessories:
1. Where combinations of valves, sensors, switches, and controls are specified, it shall be the responsibility of the Contractor to properly assemble and install these various items so that all systems are compatible and operating properly. The relationship between interrelated items shall be clearly noted on Shop drawing submittals.
 2. Valve operators and controls are to be installed where specified and designated on the Plans. The Contractor is responsible for installation of the correct valve operator and control as specified to provide a complete piping system as specified.
- D. All valves shall be field tested following installation to demonstrate that the valve operates under field conditions in a manner consistent with the design of the system.
- E. All testing of valves shall be witnessed and approved by the Engineer.

- F. The Contractor shall demonstrate that each valve operator and control installed as a part of a piping system will operate under field conditions as designed and in the manner for which the operator was specified.

END OF SECTION 15615

SECTION 15830 - MISCELLANEOUS VALVES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall furnish and install miscellaneous valves as shown and as specified herein, complete and operable including accessories and, where designated, operators, in accordance with the requirements of the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 2 - Sitework.
- B. Division 15 - Mechanical.

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Comply with the reference specifications of the General Requirements.
- B. NSF / ANSI STANDARD 61: Piping, fittings, and appurtenances in contact with potable water or water that will be treated to become potable shall be listed in NSF / ANSI Standard 61 as being suitable for contact with potable water.

1.04 CONTRACTOR SUBMITTALS

- A. Submittals shall be made in accordance with Section 01300 - Contractor Submittals.

1.05 QUALITY ASSURANCE

- A. QUALITY ASSURANCE shall comply with the quality requirements specified in RELATED WORK SPECIFIED ELSEWHERE above.
- B. All valves shall be tested in accordance with manufacturer's recommendation and applicable AWWA/ANSI specifications

PART 2 - PRODUCTS

2.01 COMBINATION AIR-VACUUM VALVES

- A. Combination Air and Vacuum Valves: Combination air valves shall combine the characteristics of air and vacuum valves and air release valves by exhausting accumulated air in systems under pressure and releasing or re-admitting large quantities of air while a system is being filled or drained, respectively. They shall be of the size shown, with flanged or screwed ends to match piping. Bodies, the float, seat, and all moving parts shall be constructed of Type 316 stainless steel. Seat washers and gaskets shall be of a material insuring water tightness with a minimum of maintenance. Valves shall be designed for minimum 150 PSI water-working pressure, unless otherwise shown.

2.02 BACKFLOW PREVENTER VALVES

- A. General: Backflow preventers shall work on the reduced pressure principle. They shall consist of two (2) spring-loaded check valves, automatic differential pressure relief valve, drain valves, and shut-off valves. The body material shall be bronze or cast iron for a working pressure of not less than 150 PSI, with bronze or stainless steel trim. Drain lines with air gaps shall be provided.

B. Manufacturers, or Equal:

1. Model: 4000B
AMES Fire & Waterworks
1427 North Market Boulevard, Suite #9
Sacramento, CA 95854
916-928-0123
916-928-9333: FAX
2. Model: 850V
FEBCO
4381 North Brawley, Suite 102
Fresno, CA 93722
559-441-5300
559-441-5301: FAX
3. Or Equal.

2.03 SMALL PRESSURE REDUCING VALVES (Air, Chemical and Water Systems)

- A. General: Small air and water pressure reducing valves shall be of the spring-loaded diaphragm type with a minimum pressure rating of 250 PSI, with bronze body, nickel alloy or stainless steel seat, and threaded ends. Each valve shall be furnished with built-in or separate strainer and union

ends.

- B. Small chemical (i.e. ammonium hydroxide, sodium bisulfite, and sodium hypochlorite) pressure reducing valves shall be of the spring-loaded diaphragm type with Teflon body, hastelloy or Teflon trim material, and Teflon seat material. Value body shall be flanged.

2.04 LARGE WATER PRESSURE REDUCING VALVES

- A. General: Large water pressure reducing valves shall be of the piston-type or diaphragm-actuated globe type, with cast iron body and stainless steel trim. Unless otherwise shown or specified, the valves shall have a pressure rating of not less than 150 PSI, shall have 125 lb flanges, and shall have an adjustable downstream pressure range with a downstream setting as required.

2.05 PRESSURE RELIEF VALVES

- A. Pressure Relief Valves for chemical piping systems shall be in-line pattern with three ports. Excess pressure shall be relieved through the port in the bottom of the valve. The valve materials shall be as described in Table 2.1. For the diaphragm material, Teflon or other suitable material may be substituted for EPDM.

TABLE 2-1 RELIEF VALVE MATERIALS FOR CHEMICAL SYSTEMS

ITEM	Systems					
	Ammonium Hydroxide	Scale Inhibitor	Sodium Bisulfite	Polymer	Sodium Hypochlorite	Sulfuric Acid
Relief Valves (Body) (Diaphragm)	PVC or Teflon EPDM	PVC EPDM	PVC or Teflon EPDM	PVC or Teflon Teflon	PVC or Teflon Teflon	PVDF or Teflon Teflon

2.06 CORPORATION STOPS

- A. Unless otherwise shown, corporation stops shall be made of solid brass for key operation, with screwed ends with corporation thread or iron pipe thread, as required.

B. Manufacturer, or Equal:

1. James Jones.
2. Mueller.
3. Or equal.

2.07 SOLENOID VALVES

- A. Solenoid valves shall be of the size, type, and class shown and shall be designed for not less than 150 PSI water-working pressure. Valves for water, air, or gas service shall have brass or bronze body with screwed ends, stainless steel trim and spring, Teflon or other resilient seals with material best suited for the temperature and fluid handled. Solenoid valves in corrosive environment shall have stainless steel bodies. For chemicals and all corrosive fluids, solenoid valves with Teflon bodies and springs or other suitable materials shall be used. General purpose enclosures for indoors shall be NEMA type 2. For explosion proof, corrosive, special purpose, or outdoor locations NEMA type 4, 7, 8, 9, 9E, 9F, or 9G enclosures shall be used, as applicable. All coil ratings shall be for continuous duty. For electrical characteristics see electrical drawings or specifications.

2.08 NSF / ANSI STANDARD 61

Piping, fittings, and appurtenances in contact with potable water or water that will be treated to become potable shall be listed in NSF / ANSI Standard 61 as being suitable for contact with potable water.

2.09 Stainless Steel Valves

A. General:

1. All valves shall be furnished and installed as illustrated on the Plans.
2. Valves with pneumatic, hydraulic, and electric motor operators and controls shall be in accordance with Division 17.

- B. Fasteners: All bolts, nuts, and washers shall be made of Type 316 stainless steel.

C. Ball Valves:

1. Sizes 1/2" - 2 1/2":
 - a. Class: 900 PSI, Screwed.
 - b. Type: Full port.
 - c. Body: 316 Stainless Steel ASTM A 351.
 - d. Ball: 316 Stainless Steel.
 - e. Seat: Reinforced PTFE Fire Safe.
 - f. Stem: 316 Stainless Steel.
 - g. Operator: Manual, Lever.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Backflow preventers shall be installed in all potable water lines and as illustrated in the Plans.
- B. All valves shall be installed in accordance with the Manufacturer's printed recommendations.
- C. Field testing of valves shall be performed in accordance with manufacturer's recommendations.
- D. All field testing shall be witnessed and approved by the Engineer.

END OF SECTION 15830

PROJECT PLANS - ATTACHED

Bending Elbow, Weather Vane and Rocking Chair
Drive Pipeline Project

248

project plans - ATTACHED

**EXHIBIT "A"
CHANGE ORDER FORM**

Borrego Water District

*806 Palm Canyon Drive
Borrego Springs, CA 92204*

Contract Change Order #

Project:	Change Order No.:		
	Orig. Contract Amt.: \$		Days
Contract No.:			
Contractor:	Prev. Appvd. Changes: \$		Days
Owner: Borrego Water District	This Change: \$		Days
	Revised Contract Amt.: \$		Days

This Change Order covers changes to the subject contract as described herein. The Contractor shall construct, furnish equipment and materials, and perform all work as necessary or required to complete the Change Order items for a lump sum price agreed upon between the Contractor and Borrego Water District, otherwise referred to as Owner.

Item No.	Description of Changes	Increase/ (Decrease) in Contract Amount	Contract Time Extension, Days
1			
2			
Totals		\$	

This Contract Change Order consists of **2 pages** and any exhibits attached to this Contract Change Order shall not be part of the Contract Change Order unless specifically initiated by or on behalf of both the Contractor and the Borrego Water District.

Contract Change Order # _____ Page 1 of 2

The amount of the contract will be increased by the sum of \$_____ and the contract time shall be extended by working days. The undersigned Contractor approves the foregoing Change Order # as to the changes, if any, in the contract price specified for each item including any and all supervision costs and other miscellaneous costs relating to the change in work, and as to the extension of time allowed, if any, for completion of the entire work on account of said Change Order #. The Contractor agrees to furnish all labor and materials and perform all other necessary work, inclusive of the directly or indirectly related to the approved time extension, required to complete the Change order items. This document will become a supplement of the contract and all provisions will apply hereto. It is understood that the Change Order shall be effective when approved by the Owner.

Contractor accepts the terms and conditions stated above as full and final settlement of any and all claims arising out of or related to the subject of this Change Order and acknowledges that the compensation (time and cost) set forth herein comprises the total compensation due for the work or change defined in the Change Order, including all impact on any unchanged work. By signing this Change Order, the Contractor acknowledges and agrees that the stipulated compensation includes payment for all Work contained in the Change Order, plus all payment for any acceleration or interruption of schedules, extended overhead costs, delay, and all impact or cumulative impact on all Work under this Contract. The signing of this Change Order acknowledges full mutual accord and satisfaction for the change and that the stated time and/or cost constitute the total equitable adjustment owed the Contractor as a result of the change. The Contractor hereby releases and agrees to waive all rights, without exception or reservation of any kind whatsoever, to file any further claim or request for equitable adjustment of any type, for any reasonably foreseeable cause that shall arise out of, or as a result of, this Change Order and/or its impact on the remainder of the Work under the Contract.

Accepted:

(Signature) Contractor's Authorized Representative

Date

Recommended:

(Signature) David Dale PE, District Engineer

Date

Approved:

(Signature) Geoff Poole, Borrego Water District

Date

Item No.	Justification for Change(s)
1	
2	

This Contract Change Order consists of **2 pages** and any exhibits attached to this Contract Change Order shall not be part of the Contract Change Order unless specifically initialed by or on behalf of both the Contractor and the Borrego Water District.

Contract Change Order #

Page 2 of 2

BORREGO WATER DISTRICT
 Bending Elbow, Rockingchair, Weather Vane, Walking H and Double O Pipeline Project
 1/18/2021

ITEM	QUANTITY	UNIT	ITEM	UNIT COST	AMOUNT
1	1	LS	Mobilization of equipment and material, Performance Bond, Payment Bond, General Liability Insurance, Workman's Compensation Insurance, Construction water, freight, project signs, Air pollution control district requirements and fees, Restroom Facilities, Vehicle Insurance, Taxes, Permits, Business license, and Similar expenses and other costs not specifically addressed within this bid item list.	\$ 45,000.00	\$ 45,000.00
2	1	LS	Preparation and Implementation of Dust Control Plan Per San Diego County Air Pollution Control District	\$ 2,500.00	\$ 2,500.00
3	1	LS	Preparation of Traffic Control Plan, Implementation of Traffic Control and Construction Area Signs	\$ 1,500.00	\$ 1,500.00
4	1	LS	Potholing of the Existing Underground Utilities and Pipelines as indicated on Improvement Plans.	\$ 4,000.00	\$ 4,000.00
5	1,075	LF	Sawcut/grind out Existing AC Pavement	\$ 7.00	\$ 7,525.00
6	1,350	SF	Remove and Dispose of AC Pavement and Underlying Base Material	\$ 3.00	\$ 4,050.00
7	1,440	LF	Furnish and Install New 6-inch Dia. AWWA C-900 DR 18 - Pressure Class 150 PVC Water Pipeline, Including Backfill and Compaction.	\$ 38.00	\$ 54,720.00
8	3,400	LF	Furnish and Install New 8-inch Dia. AWWA C-900 DR 18 - Pressure Class 150 PVC Water Pipeline, Including Backfill and Compaction.	\$ 48.00	\$ 163,200.00
9	500	CYS	Furnish and install Import sand material for backfilling the water pipe.	\$ 60.00	\$ 30,000.00
10	13	EA	Install 1 inch Water Lateral including Connection to 8" Water Main, 1 Inch Copper Pipe to Property Line and 1 inch Bronze Angle Meter Stop with Lockwing. (Do not include Water Meter, Meter box and Shut Off Valve).	\$ 1,200.00	\$ 15,600.00
11	11	LS	Install 1 inch Water Lateral (Via Directional Drill under Paved Road) including Connection to 8" Water Main, 1 Inch Copper Pipe to Property Line and 1 inch Bronze Angle Meter Stop with Lockwing. (Do not include Water Meter, Meter box and Shut Off Valve).	\$ 1,800.00	\$ 19,800.00
12	12	EA	Furnish and Install New 8-Dia. Ductile Iron Resilient Wedge Gate Valve with Valve Cover and Riser.	\$ 2,700.00	\$ 32,400.00
13	7	EA	Furnish and Install New 6-Dia. Ductile Iron Resilient Wedge Gate Valve with Valve Cover and Riser.	\$ 1,900.00	\$ 13,300.00

BORREGO WATER DISTRICT
 Bending Elbow, Rockingchair, Weather Vane, Walking H and Double O Pipeline Project
 1/18/2021

ITEM	QUANTITY	UNIT	ITEM	UNIT COST	AMOUNT
14	2	EA	Install New 8-Inch x 8-inch x 8-inch x 8-inch Dia. Cross Including Thrust Block.	\$ 2,200.00	\$ 4,400.00
15	2	EA	Furnish and Install New 8 inch x 8 inch x 8-Inch Dia. Epoxy-Coated Ductile Iron Tee and thrust block	\$ 1,900.00	\$ 3,800.00
16	1	EA	Furnish and Install New 8 inch x 8 inch x 6-Inch Dia. Epoxy-Coated Ductile Iron Tee and thrust block	\$ 1,900.00	\$ 1,900.00
17	3	EA	Furnish and Install 6-inch x 4-inch DI Reducer Fitting	\$ 500.00	\$ 1,500.00
18	1	EA	Furnish and Install 2-inch Blow-Off Assembly	\$ 2,000.00	\$ 2,000.00
19	7	EA	Furnish and Install 6-inch MJxMJ 22.5 DI Degree Bend	\$ 750.00	\$ 5,250.00
20	3	EA	Furnish and Install 6-inch MJxMJ 11.25 DI Degree Bend	\$ 750.00	\$ 2,250.00
21	1	EA	Furnish and Install 6x6x6x6 DI Cross	\$ 1,250.00	\$ 1,250.00
22	1	LS	Connect New 6-inch PVC Pipe to Existing 2-inch Service Pipe with a 2-inch Stainless Steel Saddle, Approximately 30 feet of 2-inch Sch. 40 PVC Pipe and fittings.	\$ 1,500.00	\$ 1,500.00
23	2	EA	Furnish and Install 6-inch Blind Flange and Thrust Block	\$ 300.00	\$ 600.00
24	1	EA	Furnish and Install 8-inch Blind Flange and Thrust Block	\$ 400.00	\$ 400.00
25	6	EA	Furnish and Install New Fire Hydrant Assembly Including 6" Lateral, 6" Gate Valve and Valve Can	\$ 8,500.00	\$ 51,000.00
26	5	EA	Furnish and Install New 4-Inch Dia. Epoxy-Coated Ductile Iron Transition Coupling Adapter with Stainless Steel Hardware	\$ 950.00	\$ 4,750.00
27	40	Tons	Install 4 Inches of AC Pavement 3/4" Type III Class B3 (Per San Diego County Standards and Specifications)	\$ 300.00	\$ 12,000.00
28	40	CYS	Install 9 Inches of Class II Base	\$ 100.00	\$ 4,000.00
29	1	LS	Contractor to Complete Hydrostatic Pressure Testing per Specifications.	\$ 3,000.00	\$ 3,000.00
30	1	LS	Contractor to Complete Disinfection of the New Pipeline per Specifications	\$ 3,000.00	\$ 3,000.00
31	1	LS	San Diego County Encroachment Permit Fee Allowance. Contractor to obtain encroachment permit. If permit fees exceed or are less than the allowance fee, a change order or deductive change order based on the actual cost of the permit fees only will be processed to cover the difference.	\$ 5,000.00	\$ 5,000.00

Total Base Bid Items: \$	501,195.00
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*DUE TO SIZE MAPS ARE SEPERATE
ATTACHMENT

BORREGO WATER DISTRICT
BOARD OF DIRECTORS MEETING
JANUARY 26, 2021
AGENDA ITEM II. C

January 20, 2021

TO: Board of Directors

FROM: Geoffrey Poole, General Manager/David Dale, District Engineer

SUBJECT: Approval of Plans/Specifications and Bid Documents for the Wastewater Treatment Plant Rehabilitation Project (Grant Funded)

RECOMMENDED ACTION:

Authorize Bidding of Wastewater Treatment Plan Rehabilitation

ITEM EXPLANATION:

Staff is requesting approval of plans/specifications and bid documents plus authorization to bid the rehabilitation of the Wastewater Treatment Plant headworks, oxidation ditches and clarifier. This project is funded by a State of California Water Boards 100% Reimbursable Grant.

NEXT STEPS:

1. Upon approval, the project will be advertised for public bidding.

FISCAL IMPACT: BWD is receiving

ATTACHMENTS:

1. Plans/Specifications and Bid Documents



The
Holt
Group

1601 N. Imperial Ave.
El Centro, CA 92243
760.337.3883
760.337.5997 (fax)
www.theholtgroup.net

Municipal Design • Infrastructure Engineering • Construction Management • Land Surveying

**BORREGO WATER DISTRICT
WASTEWATER TREATMENT PLANT REHABILITATION PROJECT
DATE: MAY 22, 2018**

THG PROJECT No. 1246.001E

ENGINEER'S OPINION OF PROBABLE COST

ITEM NO.	DESCRIPTION OF WORK	UNIT	UNIT PRICE	QUANTITY	COST
1	Mobilization, Submittals, Protection of Existing Facilities, Temporary Facilities, Safety Requirements, Insurance, Payment Bond, Performance Bond, Taxes, Permits, Geotechnical Services, O & M Manuals, Facilities Startup, As-Builts, Project Closeout, Demobilization and Similar Expenses.	LS	\$40,000.00	1	\$40,000.00
2	Complete the removal of existing coating and recoating of the Secondary Clarifier No. 1 interior steel parts per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	LS	\$70,000.00	1	\$70,000.00
3	Clean and coat the Secondary Clarifier No. 1 interior concrete wall per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	LS	\$10,000.00	1	\$10,000.00
4	Install new P.C.C. wall around the existing Secondary Clarifier No. 1 exterior wall per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	LS	\$5,000.00	1	\$5,000.00
5	Remove and Replace the squeegees and hardware connected to the raker arms in Secondary Clarifier No. 1 per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	LS	\$2,000.00	1	\$2,000.00
6	Remove and Replace the grout at the bottom of the clarifier to the concrete bottom of Secondary Clarifier No. 1 per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	LS	\$3,000.00	1	\$3,000.00
7	Replace a 6-inch depth of gravel around the Secondary Clarifier No. 1 exterior concrete wall per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	LS	\$500.00	1	\$500.00

ITEM NO.	DESCRIPTION OF WORK	UNIT	UNIT PRICE	QUANTITY	COST
8	Complete the removal of existing coating and recoating of the Secondary Clarifier No. 2 interior steel parts per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$70,000.00	1	\$70,000.00
9	Clean and coat the Secondary Clarifier No. 2 interior concrete wall per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$10,000.00	1	\$10,000.00
10	Remove and Replace the squeegees and hardware connected to the raker arms in Secondary Clarifier No. 2 per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$2,000.00	1	\$2,000.00
11	Remove and Replace the grout at the bottom of the clarifier to the concrete bottom of Secondary Clarifier No. 2 per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$3,000.00	1	\$3,000.00
12	Replace a 6-inch depth of gravel around the Secondary Clarifier No. 2 exterior concrete wall per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$500.00	1	\$500.00
13	Repair the gear box oil leak for Secondary Clarifier No. 2 per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$500.00	1	\$500.00
14	Replace the screw classifier unit and any necessary appurtenant items for the Headworks Facility per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$55,000.00	1	\$55,000.00
15	Replace the air system and piping for the Headworks Facility per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$20,000.00	1	\$20,000.00
16	Replace the electrical circuitry extending from the existing electrical panel to the screw classifier unit and air compressor unit per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$5,000.00	1	\$5,000.00
17	Repair the damaged areas of the Headworks Facility exterior concrete wall damaged areas per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$20,000.00	1	\$20,000.00
18	Clean and coat the Headworks Facility interior concrete walls per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$6,000.00	1	\$6,000.00
19	Replace a 6-inch depth of gravel around the Headworks Facility exterior concrete wall per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$1,000.00	1	\$1,000.00
20	Repair/replace the portion of the outlet weir which controls the oxidation ditch mix liquor liquid level per the Plan Sheets, Special Conditions, <u>Technical Specifications and any addenda(um).</u>	LS	\$10,000.00	1	\$10,000.00

ITEM NO.	DESCRIPTION OF WORK	UNIT	UNIT PRICE	QUANTITY	COST
21	Install the new air system and piping for the Sludge Holding Tank per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	LS	\$20,000.00	1	\$20,000.00
SUBTOTAL					\$333,500.00
CONTINGENCY (10%)					\$33,400.00
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST					\$366,900.00

Borrego Water District Wastewater Treatment Plant Rehabilitation



**CONTRACT DOCUMENTS,
GENERAL CONDITIONS,
SUPPLEMENTARY CONDITIONS,
SPECIAL CONDITIONS, AND
TECHNICAL SPECIFICATIONS**



May 24, 2018
THG PROJECT No. 1246.001E

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1. ADVERTISEMENT FOR BIDS

**Borrego Water District
806 Palm Canyon Drive
Borrego Springs, California 92004**

Sealed Bids for the construction of the **Borrego Water District – Wastewater Treatment Plant Rehabilitation Project** will be received by the **Borrego Water District**, at the office of the **Borrego Water District at 806 Palm Canyon Drive, Borrego Springs, California 92004**, until **2:00 pm** local time on **xxxxxxxx xx, 2018**, at which time the Bids received will be publicly opened and read. The Project consists of rehabilitation to the Headworks, Secondary Clarifiers, Oxidation Ditch, and Sludge Holding Station at the Borrego Water District Wastewater Treatment Plant.

The Headworks facility rehabilitation includes the replacement of the grit screw classifier unit, the replacement of the air lift blower system, the replacement of process piping and valves, installation of screening's receptacle containment, cleaning and coating of the interior concrete walls, as well as the repair of damaged areas of the headworks facility's concrete walls. The Oxidation Ditch rehabilitation includes the rehabilitation of the effluent weir which controls the oxidation ditch mix liquor liquid level. The rehabilitation for Clarifier No. 1 includes the repair of the concrete spall areas around the exterior Clarifier walls, sandblasting and re-coating of the interior steel components, cleaning and coating of the interior concrete walls, replacement of squeegees and hardware connected to the raker arms, as well as the removal and replacement of grout at the bottom. The rehabilitation for Clarifier No. 2 includes the sandblasting and re-coating of the interior steel components, cleaning and coating of the interior concrete walls, replacement of squeegees and hardware connected to the raker arms, removal and replacement of the grout at the bottom, and the repair of the existing gear box. The Sludge Holding Station rehabilitation includes the installation of an additional air blower system, as well as air piping and valves.

Bids will be received for a single prime Contract. Bids shall be on a lump sum and unit price basis as indicated in the Bid Form.

The Issuing Office for the Bidding Documents is:

Borrego Water District
806 Palm Canyon Drive
Borrego Springs, CA 92004
Phone: (760) 767-5806
Fax: (760) 767-5994

Prospective Bidders may examine the Bidding Documents at the Issuing Office on Mondays through Fridays between the hours of **8:00 am – 3:00 pm**, and may obtain copies of the Bidding Documents from the Issuing Office as described below.

Printed copies of the Bidding Documents may be obtained from the Issuing Office, during the hours indicated above, upon payment of a deposit of **\$100.00** for each set. Bidders who return full sets of the Bidding Documents in good condition (suitable for re-use) within 30 days after receipt of Bids will receive a full refund. Non-Bidders, and Bidders who obtain more than one set of the Bidding Documents, will receive a refund of **\$50.00** for documents returned in good condition within the time limit indicated above. Checks for Bidding Documents shall be payable to "**Borrego Water District**". Upon request and receipt of the document deposit indicated above plus a non-refundable shipping charge, the Issuing Office will transmit the Bidding Documents via delivery service. The shipping charge amount will depend on the shipping method selected by the prospective Bidder. The date that the Bidding Documents are transmitted by the Issuing Office will be considered the Bidder's date of receipt of the Bidding Documents. Partial sets of Bidding Documents will not be available from the Issuing Office. Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including Addenda if any, obtained from sources other than the Issuing Office.

A pre-bid conference will be held at **10:00 am** local time on **xxxxxxxx xx, 2018** at the **Borrego Water District at 806 Palm Canyon Drive, Borrego Springs, California 92004**. Attendance at the pre-bid conference is mandatory.

Prospective Bidders shall be licensed Contractors in the State of California and shall be skilled and regularly engaged in the general class or type of work called for under the Contract. Each Bidder shall have a Class A California Contractor's license.

Bid Security: Each Bid must be prepared and submitted in accordance with the Instruction to Bidders and must be accompanied by a bid bond in the amount of 10% of the bid value.

Disadvantage Business Enterprise: This project is subject to Disadvantaged Business Enterprise (DBE) Program requirements in accordance with State of California Clean Water State Revolving Fund (DWSRF) requirements of this Advertisement for Bids and other documents listed herein. All EPA funded or assisted projects performed in the United States, must comply with the "Good Faith Efforts" described in 40 CFR Part §33.301, and §33.211; whether by a recipient, sub-recipient, contractor, and/ or sub-contractor; for design, construction, equipment, services and supplies. The Contractor is cautioned that whenever possible, posting solicitations for DBE bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date is required. The Contractor shall carry out applicable requirements of 40 CRF part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the Contractor to carry out these requirements is a material breach of this contract which may result in termination of this contract or other legally available remedies.

The Contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of the contract.

The Contractor acknowledges to and for the benefit of the Purchaser (Borrego Water District) and the State of California that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

Davis-Bacon and Related Acts: This project requires compliance with the Davis-Bacon and Related Acts and adherence to the current U.S. Department of Labor Wage Decision. The Contractor and subcontractors must comply with the minimum rates for wages for laborers and mechanics as determined by the Secretary of Labor in accordance with the provisions of the Davis-Bacon Act (DBA) CA140002, dated 08/08/2014, as specified in 29 CFR Parts 1, 3, 5, 6 and 7, and Related Acts. The Contract provisions and related matters set forth in 29 CFR Part 5- Section 5.5 is hereby made a part of this Contract. Attention is called to the fact that not less than the minimum salaries and wages set forth in the

Contract Documents must be paid on this project. The Wage Decision, including modification, must be posted by the Contractor on the job site.

This is a Public Works Project subject to the rate of prevailing wages as established by the California Department of Industrial Relations. Bidders are notified that the higher of either the Davis-Bacon or the State prevailing wage rate shall apply.

All contractors and subcontractors who bid or work on a public works project must register and pay an annual fee to the State of California, Department of Industrial Relations (DIR) per SB 854.

No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

The awarding body must post or require the prime contractor to post job site notices prescribed by regulation. (See 8 Calif. Code Reg. §16451(d) for the notice that previously was required for projects monitored by the CMU.)

All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka California Division of Labor Standards Enforcement).

Owner: **Borrego Water District**

By:

Title:

Date: **xxxxxxx xx, 2018**

2. INSTRUCTIONS TO BIDDERS

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ARTICLE 1 - DEFINED TERMS

1.01 Terms used in these Instructions to Bidders will have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

- A. Issuing Office - The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered: **The Borrego Water District, 806 Palm Canyon Drive, Borrego Springs, California 92004, P: (760) 767-5806, F: (760) 337-5997.**

ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents in the number and for the payment, of **one hundred dollars (\$100.00)** may be obtained from the Issuing Office. **The payment is nonrefundable.**

- 2.02 Complete sets of Bidding Documents shall be used in preparing bids. The Owner nor the Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 The Owner and the Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

ARTICLE 3 - QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, within **five (5) days** of the Owner's request, the Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for below. The bidder certifies that all statements and information are true and accurate.

ARTICLE 4 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

4.01 Subsurface and Physical Conditions

- A. No reports of exploration and/or tests of subsurface conditions at or contiguous to the Site were used in preparing the Bidding Documents. The Bidder is responsible for any interpretation or conclusion that the Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports as shown or indicated on such drawings.

4.02 Underground Facilities

- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to the Owner and the Engineer by the Owners of such Underground Facilities, including the Owner, or others.

4.03 Hazardous Environmental Conditions

- A. No reports of exploration and/or tests of hazardous environmental conditions at or contiguous to the Site were used in preparing the Bidding Documents. The Bidder is responsible for any interpretation or conclusion that the Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports as shown or indicated on such drawings.

- 4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated conditions appear in Paragraphs 4.01, 4.02, and 4.03 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not

shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the Scope of the Work appear in Paragraph 4.06 of the General Conditions.

- 4.05 On request, the Owner will provide the Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as the Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. The Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.
- 4.06 Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.
- 4.07 It is responsibility of each Bidder before submitting a Bid to:
- A. Examine and carefully study the Bidding Documents, the other related data identified in the Bidding Documents, and any Addenda;
 - B. Visit the Site and become familiar with and satisfy the Bidder as to the general, local, and site conditions that may affect cost, progress, and performance of the Work;
 - C. Become familiar with and satisfy the Bidder as to all Federal, State, and Local Laws and Regulations that may affect cost, progress, or performance of the Work;
 - D. Carefully study all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in Paragraph 4.01 of the General Conditions, if any; and (2) reports and drawings of Hazardous Environmental Conditions at the Site which have been identified in the Supplementary Conditions as provided in paragraph 4.03 of the General Conditions, if any;
 - E. Obtain and carefully study (or accept consequences for not doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;
 - F. Agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for the

performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;

- G. Become aware of the general nature of the work to be performed by the Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. Correlate the information known to the Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;
- I. Promptly give the Owner written notice of all conflicts, errors, ambiguities, or discrepancies that the Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by the Owner is acceptable to the Bidder; and
- J. Determine that the Bidding Documents are generally sufficient to indicate and convey an understanding of all terms and conditions for the performance of the Work.

4.08 The submission of a Bid will constitute an incontrovertible representation by the Bidder that the Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that the Bidder has given the Owner written notice of all conflicts, errors, ambiguities, and discrepancies that the Bidder has discovered in Bidding Documents and the written resolutions thereof by the Owner are acceptable to the Bidder, and that the Bidding Documents are generally sufficient to indicate and convey an understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 - PRE-BID CONFERENCE

5.01 A **Mandatory Pre-bid Conference** will be held at **10:00 am** local time on **xxxxday, xxxxxxxx x, 2018**, at the **Borrego Water District at 806 Palm Canyon Drive, Borrego Springs, California 92004**. Representatives of the Owner and the Engineer will be present to discuss the Project. Attendance is mandatory. A site visit will immediately follow. The Engineer will transmit to all prospective Bidders of record such Addenda as the Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 6 - SITE AND OTHER AREAS

6.01 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by the Owner unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by the Contractor.

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to the Engineer in writing. Interpretations or clarifications considered necessary by the Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by the Engineer as having received the Bidding Documents. Questions received less than **seven (7) days** prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by the Owner or the Engineer.

ARTICLE 8 - BID SECURITY

- 8.01 A Bid must be accompanied by a Bid Security made payable to the Owner in an amount of **ten percent (10%)** of Bidder's maximum Bid price and in the form of a certified check or a Bid Bond (EJCDC No. C-430) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.
- 8.02 The Bid Security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid Security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within **fifteen (15) days** after the Notice of Award, the Owner may annul the Notice of Award and the Bid Security of that Bidder will be forfeited. The Bid security of other Bidders whom the Owner believes to have a reasonable chance of receiving the award may be retained by the Owner until the earlier of **seven (7) days** after the Effective Date of the Agreement or **sixty-one (61) days** after the Bid Opening, whereupon the Bid Security furnished by such Bidders will be returned.
- 8.03 The Bid Security of other Bidders whom the Owner believes do not have a reasonable chance of receiving the award will be returned within **seven (7) days** after the Bid Opening.

ARTICLE 9 - CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 -LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages are set forth in the Agreement.

ARTICLE 11 - SUBSTITUTE AND "OR-EQUAL" ITEMS

- 11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, or those substitute materials and equipment approved by the Engineer.

The materials and equipment described in the Bidding Documents establish a standard of required type, function and quality to be met by any proposed substitute or “or-equal” item. No item of material or equipment will be considered by the Engineer as a substitute unless it conforms to Paragraph 6.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon the Bidder. The Engineer’s decision of approval or disapproval of a proposed item will be final.

ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to the Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within **five (5) days** after the Bid Opening, submit to the Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by the Owner. If the Owner or the Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, the Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, without an increase in the Bid.

12.02 If the apparent Successful Bidder declines to make any such substitution, the Owner may award the Contract to the next lowest responsible Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid Security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which the Owner and the Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to the Owner and the Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.07 of the General Conditions.

12.03 The Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom the Contractor has reasonable objection.

12.04 The Contractor shall not award work to Subcontractor(s) in excess of the limits stated in General Conditions 6.07.

ARTICLE 13 - PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents.

- A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
- B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”

- 13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.
- 13.03 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.04 A Bid by an individual shall show the Bidder's name and official address.
- 13.05 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.06 All names shall be printed in ink below the signatures.
- 13.07 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.08 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.09 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 - BASIS OF BID; COMPARISON OF BIDS

14.01 Unit Price And/or Lump Sum

- A. Bidders shall submit a Bid on a unit price basis or lump sum for each item of Work listed in the Schedule of Values.
- B. The total of all bid prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price or the sum of each bid items lump sum value. The Final Quantities and Contract Price will be determined in accordance with Paragraph 11.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in the favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

ARTICLE 15 - SUBMITTAL OF BID

- 15.01 With each copy of the Bidding Documents, a Bidder is furnished one (1) separate unbound copy of the Bid Form, and the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with all the attachments outlined in Article 7 of the Bid Form.

15.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope plainly marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to Owner at the address in Article 1.01 of the Bid Form.

Project Title: Borrego Water District – Wastewater Treatment Plant Rehabilitation Project

Owner's Address: 806 Palm Canyon Drive, Borrego Springs, California 92004

ARTICLE 16 - MODIFICATION OR WITHDRAWAL OF BID

16.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

16.02 If within **twenty-four (24) hours** after Bids are opened any Bidder files a duly signed written notice with the Owner and promptly thereafter demonstrates to the reasonable satisfaction of the Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid Security will be returned. Thereafter, if the Work is rebid or negotiated, that Bidder will be disqualified from further bidding on the Work. This provision to withdraw a Bid without forfeiting the Bid Security does not apply to Bidder's errors in judgment in preparing the Bid.

ARTICLE 17 - OPENING OF BIDS

17.01 The Bids will be opened at the time and place indicated in the Advertisement for Bids and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the Bids and Deductive Alternates will be made available to the Bidders after the opening of the Bids.

ARTICLE 18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 - EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 The Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. The Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. The Owner may also reject the Bid of any Bidder if the Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. The Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

- 19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one (1) Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 19.03 In evaluating the Bids, the Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 19.04 In evaluating Bidders, the Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.
- 19.05 The Owner may conduct such investigations as the Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the Contract Documents.
- 19.06 If the Contract is to be awarded, the Owner will award the Contract to the responsible Bidder who's Bid, conforming with all the material terms and conditions of the Instructions to Bidders, is lowest, price and other factors considered. **The Award shall be made to the lowest responsive, responsible Bidder. The lowest responsive, responsible Bidder shall be determined by: (1) lowest overall cost to the owner, (2) evaluation of Bidder's experience and, (3) a Bidder's proposal that complies with all of the requirements prescribed in this document.**

ARTICLE 20 - CONTRACT SECURITY AND INSURANCE

- 20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 - SIGNING OF AGREEMENT

- 21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 22 - SALES AND USE TAXES

22.01 Contractor shall pay all sales, use and other taxes as specified in Paragraph 7.09 of the General Conditions.

ARTICLE 23- WORKERS' COMPENSATION REQUIREMENTS

23.01 As required by Section 1860 of the California Labor Code and in accordance with the provisions of Section 3700 of the Labor Code, every Contractor will be required to secure the payment of workers' compensation to its employees.

23.02 In accordance with Section 1861 of the California Labor Code, the Contractor shall furnish the Owner with a statement as follows: "I am aware of the provisions of 3700 of the Labor Code which requires every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."

ARTICLE 24 – SUBCONTRACTOR LISTING LAW

24.01 In accordance with Section 4104 of the California Public Contract Code, each Bidder, in his or her Bid, shall set forth the name and the location of the place of business of each Subcontractor who will perform Work or labor or render service to the 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 Contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent of the Contractor's total bid.

24.02 In accordance with Section 4107 of the California Public Contract Code, no Contractor whose Bid is accepted shall without consent of the OWNER either: (a) substitute a person as a Subcontractor in place of the Subcontractor listed in the original Bid; or (b) permit a subcontract to be voluntarily assigned or transferred or allow it to be performed by anyone other than the original Subcontractor listed in the original Bid; or (c) sublet or subcontract any portion of the Work in excess of one-half of one percent of the Contractor's total Bid as to which his or her original Bid did not designate a Subcontractor.

24.03 Penalties for failure to comply with the foregoing sections of the California Public Contract Code are set forth in Sections 4106, 4110, and 4111 of the Public Contract Code. A prime contractor violating this law violates his or her contract and the awarding authority may exercise the option, in its own discretion, of (1) canceling his or her contract or (2) assessing the prime contractor a penalty in an amount of not more than **ten percent (10%)** of the amount of the subcontract involved, and this penalty shall be deposited in the fund out of which the prime contract is awarded. In any proceedings under this section the prime contractor shall be entitled to a public hearing and to **five (5) days'** notice of the time and place thereof.

ARTICLE 25 – SWRCB REQUIREMENTS

25.01 Bidders are to base their bids on the project funding being provided in whole or in part by the State Water Resources Control Board which will review and approve the contract award, contract agreement, partial and final payments, and contract change orders.

25.02 Payment and retainage will comply with the contract agreement section 6.02 “Progress Payments; Retainage.”

25.03 Bidders are notified of the requirement for affirmative action to ensure equal employment opportunity (Executive Order No. 11246) as set forth in the Equal Opportunity Requirements found in paragraph 19.10 of the Supplementary Conditions.

3. WAGE REQUIREMENTS

Notice is hereby given that, pursuant to 1773 of the Labor Code of the State of California, the Owner has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages and the general prevailing rate for holidays and overtime work for each craft, classification, or type of worker required to execute the Contract. A copy of said prevailing rate of per diem wages is on file in the principal office of the Owner, to which reference is hereby made for further particulars. Said prevailing rate of per diem wages will be made available to any interested party upon request, and a copy thereof shall be posted at each job site.

Prospective Bidders may obtain the general wage rates directly from the State of California Department of Industrial Relations at their web site at www.dir.ca.gov or by requesting a CD from the State. The Contractor shall keep an up-to-date listing of the general prevailing wage rates posted at the jobsite at all times.

This Public Works project is a multi-agency funded project and requires compliance with both California's Department of Industrial Relations requirements and the California Labor Codes for a Public Works project and the federal, Davis Bacon and Related Acts. This includes the current wage decisions. The California lock in date for the wage decisions is the date of the bid advertising thus requiring compliance with California, San Diego County 2017-2 and various pre-determined increases.

Statutory Penalty for Failure to Pay Minimum Wage

- A. In accordance with 1775 of the California Labor Code, the Contractor shall as a penalty to the State of political subdivision on whose behalf a Contract is made or awarded, forfeit **fifty dollars (\$50.00)** for each calendar day or portion thereof, for each worker paid less than the stipulated prevailing rate for any public work done under the Contract by the Contractor or by any Subcontractor under the Contractor.

Statutory Penalty for Unauthorized Overtime Work

- A. In accordance with 1813 of the California Labor Code, the Contractor shall as a penalty to the State or political subdivision on whose behalf the Contract is made or awarded, forfeit **twenty-five dollars (\$25.00)** for each worker employed in the execution of the Contract by the Contractor or by any Subcontractor for each calendar day during which said worker is required or permitted to work more than eight hours in any one calendar day and forty hours in any one calendar week in violation of 1810-1815 of the California Labor Code.

Apprenticeship Requirements

- A. CONTRACTOR agrees to comply with 1777.5, 1777.6 and 1777.7 of the California Labor Code relating to the employment of apprentices. The responsibility for compliance with these provisions is fixed with the prime Contractor for all apprenticeship occupations. Under these sections of the law, contractors and Subcontractors must employ apprentices in apprenticeship occupations, where journeymen in the craft are employed on the public work, in a ratio of not less than one (1) apprentice hour for each five (5) journeymen hours (unless an exemption is granted in accordance with 1777.5) and contractors and Subcontractors shall not discriminate among otherwise qualified employees as indentured apprentices on any public work solely on the ground of race, religious creed, color, national origin, ancestry, sex, or age, except as provided in 3077 of the Labor Code. Only apprentices, as defined in 3077, which provides that an apprentice must be at least sixteen (16) years of age, who are in training under apprenticeship standards and who have signed written apprentice agreements will be employed on public works in apprenticeship occupations.

Payroll Records

- A. Contractor shall keep accurate payroll records on forms provided by the Division of Labor Standards Enforcement, or alternatively, the Contractor shall keep accurate payroll records containing the same information. Said information shall include, but not be limited to, a record of the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and actual per diem wages paid to each journeyman, apprentice, or worker employed by the Contractor. Such record shall be made available for inspection at all reasonable hours, and a copy shall be made available to employee or his authorized representative, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards in compliance with California Labor Code, Section 1776. Upon written notice from the OWNER or the Division of Labor Standards Enforcement, the Contractor shall, within **ten (10) days**, file with the Owner a certified copy of the payroll records. The Contractor shall cause an identical clause to be included in every subcontract for the Work.

Davis-Bacon and Related Acts

- A. This project requires compliance with the Davis-Bacon and Related Acts and adherence to the current U.S. Department of Labor Wage Decision. The Contractor and subcontractors must comply with the minimum rates for wages for laborers and mechanics as determined by the Secretary of Labor in accordance with the provisions of the Davis-Bacon Act (DBA) CA140002, dated 08/08/2014, as specified in 29 CFR Parts 1, 3, 5, 6 and 7, and Related Acts. The Contract provisions and related matters set forth in 29 CFR Part 5-Section 5.5 are hereby made a part of this Contract. Attention is called to the fact that not less than the minimum salaries and wages set forth in the Contract Documents must be paid on this project. The Wage Decision, including modification, must be posted by the Contractor on the job site.

This is a Public Works Project subject to the rate of prevailing wages as established by the California Department of Industrial Relations. Bidders are notified that the higher of either the Davis-Bacon or the State prevailing wage rate shall apply.

All contractors and subcontractors who bid or work on a public works project must register and pay an annual fee to the State of California, Department of Industrial Relations (DIR) per SB 854.

No Contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

No Contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

The awarding body must post or require the prime Contractor to post job site notices prescribed by regulation. (*See 8 Calif. Code Reg. §16451(d)* for the notice that previously was required for projects monitored by the CMU.)

All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka California Division of Labor Standards Enforcement).

Prevailing Wage Rates to Be Inserted.

4. BID FORM

Project Identification: **Borrego Water District – Wastewater Treatment Plant Rehabilitation Project**

Contract Identification and Number: _____

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ARTICLE 1 - BID RECIPIENT

- 1.01 This Bid Is Submitted To: **Borrego Water District, 806 Palm Canyon Drive, Borrego Springs, California 92004**
- 1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with the Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in the Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 - BIDDER'S ACKNOWLEDGMENTS

- 2.01 The Bidder accepts all of the terms and conditions of the Advertisement and Instructions to Bidders, including without limitations those dealing with the dispositions of Bid Security. The Bid will remain subject to acceptance for **sixty (60) days** after the Bid Opening, or for such longer period of time that the Bidder may agree to in writing upon a request from the Owner.

ARTICLE 3 - BIDDER'S REPRESENTATIONS

- 3.01 In submitting this Bid, the Bidder represents that:
 - A. The Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged.

Addendum No.	Addendum Date
_____	_____
_____	_____
_____	_____
_____	_____

- B. The Bidder has visited the Site and become familiar with and is satisfied as to the General, Local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. The Bidder is familiar with and is satisfied as to all Federal, State, and Local Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. The Bidder has obtained and carefully studied (or accepts the consequences for not doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by the Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by the Bidder, and safety precautions and programs incident thereto.
- E. The Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
- F. The Bidder is aware of the general nature of the Work to be performed by the Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- G. The Bidder has correlated the information known to the Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
- H. The Bidder has given the Owner written notice of all conflicts, errors, ambiguities, or discrepancies that the Bidder has discovered in the Bidding Documents, and the written resolution thereof by the Owner is acceptable to the Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
- J. The Bidder will submit written evidence of its authority to do business in the State where the Project is located not later than the date of its execution of the Agreement.

ARTICLE 4 - FURTHER REPRESENTATIONS

4.01 The Bidder further represents that:

- A. This Bid is genuine and not made in the interest of or on the behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation;
- B. The Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. The Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. The Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over the Owner.

ARTICLE 5 – BASIS OF BID

5.01 The Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

<u>No.</u>	<u>Item Description</u>	<u>Units of Measure</u>	<u>Unit Cost</u>
1.	Mobilization, Submittals, Project Meetings , Protection of Existing Facilities, Temporary Facilities, Safety Requirements, Insurance, Payment Bond, Performance Bond, Taxes, Permits, Geotechnical Services, O & M Manuals, Facilities Startup, As-Builts, Project Closeout, Demobilization and Similar Expenses.	Lump Sum	Total Sum Of \$ _____
2.	The Rehabilitation of Secondary Clarifier No. 1, in its entirety in strict conformance with the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).		Total Sum Of \$ _____ (Total of 2.a through 2.f)
2.a	Cleaning and coating of the interior concrete wall per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
2.b	Removal of existing coating and recoating of the interior steel components per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
2.c	Remove and replace the squeegees and hardware connected to the raker arms per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
2. d	Remove and replace the grout at the bottom of the clarifier to the concrete bottom per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
2.e	Replace a 6-inch depth of gravel around the Secondary Clarifier No. 1 exterior concrete wall per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
2.f	Install new P.C.C. wall around the existing Secondary Clarifier No. 1 exterior wall per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
3.	The Rehabilitation of Secondary Clarifier No. 2, in its entirety in strict conformance with the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).		Total Sum Of \$ _____ (Total of 3.a through 3.e)
3.a	Cleaning and coating of the interior concrete wall per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
3.b	Removal of existing coating and recoating of the interior steel components per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
3.c	Remove and replace the squeegees and hardware connected to the raker arms per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
3.d	Remove and Replace the grout at the bottom of the clarifier to the concrete bottom per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____

No.	Item Description	Units of Measure	Unit Cost
3.e	Repair the gear box oil leak per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
4.	The Rehabilitation of the Headworks Facility, in its entirety in strict conformance with the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).		Total Sum Of \$ _____ (Total of 4.a through 4.h)
4.a	Replace the screw classifier unit and any necessary appurtenant items per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
4.b	Replace the air blower system and piping per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
4.c	Replace process piping, fitting and valves for the headworks facility improvements per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
4.d	Inspect the electrical circuitry extending from the existing electrical panel to the screw classifier unit and air compressor unit and replace any faulty wiring per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
4.e	Repair the damaged areas of the headworks facility exterior concrete wall damaged areas per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
4.f	Clean and coat the Headworks Facility interior concrete walls per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
4.g	Replace a 6-inch depth of gravel around the Headworks Facility exterior concrete wall per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
4.h	Install new solids container, P.C.C. solids containment structure and drain piping per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	_____
5.	Rehabilitate the Effluent Weir which controls the Oxidation Ditch mix liquor liquid level per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	Total Sum Of \$ _____
6.	Installation of entire Air Blower System, including Slab and Process Piping for the Sludge Tank Station per the Plan Sheets, Special Conditions, Technical Specifications and any addenda(um).	Lump Sum	Total Sum Of \$ _____

TOTAL BID (Items 1 through 6) in Figures \$ _____

TOTAL BID (Items 1 through 6) in Words \$ _____

(only).

A. Unit Prices, if any, have been computed in accordance with **Paragraph 13.03.A** of the General Conditions.

ARTICLE 6 - TIME OF COMPLETION

6.01 The Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 14.07.B of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 The Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 - ATTACHMENTS TO BID

7.01 The following documents are attached to and made a condition of the Bid:

- A. Non-Collusion Affidavit (Section 420);
- B. Required Bid Security of ten percent (10%) in the form of a Bid Bond (Section 430) or Certified Check (circle type of security provided);
- C. If Bid amount exceeds \$10,000, signed Compliance Statement/Certifications of Nonsegregated Facilities (Section 440). Refer to specific equal opportunity requirements set forth in paragraph 19.10 of the Supplementary Conditions;
- D. If Bid amount exceeds \$25,000, signed Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion- Lower Tiered Covered Transactions (Section 450);
- E. If Bid amount exceeds \$100,000, signed Certification for Contracts, Grant, and Loans (Section 460). Refer to paragraph 19.11 of the Supplementary Conditions;
- F. Contractor’s Certification Regarding Worker’s Compensation Insurance (Section 470); and
- G. A Tabulation of Subcontractors with Names and Addresses and percent of Total Contract (Section 480);
- H. Required Bidder Qualifications Statement with supporting data (Section 490);
- I. Required Subcontractor Qualifications Statement with supporting data (Section 495);
- J. Tabulation of Major Material Suppliers (Section 500); and
- K. Disadvantage Business Enterprise Program (Section 630).

ARTICLE 8 - DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 - BID SUBMITTAL

9.01 This Bid submitted by:

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____
(Individual's signature)

SEAL,
if required
by State

Doing business as: _____

A Partnership

Partnership Name: _____

By: _____
(Signature of general partner -- attach evidence of authority to sign)

SEAL,
if required
by State

Name (typed or printed): _____

A Corporation

Corporation Name: _____

State of Incorporation: _____

Type (General Business, Profession, Service, Limited Liability): _____

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Attest _____
(Signature of Corporate Secretary)

CORPORATE
SEAL,
if required by State

Date of Qualification to do business in _____ California is ___ / ___ / _____

A Joint Venture

Name of Joint Venture: _____

First Joint Venture Name: _____

By: _____

(Signature of joint venture partner -- attach evidence of authority to sign)

SEAL,
if required
by State

Name (typed or printed): _____

Title: _____

Second Joint Venture Name: _____

By: _____

(Signature of joint venture partner -- attach evidence of authority to sign)

SEAL,
if required
by State

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is party to the venture should be in the manner indicated above.)

Bidder's Business Address:

Business Phone No. (____) _____

Business Fax No. (____) _____

Business E-Mail Address _____

State Contractor License No. _____.

Employer's Tax ID No. _____

Phone and Fax Numbers, and Address for receipt of official communications, if different from Business Contact Information:

9.02 Bid submitted on _____, 2018.

5. NON COLLUSION AFFIDAVIT
(Public Contract Code Section 7106)

State of California

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 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.

By: _____

Subscribed and sworn to before me on _____
(Date)

(Notary Public)

(SEAL)

6. BID BOND

Any singular reference to Bidder, Surety, Owner, or other party shall be considered plural where applicable.

BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

**Borrego Water District
806 Palm Canyon Drive
Borrego Springs, California 92004**

BID

Bid Due Date: **xxxday, xxxxxxxx xx, 2018**

Project: **Borrego Water District – Wastewater Treatment Plant Rehabilitation Project**

BOND

Bond Number:

Date (Not later than Bid due date):

Penal sum _____ (Words) _____ (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

SURETY

Bidder's Name and Corporate Seal (Seal) _____
Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

Note: Above addresses are to be used for giving required notice.

1. The Bidder and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to the Owner upon default of the Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of the Surety's liability.
2. Default of the Bidder shall occur upon the failure of the Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by the Owner) the executed Agreement required by the Bidding Documents and the Performance and Payment Bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 The Owner accepts the Bidder's Bid and the Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by the Owner) the executed Agreement required by the Bidding Documents and the Performance and Payment Bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by the Owner, or
 - 3.3 The Owner fails to issue a Notice of Award to the Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by the Bidder and, if applicable, consented to by the Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by the Bidder and within **thirty (30) calendar days** after receipt by the Bidder and the Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. The Surety waives notice of any and all defenses based upon or arising out of any time extension to issue the Notice of Award agreed to in writing by the Owner and the Bidder, provided that the total time for issuing the Notice of Award including extensions shall not in the aggregate exceed **one hundred and twenty (120) days** from Bid due date without the Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to **thirty (30) calendar days** after the notice of default required in Paragraph 4 above is received by the Bidder and the Surety and in no case later than **one (1) year** after the Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the State of California.
8. Notices required hereunder shall be in writing and sent to the Bidder and the Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. The Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of the Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

7. COMPLIANCE STATEMENT

This statement relates to a proposed contract with Borrego Water District
(Name of borrower or grantee)

Who expects to finance the contract with assistance from the Clean Water State Revolving Fund (CWSRF), and Federally Funded Resources (whether by a loan, grant, loan insurance, guarantee, or other form of financial assistance). I am the Undersigned Bidder or Prospective Contractor. I represent that:

1. I have, have not, participated in a previous contract or subcontract subject to Executive Order 11246 (regarding equal employment opportunity) or a preceding similar Executive Order.
2. If I have participated in such a contract or subcontract, I have, have not, filed all Compliance Reports that I have been required to file in connection with the contract or subcontract.

If the proposed contract is for \$50,000 or more and I have 50 or more employees, I also represent that:

3. I have, have not, previously had contracts subject to the written Affirmative Action Program Requirements of the Secretary of Labor.
4. If I have participated in such a contract or subcontract, I have, have not, developed and placed on file at each establishment Affirmative Action Programs as required by the rules and regulations of the Secretary of Labor.

I understand that if I have failed to file any compliance reports that have been required by me, I am not eligible and will not be eligible to have my bid considered or to enter into the proposed contract unless and until I make an arrangement regarding such reports that is satisfactory to either the DWSRF, or Federally Funded Resources, or to the office where the reports are required to be filed.

I also certify that I do not maintain or provide for my employees any segregated facilities at any of my establishments, and that I do not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I certify further that I will not maintain or provide for my employees any segregated facilities at any of my establishments, and that I will not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I agree that a breach of this certification is a violation of the Equal Opportunity Clause in my contract. As used in this certification, the term “segregated facilities” means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. I further agree that (except where I have obtained identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause; that I will retain such certifications in my files; and that I will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods).

**NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS
FOR
CERTIFICATIONS OF NON-SEGREGATED FACILITIES**

A certification of Nonsegregated Facilities, as required by the May 9, 1967, Order (32F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity Clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually)

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Date: _____

(Signature of Bidder or Prospective Contractor)

Address (including Zip Code)

8. CERTIFICATION REGARDING DEBARMENT

**Certification Regarding Debarment, Suspension, Ineligibility
and Voluntary Exclusion – Lower Tier Covered Transactions.**

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 7 CFR Part 3017.510, Participants’ responsibilities. The regulations were published as Part IV of the January 30, 1989, Federal Register (pages 4722-4733). Copies of the regulations may be obtained by contacting the Department of Agriculture agency with which this transaction originated.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

- (1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

- (2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name PR/Award Number or Project Name

Name(s) and Title(s) of Authorized Representative(s)

Signature(s) Date

INSTRUCTIONS FOR CERTIFICATION

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on the reverse side in accordance with these instructions.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms “covered transaction,” “debarred,” “suspended,” “ineligible,” “lower tier covered transaction,” “participant,” “person,” “primary covered transaction,” “principal,” “proposal,” and “voluntarily excluded,” as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled “Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – Lower Tier Covered Transactions,” without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principles. Each participant may, but is not required to, check the Nonprocurement List.
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly entered into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

9. CERTIFICATION FOR CONTRACTS, GRANTS AND LOANS

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

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant or Federal loan, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant or loan.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant or loan, the undersigned shall complete and submit Standard Form – LLL, “Disclosure of Lobbying Activities,” in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including contracts, subcontracts, and subgrants under grants and loans) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1354, Title 34, US Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

(Name)

(Date)

(Title)

**10. CONTRACTOR’S CERTIFICATION REGARDING WORKER’S
COMPENSATION INSURANCE**

State of California

County of _____

I am aware of the requirements that every employer to be insured against liability for workers’ compensation or to undertake self-insurance in accordance with the provisions of that applicable codes, and I will comply with such provisions before commencing the performance of the work of this Contract.

(Name of Contractor)

By: _____

(Signature of Contractor)

Date: _____

11. TABULATION OF SUBCONTRACTORS

No.	Subcontractor	Work To Be Performed	Percent Of Total Contract
1.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		
2.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		
3.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		
4.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		
5.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		
6.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		

7.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		
8.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		
9.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		
10.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		
11.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		
12.	Name:		
	Address:		
	Department of Industrial Relations (DIR) Registration Number:		

(ATTACH ADDITIONAL NUMBERED PAGES IF NEEDED)

12A. BIDDER QUALIFICATIONS STATEMENT

The bidder shall submit, as part of its proposal, the following statements as to its experience qualifications. . The bidder certifies that all statements and information set forth 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 nature similar in type and magnitude to that set forth in the specification extends over a period of _____ years.
- c. The bidder has satisfactorily completed all contracts awarded to it, except as follows: (Name any and all exceptions and reasons therefore. Bidder should attach additional pages if necessary).
 - 1. _____
 - 2. _____
- d. The following contracts cover work similar in type and magnitude to that set forth in the specification have been satisfactorily completed within the last **five (5) years** for the following owners (person, firms or authorities):

No.	Owner	Telephone No.	Contract Amount	Type of Work	Year Complete
1.					
2.					
3.					
4.					
5.					
6.					
7.					

12B. SUBCONTRACTOR QUALIFICATIONS STATEMENT

The bidder’s subcontractors shall submit, as part of its proposal, the following statements as to its experience qualifications. The bidder certifies that all statements and information set forth by the subcontractors are true and accurate.

- a. The subcontractor has been engaged in the contracting business under its present business name for _____ years. The name and address of the subcontractor is _____.
- b. Experience in work of nature similar in type and magnitude to that set forth in the specification extends over a period of _____ years.
- c. The Subcontractor has satisfactorily completed all contracts awarded to it, except as follows: (Name any and all exceptions and reasons therefore. Subcontractor should attach additional pages if necessary).
 - 1. _____
 - 2. _____
- d. The following contracts cover work similar in type and magnitude to that set forth in the specification have been satisfactorily completed within the last **five (5) years** for the following owners (person, firms or authorities):

No.	Owner	Telephone No.	Contract Amount	Type of Work	Year Complete
1.					
2.					
3.					
4.					
5.					
6.					
7.					

13. TABULATION OF MAJOR MATERIAL SUPPLIERS

The contractor shall indicate opposite each item of equipment or material listed below the name of the manufacturer and supplier of the equipment or material proposed to be furnished under the bid.

No.	Item	Manufacturer	Supplier
1.			
2.			
3.			
4.			
5.			
6.			
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Borrego Water District – Wastewater Treatment Plant Rehabilitation Project

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Borrego Water District – Wastewater Treatment Plant Rehabilitation Project

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(ATTACH ADDITIONAL NUMBERED PAGES IF NEEDED)

14. NOTICE OF AWARD

Dated: _____

Project: Wastewater Treatment Plant Rehabilitation Project	Owner: Borrego Water District	Owner's Contract No.:
Contract:		Engineer's Project No.: 1246.001E

Bidder: _____

Bidder's Address (send Certified Mail, Return Receipt Requested):

You are notified that your Bid dated _____ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for the construction of the **Borrego Water District – Wastewater Treatment Plant Rehabilitation Project**.

The Contract Price of your Contract is _____ Dollars (\$_____).

You must comply with the following conditions within **fifteen (15) days** of the date you receive this Notice of Award.

1. Deliver to the Owner four (4) fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents the Performance and Payment Bonds and Insurance Certificate as specified in the Instructions to Bidders (Article 20), and General Conditions (Paragraph 6.01)

Failure to comply with these conditions within the time specified will entitle the Owner to consider you in default, annul this Notice of Award and declare your Bid Security forfeited.

Within **ten (10) days** after you comply with the above conditions, the Owner will return to you one (1) fully executed counterpart of the Contract Documents.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Borrego Water District

(Owner)

(Authorized Signature)

(Title)

ACCEPTANCE NOTICE

Receipt of above NOTICE OF AWARD is hereby acknowledged

By: _____,

this the _____ day of _____, 2015.

By: _____
(Authorized Signature)

(Title)

State of _____ }

County of _____ }

On _____, before me, _____,

Notary Public, personally appeared _____,
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 of Notary Public

**15. AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT**

THIS AGREEMENT is by and between Borrego Water District (“Owner”) and _____ (“Contractor”)

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

TABLE OF ARTICLES	Page
Agreement	00521-1
Article 1 - Work	00521-1
Article 2 - The Project	00521-1
Article 3 - Contract Times	00521-1
Article 4 - Contract Price	00521-2
Article 5 - Changes in the Contract Price	00521-2
Article 6 - Payment Procedures	00521-2
Article 7 - Interest	00521-3
Article 8 - Contractor’s Representatives	00521-3
Article 9 - Accounting Records	00521-4
Article 10 - Contract Documents	00521-4
Article 11 - Miscellaneous	00521-5

ARTICLE 1 – WORK

1.01 The Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Borrego Water District – Wastewater Treatment Plant Rehabilitation Project

ARTICLE 2 – THE PROJECT

2.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Project is generally described as follows:

Borrego Water District – Wastewater Treatment Plant Rehabilitation Project

ARTICLE 3 – CONTRACT TIMES

3.01 *Time is of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

3.02 *Days to Achieve Final Completion*

A. The Work will be completed and ready for Final Payment within **sixty (60) calendar** days after the date when the Contract Time commences to run as provided in Paragraph 4.01 of the General Conditions.

3.03 *Liquidated Damages*

- A. The Contractor and the Owner recognize that time is of the essence for this Agreement and that the Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 3.02 above, plus any extensions thereof allowed in accordance with Article 11 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, the Owner and the Contractor agree that as liquidated damages for delay (but not as a penalty), the Contractor shall pay Owner **\$2,500.00** for each day that expires after the time specified in Paragraph 3.02 for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 4 – CONTRACT PRICE

- 4.01 Owner shall pay the Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 4.01.A and 4.01.B below:
 - A. For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of that item as indicated in this paragraph 4.01.B:
 - B. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by the Owner's Representative.

ARTICLE 5 – CHANGES IN THE CONTRACT PRICE

- 5.01 The amount of any increases or decreases in Contractor's fee or fee which results from a Change Order shall be set forth in the applicable Change Order subject to the following:
 - A. If Contractor's fee is a fixed fee, any increase or decrease in Contractor's fee resulting from net additions or decreases in the Cost of the Work shall be determined in accordance with Paragraph 11.04.C of the General Conditions.

ARTICLE 6 – PAYMENT PROCEDURES

- 6.01 *Submittal and Processing of Payments*
 - A. The Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will indicate the amount of the Contractor's fee then payable.
- 6.02 *Progress Payments; Retainage*
 - A. The Owner shall make progress payments on account of the Contract Price on the basis of the Contractor's Applications for Payment which are to be submitted on or about the 20th day of each month during performance of the Work as provided in Paragraphs 6.02.A.1 and 6.02.A.2 below. All such payments will be measured by the Schedule of Values established as provided in Paragraph 2.03.A of the General Conditions.
 - 1. Prior to Substantial Completion, Progress Payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 15.01 of the General Conditions:

- a. **Ninety percent (95%)** of Work completed (with the balance being retainage); and
 - b. **Ninety percent (95%)** of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
2. Upon Substantial Completion, the Owner shall pay an amount sufficient to increase total payments to the Contractor to **ninety-five percent (95%)** of the Work completed (with the balance being retainage), less such amounts as the Owner shall determine in accordance with Paragraph 15.01.E of the General Conditions.

6.03 *Final Payment*

- A. Upon receipt of the final Application for Payment accompanied by the Owner's Representative's recommendation of payment in accordance with Paragraph 15.06 of the General Conditions, the Owner shall pay the Contractor as provided in Paragraph 15.06 of the General Conditions the remainder of the Contract Price as recommended by the Owner's Representative as provided in said Paragraph 15.06, less any sum the Owner is entitled to set off against the Owner's Representative's recommendation, including but not limited to liquidated damages.

ARTICLE 7 – INTEREST

- 7.01 All moneys not paid when due as provided in Article 15 of the General Conditions shall bear interest at **eight percent (8%)** per annum.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

- 8.01 In order to induce the Owner to enter into this Agreement the Contractor makes the following representations:
- A. The Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
 - B. The Contractor has visited the Site and become familiar with and is satisfied as to the General, Local, and Site Conditions that may affect cost, progress, and performance of the Work.
 - C. The Contractor is familiar with and is satisfied as to all Federal, State, and Local Laws and Regulations that may affect the cost, progress, and performance of the Work.
 - D. The Contractor has obtained and carefully studied (or assumes responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (Surface, Subsurface, and Underground Facilities) at or contiguous to the Site which may affect the cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by the Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto.
 - E. The Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
 - F. The Contractor is aware of the general nature of work to be performed by the Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

- G. The Contractor has correlated the information known to the Contractor, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
- H. The Contractor has given the Owner written notice of all conflicts, errors, ambiguities, or discrepancies that the Contractor has discovered in the Contract Documents, and the written resolution thereof by the Owner is acceptable to the Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey a clear understanding of all terms and conditions for the performance and furnishing of the Work.

ARTICLE 9 – ACCOUNTING RECORDS

9.01 Contractor shall keep such full and detailed accounts of all materials, equipment, and labor entering into the Work as may be necessary for proper financial management, under this Agreement, and the accounting methods shall be satisfactory to Owner. Owner shall be afforded access to all Contractor's records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and other similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after final payment by Owner.

ARTICLE 10 – CONTRACT DOCUMENTS

10.01 *Contents*

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 1 to 6, inclusive).
 - 2. Performance Bond (pages ____ to ____, inclusive).
 - 3. Payment Bond (pages ____ to ____, inclusive).
 - 4. Other bonds (pages ____ to ____, inclusive).
 - a. (pages ____ to ____, inclusive).
 - b. (pages ____ to ____, inclusive).
 - c. (pages ____ to ____, inclusive).
 - 5. General Conditions (pages ____ to ____, inclusive).
 - 6. Supplementary Conditions (pages ____ to ____, inclusive).
 - 7. Technical Conditions (pages ____ to ____, inclusive).
 - 8. Special Conditions (pages ____ to ____, inclusive).
 - 9. Specifications as listed in the Table of Contents of the Project Manual.
 - 10. Drawings consisting of ____ sheets.

11. Addenda (numbers _____ to _____, inclusive).
 12. Exhibits to this Agreement (enumerated as follows):
 - a. The Contractor’s Bid (pages _____ to _____, inclusive).
 - b. Documentation submitted by the Contractor prior to the Notice of Award (pages _____ to _____, inclusive).
 - c. _____.
 13. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Notice to Proceed (pages _____ to _____, inclusive).
 - b. Work Change Directives (pages _____ to _____, inclusive).
 - c. Change Order(s).
- B. The documents listed in Paragraph 10.01.A are attached to this Agreement.
- C. There are no Contract Documents other than those listed above in this Article 10.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 11 – MISCELLANEOUS

11.01. *Terms*

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

11.02. *Assignment of Contract*

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

11.03. *Successors and Assigns*

- A. The Owner and the Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

11.04. *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon the Owner and the Contractor, who agree that the Contract Documents shall be reformed to replace

such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

IN WITNESS WHEREOF, the Owner and the Contractor have signed this Agreement in four (4) copies. One (1) counterpart each has been delivered to the Owner (two copies), the Contractor, and the Agency. All portions of the Contract Documents have been signed, initialed, or identified by the Owner and the Contractor or identified by the Engineer on their behalf.

This Agreement is dated _____. This Agreement shall not be effective unless and until the Agency's designated representative concurs.

OWNER: **Borrego Water District**

CONTRACTOR:

By: _____

By: _____

Title: _____

Title: _____

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

Agent for service of process:

(If Contractor is a corporation or a partnership, attach evidence of authority to sign.)

Agency Concurrence:

As lender or insurer of funds to defray the costs of this Contract, and without liability for any payments there under, the Agency hereby concurs in the form, content, and execution of this Agreement.

Agency: _____

By: _____

Date: _____

Title: _____

16. NOTICE TO PROCEED

Dated: _____

Project: Wastewater Treatment Plant Rehabilitation Project	Owner: Borrego Water District	Owner's Contract No.:
Contract:		Engineer's Project No.:
Contractor:		
Contractor's Address (send Certified Mail, Return Receipt requested):		

You are notified that the Contract Times under the above contract will commence to run on _____. On or before that date, you are to start performing your obligations under the Contract Documents.

Before you may start any Work at the Site, Paragraph 2.01.B of the General Conditions provides that you and the Owner must each deliver to the other (with copies to the Engineer and other identified additional insured's) Certificates of Insurance which each is required to purchase and maintain in accordance with the Contract Documents.

You are required to return an acknowledged copy of this NOTICE TO PROCEED to the OWNER.

	Borrego Water District
Contractor	Owner
Given by:	Given by:
Authorized Signature	Authorized Signature
Title	Title
Date	Date

17. PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

**Borrego Water District
806 Palm Canyon Drive
Borrego Springs, California 92004**

CONTRACT

Date:

Amount:

Description: **Borrego Water District – Wastewater Treatment Plant Rehabilitation Project**

BOND

Bond Number:

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

The Surety and the Contractor, intending to be legally bound hereby, subject to the terms hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Signature: (Seal)
Name and Title:

(Seal)
Surety's Name and Corporate Seal

By:
Signature and Title
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

Attest:
Signature and Title

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Signature: (Seal)
Name and Title:

(Seal)
Surety's Name and Corporate Seal

By:
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title:

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Contract, which is incorporated herein by reference.
2. If the Contractor performs the Contract, the Surety and the Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 3.1.
3. If there is no Owner Default, the Surety's obligation under this Bond shall arise after:
 - 3.1 The Owner has notified the Contractor and the Surety, at the addresses described in Paragraph 10 below, that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than **fifteen (15) days** after receipt of such notice to discuss methods of performing the Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and
 - 3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than **twenty (20) days** after the Contractor and the Surety have received notice as provided in Paragraph 3.1; and
 - 3.3 The Owner has agreed to pay the Balance of the Contract Price to:
 1. The Surety in accordance with the terms of the Contract;
 2. Another Contractor selected pursuant to Paragraph 4.3 to perform the Contract.
4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 4.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Contract; or
 - 4.2 Undertake to perform and complete the Contract itself, through its agents or through independent Contractors; or
 - 4.3 Obtain bids or negotiated proposals from qualified Contractors acceptable to the Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the Owner and the Contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to the Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor Default; or
 - 4.4 Waive its right to perform and complete, arrange for completion, or obtain a new Contractor and with reasonable promptness under the circumstances:
 1. After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefore to the Owner; or
 2. Deny liability in whole or in part and notify the Owner citing reasons therefore.
5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond **fifteen (15) days** after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.
6. After the Owner has terminated Contractor's right to complete the Contract, and if the Surety elects to act under Paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the

Contract. To a limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, the Surety is obligated without duplication for:

- 6.1 The responsibilities of the Contractor for correction of defective Work and completion of the Contract;
 - 6.2 Additional Legal, Design Professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and
 - 6.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the Contractor.
7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, or successors.
 8. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.
 9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within **two (2) years** after Contractor Default or within **two (2) years** after the Contractor ceased working or within **two (2) years** after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
 10. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted here from and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Surety's performance obligation includes completion of the design responsibilities of Contractor. However, Surety shall not be liable for damages of the type specified to be covered by contractor's liability insurance required by the Contract Documents even if such insurance was not obtained or is not sufficient to cover the damages.

13. Definitions.

- 12.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other Claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Contract.

- 12.2 Contract: The agreement between the Owner and the Contractor identified on the signature page, including all the Contract Documents and changes thereto.

- 12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

- 12.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY (Name, Address and Telephone)	
SURETY AGENCY OR BROKER:	_____

OWNER'S REPRESENTATIVE:	_____

	<i>Phone:</i> <i>Fax:</i>

18. PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

**Borrego Water District
806 Palm Canyon Drive
Borrego Springs, California 92004**

CONTRACT

Date:

Amount:

Borrego Water District – Wastewater Treatment Plant Rehabilitation Project

BOND

Bond Number:

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

The Surety and the Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Signature: _____ (Seal)
Name and Title:

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

Attest: _____
Signature and Title

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Signature: _____ (Seal)
Name and Title:

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title:

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to the Owner, this obligation shall be null and void if the Contractor:
 - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2 Defends, indemnifies, and holds harmless the Owner from all claims, demands, liens, or suits alleging non-payment by the Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided the Owner has promptly notified the Contractor and the Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.
4. The Surety shall have no obligation to Claimants under this Bond until:
 - 4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the addresses described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2 Claimants who do not have a direct contract with the Contractor:
 1. Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within **ninety (90) days** after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
 2. Have either received a rejection in whole or in part from the Contractor, or not received within **thirty (30) days** of furnishing the above notice any communication from the Contractor by which the Contractor had indicated the claim will be paid directly or indirectly; and
 3. Not having been paid within the above **thirty (30) days**, have sent a written notice to the Surety and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by the Owner to the Contractor or to the Surety that is sufficient compliance.
6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:
 - 6.1 Send an answer to that Claimant, with a copy to the Owner, within **forty-five (45) days** after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 6.2 Pay or arrange for payment of any undisputed amounts.
7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
8. Amounts owed by the Owner to the Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the Work.

- 9. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.
- 10. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related Subcontracts, purchase orders and other obligations.
- 11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of **one (1) year** from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
- 12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by the Surety, the Owner, or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.
- 13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions

conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

- 14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.
- 15. Definitions.
 - 15.1 Claimant: An individual or entity having a direct contract with the Contractor, or with a first-tier subcontractor of the Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, Architectural and Engineering Services required for performance of the Work of the Contractor and the Contractor's Subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
 - 15.2 Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.
 - 15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY	
(Name, Address and Telephone)	
SURETY AGENCY OR BROKER:	_____

OWNER'S REPRESENTATIVE:	_____
<i>Phone:</i>	<i>Fax:</i>

**19. CERTIFICATE OF OWNER’S ATTORNEY
EXHIBIT GC-A**

I, the undersigned, _____ the duly authorized and acting legal representative of

Borrego Water District do hereby certify as follows:

I have examined the attached Contract(s) and performance and payment bond(s) and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements is adequate and has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with the terms, conditions, and provisions thereof.

Signature: _____

Name: _____

Title: _____

Date: _____

20. CERTIFICATE OF SUBSTANTIAL COMPLETION

<p style="text-align: center;">RECORDING REQUESTED BY: Borrego Water District</p> <hr/> <p style="text-align: center;">AND WHEN RECORDED MAIL TO: Attn: Secretary of the Board Borrego Water District</p> <hr/> <p style="text-align: center;"><small>(Name)</small></p> <p style="text-align: center;">806 Palm Canyon Drive</p> <hr/> <p style="text-align: center;"><small>(Street Address)</small></p> <p style="text-align: center;">Borrego Springs, California 92204</p> <hr/> <p style="text-align: center;"><small>(City, State, Zip)</small></p>	
--	--

SPACE ABOVE THIS LINE FOR
RECORDER'S USE

Project: Wastewater Treatment Plant Rehabilitation Project	Owner's Contract No.:
Owner: Borrego Water District	
Address of Owner: 806 Palm Canyon Drive, Borrego Springs, California 92004	Date of Contract:
Contractor:	Engineer's Project No.:

This [tentative] [definitive] Certificate of Substantial Completion applies to:

- All Work under the Contract Documents: The following specified portions:

Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of the Owner, the Contractor and the Engineer, and found to be substantially complete. The Date of Substantial Completion of the Project or portion thereof designated above is hereby declared and is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

A (tentative) (revised tentative) (definitive) list of items to be completed or corrected, is attached hereto. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

The responsibilities between the OWNER and the CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as provided in the Contract Documents except as amended as follows:

- Amended Responsibilities Not Amended

Owner's Amended Responsibilities:

Contractor's Amended Responsibilities:

The following documents are attached to and made part of this Certificate:

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of the Contractor's obligation to complete the Work in accordance with the Contract Documents.

_____ Executed by Engineer	_____ Date
_____ Accepted by Contractor	_____ Date
_____ Accepted by Owner	_____ Date

21. DISADVANTAGE BUSINESS ENTERPRISE (DBE) PROGRAM

Bidders are advised that, as required by federal law and all recipients of federal funds and those of the Resources Control Board (SWRCB), The Borrego Water District is implementing Disadvantaged Business Enterprise (DBE) requirements.

The DBE Program is an outreach, education, and goaling program designed to increase the participation of DBEs in procurements funded by Federally Funded agreements. The DBE Program encompasses many of the components of the former MBE/WBE Program and includes many new features. For further information on DBE Program, DBE certification, search for DBE, public information meetings, etc., refer to the following website:

Bidder shall meet Disadvantage Business Enterprise requirements as set forth by the Guidelines for Meeting the California State Revolving Fund (CASRF) Programs (Clean Water and Drinking Water SRF) Disadvantaged Business Enterprise Requirements. The Requirements are attached this specification section as follows.



Guidelines for Meeting the California State Revolving Fund (CASRF) Programs (Clean Water and Drinking Water SRF) Disadvantaged Business Enterprise Requirements

The Disadvantaged Business Enterprise (DBE) Program is an outreach, education, and objectives program designed to increase the participation of DBEs in the Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) Programs.

How to Achieve the Purpose of the Program

Recipients of CWSRF/DWSRF financing that are subject to the DBE requirements (recipients) are required to seek, and are encouraged to use, DBEs for their procurement needs. Recipients should award a "fair share" of sub-agreements to DBEs. This applies to all sub-agreements for equipment, supplies, construction, and services.

The key functional components of the DBE Program are as follows:

- Fair Share Objectives
- DBE Certification
- Six Good Faith Efforts
- Contract Administration Requirements
- DBE Reporting

Disadvantaged Business Enterprises are:

- Entities owned and/or controlled by socially and economically disadvantaged individuals as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note) (10% statute), and Public Law 102-389 (42 U.S.C. 4370d) (8% statute), respectively;
- Minority Business Enterprise (MBE) - entities that are at least 51% owned and/or controlled by a socially and economically disadvantaged individual as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note), and Public Law 102-389 (42 U.S.C. 4370d), respectively;
- Women Business Enterprise (WBE) - entities that are at least 51% owned and/or controlled by women;
- Small Business Enterprise (SBE);
- Small Business in a Rural Area (SBRA);
- Labor Surplus Area Firm (LSAF); or
- Historically Underutilized Business (HUB) Zone Small Business Concern or a concern under a successor program.

Certifying DBE Firms:

Under the DBE Program, entities can no longer self-certify and contractors and sub-contractors must be certified at bid opening. Contractors and sub-contractors must provide to the CASRF recipient proof of DBE certification. Certifications will be accepted from the following:

- The U.S. Environmental Protection Agency (USEPA)
- The Small Business Administration (SBA)
- The Department of Transportation's State implemented DBE Certification Program (with U.S. citizenship)
- Tribal, State and Local governments
- Independent private organization certifications

If an entity holds one of these certifications, it is considered acceptable for establishing status under the DBE Program.

Six Good Faith Efforts (GFE)

All CWSRF/DWSRF financing recipients are required to complete and ensure that the prime contractor complies with the GFE below to ensure that DBEs have the opportunity to compete for financial assistance dollars.

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practical through outreach and recruitment activities. For Tribal, State and Local Government Recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
2. Make information on forthcoming opportunities available to DBEs. Posting solicitations for bids or proposals for a minimum of 30 calendar days in a local newspaper, before the bid opening date.
3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs.
4. Encourage contracting with a group of DBEs when a contract is too large for one firm to handle individually.
5. Use the services of the SBA **and/or** Minority Business Development Agency (MBDA) of the US Department of Commerce.
6. If the prime contractor awards subcontracts, require the prime contractor to take the above steps.

The forms listed in the table below and attached to these guidelines; must be completed and submitted with the GFE:

FORM NUMBER	FORM NAME	REQUIREMENT	PROVIDED BY	COMPLETED BY	SUBMITTED TO
SWRCB Form 4500-2 or EPA Form	DBE Sub-Contractor Participation Form	As Needed to Report Issues	Recipient	Sub-contractor	EPA DBE Coordinator
SWRCB Form 4500-3 or EPA Form	DBE Sub-Contractor Performance Form	Include with Bid or Proposal Package	Prime Contractor	Sub-Contractor	SWRCB by Recipient
SWRCB Form 4500-4 or EPA Form	DBE Sub-Contractor Utilization Form	Include with Bid or Proposal Package	Recipient	Prime Contractor	SWRCB by Recipient

The completed forms must be submitted with each Bid or Proposal. The recipient shall review the bidder’s documents closely to determine that the GFE was performed **prior** to bid or proposal opening date. Failure to complete the GFE and to substantiate completion of the GFE before the bid opening date could jeopardize CWSRF/DWSRF financing for the project. The following situations and circumstances require action as indicated:

1. If the apparent successful low bidder was rejected, a complete explanation must be provided.
2. Failure of the apparent low bidder to **perform** the GFE **prior** to bid opening constitutes a non-responsive bid. The construction contract may then be awarded to the next low, responsive, and responsible bidder that meets the requirements or the Recipient may re-advertise the project.
3. If there is a bid dispute, all disputes shall be settled **prior** to submission of the Final Budget Approval Form.

Administration Requirements

- A recipient of CWSRF/DWSRF financing must require entities receiving funds to create and maintain a Bidders List if the recipient of the financing agreement is subject to, or chooses to follow, competitive bidding requirements.
- The Bidders list must include all firms that bid or quote on prime contracts, or bid or quote on subcontracts, including both DBEs and non-DBEs.

- Information retained on the Bidder's List must include the following:
 1. Entity's name with point of contact;
 2. Entity's mailing address and telephone number;
 3. The project description on which the entity bid or quoted and when;
 4. Amount of bid/quote; and
 5. Entity's status as a DBE or non-DBE.
- The Bidders List must be kept until the recipient is no longer receiving funding under the agreement.
- The recipient shall include Bidders List as part of the Final Budget Approval Form.
- A recipient must require its prime contractor to pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the Recipient.
- A recipient must be notified in writing by its prime contractor prior to any termination of a DBE subcontractor by the prime contractor.
- If a DBE subcontractor fails to complete work under the subcontract for any reason, the recipient must require the prime contractor to employ the six GFEs if soliciting a replacement subcontractor.
- A recipient must require its prime contractor to employ the six GFEs even if the prime contractor has achieved its fair share objectives.

Reporting Requirements

For the duration of the construction contract(s), the recipient is required to submit to the State Water Resources Control Board DBE reports annually by October 10 of each fiscal year on the attached Utilization Report form (UR-334). Failure to provide this information as stipulated in the financial agreement language may be cause for withholding disbursements.

CONTACT FOR MORE INFORMATION

SWRCB, CASRF – Barbara August (916) 341-6952 barbara.august@waterboards.ca.gov

US EPA, Region 9 – Joe Ochab (415) 972-3761 ochab.joe@epa.gov



**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form**

A Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE¹ subcontractor² the opportunity to describe work received and/or report any concerns regarding the funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the DBE Coordinator at any time during the project period of performance.

Subcontractor Name		Project Name	
Bid / Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity	

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Amount Received by Prime Contractor

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

Please use the space below to report any concerns regarding the above funded project:

Subcontractor Signature	Print Name
Title	Date

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

Send completed Form 4500-2 to:
Mr. Joe Ochab, DBE Coordinator
US EPA, Region 9
75 Hawthorne Street
San Francisco, CA 94105

FORM 4500-2 (DBE Subcontractor Participation Form)



**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Performance Form**

This form is intended to capture the DBE¹ subcontractor's² description of work to be performed and the price of the work submitted to the prime contractor. A Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractor's bid or proposal package.

Subcontractor Name		Project Name	
Bid / Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity	

Contract Item Number	Description of Work Submitted from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor
DBE Certified By: <input type="checkbox"/> DOT <input type="checkbox"/> SBA <input type="checkbox"/> Other: _____		Meets/exceeds EPA certification standards? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Unknown

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.
² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

Subcontractor Signature	Print Name
Title	Date

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

FORM 4500-3 (DBE Subcontractor Performance Form)



Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Utilization Form

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE¹ subcontractor's² and the estimated dollar amount of each subcontract. A Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name		Project Name	
Bid / Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Issuing/Funding Entity			

I have identified potential DBE certified subcontractors. ___ YES ___ NO If yes, please complete the table below. If no, please explain:			
Subcontractor Name/ Company Name	Company Address / Phone / Email	Estimated Dollar Amount	Currently DBE Certified?

--Continue on back if needed--

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

FORM 4500-4 (DBE Subcontractor Utilization Form)



**STATE WATER RESOURCES CONTROL BOARD – DIVISION OF FINANCIAL ASSISTANCE
DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION
CALIFORNIA STATE REVOLVING FUNDS (CASRF)
FORM UR-334**

1. Grant/Finance Agreement Number:		2. Annual Reporting Period 10/1/___ through 09/30/___		3. Purchase Period of Financing Agreement:	
4. Total Payments Paid to Prime Contractor or Sub-Contractors During Current Reporting Period: \$					
5. Recipient's Name and Address:			6. Recipient's Contact Person and Phone Number:		
7. List All DBE Payments Paid by Recipient or Prime Contractor During Current Reporting Period:					
Payment or Purchase Paid by Recipient or Prime Contractor	Amount Paid to Any DBE Contractor or Sub-Contractor For Service Provided to Recipient		Date of Payment (MM/DD/YY)	Procurement Type Code** (see below)	Name and Address of DBE Contractor of Sub-Contractor or Vendor
	MBE	WBE			
8. Initial here if no DBE contractors or sub-contractors paid during current reporting period:					
9. Initial here if all procurements for this contract are completed:					
10. Comments:					
11. Signature and Title of Recipient's Authorized Representative			12. Date		

Email Form UR-334 to:

DrinkingWaterSRF@waterboards.ca.gov OR CleanWaterSRF@waterboards.ca.gov

Questions may be directed to:

Barbara August, SWRCB
Barbara.August@waterboards.ca.gov
 Phone: (916) 341-6952
 Fax: (916) 327-7469

****Procurement Type:**

1. Construction
2. Supplies
3. Services (includes business services; professional services; repair services and personnel services)
4. Equipment

**STATE WATER RESOURCES CONTROL BOARD - DIVISION OF FINANCIAL ASSISTANCE
DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION
CALIFORNIA STATE REVOLVING FUNDS**

INSTRUCTIONS FOR COMPLETING FORM UR-334

- Box 1** Grant or Financing Agreement Number.
- Box 2** Annual reporting period.
- Box 3** Enter the dates between which you made procurements under this financing agreement or grant.
- Box 4** Enter the total amount of payments paid to the contractor or sub-contractors during this reporting period.
- Box 5** Enter Recipient's Name and Address.
- Box 6** Enter Recipient's Contact Name and Phone Number.
- Box 7** Enter details for the **DBE purchases only** and be sure to limit them to the current period.
1) Use either an "R" or a "C" to represent "Recipient" or "Contractor." 2) Enter a dollar total for DBE and total the two columns at the bottom of the section. 3) Provide the payment date. 4) Enter a product type choice from those at the bottom of the page. 5) List the vendor name and address in the right-hand column
- Box 8** Initial here if no DBE contractors or sub-contractors were paid during this reporting period.
- Box 9** Initial this box only if all purchases under this financing agreement or grant have been completed during this reporting period or a previous period. If you initial this box, we will no longer send you a survey.
- Box 10** This box is for explanatory information or questions.
- Box 11** Provide an authorized representative signature.
- Box 12** Enter the date form completed.

22. STANDARD GENERAL CONDITIONS

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or

assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer’s decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into

such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and
3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.

- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

- A. Standards Specifications, Codes, Laws and Regulations
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

- A. *Reporting Discrepancies:*
 - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify

pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner’s express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer’s judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement

or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. abnormal weather conditions;
 - 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 - 4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was

not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.
- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner’s interest therein as necessary for giving notice of or filing a mechanic’s or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

- A. *Limitation on Use of Site and Other Areas:*
 - 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor’s operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 - 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner

or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
 - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures

of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
2. is of such a nature as to require a change in the Drawings or Specifications; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments:*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease

in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
 1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;

- c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.
- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
 - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area

affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is

responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.

- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).
 4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered*: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 2. claims for damages insured by reasonably available personal injury liability coverage.
 3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content*: Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

- D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer’s liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor’s pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor’s operations and completed operations. This insurance shall be maintained for no less than three years after final completion.
- G. *Additional insureds*: The Contractor’s commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor’s professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
 - 1. include at least the specific coverages provided in this Article.
 - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing

defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.

5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

- A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).
 5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come

off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

- E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights

against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 *“Or Equals”*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or equal” item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an “or equal” item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
 - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - a. shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified.

- b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from that specified, and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.
- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.
- O. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the 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. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers,

architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such

record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- C. Contractor shall comply with the applicable requirements of Owner’s safety programs, if any. The Supplementary Conditions identify any Owner’s safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor’s safety program with which Owner’s and Engineer’s employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor’s duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in

accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

- G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

- A. *Shop Drawing and Sample Submittal Requirements:*
 - 1. Before submitting a Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
 - 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
 - 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the

Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.
1. *Shop Drawings:*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.
 2. *Samples:*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.
 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. *Engineer's Review:*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof

incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.

5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
 6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
 7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.
 8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.
- E. *Resubmittal Procedures:*
1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
 2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
 3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that

is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal;
 6. the issuance of a notice of acceptability by Engineer;
 7. any inspection, test, or approval by others; or
 8. any correction of defective Work by Owner.
- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor’s responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional’s written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer’s review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer’s review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner’s employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner’s employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.

- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is

the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.
- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

10.01 *Owner’s Representative*

- A. Engineer will be Owner’s representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner’s representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor’s executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer’s efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer’s visits and observations are subject to all the limitations on Engineer’s authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer’s visits or observations of Contractor’s Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer’s consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer’s authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer’s authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.

- C. Engineer’s authority as to Change Orders is set forth in Article 11.
- D. Engineer’s authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer’s Authority and Responsibilities*

- A. Neither Engineer’s authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor’s failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer’s review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer’s employees and representatives will comply with the specific applicable requirements of Owner’s and Contractor’s safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 Amending and Supplementing Contract Documents

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
 - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.
 - 3. *Field Orders:* Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 Owner-Authorized Changes in the Work

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the

Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
 - 1. a mutually acceptable fixed fee; or
 - 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that

actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

- d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
- e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.
 - 1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
 - 2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time

thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – CLAIMS

12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.
 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval:* If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim:* If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results:* If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is

approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work:* The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work

plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
 - g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

- C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:
1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.
- D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.
- E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:* Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner’s and Engineer’s acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor’s purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor’s expense unless Contractor had given Engineer timely notice of Contractor’s intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor’s Obligation:* It is Contractor’s obligation to assure that the Work is not defective.
- B. *Engineer’s Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.

- C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner’s special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer’s confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner’s evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer’s observation, and then replace the covering, all at Contractor’s expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer’s request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
 - 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
 - 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
 - 1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
 - 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract

Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

- c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
 4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
 5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
 6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. the Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. the Contract Price has been reduced by Change Orders;
 - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - l. there are other items entitling Owner to a set off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor

remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may

submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
 - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

- A. *Application for Payment:*
 - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record

documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not

limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such other adjacent areas;
 - 2. correct such defective Work;
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor’s obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor’s persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor’s disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor’s repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other

professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions

of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if

repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

23. SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC No. C-700 (2013 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix “SC” added thereto.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01.A.8 Add the following language to the end of Paragraph 1.01.A.8:

The Change Order form to be used on this Project is EJCDC No. C-941.

SC-1.01.A.20 Add the following language to the end of Paragraph 1.01.A.20:

The Project has been designed by *The Holt Group, Inc.* The Owner has retained _____ (“Engineer”) to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

SC-1.01.A.48. Add the following language at the end of the last sentence of Paragraph 1.01.A.48:

A Work Change Directive cannot change Contract Price or Contract Times without a subsequent Change Order.

SC-1.01.A.49 Add the following new Paragraph after Paragraph 1.01.A.48:

Abnormal Weather Conditions- Conditions of extreme or unusual weather for a given region, elevation, or season as determined by Engineer. Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered Abnormal Weather Conditions.

ARTICLE 2 – PRELIMINARY MATTERS

No modifications

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

No modifications

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01.A Amend the last Paragraph of 4.01.A by striking out the following words:

In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

SC-4.05.C.2 Amend Paragraph 4.05.C.2 by striking out the following text: “abnormal weather conditions;” and inserting the following text:

Abnormal Weather Conditions;

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS;
HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.03. Delete Paragraphs 5.03.A and 5.03.B in their entirety and insert the following:

A. No reports or explorations or tests of subsurface conditions at or contiguous to the Site are known to the Owner or Engineer.

SC-5.06. Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:

A. No reports or explorations or tests of Hazardous Environmental Conditions at or contiguous to the Site are known to the Owner or Engineer.

ARTICLE 6 – BONDS AND INSURANCE

SC-6.04. Add the following new paragraph immediately after Paragraph 6.03.J:

K. The limits of liability for insurance required by paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers’ Compensation, and related coverages under paragraphs 6.03.A.1 and A.2 of the General Conditions:

- | | |
|-------------------------|-------------|
| a. State: | Statutory |
| b. Employer’s Liability | \$1,000,000 |

2. Contractor’s Commercial General Liability under paragraphs 6.03.B and 6.03.C of the General Conditions:

- | | |
|--|-------------|
| a. General Aggregate | \$2,000,000 |
| b. Products - Completed
Operations Aggregate | \$1,000,000 |
| c. Personal and Advertising
Injury | \$1,000,000 |
| d. Each Occurrence
(Bodily Injury and
Property Damage) | \$1,000,000 |
| e. Excess or Umbrella Liability | |

2. Automobile Liability under paragraph 6.03.D of the General Conditions:
 - a. Combined Single Limit \$1,000,000
3. Umbrella or excess liability under paragraph 6.03.E of the General Conditions:
 - a. General Aggregate \$2,000,000
 - b. Each Occurrence \$2,000,000
4. Contractual Liability coverage required by paragraph 6.03.C.2 of the General Conditions shall be provided as part of the Commercial General Liability coverage.
5. The Owner and Engineer are to be included as additional insureds.

ARTICLE 7 – CONTRATOR’S RESPONSIBILITIES

SC-7.04.A Amend the third sentence of the paragraph by striking out the following words:
Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or-equal” item is permitted.

SC-7.04.A.1 Amend the last sentence of Paragraph a.3 by striking out “and:” and adding a period at the end of Paragraph a.3.

SC-7.04.A.1 Delete paragraph 7.04.A.1.a.4 in its entirety and insert the following in its place:
[Deleted]

SC-7.06.A Amend Paragraph 7.06.A by adding the following text to the end of the Paragraph:
The Contractor shall not award work valued at more than fifty percent of the Contract Price to Subcontractor(s), without prior written approval of the Owner.

SC-7.06.B Delete Paragraph 7.06.B in its entirety and insert the following in its place:
[Deleted]

SC-7.12. Add the following new paragraph immediately after Paragraph 7.12.G:

H. For all excavations in excess of five (5) feet, the Contractor shall, pursuant to Labor Code Section 6705, submit in advance of any excavation hereunder a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from caving ground. No such excavation shall be made until said detailed plan is submitted by Contractor and accepted by Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

No modifications

ARTICLE 9 – OWNER’S RESPONSIBILITIES

No modifications

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

SC-10.03. Add the following language at the end of paragraph 10.03:

The Duties, Responsibilities, and Limitations of Authority of the Resident Project Representative will be stated in the Agreement for Engineering Services executed for this specific Project.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

No modifications

ARTICLE 12 - CLAIMS

SC-12.01. Add the following new paragraph immediately after paragraph 12.01.G:

H. If this is a “Public Works Contract” as defined in Section 22200 of the California Public Contract Code, claims shall be resolved pursuant to Sections 20104 et seq. of the California Public Contract Code. These sections are summarized as follows:

1. Claim means a separate demand by the Contractor for (a) a time extension, (b) payment of money or damages arising from work done by, or on behalf of the contractor, pursuant to this Contract, payment not otherwise expressly provided the Contract, or (c) any separate demand by the Contractor, the amount of which is disputed by the Owner.
2. For claims less than \$50,000, the Owner shall respond in writing to all written claims within forty-five (45) days of receipt of the claim, or may request in writing, within thirty (30) days of receipt of the claim, any additional documentation supporting the claim or relating to any defenses the Owner may have against such claim. The Owner’s written response to the claim, as further documented, will be submitted to the Contractor within fifteen (15) days from receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional documentation, whichever is greater.
3. For claims over \$50,000 and less than or equal to \$375,000, the Owner shall respond in writing to all written claims within sixty (60) days of receipt of the claim, or may request in writing, within thirty (30) days of receipt of the claim, any additional documentation supporting the claim or relating to any defenses the Owner may have against such claim. The Owner’s written response to the claim, as further documented, will be submitted to the Contractor within thirty (30) days from receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional documentation, whichever is greater.

4. If the Contractor disputes the Owner’s written response, or the Owner fails to respond within the time specified, the Contractor may notify the Owner in writing within either fifteen (15) days of receipt of the Owner’s response, or within fifteen (15) days of the Owner’s failure to respond within the statutorily prescribed time, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon demand, the Owner shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

5. Following the meet and confer conference, if the claim or any portion remains in dispute, the Contractor may file a claim pursuant to Government Code Sections 900, et seq. The period of time within to file such a claim shall be defined in Public Contract Code Section 20104.2(e).

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-13.02.C Delete Paragraph 13.02.C in its entirety and insert the following in its place:
[Deleted]

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTIONS; REMOVAL OR ACCEPTANCE
OF DEFECTIVE WORK

No modifications.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION
PERIOD

SC-15.01.B Amend the second sentence of Paragraph 15.01.B.1 by striking out the following text:

“a bill of sale, invoice, or other.”

SC-15.01.B.3 Add the following language at the end of paragraph 15.01.B.3:

No payments will be made that would deplete the retainage, place in escrow any funds that are required for retainage, or invest the retainage for the benefit of the Contractor.

SC-15.01.B.4. Add the following new paragraph after Paragraph 15.01.B.3

The Application for Payment Form to be used on this Project is EJCDC No. C-620.

SC-15.01.D.1 Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

The Application for Payment with Engineer’s recommendation will be presented to the Owner for consideration. If the Owner finds the Application for Payment acceptable, the recommended amount less any reduction under the provisions of Paragraph 15.01.E will become due thirty (30) days after the Application for Payment is presented to the Owner, and the Owner will make payment to the Contractor.

SC-15.02.A Amend Paragraph 15.02.A by striking out the following text:

“no later than seven days after the time of payment by Owner” and insert “no later than the time of payment by Owner.”

SC-15.06.D Delete Paragraph 15.06.D in its entirety and insert the following in its place:

Thirty-five days after the filing of a Notice of Completion with the County Recorder and after presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer’s recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

No modifications.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

No modifications.

ARTICLE 18 – MISCELLANEOUS

No modifications.

SC-19 Add the following new Article:

ARTICLE 19 – BUY AMERICAN/USE OF AMERICAN IRON AND STEEL

General:

All iron and steel products used in the project shall be produced in the United States, unless a waiver is provided by the United States Environmental Protection Agency (EPA).

The term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves structural steel, reinforced precast concrete, and construction materials.

Production of iron or steel products in the United States requires that all manufacturing processes must take place in the United States, except metallurgical processes such as melting, refining, forming, rolling, drawing, finishing, fabricating, and coating. Steel means an alloy that includes at least 50 percent iron and between 0.02 and 2 percent carbon and may contain other elements.

International trade agreements have no effect on this provision for this contract. Local government entities, such as Owner, are not obligated under international trade agreements to treat foreign produced iron and steel the same as United States produced iron and steel.

See the following EPA website for further information and details on this requirement: http://water.epa.gov/grants_funding/aisrequirement.cfm. See especially the “American Iron and Steel Requirement Guidance” at the website.

Documentation:

Contractor shall collect Buy American documentation for each iron and steel product used in the project. The documentation shall show that all production processes for each product occurred in the United States. Documentation shall show the manufacturer(s) involved in production of the product and the city and state where each process occurred. Copies of all Buy American documentation shall be submitted to Engineer. This shall be submitted along with any other products under the EPA issued “De Minimus” waiver, Contractor shall collect the documentation required under that waiver and submit a copy to Engineer. Additional information, including example product certifications and the De Minimus waiver can be found at the above referenced EPA website.

Waivers:

EPA may grant a waiver if it determines that:

1. Applying the requirement would be inconsistent with the public interest,
2. Iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality, or
3. Inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent

Owner is the entity that formally makes the request for a waiver, including requests that originate from Contractor or Subcontractors or suppliers. EPA requires detailed supporting information to evaluate a waiver request. See the above referenced EPA website for additional information on the waiver process. Owner shall send waiver request, in the form of a Word document (.doc), along with all supporting documentation, to the SRF program. The SRF program will forward waivers to EPA.

EPA will make available to the public on an informal basis a copy of the waiver request and information available to the EPA concerning the request, and shall allow for informal public input on the request for at least 15 days prior to making a finding based on the request. EPA shall make the waiver request and accompanying information available on the above referenced EPA website. If EPA grants a waiver, it will publish such waiver on that website.

SC-20 Add the following new Article:

ARTICLE 20 - PROJECT SIGN

A. Contractor will place a temporary construction project sign at a location designated by the Engineer. This sign measuring 4' x 8', will be made of 3/4" exterior grade plywood and adhere to the format and details given on the sheet at the end of this section. The sign will be prepared by a professional sign maker.

SC-21 Add the following new Article:

ARTICLE 21 – CALIFORNIA STATE REQUIREMENTS

A. This project is a “public works” project as defined in California Labor Code Section 1720 through 1743. In accordance with California Labor Code Article 1725.5, Contractor and all subcontractors are required to be registered with the California Department of Industrial Relations (DIR) in order to bid or be listed on a bid and/or work on a public works project.

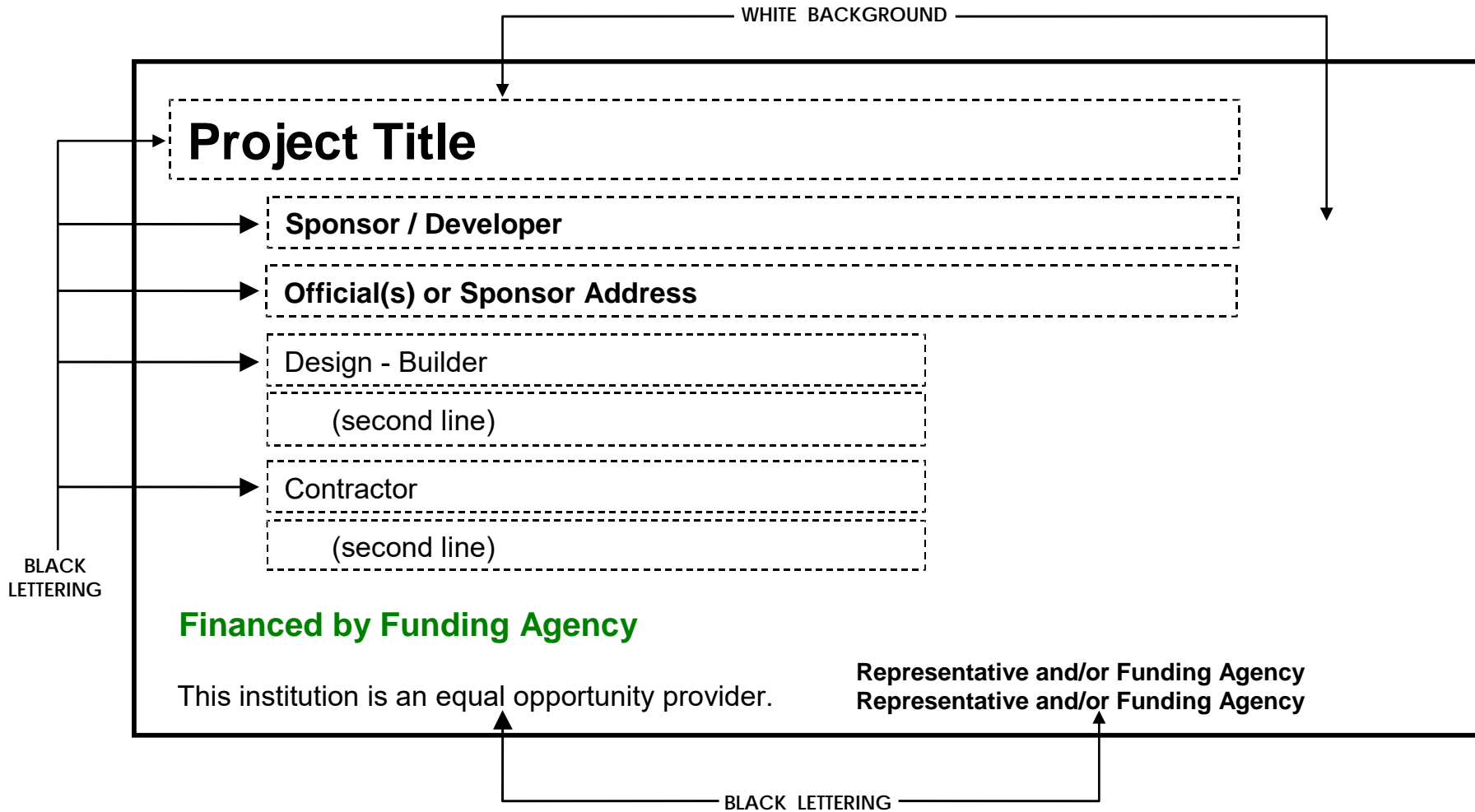
B. In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 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, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

C. Contractor shall be responsible for marking all excavations and notifying Underground Service Alert (USA) at least 48 hours before digging and follow all other provisions of California Government Code Sections 4216 through 4216.9. Contractor shall maintain an active USA ticket number for the entire duration of the excavation.

D. Unless otherwise indicated in the Contract Documents, all utility lines, conduits, wires, or structures shall be maintained by the Contractor and shall not be disturbed, disconnected, or damaged by him during the progress of the Work, provided, that should the Contractor in the performance of the Work disturb, disconnect, or damage any of the above, all expenses arising from such disturbance or in the replacement or repair thereof shall be borne by the Contractor. However, in accordance with Section 4215 of the California Government Code, the Contractor shall be compensated for all costs of locating and repairing damage to main or trunkline utility facilities located on the work site and for costs of operating equipment on the work site necessarily idled during such work where the Contractor has exercised reasonable care in removing or relocating utility facilities which are inaccurately indicated in the Contract Documents.

24. PROJECT SIGN

TEMPORARY CONSTRUCTION SIGN FOR PROJECT



SIGN DIMENSIONS: 1200 mm x 2400 mm x 19 mm (approx. 4' x 8' x 3/4")
PLYWOOD PANEL (APA RATED A-B GRADE-EXTERIOR)

25. CONTRACTOR’S APPLICATION FOR PAYMENT

	Application Period:	Application Date:
To (Owner): Borrego Water District	From (Contractor):	Via (Owner’s Representative)
Project: Wastewater Treatment Plant Rehabilitation	Contract:	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.:

APPLICATION FOR PAYMENT

Change Order Summary

Approved Change Orders				
Number	Additions	Deductions		
			1. ORIGINAL CONTRACT PRICE	\$ _____
			2. Net change by Change Orders.....	\$ _____
			3. CURRENT CONTRACT PRICE (Line 1 ± 2).....	\$ _____
			4. TOTAL COMPLETED AND STORED TO DATE	
			(Column F on Progress Estimate)	\$ _____
			5. RETAINAGE:	
			a. % x \$ Work Completed	\$ _____
			b. % x \$ Stored Material.....	\$ _____
			c. Total Retainage (Line 5a + Line 5b)	\$ _____
			6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5c).....	\$ _____
			7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application)	\$ _____
			8. AMOUNT DUE THIS APPLICATION	\$ _____
			9. BALANCE TO FINISH, PLUS RETAINAGE	
			(Column G on Progress Estimate + Line 5 above).....	\$ _____
TOTALS				
NET CHANGE BY CHANGE ORDERS				

CONTRACTOR’S CERTIFICATION

The undersigned Contractor certifies that: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

By: _____ Date: _____

Payment of: \$ _____
(Line 8 or other - attach explanation of other amount)

is recommended by: _____ (Date) _____
(Owner’s Representative)

Payment of: \$ _____
(Line 8 or other - attach explanation of other amount)

is approved by: _____ (Date) _____
(Owner)

Approved by: _____ (Date) _____
Funding Agency (if applicable)

STORED MATERIAL SUMMARY

CONTRACTOR'S APPLICATION

For (contract):					Application Number:				
Application Period:					Application Date:				
A	B	C	D		E		F		G
Invoice No.	Shop Drawing Transmittal No.	Materials Description	Stored Previously		Stored this Month		Incorporated in Work		Materials Remaining in Storage (\$) (D + E – F)
			Date (Month/Year)	Amount (\$)	Amount (\$)	Subtotal	Date (Month/Year)	Amount (\$)	
		TOTALS							

26. CHANGE ORDER FORM

No. _____

Date of Issuance:

Effective Date:

Project:
Wastewater Treatment Plant Rehabilitation Project

Owner:
Borrego Water District

Owner's Contract No.:

Contract:

Date of Contract:

Contractor:

Owner's Project No.:

The Contract Documents are modified as follows upon execution of this Change Order:

Description:

Attachments: (List documents supporting change):

CHANGE IN CONTRACT PRICE:

CHANGE IN CONTRACT TIMES:

Original Contract Price:

Original Contract Working days Calendar days

\$ _____

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

[Increase] [Decrease] from previously approved Change Orders No. _____ to No. _____:

[Increase] [Decrease] from previously approved Change Orders No. _____ to No. _____:

\$ _____

Substantial completion (days): _____

Ready for final payment (days): _____

Contract Price prior to this Change Order:

Contract Times prior to this Change Order:

\$ _____

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

[Increase] [Decrease] of this Change Order:

[Increase] [Decrease] of this Change Order:

\$ _____

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

Contract Price incorporating this Change Order:

Contract Times with all approved Change Orders:

\$ _____

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

RECOMMENDED:

ACCEPTED:

ACCEPTED:

By: _____

By: _____

By: _____

Engineer (Authorized Signature)

Owner (Authorized Signature)

Contractor (Authorized Signature)

Date: _____

Date: _____

Date: _____

Approved by Funding Agency (if applicable):

Date: _____

Date: _____

CHANGE ORDER INSTRUCTIONS

A. General Information

This document was developed to provide a uniform format for handling contract changes that affect Contract Price or Contract Times. Changes that have been initiated by a Work Change Directive must be incorporated into a subsequent Change Order if they affect Price or Times.

Changes that affect Contract Price or Contract Times should be promptly covered by a Change Order. The practice of accumulating Change Orders to reduce the administrative burden may lead to unnecessary disputes.

If Milestones have been listed in the Agreement, any effect of a Change Order thereon should be addressed.

For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Times, a Field Order should be used.

B. Completing the Change Order Form

Engineer normally initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by Contractor, or requests from Owner, or both.

Once Engineer has completed and signed the form, all copies should be sent to Owner or Contractor for approval, depending on whether the Change Order is a true order to the Contractor or the formalization of a negotiated agreement for a previously performed change. After approval by one contracting party, all copies should be sent to the other party for approval. Engineer should make distribution of executed copies after approval by both parties.

If a change only applies to price or to times, cross out the part of the tabulation that does not apply.

SPECIAL CONDITIONS

SECTION	DESCRIPTION	
1	Project Description	00900-2
2	Scope	00900-3
3	Inspection of Work	00900-3
4	Project Signs	00900-5
5	Submittal Documents	09000-7
6	Sequence of Construction	09000-9
7	Geotechnical Testing	09000-10

1. Project Description

Borrego Water District (BWD) proposes to design and construct rehabilitation improvements of the BWD Wastewater Treatment Plant (WWTP). The WWTP is located at 4891 Borrego Springs Road, Borrego Springs, CA 92004. The rehabilitation scope of work is based upon the February 2016 WWTP Project Report prepared by David Dale, Professional Civil Engineer and by the WWTP field review conducted by The Holt Group, Inc. and BWD Staff.

The WWTP is a fully operational facility. The scope of work is to be conducted in a manner and phase that will not halt or have a change in the treatment process of the WWTP. The contract scope of work will require continuous coordination with the WWTP Operator(s) throughout the rehabilitation of the Project. The Project consists of rehabilitation to the Headworks Station, Secondary Clarifiers, Oxidation Ditch Facility, and Sludge Holding Station. Following is the scope of work for the various facilities.

The Headworks facility rehabilitation includes the replacement of the grit screw classifier unit, the replacement of the air lift blower system, the replacement of process piping and valves, installation of screening's receptacle containment, cleaning and coating of the interior concrete walls, as well as the repair of damaged areas of the headworks facility's concrete walls. The interior coating of the concrete walls and concrete repairs will require the contractor to temporarily bypass raw wastewater from the WWTP's upstream manhole to the downstream oxidation ditch splitter box.

There are two (2) secondary clarifiers at the BWD WWTP. The rehabilitation for Clarifier No. 1 includes the repair of the concrete spall areas around the exterior Clarifier walls, sandblasting and re-coating of the interior steel components, cleaning and coating of the interior concrete walls, replacement of squeegees and hardware connected to the raker arms, as well as the removal and replacement of grout at the bottom. The rehabilitation for Clarifier No. 2 includes the sandblasting and re-coating of the interior steel components, cleaning and coating of the interior concrete walls, replacement of squeegees and hardware connected to the raker arms, removal and replacement of the grout at the bottom, and the repair of the existing gear box. The current wastewater treatment flows only

require operation of a single clarifier. The rehabilitation for the clarifiers is to be conducted one clarifier at a time.

The Oxidation Ditch rehabilitation includes the removal and replacement of the effluent weir which controls the oxidation ditch mix liquor liquid level. The rehabilitation will require draw down of the mixed liquor level, via pumping from the oxidation ditch to the secondary clarifier. The drawdown of mixed liquor will allow temporary access to bolt connections for removal and replacement of the effluent weir. The drawdown of mixed liquor is to be conducted on two separate occasions; once to measure dimensions of the effluent weir required for fabrication and re-installation; and secondly to replace the existing effluent weir with a new weir.

The Sludge Holding Station rehabilitation includes the installation of a dedicated air blower system, as well as air piping and valves. The air blower system will tie into the existing air piping that extends from the Headworks Facility. The new air blower system will allow for adequate air flow to the sludge holding tank, while providing a redundant air flow to the Headworks Facility.

Any other minor items necessary to complete the rehabilitation work associated are included in the Project's scope of work.

2. Scope

These Special Conditions supplement the General Conditions, Technical Specifications, and Plans. All requirements and provisions of the General Conditions, Technical Specifications and Plans apply. Where codes, procedures, conditions, specifications or requirements conflict, the more stringent shall apply.

3. Inspection of Work

3.1 All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.

3.2 The Contractor shall provide all inspection and testing services unless specified to be provided by the Owner.

3.3 The Engineer shall provide at the Contractor's expense the testing and inspection services required by the Contract Documents if the Contractor fails or refuses to provide the required testing and inspection services.

3.4 If the Contract documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any work to specifically be inspected, tested, or approved by someone other than the Engineer, the Contractor will give the Engineer timely notice of readiness. The Contractor will then furnish the Engineer the required certificates of inspection, testing or approval.

3.5 Inspections, tests, or approvals by the Engineer or others shall not relieve the Contractor from the obligations to perform the work in accordance with the requirements of the Contract Documents.

3.6 The Engineer and the Engineer's representative will at all times have access to the work. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, records on personnel, invoices of materials, and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the work and also for any inspection or testing thereof.

3.7 If any work is covered prior to inspection by the Engineer it must, if requested by the Engineer, be uncovered for the Engineer's observation and replaced at the Contractor's expense.

3.8 If the Engineer considers it necessary or advisable that covered work be inspected or tested by others, the Contractor, at the Engineer's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such work is defective, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such work is not found to be defective, the Contractor will be allowed an increase in the contract price or any extension of the contract time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and construction and an appropriate change order shall be issued.

4. Project Signs

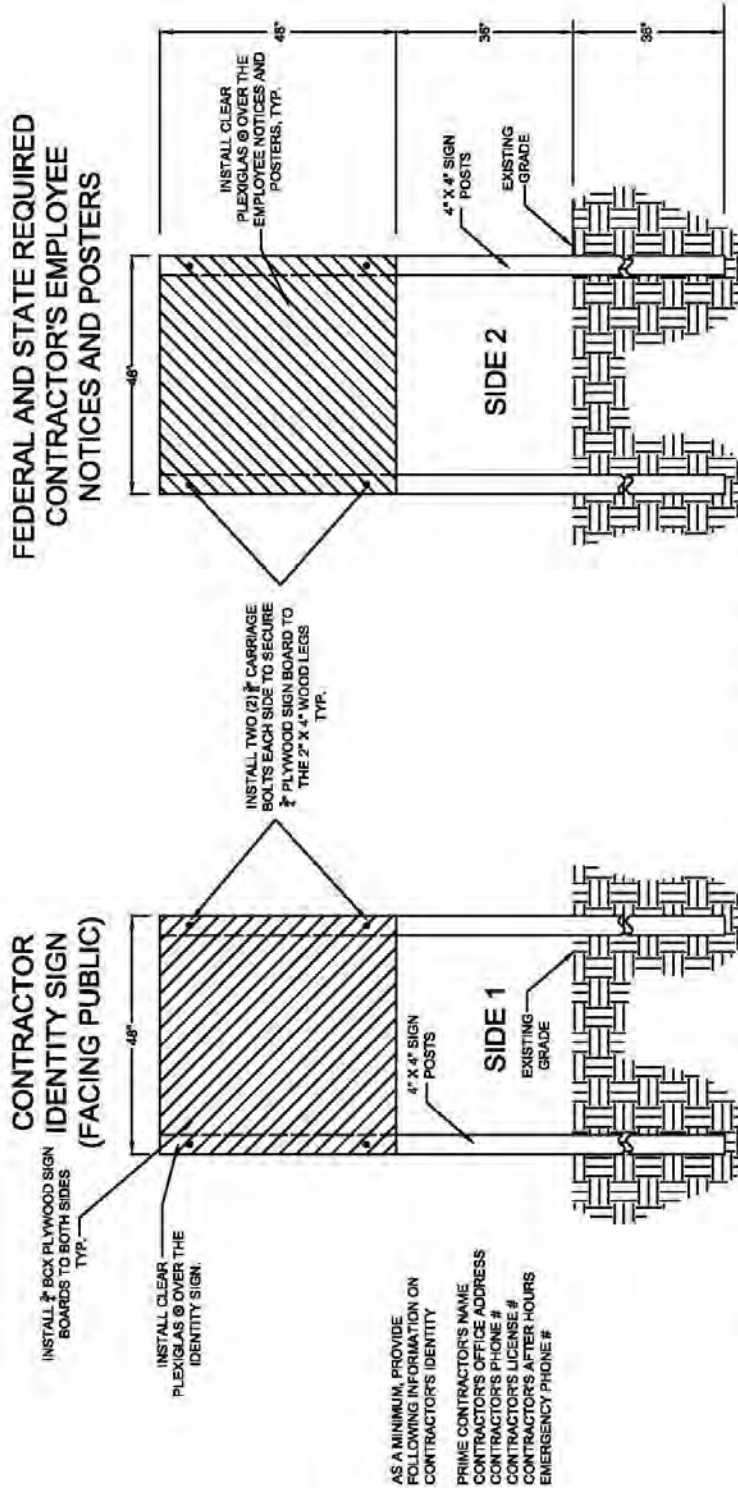
Contractor will place one (1) Project Identity Sign and one (1) Prime Contractor Identity Sign at locations designated by the Owner/Engineer. The Project Identity Sign will measure 4' x 8' and the Prime Contractor Identity Sign will measure 4' x 4', and both will be made of 3/4" exterior grade plywood. The Project Identity Sign will adhere to the format and details given in Article 20 of the Supplementary Conditions and Section 00810 of the Contract Documents. The Prime Contractor Identity Sign will adhere to the format and details given in the sheet at the end of this section. The signs will be prepared by a professional sign painter.

California requires a Prime Contractor Identity Sign for all construction projects in the State of California. At a minimum, this sign shall contain the Prime Contractor's name, address, telephone number, State Contractor's License number, and an after-hours' emergency telephone number in the event of an emergency.

California and Federal labor laws require that employee notices and posters be posted at all project sites that employ workers. Federal labor laws for Public Works Projects require that current Federal Wage Decisions be posted and maintained at the project site for the duration of the construction project. California labor laws for Public Works projects require that current State Wage Decisions be posted and maintained at the project site for the duration of the construction project. In addition, there are EEO, OSHA and other required information to be posted and maintained at the project site for the duration of the construction project.

The Prime Contractor Identity Sign and California Labor Law/EEO and OSHA Sign requirements are illustrated by the drawing on the following page.

The contract price paid for the Project Identity Sign and Prime Contractor Identity Sign shall be considered included in the Mobilization bid item and shall include full compensation for furnishing, erecting and maintaining the signs, as shown on the plans, as specified in the Standard Specifications and these Special Conditions, and as directed by the Owner's Representative.



NOTE: THE CONTRACTOR SHALL INSTALL TWO (2) SEPARATE CONTRACTOR IDENTITY AND CONTRACTOR'S EMPLOYEE NOTICE SIGNS OR USE ONE SET OF SIGN POSTS AND MOUNT THE CONTRACTOR IDENTITY AND THE CONTRACTOR'S EMPLOYEE NOTICES ON OPPOSITE SIDES OF THE SIGN POST. THE CONTRACTOR IDENTITY SIGN MUST FACE THE PUBLIC AT THE LOCATION DESIGNATED BY THE AWARDED AGENCY. IF TWO (2) SEPARATE SIGNS ARE INSTALLED, PLACE THOSE SIGNS IN CLOSE PROXIMITY.

NOT TO SCALE

5. Submittal Documents

5.1 General

The Contractor shall submit electronic or hard copy submittal documents to the Borrego Water District. Submittal Documents shall be forwarded by the Contractor within 16 calendar days of the issuance of the Notice to Proceed. Submittals shall be reviewed by the Borrego Water District and Engineer within 10 calendar days after receipt of the submittal documents. Submittals shall be reviewed and designated as follows:

1. Approved with no exceptions taken.
2. Approved as noted.
3. Revise and Re-Submit.
4. Rejected.

Submittals returned to the Contractor in the “revise and re-submit” or “rejected” category shall be revised or re-prepared and returned to the Borrego Water District within 7 calendar days after the receipt by the Contractor. Iterative submittal reviews by the Borrego Water District and subsequent revisions by the Contractor shall be completed within 5 calendar days.

5.2 Submittal Document Listing

The following submittal documents are to be forwarded to the Borrego Water District for review:

1. Construction Schedule.
2. Schedule of Values.
3. Operation and Maintenance Manuals.
4. Project Signs
5. Contractor’s Superintendent. Include name and cell phone.

6. PCC Concrete Submittal – one page vendor printout.
7. Class 2 Base – Sieve Gradation and Sand Equivalent.
8. Reinforcing Steel. Conformance with Buy American or Buy America Provisions shall accompany the submittal documents as applicable.
9. Secondary Clarifiers.
 - a. Steel Coating System.
 - b. Concrete Coating System
 - c. Squeegees and Hardware.
 - d. Grout.
10. Headworks Facility.
 - a. Screw Classifier Unit.
 - b. Air System. Conformance with Buy American or Buy America Provisions shall accompany the submittal documents as applicable.
 - i. Air Diffusers.
 - ii. Stainless Steel Air Piping
 - iii. Ductile Iron Air Piping
 - iv. Air Piping Fittings
 - v. Air Piping Supports and Anchors
 - vi. Valves
 - vii. Air Compressor with Motor and Appurtenances
 - viii. Miscellaneous Mechanical Air System components.
11. Oxidation Ditch Outlet Weir.
12. Sludge Holding Station
 - a. Air System

- b. Air System. Conformance with Buy American or Buy America Provisions shall accompany the submittal documents as applicable.
 - i. Ductile Iron Air Piping
 - ii. Air Piping Fittings
 - iii. Air Piping Supports and Anchors
 - iv. Valves

The Contractor shall review the submittal and miscellaneous requirements section of each Technical Specification section. All items listed in the Submittal and Miscellaneous requirements of the Technical Specifications Sections are to be included in addition to the items listed above.

6. Sequence of Construction

6.1 General

The Contractor shall not operate any existing Borrego Water District facilities. The Contractor shall be fully responsible for coordination of construction activities that require changes to the wastewater treatment plant.

The Contractor shall inform the Borrego Water District and the Resident Engineer a minimum of 14 days prior to facility and pipeline outages.

6.2 Pumping Facilities

The Contractor shall maintain and provide all required pumping equipment, fuel, electricity, suction piping, discharge piping and all fittings necessary to dispose of the water resultant from removing, demolishing and/or interconnecting the existing pipelines and facilities. The Contractor, Resident Engineer and Borrego Water District shall agree on an acceptable downstream point to discharge of the liquid resultant from the pipe and/or structure connection and disconnection construction activities. A minimum 1,500 gpm (as appropriate) pump shall be maintained at the project site. The pump shall be in operational condition. The pump shall be witnessed to be operational by the Resident Engineer a minimum of 24 hours prior to construction activities to the existing or new pipelines or facilities.

The Contractor shall provide lighted barricades 5 feet on center around all open excavations. If open excavations are maintained in an “open” condition after working hours or during holidays and weekends, it shall be required for the Contractor to place a 6-foot tall, 9-gauge chain link fence around the perimeter of the excavation.

6.3 Structure Connections Requirement Facility Shutdown

This project shall require outage of operation treatment facilities. It shall be necessary to accomplish outages within a four (4)-hour period as it will be necessary to “shut down” the wastewater treatment plant during a portion of the required work. The work shall commence at 10:00 p.m. at night and be completed by 2:00 a.m. the next day, or as allowed by the Borrego Water District.

7. Geotechnical Testing

The Contractor shall provide the services of an independent Geotechnical Consultant approved by the Engineer to perform the required testing specified within the contents of the plans and specifications. The cost for the Geotechnical Testing shall be borne by the Contractor and included as a part of mobilization cost. A copy of all tests shall be forwarded to the Owner’s Representative within two (2) days after the testing is complete.

The Geotechnical testing shall include but not be limited to compaction tests on the native material backfill, sand bedding, and Class 2 Base material for pads and footings and one (1) set of concrete cylinders, consisting of four (4) cylinders, and slump test for each concrete structure, foundation and slab. The Owner’s Representative shall determine the location of the tests. Any other compaction testing and requirements can be found in Section 02200 of the Technical Specifications.

The Geotechnical Consultant shall be required to be present at the site and conduct testing for various work activities. The following chart indicates the items which will require geotechnical testing.

<u>NO.</u>	<u>ITEM</u>	<u>GEOTECHNICAL TESTING</u>
1.	Installation of Class 2 Base material beneath the New Headworks Solids Container structure.	Compaction Testing
2.	Installation of Class 2 Base material beneath the New Sludge Holding Tank Air Blower slab.	Compaction Testing
3.	Installation of Sand Fill material beneath the New gravel fill for the Secondary Clarifier.	Compaction Testing
4.	Installation of Sand Fill material beneath the New gravel surface fill for the Headworks Facility.	Compaction Testing
5.	Installation of New P.C.C. Wall around Secondary Clarifier No. 1	Strength Testing
6.	Repair of the existing Headworks Facility Exterior P.C.C. Wall	Strength Testing
7.	Installation of New P.C.C. Headworks Solids Container structure.	Strength Testing
8.	Installation of New P.C.C. Sludge Holding Tank Air Blower Slab	Strength Testing

28. TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

01090	REFERENCE STANDARDS
01505	MOBILIZATION
01520	TEMPORARY FACILITIES
01530	PROTECTION OF EXISTING FACILITIES
01550	SITE ACCESS AND STORAGE
01560	PROJECT ENVIRONMENTAL CONTROLS
01600	MATERIALS AND EQUIPMENT
01660	MECHANICAL EQUIPMENT - INSTALLATION AND START-UP
01700	PROJECT CLOSEOUT
01730	OPERATION AND MAINTENANCE MANUALS
01783	AS-BUILTS

DIVISION 2 - SITEWORK

02200	EARTHWORK
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DIVISION 3 - CONCRETE

03100	CONCRETE FORMWORK
03200	REINFORCEMENT STEEL
03300	CAST-IN-PLACE CONCRETE
03315	GROUT
03730	CONCRETE REHABILITATION

DIVISION 11 - EQUIPMENT

11100 GRIT CLASSIFIER

DIVISION 15 - MECHANICAL

15050 BASIC MECHANICAL MATERIALS AND
METHODS

15140 SUPPORTS AND ANCHORS

15141 PROCESS PIPE AND FITTINGS

15142 STAINLESS STEEL PROCESS PIPE AND
FITTINGS

15615 VALVES

SECTION 01090 - REFERENCE STANDARDS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Whenever in these Specifications references are made to published specifications, codes, standards or other requirements, it shall be understood that when no date is specified, only the latest published specifications, standards or requirements of the respective issuing agencies, as of the date that the Work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the drawings shall be waived because of any provision of, or omission from, said standards or requirements.

1.02 REFERENCE SPECIFICATIONS, CODE AND STANDARDS

- A. All work specified herein shall conform to or exceed the requirements of the referenced specifications, codes and standards to the extent that the provisions of such documents are not in conflict with the requirements of these Specifications.
- B. References herein to "Building Code" or UBC shall mean the Uniform Building Code of the International Conference of Building Officials (ICBO). The latest edition of the code, as of the date of award, as approved and adopted by the agency having jurisdiction, including all addenda, modifications, amendments or other lawful changes thereto, shall apply to the Work.
- C. References herein to American Water Works Association or AWWA shall comply with the latest edition of the code, as of the date of award.
- D. In case of conflict between codes, reference standards, drawings and other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the Engineer for clarification and directions prior to ordering or providing any materials or labor. The contractor shall bid the most stringent requirements.
- E. Applicable Standard Specifications: The Contractor shall construct the Work specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards and specifications listed herein;

except, that wherever references to “Standard Specifications” are made, the provisions therein for measurement and payment shall not apply.

- F. References herein to “OSHA Regulations for Construction” shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- G. References herein to “OSHA Standards” shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- I. References in the Contract Documents to “Standard Specifications” shall mean the Greenbook, formally known as the “Standard Specifications for Public Works Construction” as published by the American Public Works Association, including all current supplements, addenda and revisions thereof, latest edition.

END OF SECTION 01090

SECTION 01505 - MOBILIZATION

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Mobilization shall include obtaining all permits; moving plant equipment on-site; furnishing and erecting plants, temporary buildings and other construction facilities; all as required for the proper performance and completion of the Work. Mobilization shall include, but not be limited to, the following principal items:
1. Moving on to the site, Contractor's and subcontractor's equipment and materials required for first month operations.
 2. Installing temporary construction power, wiring and lighting facilities.
 3. Establishing fire protection equipment and instructing designated personnel in the operation of such apparatus.
 4. Providing all on-site Contractor communication facilities.
 5. Providing on-site Contractor's sanitary facilities.
 6. Arranging and setting up the Contractor's work and storage yard.
 7. Obtaining all required permits.
 8. Posting all OSHA required notices and establishment of safety programs.
 9. Have Contractor's superintendent at the Site full time.
 10. Install Project Sign, by the Special Conditions.
 11. Proof of Permits, Freight and similar expenses.

1.02 PAYMENT FOR MOBILIZATION

- A. Payment for Mobilization, as noted in the Proposal Forms and approved Schedule of Values, shall not be released to the Contractor unless all items in Paragraph "A" above have been satisfied.

END OF SECTION 01505

SECTION 01520 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

The Owner shall bear no costs of temporary facilities, unless noted otherwise.

It shall be the Contractor's responsibility to provide equipment that is adequate for the performance of the Work under this Contract within the time specified. All equipment shall be kept in satisfactory operating condition, shall be capable of safely and efficiently performing the required Work and shall be subject to inspection and approval by the Owner's representative at any time within the duration of the Contract. All work hereunder shall conform to the applicable requirements of the OSHA Standards for Construction.

1.02 POWER AND LIGHTING

The Contractor shall provide temporary electric power as necessary for the execution of the Work, including that required by all Subcontractors. Contractor shall make the necessary arrangements with utility purveyor to include all permits, applications and fees, and shall bear all costs for these temporary services and shall furnish and install all necessary transformers, metering facilities and distribution centers from branch circuits as may be required.

The Contractor shall provide lighting and outlets in temporary structures throughout the Project as may be required for safety, proper performance and inspection of the Work. If operations are performed during hours of darkness, or if natural lighting is deemed insufficient by the Owner, the Contractor shall provide adequate floodlights, clusters and spot illumination. The use of permanently installed lighting fixtures, lamps and tubes for work shall not be permitted except by special permission of the Owner. The Contractor shall make arrangements with Subcontractors for electrical services and lighting as may be necessary in the performance of their work.

1.03 WATER SUPPLY

- A. General: The Contractor shall provide an adequate supply of water of a quality suitable for all domestic and construction purposes. Utility or plant effluent water may be used for hydraulic structures and pipeline testing as approved, in writing, by the Owner.

- B. Drinking Water: All drinking water on the site during construction shall be furnished by the Contractor and shall be bottled water or water furnished in approved dispensers. Notices shall be posted conspicuously throughout the site warning the Contractor's personnel that piped water for construction purposes may be contaminated and is not for human consumption.
- C. Water Connections: The Contractor shall not make connection to, or draw water from, any fire hydrant or pipeline without first obtaining permission, in writing, of the authority having jurisdiction over the use of said fire hydrant or pipeline and from the agency owning the water system. For each such connection made the Contractor shall first attach to the fire hydrant or pipeline a valve, backflow preventer and a meter, if required by the said authority, of a size and type acceptable to said authority and agency.
- D. Removal of Water Connections: Before final acceptance of the Work all temporary water connections and piping installed by the Contractor shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of the Owner and to the agency owning the affected utility.
- E. Fire Protection: The Contractor shall provide fire extinguishers and other fire protection equipment to adequately protect new and existing facilities and temporary facilities against damage by fire. Hose connections and hose, water casks, chemical equipment or other sufficient means shall be provided for fighting fires in the new, existing and temporary structures and other portions of the Work and responsible persons shall be designated and instructed in the operation of such fire apparatus so as to prevent or minimize the hazard of fire. The Contractor's fire protection program shall conform to the requirements of the OSHA Standards for Construction. The Contractor shall employ every reasonable means to prevent the hazard of fire.

1.04 SANITATION

- A. Toilet Facilities: Portable chemical toilet facilities shall be provided wherever needed for the use of employees. Toilets at Site(s) shall conform to the requirements of Subpart "D", Section 1926.51 of the OSHA Standards for Construction. The Owner's toilet facilities shall not be used by the Contractor or subcontractors. Two (2) toilet facilities shall be positioned at the project site. One (1) toilet facility shall be for men. The other toilet facility shall be for women.

Toilet facilities shall be relocated as required and be maintained close to daily work activities. The toilet facilities shall be cleaned and serviced on a weekly basis.

- B. Sanitary and Other Organic Wastes: The Contractor shall establish adequate and regular collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of in a manner satisfactory to the Owner and in accordance with all laws and regulations pertaining thereto. Contractor may install temporary piping for toilet facilities to discharge into the incoming sewer.

1.05 CONTRACTOR PARKING

The Contractor shall not park his equipment, nor allow his personnel to park, in any area except those specifically designated by the Owner.

1.06 TEMPORARY LIVING QUARTERS

Temporary living quarters shall not be allowed on the Site or on publicly owned properties. In addition, all local zoning codes for the area in question shall be strictly adhered to.

1.07 REMOVAL OF TEMPORARY CONSTRUCTION

The Contractor shall remove temporary office facilities, toilets, storage sheds and other temporary construction from the site as soon as, in Owner's opinion, the progress of Work permits. Contractor shall recondition and restore those portions of the site occupied by the same to a condition equal to or better than it was prior to construction.

END OF SECTION 01520

SECTION 01530 - PROTECTION OF EXISTING FACILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall protect all existing utilities, piping and improvements not designated for removal and shall restore damaged or temporarily relocated utilities, piping and improvements to a condition equal to or better than they were prior to such damage or temporary relocation.
- B. The Contractor shall verify the exact locations and depths of all underground piping and utilities shown and not shown and shall make exploratory excavations of all piping and utilities that may interfere with the Work. It shall be the Contractor's responsibility to ascertain the actual location of all existing utilities, piping and other improvements that will be encountered during construction operations and verify that such utilities or other improvements are adequately protected from damage due to such operations.
- C. Maintaining in Service: All pipelines, electrical, power, telephone communication cables, gas and water mains shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Engineer are made with the Owner. Where the proper completion of the Work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement the Contractor, after necessary scheduling and approval, shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the Engineer and the Owner of the facility. In all cases of such temporary removal or relocation, the Work shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement to a new condition meeting the specification requirements.
- D. All repairs to a damaged utility or improvement are subject to inspection and approval by a Resident Project Representative before being concealed by backfill or other work.

1.02 RIGHTS-OF-WAY

- A. The Contractor shall refrain from commencing work or entering upon the rights-of-way of any oil, gas, sewer or water pipeline; any telephone or electric transmission line; any fence; or any other structure, until notified that the Owner has secured authority to do

so. After authority has been obtained, the Contractor shall give the governing utility proper advanced notice of its intention to begin work.

1.03 RESTORATION OF PAVEMENT AND SIDEWALKS

- A. All paved areas and sidewalks not designated for replacement, cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas unless otherwise noted. All sidewalks, curbs and gutters and pavements which are subject to partial removal shall be neatly saw-cut in straight lines. The sidewalk, curb and gutter and pavement shall be constructed in accordance with the Standard Details and Plans of the governing agency.

1.04 UNDERGROUND UTILITIES NOT SHOWN OR INDICATED

- A. If the Contractor damages existing utilities, piping or improvements that are not illustrated or the location of which was not made known to the Contractor prior to excavation and the damage was not due to failure of the Contractor to exercise reasonable care the Contractor shall immediately notify the Owner or appointed representative. If directed by the Owner or appointed representative repairs shall be made by the Contractor under the provisions for changes and extra work contained in Articles 10, 11 and 13 of the Standard General Conditions.

1.05 NOTIFICATION BY THE CONTRACTOR

- A. Prior to any excavation in the vicinity of any existing underground facilities, including water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications or telecommunication cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way, the Contractor shall notify the respective utility purveyors or agencies or owners responsible for such facilities not less than three (3) working days prior to excavation so that a representative is afforded the opportunity to be present during the excavation work.

END OF SECTION 01530

SECTION 01550 - SITE ACCESS AND STORAGE

PART 1 - GENERAL

1.01 HIGHWAY AND STREET LIMITATIONS

- A. The Contractor shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits and other limitations affecting transportation and ingress and egress to the Site. It shall be the Contractor's responsibility to construct and maintain any haul roads required for its construction operations or define any alternate routes to the Site due to roadway or bridge restrictions.

- B. Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street, utility right-of-way or the Site during the performance of the Work hereunder. The Contractor shall conduct its operations so as not to interfere unnecessarily with the authorized work of utility companies, other agencies, or the Owner's plant personnel. No street or access shall be closed without first obtaining permission of the Owner or proper governmental authority. Where excavation is being performed in primary streets or highways one (1) lane in each direction shall be kept open to traffic at all times unless otherwise provided or shown by the Contract Documents. Fire hydrants on or adjacent to the Work shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the Contractor to assure the use of sidewalks, access routes and the proper functioning of all gutters, sewer inlets and other drainage facilities.

1.02 CONTRACTOR'S WORK AND STAGING AREA

- A. The Owner will designate and arrange, for the Contractor's use, a portion(s) of the property on or adjacent to the Site for its exclusive use during the term of the Contract. The area is designated for an office, storage and shop area for construction operations as applicable to this Contract. Contractor shall be solely responsible for the security of its tools, supplies and equipment at the site. The Contractor shall coordinate the location of the staging area with the Owner.

END OF SECTION 01550

SITE ACCESS AND STORAGE

01550-2

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SECTION 01560 - PROJECT ENVIRONMENTAL CONTROLS

PART 1 – GENERAL

Environmental Documents have not been prepared for this Project. The Project was exempted by California Environmental Quality Act (CEQA).

The Contractor is responsible for exercising their Best Management Practices (BMPs) during the duration of construction on the Project Site.

1.01 EXPLOSIVES AND BLASTING

- A. The use or storage of explosives on the Work or site will not be permitted.

1.02 DUST ABATEMENT AND RUBBISH CONTROL

- A. The Contractor shall provide under the Contract all necessary measures to prevent its operation from producing dust in amounts damaging to property or causing a nuisance to Owner's plant personnel and operations or to persons living in or occupying buildings in the vicinity. The Contractor shall be responsible for damage resulting from any dust originating from its operations. The dust abatement measures shall be continued throughout the length of the Contract.
- B. During the progress of the Work the Contractor shall keep the Site and other areas used by it in a neat and clean condition and free from any accumulation of rubbish and waste materials. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the Site, and shall establish regular intervals of collection and disposal of such materials and waste. The Contractor shall also keep its haul roads free from dirt, rubbish and unnecessary obstructions resulting from its operations. Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal and in conformance with all applicable Safety Laws and Health Standards for Construction. The Owner's dumpster shall not be used by the Contractor.
- C. Contractor shall implement regulations set by CAL EPA and the San Diego County Air Pollution Control District for all work activities related to this Project.

1.03 CHEMICALS

- A. All chemicals used during project construction or furnished for project operation, whether soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval for use by the local jurisdictional agency. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

1.04 CULTURAL RESOURCES

- A. The Contractor's attention is directed to the National Historic Preservation Act of 1966 (16 U.S.C. 470) and 36 CFR 800 which provides for the preservation of potential historical, architectural, archeological or cultural resources (hereinafter called "cultural resources"). If potential cultural resources are discovered during subsurface excavations at the site of construction, the following procedures shall be instituted:
 - 1. The Contractor shall immediately notify the Owner or representative.
 - 2. The Owner or representative will issue a Field Order directing the Contractor to cease all construction operations at the location of such potential cultural resources find.
 - 3. Such Field Order shall be effective until such time as a qualified archeologist can be called to assess the value of these potential cultural resources and make recommendations to the California State Historical Society Archeologist.
- B. If the archeologist determines that the potential find is a bona fide cultural resource, at the direction of the California State Historical Society Archeologist, the Contractor shall suspend work at the location of the find under the provisions for changes contained in Articles 4, 9 and 14 of the Standard General Conditions and Supplementary Conditions 4.04.

END OF SECTION 01560

SECTION 01600 - MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 QUALITY ASSURANCE

- A. To the greatest extent possible for each unit of work, the Contractor shall provide products, materials or equipment from a single source.
- B. Where more than one choice is available as options for Contractor's selection of a product, material or equipment, the Contractor shall select an option which is compatible with other products, materials or equipment already selected.

1.02 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. The Contractor shall transport, deliver, handle and store products in accordance with supplier's written recommendations and by methods and means which will prevent damage, deterioration and loss including theft. Delivery schedules shall be coordinated to minimize long-term storage of products at the Site and overcrowding of construction spaces. The Contractor shall provide installation coordination to ensure minimum storage times for products recognized to be flammable, hazardous or easily damaged.
- B. Products shall be delivered in a dry, undamaged condition in the supplier's unopened packaging. The Owner and Owner's Representative reserve the right to reject all damaged products, materials and equipment. Rejected products shall be immediately removed from the Site.
- C. Products, materials and equipment shall be stored in accordance with the manufacturer's written instructions, with seals and labels intact and legible. Motors, electrical gear, mechanical equipment with open bearings or moving parts or any product sensitive to the environment shall be stored in weather-tight enclosures with necessary temperature and humidity ranges maintained within the manufacturer's instructions.
- D. Fabricated structural components shall be stored on supports above ground and in a manner to prevent accumulation of water and warping. Products subject to deterioration from atmospheric conditions shall be covered in a manner that will provide adequate ventilation to avoid condensation.

- E. Products, materials and equipment not stored in a manner that will insure the maintaining of a new condition will be rejected by the Owner's Representative. Such rejected products, materials and equipment shall be immediately removed from the Site.

END OF SECTION 01600

**SECTION 01660 - MECHANICAL EQUIPMENT -
INSTALLATION AND START-UP**

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section contains general information required for the installation of mechanical equipment as specified within the various individual specifications. The plans and/or performance specifications describe equipment and general layout based on certain commercially available equipment. It shall be the responsibility of the Contractor to ascertain the compatibility of all equipment and utilization of available space based on the Project Plans and/or shop drawings and intent of these Contract Documents.

- B.. Included shall be all supervision, labor, materials, tools, equipment and services as required for the furnishing, installation, testing and operation of equipment including the services of manufacturer service engineers, receiving, unloading, storage, protection, installation and complete erection of all mechanical equipment required in these Contract Documents.

- C. Installation shall include, but not be limited to placing, core drilling, shimming, anchoring, grouting, cleaning, painting, lubricating, assembling, testing and adjusting of all mechanical equipment. Installation shall also include providing all required miscellaneous parts and appurtenances.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 15380 – Motors

1.03 DESCRIPTION

A. General:

- 1. The Contractor shall be liable for all damage to the equipment which is to be furnished and installed under this Contract, as well as for any damage to the building structures, existing equipment or other property, real or personal, resulting from the movement of equipment or installation work. This liability shall continue until the installed equipment is accepted by the Owner.

2. The Contractor shall cause the equipment to be furnished under this division to be the product of firms regularly engaged in the design and manufacture of the type of item specified, possessing the required technical competence, skill, resources and ability to complete the work specified herein with the requisite degree of quality and in a timely and efficient manner. The Contractor shall be prepared to adequately document the qualification of the manufacturers nominated to provide equipment specified under this division. All documentation shall be submitted to the Owner or Owner's Representative for review and acceptance prior to design, fabrication and shipment of any component specified herein. Nothing contained within these provisions shall be construed as relieving the Contractor of his responsibility for any portion of the work covered by this division.

B. Arrangement:

1. This arrangement of equipment as described by the specifications is based upon the best information available to the Owner at the time of the preparation of the concept drawings and specifications and is not intended to show exact dimensions peculiar to any specific manufacturer unless otherwise shown or specified. The Project Plans are, in part, diagrammatic, and, therefore, it is to be expected that the installation of the illustrated equipment, if any, conform adequately to actual equipment installation requirements. The Owner or Owner's Representative will review all equipment shop drawings, and installations to assure compliance with these requirements. It is to be anticipated that structural supports, equipment pads, foundations, connected piping and valves shown, in part or in whole, may have to be altered in order to accommodate the equipment furnished. Equipment pads shall be increased or reduced in size to properly suit the actual equipment. No additional payment will be made for such changes. All necessary calculations and drawings shall be submitted to the Owner or representative prior to beginning of the construction phase.

1.04 QUALITY ASSURANCE

- A. Equipment and appurtenances shall be designed in conformity with the Project Plans and performance specifications. Equipment shall be constructed of materials for the conditions of exposure and of

such strength to withstand all stress which may occur during testing, installation, all conditions of operation, including start-up, shut-down and power failure.

- B. All equipment shall be installed true and level and to the locations shown on the Project Plans. All work shall be performed to the satisfaction of the Owner. Precision gauges and levels shall be used in setting all equipment.
- C. The Contractor shall be responsible for installation of the equipment in a manner consistent with the requirements of performance warranties and equipment workmanship of the manufacturer.
- D. Machinery parts shall conform exactly to the dimensions shown on the Shop Drawings. The corresponding parts of identical machines shall be made interchangeable. Clearance shall be provided for repairs, inspection and adjustment.
- E. Exposed surfaces shall be finished in appearance. All exposed welds shall be ground smooth at the corners for personnel protection.
- F. All machinery and equipment shall comply in all respects with the provisions of the Occupational Safety and Health Act of 1970, and other applicable Federal, State and local laws and regulations.

PART 2 - PRODUCTS

2.01 ANCHORS AND SUPPORTS

- A. The Contractor shall furnish, install and protect all guides, bearing plates, anchor and attachment bolts, and all other appurtenances required for the installation of equipment. Anchors and supports shall be of ample size and strength for the purpose intended and shall be approved by the Owner or Representative.
- B. Anchor bolts shall be furnished and set in concrete foundations where required. All anchor bolts, studs and fasteners shall be Class 316 stainless steel.
- C. Anchor bolts, flange bolts, and other fasteners using nuts and threaded bolts shall have no more than 1 ½ to 2 threads extending beyond the nut when fully tightened.

- D. The Contractor shall obtain and use shop drawings and suitable templates when required for installation of equipment.

2.02 LUBRICATION

- A. The Contractor shall thoroughly lubricate all equipment in accordance with the equipment manufacturer's instructions. Lubricating oils and greases shall be of the type and viscosity recommended by the equipment manufacturer.
- B. All lubricants shall be furnished with flushing oils as recommended by the manufacturer. This includes, but is not limited to, all gearing and bearings, regardless of whether they have been shipped with or without oil soluble protective coatings.
- C. Following flushing, oil lubricating systems shall be filled with "run-in" oil as recommended by the equipment manufacturer. The equipment shall be "run-in" at the no load condition for a minimum of two (2) hours. Following "run-in" and inspection, the equipment is to be drained and flushed again with flushing oil and refilled with lubricant as recommended by the manufacturer.
- D. The grease fittings on all mechanical equipment shall be such that they can be serviced with a single type of grease gun. Grease fittings shall be standard zirt type.
- E. Where locally mounted grease fittings would be difficult to service, the fitting shall be extended by adequately sized 316 stainless steel tubing to a point that shall provide accessibility for normal maintenance. Such points shall be located and installed as per the Owner or Representative's directive.

2.03 PROTECTIVE COATING AND PAINTING

- A. All equipment and materials shall be shop painted. Particular attention shall be directed to wetted surfaces and other areas exposed to corrosive, extreme temperature or other hazardous environments.
- B. Painting shall be in strict accordance with the Project Plans or Section 09800. If not indicated on the Project Plans or there is no Section 09800, coating shall be as follows:
 - 1. Ferrous Metals: Exterior Exposure (Non-submerged and non-buried)

- a. Surface preparation: SSPC-SP 6.
 - b. Product: Devoe:
 - (1) Primer: Bar Rust 231 - 2 coats (3-5 mils DFT)
 - (2) Intermediate: Devran 224 HS (4-5 mils DFT)
 - (3) Finish: Devthane 378H - 1 coat (3-5 mils DFT)or approved equal.
 - c. Color to be selected by the Owner.
2. All Piping and Valves that have a factory epoxy coating shall receive a final coating in the field with a product compatible with the existing coating.
- a. Color to be selected by the Owner.
- C. All machined surfaces and shafting shall be cleaned and protected from corrosion by the proper type and amount of coating necessary to assure a minimum protection for two (2) years after shipment.
- D. Oil lubricated gearing, bearings, and other lubricated components shall be shipped with an oil soluble protective coating as recommended by the manufacturer. The coating shall be selected to provide protection for two (2) years.
- E. Motors, reducers and electric controls shall have the standard factory finish prior to delivery except where specific exception is noted in the individual equipment specifications.
- F. Provide two (2) gallons of paint compatible with the equipment finish coat for field touch-up and provide blend numbers for primer coat and finish coat paints.

2.04 COUPLINGS

- A. Unless otherwise specified, mechanical equipment with a driver greater than ½ horsepower, and where the input shaft of a driven unit is directly connected to the output shaft of the drive, shall have its two shafts connected by a flexible coupling which can accommodate angular misalignment, parallel misalignment and end float, and which cushions shock loads and dampens torsional vibrations. The flexible member shall consist of a tire with synthetic

tension members bonded together in rubber. The flexible member shall be attached to flanges by means of clamping rings and cap screws, and the flanges shall be attached to the sub shaft by means of taperlock bushings which shall give the equivalent of a shrunk-on fit. There shall be no metal-to-metal contact between the driver and the driven unit.

- B. Coupling sizes shall be as recommended by the manufacturer for the specific application, considering horsepower, speed of rotation, and type of service, and shall be installed as recommended by the manufacturer.

2.05 GUARDS

- A. All exposed moving parts shall be provided with guards in accordance with the requirements of CAL/OSHA. Guards shall be fabricated of 14 gage steel, ½-13-15 expanded metal screen to provide visual inspection of moving parts without removal of the guard. Guards shall be galvanized after fabrication and shall be designed to be readily removable to facilitate maintenance of moving parts. Reinforced holes shall be provided.

2.06 NAMEPLATES

- A. A nameplate shall be provided on all items of equipment and shall contain approved equipment name or abbreviation and equipment number. Equipment nameplates shall be engraved or stamped on stainless steel and fastened to the equipment in an accessible location with No. 4 or larger oval head stainless steel screws or drive pins. Nameplates for motor-driven equipment shall include capacity, head, horsepower, bearing data, model number and serial number of pump, blower, compressor and motor. The main sewage pump nameplates shall also include the impeller diameter.

2.07 TOOLS AND ACCESSORIES

- A. The Contractor shall supply one (1) complete set of any special wrenches or other special tools necessary for the assembly, adjustment, and dismantling of the equipment. Special tools shall include any type of tool that has been specifically made for use on an item of equipment for assembly, disassembly, repair, and maintenance or is not available in current Snap-On Catalogue or Proto Professional Tools Full-Line Catalogue. When special tools are provided, they shall be marked or tagged, and a list of such tools shall be included with the maintenance and operation manuals describing the use of each marked tool. All wrenches and

spanners shall be of best quality, hardened steel forgings with bright, finished heads and with work faces dressed to fit nuts. Each set of tools shall be neatly mounted in a toolbox of suitable design provided with a hinged cover.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The Contractor shall cause each item of equipment provided as a part of the Contract Documents to be installed, aligned and tested by skilled workmen to the tolerances recommended by the equipment manufacturer. In addition, the equipment shall be installed, aligned and tested under the direction of installation engineers who have been factory trained by the equipment manufacturer. Upon completion of the Work and as a condition precedent to final acceptance, the Contractor shall furnish written certification from each equipment manufacturer that each item has been installed, aligned and tested correctly and that the installation meets all the manufacturer's requirements for efficient, trouble-free operation. This provision, however, shall not be construed as relieving the Contractor of his overall responsibility for the Work.

3.02 NOISE REQUIREMENTS

- A. All equipment specified shall be tested for noise generation after installation. When tested, equipment shall include the complete driver and driven equipment. Three (3) certified copies of the test shall be submitted to the Owner for approval prior to final acceptance.

3.03 SHOP INSPECTION AND SHOP TESTING

- A. The Owner shall be granted reasonable access to the production and shop test areas of the equipment manufacturer's facility during manufacturing and testing.
- B. The Contractor shall notify the Owner in writing, at least ten (10) working days prior to commencement of shop tests, of the time and place of all shop tests.
- C. Inspection by the Owner will not relieve the Contractor of his responsibility for workmanship, materials and Project Plans and Specification requirements.

- D. Manufacturer's standard test procedures shall be required and the manufacturer shall demonstrate that equipment meets all the requirements of these Project Plans and Specifications.

3.04 SHIPPING AND IDENTIFICATION

- A. All shipments shall be "tagged" by the Contractor with "wired-on" metal or plastic tag clearly stenciled or lettered with paint or waterproof ink. The information on the tags and cartons shall include Contractor's order number, purchase order number, manufacturer's number, and equipment number. Any expense incurred by the Owner due to the Contractor's failure to do so will be backcharged or deducted from his Contract.
- B. Each piece of equipment shall be provided with a substantial stainless steel nameplate, securely fastened in a conspicuous location and clearly inscribed with the manufacturer's name, year of manufacturer, serial number, principal rating data and equipment item number.
- C. The equipment covered in these Specifications shall be fabricated in the minimum number of sub-assemblies necessary for transportation. Small components or assemblies shall be adequately boxed or crated to prevent damage during shipment.
- D. Each assembly or package shall be identified with a durable shipping tag securely attached and plainly marked with the Contractor's order number, manufacturer's purchase order number and equipment number.
- E. All openings shall be covered with plywood, plastic or wood plugs or shields to prevent debris from entering the assemblies. Each assembly or sub-assembly shall have lifting lugs to facilitate erection and subsequent removal when necessary.

3.05 OPERATION AND MAINTENANCE MANUALS

- A. Operation and Maintenance manuals shall be furnished in accordance with Section 01730.

3.06 OPERATION AND MAINTENANCE INSTRUCTION

- A. The Contractor shall provide instruction time in accordance with the detailed equipment specifications, after the equipment has been accepted by the Owner. The time shall be used to instruct the Owner's personnel in the proper operation and maintenance of the

equipment. The manufacturer shall provide technical personnel familiar with the operation and maintenance of the equipment in making this presentation.

- B. Training shall consist of on-site operation training, classroom training, operational, safety and emergency drills.

3.07 INSTALLATION OF EQUIPMENT

- A. The Contractor's work procedure shall conform to the manufacturer's installation instructions unless expressly directed otherwise by the Owner.
- B. Equipment shall be erected level and plumb on the existing foundations and supports at the locations and elevations shown on the Plans, unless otherwise directed, in writing, by the Owner and Resident Project Representative during installation. Any additional pads, plates and other appurtenances necessary for the installation shall be provided by the Contractor.
- C. The equipment shall be brought to proper level with leveling nuts. After the machine has been leveled and aligned, the nuts on the anchor bolts shall be tightened to anchor the machine firmly into place against the leveling nuts.
- D. The grout shall be installed in accordance with the manufacturer's instructions.
- E. All equipment shall be installed in such a manner as to provide access for routine maintenance and lubrication as specified in Section 2.02 of this specification.
- F. Equipment of a portable nature which requires no installation shall be delivered to a location designated by the Owner.

3.08 MECHANICAL START-UP

- A. Once the equipment has been installed, complete with all auxiliary and support systems, and is ready for operation, the Contractor shall mechanically check out the equipment to verify that the equipment functions correctly under "non-process" conditions. The equipment shall be fine-tuned, adjusted, water tested, where applicable, and completely checked out before the equipment and support systems are considered ready for process start-up.

- B. The Contractor will be responsible for coordinating this effort and providing all support services and facilities necessary for this work effort.
- C. The equipment will not be considered ready for process start-up until the Owner is satisfied that the equipment has been satisfactorily checked out and successfully passed leakage and non-process test runs and appropriate training has been completed per the detailed equipment specifications.

3.09 FIELD SERVICE

It is understood that the Contractor and manufacturer share a joint responsibility in this Work. The Contractor shall provide the Manufacturer's qualified field representative and supporting personnel as required for the equipment furnished and installed under this Contract to perform the following:

- A. Assistance during equipment installation shall be provided to align the equipment or check the alignment of pre-aligned equipment prior to making connections to or anchoring of the equipment.
- B. Inspection during equipment installation work shall be provided to determine compliance with equipment erection methods and procedures recommended by the manufacturer.
- C. Conduct the process start-up necessary to operate, adjust, calibrate and tune the equipment and systems into operating service in accordance with the design criteria described in the Project Plans and/or Specifications.
- D. Conduct performance tests to demonstrate compliance with design criteria and performance guarantee set forth in the Project Plans and/or Specifications.

3.10 PROCESS START-UP

- A. Once the equipment has been considered ready for process start-up and the support system can deliver the process material, the Contractor shall start up the equipment under process conditions and conduct performance tests to verify compliance with the Specifications. The Contractor shall give the Owner forty-eight (48) hours written notice of his intent to start up equipment under process conditions and conduct performance testing.

- B. The Contractor shall provide the necessary supervision and technical personnel and services required to perform the work. The Owner shall coordinate this phase of the work with the Contractor and provide all necessary support services and facilities to assist the Contractor in performing the work.
- C. The equipment shall be considered ready for a performance test only after the Contractor has demonstrated to the Owner that the equipment can operate continuously, without mechanical interruption under the process flow conditions for up to three (3) days, or such time as may be mutually agreeable to the Owner and Contractor.
- D. After it has been determined that the equipment will operate satisfactorily under process conditions, the performance test shall be made by the Contractor to verify that the equipment can meet the requirements outlined in the Specifications. The performance test shall be based on maintaining the design requirements for a time period mutually agreeable to the Owner and the Contractor, or such period as is stipulated in the General Provisions.

3.11 OWNER FURNISHED EQUIPMENT

- A. The Contractor shall notify the Owner when Owner furnished equipment is completely installed in accordance with the Owner furnished manufacturer's instruction and requirements of the Contract Documents and ready for operation testing. The Owner or Representative will schedule the manufacturer's representative to visit the site of the Work and inspect, check adjust if necessary and approve the equipment installation. If the manufacturer's representative cannot complete the testing and startup services due to the Contractor's negligence in installing the equipment, the Contractor shall be responsible for the costs of the service representatives' revisit to the site of the Work.

3.12 PERFORMANCE TESTS

- A. Performance test procedures shall be prepared by the Contractor and approved (in writing) by the Owner a minimum of fourteen (14) days before performance tests are conducted.
- B. Costs of all inspections, field service, mechanical start-up, run-in work, process start-up and performance tests shall be borne by the Contractor and shall be included in the total price bid for the Work.

- C. The Contractor shall also agree to repay the Owner installation costs for any rejected equipment. The installation costs will be derived by the Owner based on actual costs charged for the installation of the equipment.

3.13 ACCEPTANCE OF EQUIPMENT BY THE OWNER

After all the conditions of the Performance Specifications have been satisfied, the Owner will designate in writing that the equipment is accepted, and at such time the Owner will be responsible for all further maintenance and operation of same. The warranty period for all equipment shall start on the date of final acceptance by the Owner.

END OF SECTION 01660

SECTION 01700 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 FINAL CLEANUP

- A. The Contractor shall promptly remove from the vicinity of the completed work, all rubbish, unused materials, concrete forms, construction equipment and temporary structures and facilities used during construction. Final acceptance of the Work by the Owner will be withheld until the Contractor has satisfactorily complied with the requirements for final cleanup of the site.

1.02 FINAL SUBMITTALS

- A. The Contractor, prior to requesting final payment shall obtain and submit the following items to the Owner's representative for transmittal to the Owner:
1. Written guarantees, where required.
 2. Operating manuals, technical manuals and instructions. The Contractor's attention is directed to the condition that one percent (1%) of the contract price will be deducted from any monies due the Contractor as progress payments if at the seventy-five percent (75%) construction completion point the approved technical manuals have not been submitted in accordance with the Special Conditions. The aforementioned amount will be retained by the Owner as the agreed estimated value of the approved technical manuals. Any such retention of money for failure to submit the approved technical manuals on or before the seventy-five percent (75%) construction completion point shall be in addition to the retention of any payments due to the Contractor as specified in Article 13 of the Standard General Conditions and the Agreement.
 3. Manufacturers representatives' installation, testing and startup report.
 4. Keying.
 5. Maintenance stock items, spare parts and special tools.
 6. Completed As-Builts.

7. Certificates of inspection and acceptance by local governing agencies having jurisdiction.
8. Releases from all parties who are entitled to claims against the subject project, property or improvement pursuant to the provisions of law.
9. Extension of Performance Bond in accordance with Article 6.01A of the Standard General Conditions, if applicable.

1.05 MAINTENANCE AND GUARANTEE

- A. The Contractor shall provide a bond to comply with the guarantee requirements contained in Article 6.01A of the Standard General Conditions.
- B. The Contractor shall make all repairs and replacements promptly upon receipt of written order from the Owner. If the Contractor fails to make such repairs or replacements promptly the Owner reserves the right to do the Work and the Contractor and his surety shall be liable to the Owner for the cost thereof. Replacement of native material or aggregate fill, backfill or resurfacing where it has settled below the required finish elevations shall be considered as part of such required repair work.

END OF SECTION 01700

SECTION 01730 - OPERATION AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor shall furnish to the Owner's representative six (6) identical sets of operation, maintenance and technical manuals. The Contractor shall include in the manuals for each item of mechanical, electrical and instrumentation equipment the following:

1. Complete operating instructions, including recommended troubleshooting and start-up procedures; tabulation of proper settings for all pressure relief valves, pressure switches and other related equipment protection devices; detailed test procedures to determine performance efficiency of equipment; list of all electrical relay settings including alarm and contact settings.
2. Preventive maintenance procedures and schedules, including required lubricants, filters, adjustments and special tools.
3. Parts lists, by generic title and identification number, complete with exploded views of each assembly. Spare parts information shall be included for each mechanical, electrical and instrumentation equipment. The spare parts list shall include the current list price of each spare part. The spare parts list shall be limited to those spare parts which each manufacturer recommends be maintained by the Owner in inventory at the plant site. Each manufacturer or supplier shall indicate the name, address and telephone number of its nearest outlet for spare parts to facilitate the Owner in ordering.
4. Disassembly and reassembly instructions, including required special tools.
5. Record drawings including diagrams and schematics as required under the electrical and instrumentation portions of these specifications.

1.02 OPERATIONS AND MAINTENANCE MANUALS

A. General:

1. The “Operating and Maintenance Manual” is a bound compilation of drawings and data required for each project. These manuals, complete with drawings and data, shall be furnished to the Owner.
2. The Contractor has overall responsibility to obtain the necessary data from and compile the data as set forth in this specification, including items or equipment purchased by the Owner and delivered to the Contractor for installation.
3. The number of binders (or “volumes”) required for each individual project will depend on the amount of information to be catalogued.
4. All information included shall be legible and sufficiently marked to indicate the exact size, model, type, etc., of equipment furnished and installed.

B. Purpose: The Operating and Maintenance Manual is prepared to provide a ready reference to all important mechanical, electrical and instrumental equipment components installed at the project. It is also to provide the necessary operating and maintenance data for use by service personnel. It is also to provide information required for checking equipment performance or for planning of plant expansion or redesign.

C. Quantity and Preparation (Submit through Owner’s representative):

1. Operation and Maintenance Manuals shall be prepared for the project.
 - A. Three (3) sets to the Owner’s representative.
 - B. Three (3) sets to Owner.
2. The quantities of drawings, manufacturer’s literature, or other data required for these manuals are in addition to those otherwise required for normal distribution for approval during the construction period.

PART 2 - MATERIALS AND METHODS

2.01 PAGE SIZE

- A. All pages shall be standard 8-½ x 11 inches size or approximate multiples (preferably 11 x 17 inches) folded to 8-½ x 11-inch manila pockets, which shall have standard three-ring side punching for insertion in the binders. The equipment name, drawing description and number shall be written on the face of each manila pocket.

2.02 DRAWINGS

- A. All drawings larger than 8-½ x 11" shall be folded and inserted in individual 8-½" x 11" manila pockets, which shall have standard three-ring side punching for insertion in the binders. The equipment name, drawing description and number shall be written on the face of each manila pocket.

2.03 BINDERS

- A. Binders shall be Buckram binders with block lettering for sheet size 8-½ x 11 inches with 2" to 3-½" expandable metal capacity as required for the project. The number of binders, however, shall be based on not filling them beyond 4".
- B. The following information shall appear on the front cover and backbone:
 - 1. "Operation and Maintenance Manual"
 - 2. Project Name (Borrego Water District Wastewater Treatment Plant Rehabilitation Project) and volume number if more than one volume
 - 3. Owner's name
 - 4. Owner's representative's name
 - 5. General Contractor's name

Item 5 need not be printed on the backbone.

2.04 CONTENTS AND INDEXING

- A. Manuals shall contain descriptions of the plant systems in sufficient detail to adequately indicate the type of systems installed and the basic details of their operation.
- B. All purchased equipment data shall be used to designate the sections. Within each section additional indexing of component parts may be required.
- C. Operation and Maintenance Manuals shall contain to the fullest extent all possible information pertinent to the equipment. The arrangement and type of information to be filed shall be as follows:
 - 1. Copy of purchase order change (if any).
 - 2. Outline drawings, special construction details, "as built" electrical wiring and control diagrams for all major and supplementary systems.
 - 3. Manufacturer's test or calculated performance data and certified test curves.
 - 4. Installation, operating and maintenance instructions, including a complete parts list and sectional drawing with parts identification numbers. Mark with model, size and plan number.
 - 5. Manufacturer's brochure marked to indicate exact equipment purchased. Brochures on component parts supplied by a manufacturer with his equipment, but not manufactured directly by him, shall also be included.
 - 6. The serial numbers of each item of equipment installed are to be listed with the model numbers and plan symbols.
 - 7. Written warranties.
 - 8. Include a Table of Contents. The contents shall be divided with tabbed index dividers into the following suggested parts:
 - Part I Treatment Plant and System Descriptions
 - Part II Purchased Equipment Data
 - Part III Test Reports and Valve Charts

Part IV Start-Up and Operation

Part V Preventative Maintenance Recommendations

9. A copy of the approved submittals for each piece of equipment.
10. A copy of all testing, adjusting and balancing reports.
11. Wiring diagrams marked with model and size and plan symbol.
12. Operating and Maintenance Manuals data for Part I shall be obtained directly from the mechanical and electrical consultants. (All consultant preparation cost.)
13. The index shall contain the name and address of the manufacturer and, if different, where replacement and repair parts may be obtained.

2.05 EQUIPMENT SUMMARY DATA FORMS INFORMATION SHEET

Equipment Summary Data Forms are intended to provide the Maintenance Department with sufficient information to catalogue newly purchased equipment items installed at the project site. This information is used for inventory purposes as well as for equipment performance tracking purposes. Each item of equipment installed at the facility must be documented on Equipment Summary Data Form. Examples of the form are herein. Additional requirements regarding submittal format, quantities, etc, are found elsewhere in this Specification.

1. Equipment item (included industry-accepted nomenclature).
2. Manufacturer address, phone/fax numbers
3. Supplier address (if different than above), phone/fax numbers
4. Equipment serial and model numbers
5. Size
6. Capacity
7. Rated output

8. Drive motor data (as appropriate).

In addition, information specific to the item described shall be provided as indicated on the following form.

**EQUIPMENT SUMMARY
DATA FORM**

EQUIPMENT ITEM: _____

EQUIPMENT COST: _____

EQUIPMENT SUPPLIER: _____

COMPONENT INFORMATION:	
NAMEPLATE DATE:	MANUFACTURER:
EQUIPMENT MODEL NO.:	EQUIPMENT SERIAL NO.:
EQUIPMENT MODEL DESIGNATION:	TYPE:
SIZE:	RATED OUTPUT:
CAPACITY:	SERVICE:
COMPONENT INFORMATION: DRIVE MOTOR DATA	
MANUFACTURER:	
SERIAL NO.:	HORSEPOWER:
MODEL:	FRAME:
TYPE:	VOLTAGE:
ENCLOSURE:	AMPERAGE:
PHASE: HERTZ:	SERVICE FACTOR:
LUBRICATION REQUIREMENTS: MOTOR	
COMMENTS:	

2.06 INFORMATION SHEET FOR EQUIPMENT MAINTENANCE SUMMARY FORMS

Equipment Maintenance Summary forms are intended to provide the Maintenance Division with information sufficient to properly diagnose (troubleshoot, repair, check-out, and return an item of equipment to service. Standard information contained in each Form shall be as follows:

In addition, Maintenance information required to troubleshoot, repair, and return electrical/electronic equipment to service (including set point, derivatives, etc.) shall be included as required. The Maintenance Summary Form attached in intended to serve as a (minimum) guide to the information required per item of equipment. Additional requirements regarding submittal format, quantities, etc. are found elsewhere in this Specification.

1. Equipment item (include industry-accepted nomenclature)
2. Manufacturer address, phone/fax numbers
3. Equipment serial number(s)
4. Weight of individual components (over 100 pounds)
5. Nameplate data (including voltage, horsepower, lubrication requirements, speed, etc.)
6. Manufacturer's local representative address, phone/fax numbers
7. Maintenance operation(s) required. Listing shall include (1) Maintenance Operation to be performed. (2) Frequency of said Maintenance Operation based on actual service conditions of installed equipment (i.e., type of duty, environmental factors). Reference shall be made to the appropriate section of the manufacturer's technical literature.
8. Lubricant list. List shall include a primary and two secondary manufacturer-approved lubricants.
9. Spare parts required for a minimum of one (1) year of equipment operation based on anticipated actual service conditions. Also the name, address, and phone number of the recommended source of spare parts shall be included if different than manufacturer's representative.

TYPICAL MAINTENANCE SUMMARY FORM

NOTE: SUPPLEMENTARY INFORMATION SHALL BE INCLUDED AS APPROPRIATE

1. EQUIPMENT ITEM: _____
2. MANUFACTURER: _____
 ADDRESS: _____
 TELEPHONE NO.: _____ FAX NO.: _____
3. EQUIPMENT SERIAL/IDENTIFICATION NUMBERS: _____
4. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS): _____
5. NAMEPLATE DATA: _____
6. MANUFACTURER'S LOCAL REPRESENTATIVE: _____
 ADDRESS: _____
 TELEPHONE NO.: _____
 FAX NO.: _____
7. MAINTENANCE OPERATION(S) REQUIRED: (attach separate sheet if required).

OPERATION	FREQUENCY	COMMENTS

8. LUBRICANT LIST. Provide Reference symbol used in items recommended.

SHELL	STANDARD OIL	GULF	ARCO	EQUAL

9. RECOMMENDED SPARE PARTS LISTS FOR MINIMUM OF ONE (1) YEAR UNINTERRUPTED SERVICE. (Attach separate sheet if required).

ITEM	PART NO.	QUANTITY REQUIRED (per unit)	UNIT COST	COMMENTS

END OF SECTION 01730

SECTION 01783 - AS-BUILTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. As-Builts are full size drawings (Plans) and Record Project Manual which are marked up during construction to delineate the actual in-place constructed conditions. As-Builts shall be provided by the Contractor for this Project. Requirements for As-Builts, as specified elsewhere, shall supplement the requirements specified herein.
- B. As-Builts shall include all changes in the Plans including those issued as Change Orders, Plan Clarifications, Addenda, Notice to Bidders, responses to Requests for Information, Project Site Memos, and any additional details needed for the construction of the Project but not shown on the Plans. Any substructures encountered while excavating that are left in place shall be located by survey, to the satisfaction of the Owner, shown, and identified on the As-Builts. All substructures including, but not limited to, concrete structures, electrical conduit and duct banks, drains and sanitary sewer pipelines, process piping, water lines, etc, whose installed location differs from that shown on the original Plans shall be precisely located by survey to the satisfaction of the Owner and recorded on the As-Builts before backfilling.
- C. As-Builts shall be marked with red ink or chemical fluid on one (1) set of full size prints to produce a record of the complete installation. Any additional drawings that may be required to indicate record conditions shall be prepared on 24" x 36" paper. All additions to the plans shall employ and use drafting standards which are consistent with the drafting standards used in the Contract.
- D. The As-Builts, including those of all Subcontractors, shall be kept by the Contractor in the Contractor's project site office, shall be updated during construction, and shall be available for the Owner's inspection and copying at all times. The Owner will review the As-Builts prior to submittal of all Monthly Payment Requests. If, in the opinion of the Owner, the As-Builts are not current, approval of the Monthly Payment may be withheld until the drawings are made current. In addition, the Contractor shall submit a signed certification with each Monthly Payment Request stating that all As-Builts are complete and accurate as of the date of the payment request.

- E. Where the Plans are diagrammatic or lacking precise details, the Contractor shall produce dimensioned full size sheets as the As-Builts. For installations outside of structures, the locations shall be given by coordinates and elevations. Where substructures are encased in concrete, the outside dimensions of the encasement shall also be given.
- F. In the case of those Drawings which depict the detail requirements for equipment to be assembled and wired in the factory, the As-Builts shall be updated by indicating those portions which are superseded by final Shop Drawings and by including appropriate reference information describing the Shop Drawings by manufacturer, drawing and revision numbers.
- G. At the Completion of the Work and after Final Inspection, the Contractor shall copy As-Built data, using red ink, onto a new set of Plans provided by the Owner. The Contractor shall certify to the completeness and accuracy of the "as installed" information indicated on the new set of Plans with its signature. The Contractor shall then deliver as a submittal to the Owner, for review and approval, both the field developed As-Built Plans and the final signed As-Built Plans as a condition precedent to the Owner's release of any retained funds.

END OF SECTION 01783

SECTION 02200 - EARTHWORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Work of this Section includes all earthwork required for construction of the Work. Earthwork shall include, but not be limited to the loosening, removing, loading, transporting, depositing and compacting in its final location of all materials wet and dry, as required for the purposes of completing the work specified in the Contract Documents which shall include, but not be limited to: P.C.C. concrete and underlying material to a subbase design grade, the installation of subbase material to a subbase grade beneath concrete infrastructure, the excavation of pipeline trenches, the installation of backfill material within pipeline trenches, excavations for above-grade and below-grade structures, backfill requirements for material to be placed beneath above-grade and below-grade structures, backfill requirements for the areas surrounding above-grade and below-grade structures, backfilling of depressed areas resultant from demolition, the disposal of excess excavated materials, borrow of materials to make up deficiencies for fills; and all other incidental earthwork, all in accordance with the requirements of the Contract Documents.

Principal work items included in this Section are:

1. Structural excavation and backfills.
2. Trench excavation and backfills.
3. Disposal of surplus and/or unsuitable materials.
4. Clean-up.

1.02 REFERENCE STANDARDS

ASTM C 131	Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM D 75	Practice for Sampling Aggregates
ASTM D 422	Method for Particle-Size Analysis of Soils

ASTM D 698	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb (2.49-kg) Rammer and 12-in (304.8-mm) Drop
ASTM D 1556	Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	Test Method for Moisture-Density Relations of Soils Using Rammer and Drop
ASTM D 2419	Test method for Sand Equivalent Values of Soil and Fine Aggregate
ASTM D 2487	Classification of Soils for Engineering Purposes
ASTM D 2922	Test Method for Density of Soil in Places by Nuclear Methods (Shallow Depth)
ASTM D 3017	Test method for Water Content of Soil and Rock in Place by Nuclear Methods
ASTM D 4253	Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Plate
ASTM D 4254	Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
CAL-OSHA	Title 8 General Industry Safety Orders

1.03 RELATED WORK SPECIFIED ELSEWHERE

None.

1.04 DEFINITIONS

- A. Site: The property owned by the Borrego Water District. The site includes the Borrego Water District Wastewater Treatment Plant.
- B. Controlled Fill: Compacted suitable fill material in all areas of the site requiring filling to grade as shown on the Plans.
- C. Structural Fill: Compacted suitable fill material which will support a structure or some part of a structure. This includes support material for P.C.C. structures and pads
- D. Structural Backfill: Compacted suitable material placed between the wall of a structure and construction excavation slope up to finished grade.

- E. Suitable Material: As specified herein shall be any material imported or excavated from the cut areas that is, in the opinion of the Owner's Representative, suitable for use in constructing fills.
- F. Waste Excavation: Also Surplus Material. Material from project excavations which is not suitable for use in backfill or compacted fills or is in excess of that required to be used for backfill or to construct fills.
- G. Pipe Zone Backfill: Material suitable for placement below or surrounding the pipe to a given vertical distance above the pipe as required by the pipe section.
- H. Pipe Trench Backfill: Material suitable for placement from the pipe zone to finish grade or to pavement subbase material.

1.05 SITE INVESTIGATION

- A. Contractor's Responsibility: The Contractor shall carefully examine the site and make all inspections necessary in order to determine the full extent of the work required to make the completed Work conform to the Drawings and Specifications. The Contractor shall satisfy himself/herself as to the nature and location of the Work, conditions, the conditions of the existing ground surface, and the character of equipment and facilities needed prior to and during prosecution of the Work. The Contractor shall satisfy himself/herself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered. Any inaccuracies or discrepancies between the actual field conditions and the Plans, or between the Plans and Specifications must be brought to the Owner's Representative's attention in order to clarify the exact nature of the Work to be performed.
- C. Existing Elevations: All existing elevations illustrated on the Plans are approximate. The Contractor shall recognize and acknowledge the condition that the bid lump sum price shall include all earthwork activities irrespective of the possible localized difference in contour elevations and actual ground; and that there will be no additional compensation from the Owner for earthwork changes, engineering, or field staking in this regard.

1.06 SAFETY

The Contractor shall familiarize himself/herself with, and shall at all times conform to, the regulations of the "OSHA General Industry Occupational Safety and Health Standards", and "OSHA Safety and Health Regulations

for Construction Safety Orders” and “Trench Construction Safety Orders” of the State of California, Department of Industrial Relations, Division of Occupational Health and Safety. A copy of these documents shall be kept on the job site.

1.07 ENVIRONMENTAL SAFEGUARDS AND REGULATIONS

The Contractor shall comply with regulations in force at all times to prevent pollution of air and water. The Contractor shall be responsible for the construction of Project Environmental Control facilities in accordance with Section 01560 of the Technical Specifications, as applicable.

1.08 GEOTECHNICAL TESTING

The Contractor shall provide the services of a qualified Geotechnical Consultant to perform the required earthwork geotechnical testing specified within the contents of the Plans and Specifications. The cost for the Geotechnical Testing shall be borne by the Contractor. A copy of all tests shall be forwarded to the Owner’s Representative within two (2) days after the testing is complete. Geotechnical Earthwork Testing shall include in-situ native soil compaction testing, moisture-density soils testing, compaction testing, gradation testing, sand equivalent testing and similar testing. The Contractor shall bear the cost of retest and re-inspection of re-worked material due to faulty work.

1.09 STANDARDS FOR SOIL CLASSIFICATION, PROPERTIES AND TESTS

A. Backfill for Trench:

1. Classification - ASTM D 2487.
2. Compaction - Modified Proctor ASTM D 1557-91.
3. Field Density Test - ASTM 1556-82; D 2937-83, D 2922-81 (as approved by Geotechnical Engineer).

B. Structural Fill and Backfill:

1. Classification - ASTM D 2487.
2. Attenberg Limits - PlastiOwner Index and Liquid Limit ASTM D 4318.
3. Compaction - Modified Proctor ASTM D 1557-91.
4. Physical Properties - ASTM D 854, D 2216.

5. Field Density Test - ASTM D 1556-82, D 2937-83, D 2922-81 (as approved by Geotechnical Engineer).

C. Controlled Fills:

1. Classification - ASTM D 2487.
2. Physical Properties - ASTM D 854, D 2216.
3. Compaction - Modified Proctor ASTM D 1557-91.
4. CBR - ASTM D 1883 (R-Value - ASTM 2844).
5. Field Density Test - ASTM D 1556-82, D 2937-83, D 2922-81 (as approved by Geotechnical Engineer).

D. Borrow:

1. Classification - ASTM D 2487.
2. Other properties - as determined by requirements at point of use.

E. Pipe Trenches:

1. Classification - ASTM D 2487.
2. Physical Properties - ASTM D 854, D 2216.
3. Compaction - Modified Proctor ASTM D 1557-91.
4. CBR - ASTM D 1883.
5. Field Density Test - ASTM D 1556-82, D 2937-83, D 2922-81 (as approved by Geotechnical Engineer).

1.10 COMPACTION

The maximum dry density, optimum moisture content and field density of each soil type used in the controlled compacted fill shall be determined as stated in Section 1.09 above.

1.11 INSPECTION

Observation and compaction tests shall be obtained by the Geotechnical Consultant engaged by the Contractor during the filling and compacting operations.

1.12 GUARANTEE

Work required by this Section shall be subject to the guarantee requirements stated in the Conditions of the Contract and included in the Performance/Maintenance Bond.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Structural Fill Material: Materials shall consist of crushed rocks, Class 2 Base, granular sand, decomposed granite (crusher fines) or fine gravel either imported or manufactured from excavated onsite rocky material.

The crushed aggregate, granular sand, decomposed granite (crusher fines) or fine gravel shall be uniformly graded. The following gradations shall apply:

1. Granular Sand:

Clean granular sand free of clay, shale and deleterious material. Sand shall be compacted to 95 percent of maximum density at optimum water content per ASTM D 1557 unless otherwise noted on the Plans. The material shall conform to a sand equivalent of 30 or greater. The maximum amount of material passing the Number 200 sieve shall be 5 percent. The sand shall conform to the following gradation percentages:

<u>SIEVE SIZE</u>	<u>GRANULAR SAND</u> <u>% PASSING</u>
3/8"	100
No. 4	98-90
No. 8	90-75
No. 10	75-60
No. 16	60-50

No. 30	50-38
No. 40	38-29
No. 50	29-19
No. 100	19-7
No. 200	5-0

The Contractor shall supply a 5-gallon sample of sand material to the material testing laboratory within five (5) days after the Notice to Proceed is issued. The gradation, sand equivalent and maximum density of the sand material shall be determined. The test results shall be forwarded to the Owner's Representative. The cost of testing shall be incurred by the Contractor. The gradation of the granular sand shall be determined and the test results forwarded to the Owner's Representative prior to the delivery of the granular sand material to the Site. Prior to the placement of sand the native subbase grade shall be checked and approved by the Owner's Representative.

Crusher fines shall be allowed to be utilized in lieu of sand if approved by the Owner's Representative.

2. Crusher Fines:

Crusher fines shall consist of decomposed granite indigenous to the area. Crusher fines utilized for this project shall conform to the following gradation requirements:

<u>SIEVE SIZE</u>	<u>PERCENT PASSING</u>
5/8"	100
No. 4	80-100
No. 8	50-85
No. 30	30-50
No. 200	4-15

The sand equivalent shall be 20 or greater.

The Contractor shall supply a five-gallon sample of crusher fines material to the material testing laboratory within five (5) days after the Notice to Proceed is issued. The Gradation and Maximum Density of the crusher fines material shall be determined. The test results shall be forwarded to the Owner's Representative for approval prior to the delivery of the material to the Site. The cost of the testing shall be incurred by the Contractor.

3. Fine Gravel:

Clean fine gravel free of clay, shale and deleterious material. Fine gravel shall be compacted with a plate compactor with one pass in maximum 1 foot lifts. Additional lifts shall not be added until previous lifts shall have been passed over by the plate compactor. The maximum amount of material passing the 1/4" Sieve shall be 2 percent. The fine gravel shall conform to the following gradation percentages:

<u>SIEVE SIZE</u>	<u>PERCENT PASSING</u>
3/8"	100
1/4"	0-2

The Contractor shall supply a five-gallon sample of fine gravel material to the material testing laboratory within five (5) days after the Notice to Proceed is issued. The Gradation and Maximum Density of the fine gravel material shall be determined. The test results shall be forwarded to the Owner's Representative for approval prior to the delivery of the material to the Site. The cost of the testing shall be incurred by the Contractor.

4. Class 2 Base:

The Class 2 Base material shall conform to Caltrans Section 26, Latest Edition, for 25mm maximum base material. The gradation requirements are as follows:

<u>SIEVE SIZE</u>	<u>CLASS 2 BASE % PASSING</u>
1"	100
3/4"	87-100
No. 4	30-65
No. 30	5-35
No. 200	0-12

The sand equivalent shall be 25 or greater. An angular aggregate is to be used. Class 2 Base material shall be compacted to 95 percent of maximum density according to ASTM D 1557, unless otherwise noted on the Plans or Details. The tolerance for the Class 2 Base between design subgrade elevation and actual subgrade elevation as constructed in the field shall be plus or minus 0.02 feet as

referenced from the design subgrade. Prior to the placement of Class 2 Base, the native subbase grade shall be checked and approved by the Owner's Representative. The native subbase grade shall be within plus or minus 0.05 feet of native subbase design grade prior to the placement of Class 2 Base.

The Contractor shall supply a 5-gallon sample of the Class 2 Base to the material testing laboratory within four (4) days of the Notice to Proceed. The material shall be delivered to the testing laboratory to determine the maximum density, gradation, R-value, sand equivalent and durability index of the Class 2 Base. A copy of the test results shall be forwarded to the Owner's Representative by the Geotechnical Consultant for review. The gradation of the Class 2 Base shall be determined and the test results forwarded to the Owner's Representative for approval prior to the delivery of the Class 2 Base material to the Site. *Class 2 Base utilizing recycled materials shall not be allowed.*

- C. Structural Backfill Material: Structural Backfill Material shall consist of the same material listed with the Structural Fill Material item above.
- D. Special Crushed Rock Bedding and Structure Foundation: When groundwater is encountered in the excavation and/or where indicated on the Plans, the material in the bottom of the trench or excavation shall be removed to a depth directed by the Geotechnical Engineer and replaced with 3/4-inch maximum crushed rock bedding or 1" round rock bedding. The rock beddings shall be installed and compacted per these Specifications. The 3/4-inch maximum crushed rock and 1" round rock materials shall be approved by the Geotechnical Engineer before use.

The bottom and sidewalls of the trench shall be covered with a geotextile. The geotextile fabric shall extend to the top of the pipe zone material on both sides of the trench excavation, and cover the top of the crushed rock and or 1-inch round rock.

1. 3/4-Inch Maximum Crushed Rock

Crushed rock shall be the product of crushing rock or gravel. Fifty percent (50%) of the particles by weight retained on a 3/8-inch sieve shall have their entire surface area composed of faces resulting from fracture due to mechanical crushing.

Not over 5% shall be particles that show no faces resulting from crushing. Less than 10% of the particles that pass the 3/8-inch sieve and are retained on the No. 4 sieve shall be waterworn particles. Gravel shall not be added to the crushed rock. Crushed rock (3/4") shall have the following gradation:

<u>SIEVE SIZES</u>	<u>3/4-INCH MAX. CRUSHED ROCK % PASSING</u>
1"	100
3/4"	90-100
1/2"	30-60
3/8"	0-20
No. 4	0-5
No. 8	-

The 3/4-inch maximum crushed rock shall be compacted with a plate compactor in one pass in maximum 1 foot lifts. Additional lifts shall not be added until previous lifts shall have been passed over by the plate compactor.

The Contractor shall supply a five-gallon sample of the 3/4-inch maximum crushed rock material to the material testing laboratory within four (4) days of the Notice to Proceed. The Gradation and Sand Equivalent of the crushed rock shall be determined. The tests results shall be forwarded to the Owner's Representative for approval prior to the delivery of the material to the Site. The cost of the testing shall be incurred by the Contractor.

2. 1" Round Rock

The 1-inch round rock material shall conform to the following gradation requirements:

<u>SIEVE SIZES</u>	<u>1-INCH ROUND ROCK % PASSING</u>
1-1/2"	100
1"	96
3/4"	79
1/2"	25
3/8"	1

The 1-inch round rock shall be compacted with a plate compactor in one pass in maximum 1 foot lifts. Additional lifts shall not be added until previous lifts shall have been passed over by the plate compactor.

The Contractor shall supply a five-gallon sample of the 1-inch round rock material to the material testing laboratory within four (4) days of the Notice to Proceed. The Gradation of the round rock shall be determined. The tests results shall be forwarded to the Owner's Representative for approval prior to the delivery of the material to the Site. The cost of the testing shall be incurred by the Contractor.

PART 3 - EXECUTION

3.01 GENERAL

The Work performed under this Specification shall be constructed to the lines, grades, elevations, slopes and cross-sections indicated on the Plans, specified herein, and/or directed by the Owner. Slopes, graded surfaces, and drainage features shall present a neat uniform appearance upon completion of the Work.

It shall be the Contractor's responsibility (1) to maintain adequate safety measures and working conditions; and (2) to take all measures necessary during the performance of the Work to protect the entire project area and adjacent properties which would be affected by this Work from storm damage, flood hazard, caving of trenches and embankments, and sloughing of material, until final acceptance by the Owner. It shall be the Contractor's responsibility to maintain completed areas until the entire project area is in satisfactory compliance with the job specification.

Utility lines and structures indicated on the Plans which are to remain in service shall be protected by the Contractor from any damage as a result of his/her operation. Where utility lines or structures not shown on the Plans are encountered, the Contractor shall report them to the Owner before proceeding with the Work. The Contractor shall bear the cost of repair or replacement of any utility lines or structures which are broken or damaged by his/her operations.

3.02 REMOVALS, CLEARING AND GRUBBING

- A. Clearing: Clearing consists of the complete removal of objectionable materials and obstructions above and below the ground surface including tree stumps, brush, grass, vegetative matter and other objectionable materials within the project limits. All brush and organic material shall be removed before placing any earth fills. It shall be the Contractor's responsibility to save and protect all trees that lie outside the construction area.
- B. Grubbing: Grubbing consists of the complete removal of stumps, including tap roots or lateral roots 1-1/2 inches or more in diameter, and the removal of brush, grass or weeds to depths below the natural ground as specified herein. Stumps shall be grubbed to a depth of 3 feet and grass or weeds shall be grubbed to a depth of 6 inches below the natural ground surface, or to the depths as determined in the field by the Owner's Representative at the time of construction.
- C. Protection: Existing items not designated to be demolished or removed shall be protected from damage. Any such item damaged by the Contractor shall be restored or replaced immediately at the Contractor's expense.
- D. Debris and Waste Material: All debris and waste material resulting from demolition, clearing and grubbing shall be removed from the site and disposed of by the Contractor.

3.03 DUST CONTROL

The Contractor shall take all steps possible to prevent and reduce dust arising from the construction activity. Section 01560 Project Environmental Controls elaborates on dust control requirements.

3.04 CARE OF DRAINAGE WATER

Contractor shall take care of drainage water from the construction operations, and of stormwater and/or wastewater reaching the construction area from any source, so that damage is not incurred to the excavation, pipe or structures. The Contractor shall be responsible for any damages to persons or property on or off the Site due to such drainage water or to the interruption or diversion of such stormwater or wastewater on account of his/her operation.

Such grading shall be accomplished as may be necessary to prevent surface water from flowing into excavations, and any water accumulating therein shall be removed by pumping or by other reviewed methods.

Protection of the site during construction shall be the responsibility of the Contractor. Completion of a portion of the project shall not preclude that portion or adjacent areas from the requirements for site protection until such time as the entire project is complete.

3.05 EXCAVATION

- A. General: The Contractor shall perform all excavation necessary or required as illustrated on the Plans. The excavation shall include the removal and disposal of all earth materials of whatever nature encountered, which shall include both rock excavation and common excavation when both are present, and shall include the furnishing, placing and maintaining of shoring and bracing necessary to safely support the sides of the excavations. The Work shall also include all pumping, ditching and other required methods for the removal or exclusion of water.

- B. Excavation for Structures: Structure excavation shall include the removal of all materials of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the Work. The removal of such materials shall conform to the lines and grades shown on the Plans and/or herein specified. Temporary structure excavations shall at all times conform to the Requirements of the State of California, Division of Occupational Health and Safety.

Continuous wall and isolated footings shall be underlain by a minimum compacted controlled fill thickness to a minimum 1.5 times the footing width or greater or as required by the Plans. This zone of over-excavation, scarification and recompaction shall extend a minimum of five feet (5') beyond the footing lines unless otherwise illustrated on the Plans. Exposed native surface shall be scarified, and brought to optimum moisture content and compacted to a minimum of 90 percent relative compaction if required by the Plans.

All surfaces to receive concrete slabs-on-grade shall be underlain by a minimum compacted controlled fill thickness of 18 inches or greater or as required by the Plans. This shall be accomplished by combination of over-excavation and recompaction of native material to 90% of relative compaction or as required by the Plans.

Contingent upon locations, all surfaces to receive compacted fill shall be scarified, brought to near optimum moisture content and compacted to required percentage of relative compaction as specified herein unless otherwise indicated on the Plans.

Rough grade excavations for structures and footings will be inspected by the Geotechnical Engineer to verify that the excavations extend into satisfactory soils and are free of loose and disturbed materials.

Foundation for tanks, pump vaults or subsurface chambers shall have structural fill material extending 12 inches, minimum, below the structural base slab to native material, which has been scarified and compacted to 90% relative compaction unless otherwise indicated on the Plans.

3.06 STRUCTURE FILL AND STRUCTURE BACKFILL MATERIAL

- A. Placement of Structure Backfill: Before beginning backfilling, all foreign material, including water, shall be removed from the space to be backfilled and the area to be backfilled shall be inspected and approved by the Geotechnical Engineer. Sloping sides of the excavated space shall be stepped to prevent wedging action of the backfill against the structure. No backfill shall be placed around or upon any structure until it is proven that the concrete has attained satisfactory strength in accordance with the Division 3 of Technical Specifications and that the structure as a whole is adequate to receive backfill. The compressive strength shall be determined by tests on representative cylinders cured under conditions similar to those prevailing at the site.

- B. General: Structure fill and structure backfill shall consist of granular sand, Class 2 Base, crusher fines or other material as indicated on the Plans. The subbase grade shall be excavated to within plus or minus 0.05 feet of design grade prior to the placement of structure fill and structure backfill. The design subbase grade shall be field verified and approved by the Owner's Representative prior to the placement of the structure fill or structure backfill material. The Owner's Representative shall determine the number and location of points to check for the subbase grade elevation compliance. Prior to the Owner's Representative's inspection of the subbase grade the Contractor shall establish bluetop stakes on a 20-foot by 20-foot grid across the area which structure backfill is to be placed.

Granular sand, Class 2 Base and crusher fine structure fill and structure backfill material shall be placed in maximum 8-inch lifts and compacted to 95 percent of maximum density at optimum water content per ASTM D 1557. Additional granular sand, Class 2 Base or crusher fine lifts shall not be placed until previous lifts have attained the specified compaction requirement and are approved by both the on-site geotechnical representative and the Owner's Representative.

- C. Placing, Spreading and Compacting Fill Material: The structural fill and structural backfill material shall be placed by the Contractor in thin layers that when compacted shall not exceed 8 inches. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to obtain uniformity of material in each layer.

When the moisture content of the fill material is below that required by the Geotechnical Engineer, water shall be added by the Contractor until the moisture content is as required for the specified compaction.

When the moisture content of the fill material is above that required by the Geotechnical Engineer, the fill material shall be aerated by the Contractor by blading, mixing, or other satisfactory methods until the moisture content is as required for the specified compaction.

After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted by the Contractor to the specified density. Compaction shall be accomplished by sheepfoot rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers or other types of acceptable compacting equipment. Equipment shall be of such design that it shall be able to compact the fill to the specified density. Compaction shall be continuous over the entire area and the equipment shall make sufficient passes over the material to ensure that the desired density has been obtained.

Compacted fill slopes shall be overbuilt and cut back to grade, exposing the firm, compacted inner core. The slopes shall be overbuilt a minimum of five feet (5'). If the desired compaction is not achieved, the existing slope shall be overexcavated and reconstructed. The amount of overbuilding shall be increased until the desired compaction is achieved on the slope. The Contractor shall provide thorough mechanical compaction to the outer edge of the overbuilt slope surface. There shall be no excessive loose soil on the slopes.

The Contractor shall provide and maintain adequate erosion control facilities during the construction of the fill areas. The erosion control facilities shall be maintained in optimum condition until the permanent drainage system and vegetation is complete. The facilities shall be inspected following significant rainfall, repairs made and excess sediment removed. It shall be the Contractor's responsibility to prevent the discharge of sediment off-site or to adjacent watercourses.

3.07 SUITABLE MATERIAL AND WASTE EXCAVATION

- A. General: Suitable material or waste excavation consists of native material. The subbase grade shall be excavated to within plus or minus 0.05 feet of design grade prior to the placement of suitable material or waste excavation material. The design subbase grade shall be field verified and approved by the Owner's Representative prior to the placement of the suitable material or waste excavation material. The Owner's Representative shall determine the number and location of points to check for the subbase grade elevation compliance. Prior to the Owner's Representative's inspection of the subbase grade the Contractor shall establish bluetop stakes on a 20-foot by 20-foot grid across the area suitable material or waste excavation material is to be placed.

The suitable material or waste excavation material shall be placed in maximum 1-foot lifts and compacted to 90 percent of maximum density at optimum water content per ASTM D 1557. Additional suitable material or waste excavation material lifts shall not be placed until previous lifts have attained the specified compaction requirement and are approved by both the on-site geotechnical representative and the Owner's Representative.

- B. Placing, Spreading and Compacting Suitable Material and Waste Excavation Material: The suitable material and waste excavation material shall be placed by the Contractor in 1-foot lifts. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to obtain uniformity of material in each layer.

When the moisture content of the fill material is below that required by the Geotechnical Engineer, water shall be added by the Contractor until the moisture content is as required for the specified compaction.

When the moisture content of the fill material is above that required by the Geotechnical Engineer, the fill material shall be aerated by the Contractor by blading, mixing, or other satisfactory methods

until the moisture content is as required for the specified compaction.

After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted by the Contractor to the specified density. Compaction shall be accomplished by sheepsfoot rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers or other types of acceptable compacting equipment. Equipment shall be of such design that it shall be able to compact the fill to the specified density. Compaction shall be continuous over the entire area and the equipment shall make sufficient passes over the material to ensure that the desired density has been obtained.

Compacted fill slopes shall be overbuilt and cut back to grade, exposing the firm, compacted inner core. The slopes shall be overbuilt a minimum of five feet (5'). If the desired compaction is not achieved, the existing slope shall be overexcavated and reconstructed. The amount of overbuilding shall be increased until the desired compaction is achieved on the slope. The Contractor shall provide thorough mechanical compaction to the outer edge of the overbuilt slope surface. There shall be no excessive loose soil on the slopes.

The Contractor shall provide and maintain adequate erosion control facilities during the construction of the fill areas. The erosion control facilities shall be maintained in optimum condition until the permanent drainage system and vegetation is complete. The facilities shall be inspected following significant rainfall, repairs made and excess sediment removed. It shall be the Contractor's responsibility to prevent the discharge of sediment off-site or to adjacent watercourses.

3.08 ESTABLISHMENT OF SUBBASE GRADE, SUBGRADE OR FINISH GRADE

Finish Grade is defined as the finish surface grade. For instance, the top of an A.C. or P.C.C. paved surface is referred to as finish grade.

Subgrade is defined as the grade of the material beneath the finish surface. For instance, the top of Class 2 Base grade beneath an A.C. or P.C.C. paved surface is referred to as subgrade.

Subbase is defined as the grade of the material beneath the base material. For instance, the top of native material beneath the Class 2

Base subgrade material of an A.C. or P.C.C. paved roadway is the subbase grade.

Finish grade surfaces are to be graded to within plus or minus 0.02 feet from design grade as illustrated on the Plans. The Contractor shall place bluetop stakes on a 20-foot x 20-foot grid across the top of the finish grade surface during final grading. A bluetop stake is defined as a stake placed at the finish grade elevation within the tolerance of plus or minus 0.02 feet of finish grade. The Owner's Representative shall obtain elevations across finish grade surfaces at locations determined by the Owner's Representative prior to accepting and approving the finish grade surfaces. The Contractor shall rework areas not conforming to the finish surface grade tolerance as required. Work items to occur after the establishment of finish grade shall not occur until the Owner's Representative has approved the finish grade.

Subgrade surfaces are to be graded to within plus or minus 0.02 feet from design grade as illustrated on the Plans. Bluetop stakes shall be placed on a 20-foot x 20-foot grid pattern across rectangular or square facilities such as parking lots and access roads. The Owner's Representative shall obtain elevations across the subgrade surfaces at locations determined by the Owner's Representative prior to accepting and approving the subgrade surfaces. The Contractor shall rework areas not conforming to the subgrade tolerance as required. Work items to occur after the establishment of subgrade shall not occur until the Owner's Representative has approved the finish subgrade.

Subbase surfaces are to be graded to within plus or minus 0.05 feet of subbase design grade as illustrated on the Plans. Bluetop stakes shall be placed on a 20-foot x 20-foot grid pattern across rectangular or square facilities such as parking lots, access roads, sludge beds, structures, building pads, etc. The Owner's Representative shall obtain elevations across the subbase surfaces at locations determined by the Owner's Representative prior to accepting and approving the subbase surfaces. The Contractor shall rework areas not conforming to the subbase design grade tolerance as required. Work items to occur after the establishment of subbase grade shall not occur until the Owner's Representative has approved the subbase grade.

3.09. CLEAN-UP

Upon completion of Work in this Section, all rubbish and debris shall be removed from the site. All construction equipment and implements of service shall be removed and the entire area involved shall be left in a clean, neat and acceptable condition.

END OF SECTION 02200

SECTION 03100 - CONCRETE FORMWORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall provide concrete formwork, bracing, shoring, supports, and false work, in accordance with the Contract Documents.
- B. Work included in this Section: Principal items are:
 - 1. Furnishing, erection, and removal of forms.
 - 2. Shoring and bracing of formwork.
 - 3. Setting of embedded items and pipe sleeves for mechanical and electrical work under direction of respective trade.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. The Work of the following Sections apply to the Work of this Section. Other Sections, not referenced below, shall also apply to the extent required for proper performance of the Work.
 - 1. Section 03200 - Reinforcement Steel
 - 2. Section 03300 - Cast-in-Place Concrete
 - 3. Section 03315 – Grout

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Except as otherwise indicated in this Section of the Specifications, the Contractor shall comply with the latest adopted edition of the Standard Specifications for Public Works Construction (SSPWC), together with the latest adopted editions of the Regional Amendments.
- B. The current edition of the Uniform Building Code (UBC) of International Conference of Building Officials (ICBO).
- C. Except as otherwise indicated, the current editions of the following apply to the Work of this Section:

1. PS 1 U.S. Product Standard for Concrete Forms, Class 1
2. PS 20 American Softwood Lumber Standard
3. ACI 117 Standard Tolerances for Concrete Construction and Materials
4. ACI 347 Recommended Practice for Concrete Formwork

1.04 CONTRACTOR SUBMITTALS

- A. The Contractor shall, in accordance with the requirements in the Special Conditions, submit detailed drawings of the false work proposed to be used. Such drawings shall be in sufficient detail to indicate the general layout, sizes of members, anticipated stresses, grade of materials to be used in the false work, means of protecting existing construction which supports false work, and typical soil conditions.
- B. The Contractor shall, in accordance with the requirements in the Special Conditions, submit the following:
 1. Form ties and all related accessories, including taper tie plugs, if taper ties are used.
 2. Form gaskets.
- C. The Contractor shall submit shop drawings showing the proposed location and type of required construction for any joints not shown on the Plans, and the sequence of forming and concrete placing operations.
- D. Forms and false work to support the roof and floor slabs shall be designed for the total dead load, plus a live load of 50 PSF (minimum). The minimum design load for combined dead and live loads shall be 100 PSF.
- E. The Contractor shall design formwork prior to fabrication, placing the order, or use on the jobs.
- F. The Contractor shall design joints in forms to remain mortar-tight and withstand placing pressures without bulging outward or creating surface patterns.

- G. Calculations shall be signed and sealed by a Professional Civil or Structural Engineer registered in the State of California for both the forming system and the stresses induced on the form system.
- H. Suitable and effective means shall be provided for holding adjacent edges and end panels and sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, offsets or similar surface defects in the finished concrete. The forms shall be tight so as to prevent the loss of water, cement, and fines during placing and vibrating of the concrete.

1.05 QUALITY ASSURANCE

- A. The Contractor shall comply with the requirements of California Division of Occupational Health and Safety Construction Safety Orders Section 1717 and OSHA Part 1926, Section 1926.701 that apply to the Work of this Section. The Contractor shall prepare and maintain at least one copy of the required Plans at the site. Design of the structures shown on the Plans does not include any allowance or consideration for imposed construction loads. The Contractor shall provide forms, shoring and false work adequate for imposed live and dead loads, including equipment, height of concrete drop, concrete and foundation pressures, stresses, lateral stability, and other safety factors during construction.
- B. Tolerances: The Contractor shall employ formwork complying with ACI 347 Guide to Formwork for Concrete, except as exceeded by the requirements of regulatory agencies, or as otherwise indicated or specified. The Contractor shall design and construct formwork to produce finished concrete conforming to tolerances given in ACI 117.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Except as otherwise accepted by the Owner's Representative, all lumber brought on the Site for use as forms, shoring, or bracing shall be new material. All forms shall be smooth surface forms and shall be of the following materials:

Walls:	Steel or plywood panel
Columns:	Steel, plywood or fiberglass
Roof and Floor:	Plywood
All Other Work:	Steel panels, plywood or tongue and groove lumber

- B. Form materials which may remain or leave residues on or in the concrete shall be classified as acceptable for potable water use by the Environmental Protection Agency within 30 days of application or use.

2.02 FORM AND FALSE WORK MATERIALS

- A. Materials for concrete forms, formwork, and false work shall conform to the following requirements:
 1. Lumber shall be Douglas Fir or Southern Yellow Pine, construction grade or better, in conformance with U.S. Product Standard PS 20.
 2. Plywood for concrete formwork shall be new, waterproof, synthetic resin bonded; exterior type Douglas Fir or Southern Yellow Pine plywood manufactured especially for concrete formwork and shall conform to the requirements of PS 1 for Concrete Forms, Class I, and shall be edge sealed.
 3. Form materials shall be metal, wood, plywood, or other approved material that will not adversely affect the concrete and will facilitate placement of concrete to the shape, form, line, and grade shown. Metal forms shall be an approved type that will accomplish such results. Wood forms for surfaces to be painted shall be Medium Density Overlaid plywood, MDO Ext. Grade.

2.03 FORM TIES

- A. Form ties with integral waterstops shall be provided with a plastic cone or other suitable means for forming a conical hole to ensure that the form tie may be broken off back of the face of the concrete. The maximum diameter of removable cones for rod ties, or of other removable form-tie fasteners having a circular cross-section, shall not exceed 1-1/2 inches; and all such fasteners shall be such as to leave holes of regular shape for reaming. Form ties shall be snap ties by MeadowBurke; snapties by Dayton Superior; or equal.
- B. Form ties for water-retaining structures shall have integral waterstops. Removable taper ties may be used when approved by the Owner's Representative or Resident Project Representative. A preformed neoprene or polyurethane tapered plug sized to seat at the center of the wall shall be inserted in the hole left by the

removal of the taper tie. Use taper-ties by MeadowBurke; taper-ties by Dayton Superior; or equal.

2.04 FORM COATING

- A. Non-grainrising and nonstaining resin or polymer type that will not leave residual matter on surface of concrete or adversely effect bonding to concrete of paint, plaster, mortar, protective coatings, waterproofing or other applied materials. Coatings containing mineral oils, paraffins, waxes or other nondrying ingredients, are not permitted. For concrete surfaces contacting potable stored water, use only coatings and form-release agents that are completely nontoxic.

2.05 FORM JOINT SEALERS

- A. For joints between form panels, use resilient foam rubber strips, non-hardening plastic-type caulking compound free of oil, or waterproof pressure-sensitive plastic tape of minimum 8 mil thickness and 2 inches width. For form tie holes, use rubber plugs, plastic caulking compound, or equal.

PART 3 - EXECUTION

3.01 GENERAL

- A. Forms to confine the concrete and shape it to the required lines shall be used wherever necessary. The Contractor shall assume full responsibility for the adequate design of all forms, and any forms which are unsafe or inadequate in any respect shall promptly be removed from the Work and replaced at no increased cost to the Owner. The Contractor shall provide worker protection from protruding reinforcement bars in accordance with applicable safety codes. A sufficient number of forms of each kind shall be provided to permit the required rate of progress to be maintained. The design and inspection of concrete forms, false work, and shoring shall comply with applicable local, state and Federal regulations. Plumb and string lines shall be installed before concrete placement and shall be maintained during placement. Such lines shall be used by Contractor's personnel and by the or Resident Project Representative and shall be in sufficient number and properly installed. During concrete placement, the Contractor shall continually monitor plumb and string line form positions and immediately correct deficiencies.

- B. Concrete forms shall conform to the shape, lines, and dimensions of members as called for on the Drawings, and shall be substantial, free from surface defects, and sufficiently tight to prevent leakage. Forms shall be properly braced or tied together to maintain their position and shape under a load of freshly placed concrete. If adequate foundation for shores cannot be secured, trussed supports shall be provided.
- C. Unless otherwise indicated, exterior corners in concrete members shall be provided with $\frac{3}{4}$ inch chamfers. Re-entrant corners in concrete members shall not have fillets unless otherwise indicated.
- D. The Contractor shall notify the Owner's Representative or Resident Project Representative at least 48 hours prior to concrete placement so the completed formwork can be inspected.
- E. Final inspection will be made only after all formwork, embeds, blowouts, screeds, ties, final adjustments, and related work have been completed by the Contractor.
- F. The Contractor shall correct defective work identified by the Owner's Representative or Resident Project Representative, prior to delivery of the concrete.
- G. Neither the review of the Contractor's drawings nor inspection of forms by the Owner's Representative or Resident Project Representative shall relieve the Contractor of responsibility for the adequacy of the forms nor from the necessity for remedying all defects which may develop or become apparent with use. The Owner's Representative or Resident Project Representative may at any time condemn any section or sections of the forms found deficient. The Contractor shall promptly remove the condemned forms from the Work and replace them.

3.02 FORM DESIGN

- A. All forms shall be true in every respect to the required shape and size, shall conform to the established alignment and grade, and shall be of sufficient strength and rigidity to maintain their position and shape under the loads and operations incident to placing and vibrating the concrete. Suitable and effective means shall be provided on all forms for holding adjacent edges and ends of panels and sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, offsets, or similar surface defects in the finished concrete. Plywood, $\frac{5}{8}$ inch and greater in

thickness, may be fastened directly to studding if the studs are spaced close enough to prevent visible deflection marks in the concrete. The forms shall be tight so as to prevent the loss of water, cement and fines during placing and vibrating of the concrete. Specifically, the bottom of wall forms that rest on concrete footings or slabs shall be provided with a gasket to prevent loss of fines and paste during placement and vibration of concrete. Such gasket may be a 1- to 1-1/2 inch diameter polyethylene rod held in position to the underside of the wall form. Adequate clean-out holes shall be provided at the bottom of each lift of forms. The size, number, and location of such clean-outs shall be as acceptable to the Owner's Representative or Resident Project Representative. Whenever concrete cannot be placed from the top of a wall form in a manner that meets the requirements of the Contract Documents, form windows shall be provided in the size and spacing needed to allow placement of concrete to the requirements of Section 03300 - Cast-in-Place Concrete. The size, number, and location of such form windows shall be as acceptable to the Owner's Representative.

B. Wall Forms:

1. All walls shall be formed by methods acceptable to the Owner's Representative or Resident Project Representative and to the correct elevations and location illustrated on the Plans.
2. Pouring Openings:
 - a) The minimum pouring opening size shall be 18" x 18".
 - b) The bottom of the lower openings shall be no more than 48 inches from the top of the wall-footing.
 - c) The horizontal centerline distance between such openings shall not exceed 96 inches nor shall the distance between the nearest opening and the bulkhead for the vertical joint exceed 36 inches.
 - d) The vertical centerline distance between horizontal rows of openings shall not exceed 96 inches.
 - e) Under no circumstances shall forming be such that the drop of concrete in the forms will exceed 4 feet in any one place.

3.03 CONSTRUCTION

- A. Vertical Surfaces: All vertical surfaces of concrete members shall be formed, except where placement of the concrete against the ground is shown. Not less than 1 inch of concrete shall be added to the thickness of the concrete member as shown where concrete is permitted to be placed against trimmed ground in lieu of forms. Such permission will be granted only for members of comparatively limited height and where the character of the ground is such that it can be trimmed to the required lines and will stand securely without caving or sloughing until the concrete has been placed.
- B. Construction Joints: Concrete construction joints will not be permitted at locations other than those shown or specified, except as may be acceptable to the Owner's Representative or Resident Project Representative. When a second lift is placed on hardened concrete, special precautions shall be taken in the way of the number, location, and tightening of ties at the top of the old lift and bottom of the new to prevent any unsatisfactory effect whatsoever on the concrete. Pipe stubs and anchor bolts shall be set in the forms where required.
- C. Form Ties:
1. Embedded Ties: Holes left by the removal of form tie cones shall be reamed with suitable toothed reamers so as to leave the surface of the holes clean and rough before being filled with non-shrink grout as specified for "Finish of Concrete Surfaces" in Section 03315 - Grout. Wire ties for holding forms will not be permitted. No form-tying device or part thereof, other than metal, shall be left embedded in the concrete. Ties shall not be removed in such manner as to leave a hole extending through the interior of the concrete members. The use of snap-ties which cause spalling of the concrete upon form stripping or tie removal will not be permitted. If steel panel forms are used, rubber grommets shall be provided where the ties pass through the form in order to prevent loss of cement paste. Where metal rods extending through the concrete are used to support or to strengthen forms, the rods shall remain embedded and shall terminate not less than 1 inch back from the formed face or faces of the concrete.
 2. Removable Ties: Where taper ties are approved for use, the larger end of the taper tie shall be on the wet side of walls in water retaining structures. After the taper tie is removed, the hole shall be thoroughly cleaned and roughened for bond. A

precast neoprene or polyurethane tapered plug shall be located at the wall centerline. The hole shall be completely filled with non-shrink grout for water bearing and below-grade walls. The hole shall be completely filled with non-shrink or regular cement grout for above-grade walls which are dry on both sides. Exposed faces of walls shall have the outer 2 inches of the exposed face filled with a cement grout which shall match the color and texture of the surrounding wall surface.

D. Embedded Items:

1. Before the placement of concrete within the forms, each trade having embedded items, including waterstops within the forms and affected by the pour, shall certify that all items are properly located and braced. This certification shall be provided by the Contractor to the Owner's Representative or Resident Project Representative at least 48 hours in advance of placement.

3.04 EMBEDDED PIPING AND ROUGH HARDWARE

- A. The Contractor shall consult with all trades which require openings for the passage of pipes, conduits and other inserts, and properly and accurately install the necessary pipe sleeves, anchors, or other required inserts, and properly size the equipment pads. The Contractor shall reinforce openings as indicated and required. The Contractor shall locate conduits or pipes so as not to reduce the strength of the construction, and in no case, place pipes, other than conduits in a slab 4-1/2 inches or less in thickness. The Contractor shall not embed conduit having an outside diameter greater than 1/3 of the thickness of the slab in a concrete slab, nor place conduit below bottom reinforcing steel or over top reinforcing steel. Conduits may be embedded in walls, provided they are not larger in outside diameter than 1/3 the thickness of the wall, are not spaced closer than three diameters on center, and do not impair the strength of the structure. The Contractor shall support embedded pipes and conduits independently from reinforcing steel in a manner to prevent metallic contact, and thereby, prevent electrolytic deterioration. The Contractor shall place embedded pipes and conduits as nearly as possible to the centerline of the concrete section. The Contractor shall submit all conduit, piping and other wall penetrations, reinforcements and anchor bolt sizing and locations for review and approval.

3.05 REMOVAL OF FORMS

- A. Careful procedures for the removal of forms shall be strictly followed, and this Work shall be accomplished with care so as to avoid injury to the concrete. No heavy loading on green, insufficiently cured concrete will be permitted. In the case of roof slabs and above-ground floor slabs, forms for supported slab, but not shoring, shall remain in place until test cylinders for the roof concrete attain a minimum compressive strength of 75 percent of the 28 day strength specified in Section 03300 - Cast-in-Place Concrete; provided, that no forms shall be disturbed or removed under an individual panel or until before the concrete in the adjacent panel or unit has attained 75 percent of the specified 28 day strength and has been in place for a minimum of 7 days. The time required to establish said strength shall be as determined by the Owner's Representative from several test cylinders obtained by the Contractor for this purpose from concrete used in the first group of roof panels placed. If the time so determined is more than the 7 day minimum, then that time shall be used as the minimum length of time. Forms for all vertical walls and columns shall remain in place at least 2 days after the concrete has been placed. Forms for all parts of the Work not specifically mentioned herein shall remain in place for periods of time as determined by the Owner's Representative.
- B. The Contractor shall not backfill against walls until the top slab is in place and all concrete has obtained compressive strength equal to the specified 28 day compressive strength.
- C. Immediately upon removal of the forms, the concrete surfaces shall be thoroughly wetted and shall be kept wet until the curing compound is applied or other curing procedure made effective, in accordance with the specification requirements.
- D. The Contractor shall assume the responsibility for damage resulting from improper and premature removal of forms.

3.06 REUSE OF FORMS

- A. Forms may be reused only if in good condition and only if acceptable to the Owner's Representative or Resident Project Representative. Light sanding between uses will be required wherever necessary to obtain uniform surface texture on all exposed concrete surfaces. Exposed concrete surfaces are defined as surfaces which are permanently exposed to view. In the case of forms for the inside wall surfaces of hydraulic/water

retaining structures, unused tie rod holes in forms shall be filled with non-shrink grout.

3.07 MAINTENANCE OF FORMS

- A. Forms shall be maintained at all times in good condition, particularly as to size, shape, strength, rigidity, tightness, and smoothness of surface. Forms, when in place, shall conform to the established alignment and grades. Before concrete is placed, the forms shall be thoroughly cleaned. The form surfaces shall be treated with a non-staining mineral oil or other lubricant acceptable to the Owner's Representative or Resident Project Representative. Any excess lubricant shall be satisfactorily removed before placing the concrete. Where field oiling of forms is required, the Contractor shall perform the oiling at least 2 weeks in advance of their use. Care shall be exercised to keep oil off the surfaces of steel reinforcement and other metal items to be embedded in concrete.

3.08 FALSE WORK

- A. The Contractor shall be responsible for the design, engineering, construction, maintenance, and safety of all false work, including staging, walkways, forms, ladders, and similar appurtenances, which shall equal or exceed the applicable requirements of the provisions of the OSHA Safety and Health Standards for Construction, and the requirements of the California Division of Industrial Safety.

3.09 REMOVAL OF SHORING AND FALSE WORK

- A. The Contractor shall not remove shoring and false work until 21 days after concrete placement, or concrete has attained at least 90 percent of the 28 day design compressive strength as demonstrated by control test cylinders, but not sooner than 14 days. If testing is completed to review the 90 percent compressive strength, the Contractor shall incur the cost.

3.10 LOAD RESTRICTION

- A. The Contractor shall not impose construction, equipment or permanent loads on columns, supported slabs, or supported beams until concrete has attained the 28 day design compressive strength.

END OF SECTION 03100

SECTION 03200 - REINFORCEMENT STEEL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall provide concrete reinforcement steel, welded wire fabric, couplers, concrete inserts, wires, clips, supports, chairs, spacers, and other accessories, complete, all in accordance with the Contract Documents.
- B. Work Included in this Section: Principal items are:
 - 1. Furnishing and placing bar and mesh reinforcing for cast-in-place concrete.
 - 2. Furnishing reinforcing steel bars for masonry, including delivery to the site.
 - 3. Submittals.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. The Work of the following Sections apply to the Work of this Section. Other Sections, not referenced below, shall also apply to the extent required for proper performance of this Work.
 - 1. Section 03100 - Concrete Formwork
 - 2. Section 03300 - Cast-in-Place Concrete
 - 3. Section 03315 – Grout
 - 4. Section 03730 – Concrete Rehabiliataion

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Except as otherwise indicated in this Section of the Specifications, the Contractor shall comply with the latest adopted edition of the Standard Specifications for Public Works Construction (SSPWC), together with the latest adopted editions of the Regional Amendments.
- B. The current edition of the Uniform Building Code (UBC) of International Conference of Building Officials (ICBO).

C. Commercial Standards (Current Edition):

1. ACI 315 Details and Detailing of Concrete Reinforcement
2. ACI 318 Building Code Requirements for Structural Concrete
3. CRSI MSP Concrete Reinforcing Steel Institute Manual of Standard Practice
4. CRSI PRB Concrete Reinforcing Steel Institute Placing Reinforcing Bars
5. WRI Manual of Standard Practice for Welded Wire Fabric
6. AWS D 1.4 Structural Welding Code - Reinforcing Steel
7. ACI 117 Standard Tolerance for Concrete Construction Materials

D. ASTM Standards in Building Codes (Current Edition):

1. ASTM A 82: Specification for Steel Wire, Plain, for Concrete Reinforcement
2. ASTM A 185: Specification for Welded Steel Wire Fabric, Plain, for Concrete Reinforcement
3. ASTM A 615: Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
4. ASTM A 706: Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement
5. ASTM A 775: Specification for Epoxy-Coated Reinforcing Steel Bars

1.04 CONTRACTOR SUBMITTALS

- A. The Contractor shall furnish shop bending diagrams, placing lists, and drawings of all reinforcement steel before fabrication in accordance with the requirements of the Special Conditions.

- B. Details of the concrete reinforcement steel and concrete inserts shall be submitted at the earliest possible date after receipt of the Notice to Proceed. Details of reinforcement steel for fabrication and erection shall conform to ACI 315 and the requirements indicated. The shop bending diagrams shall show the actual lengths of bars, to the nearest inch, measured to the intersection of the extensions (tangents for bars of circular cross-section) of the outside surface. The shop drawings shall include bar placement diagrams which clearly indicate the dimensions of each bar splice.
- C. Where mechanical couplers are required or permitted to be used to splice reinforcement steel, the Contractor shall submit manufacturer's literature including instructions and recommendations for installation for each type of coupler used; certified test reports which verify the load capacity of each type and size of coupler used; and shop drawings which show the location of each coupler with details of how they are to be installed in the formwork.
- D. If reinforcement steel is spliced by welding at any location, the Contractor shall submit mill test reports which shall include the information necessary for the determination of the carbon equivalent as specified in AWS D 1.4. The Contractor shall submit a written welding procedure for each type of weld for each size of bar which is to be spliced by welding; a mere statement that AWS procedures will be followed will not be acceptable.

1.05 QUALITY ASSURANCE

- A. If requested by the Owner's Representative or Resident Project Representative, the Contractor shall furnish samples from each heat of reinforcement steel delivered in a quantity adequate for testing. Costs of initial tests will be paid by the Contractor. Costs of additional tests due to material failing initial tests shall also be paid by the Contractor.
- B. If reinforcement steel is spliced by welding at any location, the Contractor shall submit certifications of procedure qualifications for each welding procedure used and certification of welder qualifications, for each welding procedure, and for each welder performing the Work. Such qualifications shall be as specified in AWS D 1.4.
- C. If requested by the Owner's Representative or Resident Project Representative, the Contractor shall furnish samples of each type

of welded splice used in the Work in a quantity and of dimensions adequate for testing. At the discretion of the Owner's Representative or Resident Project Representative, radiographic testing of direct butt welded splices will be performed. The Contractor shall provide assistance necessary to facilitate testing. The Contractor shall repair any weld which fails to meet the requirements of AWS D 1.4. The costs of testing will be paid by the Contractor. The costs of all tests which fail to meet specified requirements shall also be paid by the Contractor.

PART 2 - PRODUCTS

2.01 MATERIAL REQUIREMENTS

- A. Materials which may remain or leave residues on or within the concrete shall be classified as acceptable for potable water use by the Environmental Protection Agency within 30 days of application or use.

2.02 REINFORCEMENT STEEL

- A. Reinforcement steel for all cast-in-place reinforced concrete construction shall conform to the following requirements:
 - 1. Bar reinforcement shall conform to the requirements of ASTM A 615 for Grade 60 Billet Steel Reinforcement or as otherwise indicated.
 - 2. All welded reinforcement, specifically detailed or otherwise indicated, shall be low-alloy Grade 60 deformed bars conforming to the requirements of ASTM A 706.
 - 3. Welded wire fabric reinforcement shall conform to the requirements of ASTM A 185 and the details indicated; provided, that welded wire fabric with longitudinal wire of W4 size wire and smaller shall be either provided in flat sheets or in rolls with a core diameter of not less than 10 inches; and provided further, that welded wire fabric with longitudinal wires larger than W4 size shall be provided in flat sheets only.
 - 4. Spiral reinforcement shall be cold-drawn steel wire conforming to the requirements of ASTM A 82.
 - 5. Tie wire shall be Annealed Steel, 14 gauge minimum.

B. Accessories:

1. Accessories shall include all necessary chairs, slab bolsters, concrete blocks, tie wires, dips, supports, spacers, and other devices to position reinforcement during concrete placement. All bar supports shall meet the requirements of the CRSI Manual of Standard Practice, Chapter 3, including special requirements for supporting epoxy-coated reinforcing bars. Wire bar supports shall be CRSI Class 1 for maximum protection with a 1/8 inch minimum thickness of plastic coating which extends at least 1/2 inch from the concrete surface. Plastic shall be gray in color.
 2. Concrete blocks (dobies), used to support and position reinforcement steel, shall have the same or higher compressive strength as specified for the concrete in which it is located. Wire ties shall be embedded in concrete block bar supports.
- C. Epoxy coating for reinforcing and accessories, where indicated, shall conform to ASTM A 775.

2.03 MECHANICAL COUPLERS

- A. Mechanical couplers shall be provided where indicated and where approved by the Owner's Representative or Resident Project Representative. The couplers shall develop a tensile strength which exceeds 125 percent of the yield strength of the reinforcement bars being spliced at each splice.
- B. Where the type of coupler used is composed of more than one component, all components required for a complete splice shall be supplied. This shall apply to all mechanical splices, including those splices intended for future connections.
- C. The reinforcement steel and coupler used shall be compatible for obtaining the required strength of the connection. Straight threaded type couplers shall require the use of the next larger size reinforcing bar or shall be used with reinforcing bars with specially forged ends which provide upset threads which do not decrease the basic cross-section of the bar.

2.04 WELDED SPLICES

- A. Welded splices shall be provided where indicated and where approved by the Owner's Representative or Resident Project Representative. All welded splices of reinforcement steel shall develop a tensile strength which exceeds 125 percent of the yield strength of the reinforcement bars which are connected.
- B. Provided materials shall be capable of conforming to the Weld Splice requirements of AWS D 1.4.

2.05 EPOXY GROUT

- A. Epoxy for grouting reinforcing bars shall be specifically formulated for such application, for the moisture condition, application temperature, and orientation of the hole to be filled. Epoxy grout shall be in conformance with Section 03315 - Grout.

2.06 MANUFACTURERS

- A. Couplers/welded splices shall be manufactured by one of the following or equal:
 - 1. Lenton Form Saver by Erico Products
 - 2. Dowel Bar Splicer System by Dayton Superior

PART 3 - EXECUTION

3.01 GENERAL

- A. All reinforcement steel, welded wire fabric, couplers, and other appurtenances shall be fabricated, and placed in accordance with the requirements of the Uniform Building Code and the supplementary requirements indicated herein.

3.02 FABRICATION AND DELIVERY

- A. The Contractor shall conform to CRSI MSP, Chapters 6 and 7, except as otherwise indicated or specified. The Contractor shall bundle reinforcement and tag with suitable identification to facilitate sorting and placing, and transport and storage at the site so as not to damage material. The Contractor shall keep a sufficient supply of tested, approved, and proper reinforcement at the site to avoid delays.

- B. Bending and Forming: The Contractor shall bend bars of indicated size and accurately form in accordance with the requirements of ACI 315 and ACI 318 to shapes and lengths indicated on the Plans and required by methods not injurious to materials. The Contractor shall not heat reinforcement for bending. Bars with kinks or bends not conforming with approved shop drawings will be rejected.
- C. Fabricating Tolerance: All fabrication of reinforcing bars shall meet the requirements of ACI 117.
- D. Reinforcing Bars for Masonry: The Contractor shall detail and fabricate bars at the shop, ready for installation by masons.

3.03 PLACING

- A. Reinforcement steel shall be accurately positioned and shall be supported and wired together to prevent displacement, using annealed iron wire ties or suitable clips at intersections. All reinforcement steel shall be supported by concrete, plastic or metal supports, spacers or metal hangars which are strong and rigid enough to prevent any displacement of the reinforcement steel. Where concrete is to be placed on the ground, supporting concrete blocks (or dobies) shall be used, in sufficient numbers to support the bars without settlement, but in no case shall such support be continuous. All concrete blocks used to support reinforcement steel shall be tied to the steel with wire ties which are embedded in the blocks. For concrete over formwork, the Contractor shall furnish concrete, metal, plastic, or other acceptable bar chairs and spacers.
- B. Limitations on the use of bar support materials shall be as follows:
 - 1. Concrete Dobbies: Permitted at all locations except where architectural finish is required.
 - 2. Wire Bar Supports: Permitted only at slabs over dry areas, interior dry wall surfaces, and exterior wall surfaces.
 - 3. Plastic Bar Supports: Permitted at all locations except on grade.
- C. Tie wires shall be bent away from the forms in order to provide the specified concrete coverage.
- D. Bars additional to those shown which may be found necessary or desirable by the Contractor for the purpose of securing

reinforcement in position shall be provided by the Contractor at no additional cost to the Owner.

- E. Unless otherwise specified, reinforcement placing tolerances shall be within the limits specified in Section 7.5 of ACI 318 except where in conflict with the requirements of the UBC.
- F. Bars may be moved as necessary to avoid interference with other reinforcement steel, conduits, or embedded items. If bars are moved more than one bar diameter, or enough to exceed the above tolerances, the resulting arrangement of bars shall be subject to the approval of the Owner's Representative or Resident Project Representative.
- G. Welded wire fabric reinforcement placed over horizontal forms shall be supported on slab bolsters. Slab bolsters shall be spaced not more than 30 inches on center, shall extend continuously across the entire width of the reinforcement mat, and shall support the reinforcement mat in the plane indicated.
- H. Welded wire fabric placed over the ground shall be supported on wired concrete blocks (dobies) spaced not more than 3 feet on center in any direction. The construction practice of placing welded wire fabric on the ground and hooking into place in the freshly placed concrete shall not be allowed.
- I. Epoxy-coated reinforcing bars shall be stored, transported, and placed in such a manner as to avoid chipping of the epoxy coating. Non-abrasive slings made of nylon and similar materials shall be used. Specially coated bar supports shall be used. All chips or cracks in the epoxy coating shall be repaired with a compatible epoxy repair material prior to placing concrete.
- J. Accessories supporting reinforcing bars shall be spaced such that there is no deflection of the accessory from the weight of the supported bars. When used to space the reinforcing bars from wall forms, the forms and bars shall be located so that there is no deflection of the accessory when the forms are tightened into position.

3.04 SPLICES

- A. Splicing shall be in accordance with ACI 318, unless otherwise noted on the Plans.

- B. Vertical Bars: Except as specifically detailed or otherwise indicated, splicing of vertical bars in concrete is not permitted, except at the indicated or approved horizontal construction joints or as otherwise specifically detailed.
- C. Horizontal Bars: Except as specifically detailed or otherwise indicated, splicing of horizontal bars in concrete is not permitted.
- D. Mechanical Couplers: Unless otherwise indicated or approved by the Owner's Representative or Resident Project Representative, use of mechanical couplers is not permitted.
- E. Welding: Except as specifically detailed or otherwise indicated, welding of reinforcing bars is not permitted.

3.05 ADDITIONAL REINFORCING

- A. The Contractor shall provide additional reinforcing bars at sleeves and openings as indicated on the Plans.

3.06 WELDED WIRE MESH

- A. The Contractor shall install necessary supports and chairs to hold the wire mesh in place during concrete pours. The Contractor shall straighten mesh to lay in a flat plane and bend mesh as shown or required to fit work. The Contractor shall provide laps of no less than one complete mesh, unless otherwise detailed, and shall tie every other wire at laps. Roll mesh is not acceptable.

3.07 EMBEDMENT OF DRILLED REINFORCING STEEL DOWELS

- A. Hole Preparation:
 1. The hole diameter shall be as recommended by the epoxy manufacturer but shall be no larger than 0.25 inch greater than the diameter of the outer surface of the reinforcing bar deformations.
 2. The depth of the hole shall be as recommended by the epoxy manufacturer to fully develop the bar but shall not be less than 12 bar diameters, unless noted otherwise.
 3. The hole shall be drilled by methods which do not interfere with the proper bonding of epoxy.

4. Existing reinforcing steel in the vicinity of proposed holes shall be located prior to drilling. The location of holes to be drilled shall be adjusted to avoid drilling through or nicking any existing reinforcing bars.
5. The hole shall be blown clean with clean, dry compressed air to remove all dust and loose particles.
6. Epoxy shall be injected into the hole through a tube placed to the bottom of the hole. The tube shall be withdrawn as epoxy is placed but kept immersed to prevent formation of air pockets. The hole shall be filled to a depth that ensures that excess material will be expelled from the hole during dowel placement.
7. Dowels shall be twisted during insertion into the partially filled hole so as to guarantee full wetting of the bar surface with epoxy. The bar shall be inserted slowly enough to avoid developing air pockets.

3.08 CLEANING AND PROTECTION

- A. Reinforcing steel delivered to the jobsite shall be suitably stored off the ground and protected from oils, mud, concrete splatter and all conditions conducive to corrosion until embedded in concrete.
- B. The surfaces of all reinforcement steel and other metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar and other foreign substances immediately before the concrete is placed. Where there is delay in depositing concrete, reinforcement shall be re-inspected and, if necessary, re-cleaned.

END OF SECTION 03200

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall provide finished structural concrete, complete, in accordance with the Contract Documents.
- B. The following types of concrete are covered in this Section:
 - 1. **STRUCTURAL CONCRETE**: Normal weight (145 PCF) concrete to be used in all cases except where noted otherwise in the Contract Documents.
 - 2. **LEAN CONCRETE**: Concrete to be used for thrust blocks, anchor blocks, pipe trench cut-off blocks and cradles, where the preceding items are detailed on the Plans as unreinforced. Concrete to be used as protective cover for dowels intended for future connection.
- C. The term “hydraulic structure” used in these Specifications refers to environmental engineering concrete structures for the containment, treatment, or transmission of water, or other fluids.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. The Work of the following Sections applies to the Work of this Section. Other Sections, not referenced below, shall also apply to the extent required for proper performance of this Work.
 - 1. Section 03100 - Concrete Formwork
 - 2. Section 03200 - Reinforcement Steel
 - 3. Section 03730 – Concrete Rehabilitation
 - 4. Section 03315 – Grout

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Except as otherwise indicated in this Section, the Contractor shall comply with the latest adopted edition of the Standard Specifications for Public Works Construction (SSPWC), together with the latest adopted editions of the Regional Amendments.

B. The current edition of the Uniform Building Code (UBC) of International Conference of Buildings Officials (ICBO).

C. Federal Specifications:

1. UU-B-790A(1)(2): Building Paper, Vegetable Fiber (Kraft, Water-Proofed, Water Repellant and Fire Resistant)

D. Commercial Standards:

1. ACI 117: Standard Tolerances for Concrete Construction and Materials
2. ACI 214: Recommended Practice for Evaluation of Strength Test Results of Concrete
3. ACI 301: Specifications for Structural Concrete for Buildings
4. ACI 309: Consolidation of Concrete
5. ACI 315: Details and Detailing of Concrete Reinforcement
6. ACI 318: Building Codes Requirements for Reinforced Concrete
7. ACI 350R: Environmental Engineering Concrete Structures

E. ASTM Standards in Building Codes:

1. ASTM C 31: Practice for Making and Curing Concrete Test Specimens in the Field
2. ASTM C 33: Specification for Concrete Aggregates
3. ASTM C 39: Test Method for Compressive Strength of Cylindrical Concrete Specimens
4. ASTM C 40: Test Method for Organic Impurities in Fine Aggregates for Concrete
5. ASTM C 42: Test Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

6. ASTM C 88: Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
7. ASTM C 94: Specification for Ready-Mixed Concrete
8. ASTM C 136: Test Method for Sieve Analysis of Fine and Coarse Aggregates
9. ASTM C 138: Test Method for Unit Weight, Yield, and Air Content of Concrete
10. ASTM C 143: Test Method for Slump of Hydraulic Cement Concrete
11. ASTM C 150: Specification for Portland Cement
12. ASTM C 156: Test Method for Water Retention by Concrete Curing Materials
13. ASTM C 157: Test Method for Length Change of Hardened Hydraulic Cement Mortar and Concrete
14. ASTM C 192: Practice for Making and Curing Concrete Test Specimens in the Laboratory
15. ASTM C 231: Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
16. ASTM C 260: Specification for Air-Entraining Admixtures for Concrete
17. ASTM C 289: Test Method for Potential Reactivity of Aggregates (Chemical Method)
18. ASTM C 309: Specification for Liquid Membrane-Forming Compounds for Curing Concrete
19. ASTM C 494: Specification for Chemical Admixtures for Concrete
20. ASTM C 107: Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation

21. ASTM D 1751: Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-Extruding and Resilient Bituminous Types)
22. ASTM D 2419: Test Method for Sand Equivalent Value of Soils and Fine Aggregate
23. ASTM E 119: Method for Fire Tests of Building Construction and Materials

1.04 CONTRACTOR SUBMITTALS

- A. Mix Designs: Before starting the Work and within 14 days of the Notice to Proceed, the Contractor shall submit to the Owner's Representative, for review, preliminary concrete mix designs which shall illustrate the proportions and gradations of all materials proposed for each class and type of concrete specified herein in accordance with the Special Conditions. The mix designs shall be checked and certified to conform to these Specifications by an independent testing laboratory acceptable to the Owner's Representative or Resident Project Representative to be in conformance with these Specifications. All costs related to such checking and testing shall be borne by the Contractor at no cost to the Owner.
- B. Delivery Tickets: Where ready-mix concrete is used, the Contractor shall furnish delivery tickets at the time of delivery of each load of concrete. Each ticket shall show the state-certified equipment used for measuring and the total quantities, by weight, of cement, sand, each class of aggregate, admixtures, and the amounts of water in the aggregate added at the batching plant, and the amount of water allowed to be added at the site for the specific design mix. In addition, each ticket shall state the mix number, total yield in cubic yards, and the time of day, to the nearest minute, corresponding to the times when the batch was dispatched, when it left the plant, when it arrived at the site, when unloading began, and when unloading was finished.
- C. The Contractor shall provide the following submittals in accordance with ACI 301:
 1. Mill tests for cement.
 2. Admixture certification. Chloride ion content must be included.

3. Aggregate gradation and certification.
 4. Materials and methods for curing.
- D. The Contractor shall provide catalog cuts and other manufacturer's technical data demonstrating compliance with the requirements indicated and specified herein for all admixtures used in the concrete mix design.

1.05 QUALITY ASSURANCE

A. GENERAL

1. Tests on component materials and for compressive strength and shrinkage of concrete will be performed as specified herein. Test for determining slump will be in accordance with the requirements of ASTM C 143.
2. The cost of all laboratory tests requested by the Owner's Representative or Resident Project Representative for cement, aggregates, and concrete, will be borne by the Contractor. The laboratory must meet or exceed the requirements of ASTM C 1077.
3. Concrete for testing shall be supplied by the Contractor at no cost to the Owner and the Contractor shall provide assistance to the independent testing laboratory acceptable to the Owner's Representative or Resident Project Representative in obtaining samples, and disposal and clean up of excess material.
4. A minimum of one (1) set of concrete cylinders and a slump test shall be obtained for every major concrete placement. A minimum of one (1) set of concrete cylinders shall be obtained for all concrete structures, foundations and slabs. One (1) set of cylinders shall be obtained for every forty (40) yards of concrete placed for a particular pour. For instance, if the walls of a structure require eighty (80) yards of concrete; then two (2) sets of concrete cylinders shall be required.

B. Field Compression Tests:

1. Compression test specimens will be taken during construction from the first placement of each class of concrete specified herein and at intervals thereafter as

selected by the Owner's Representative or Resident Project Representative to ensure continued compliance with these Specifications. Each set of test specimens will consist of four (4) cylinders.

2. Compression test specimens for concrete shall be made in accordance with Section 9.2 of ASTM C 31. Specimens shall be 6-inch diameter by 12-inch high cylinders.
3. Compression tests shall be performed in accordance with ASTM C 39. One (1) test cylinder will be tested at 7 days and two (2) at 28 days. The remaining cylinder will be held to verify test results, if needed.

C. Evaluation and Acceptance of Concrete:

1. Evaluation and acceptance of the compressive strength of concrete shall be according to the requirements of ACI 318, Chapter 5, "Concrete Quality", and as specified herein.
2. A statistical analysis of compression test results will be performed according to the requirements of ACI 214. The standard deviation of the test results shall not exceed 640 PSI, when ordered at equivalent water content as estimated by slump.
3. If any concrete fails to meet these requirements, immediate corrective action shall be taken to increase the compressive strength for all subsequent batches of the type of concrete affected.
4. When the standard deviation of the test results exceeds 640 PSI, the average strength for which the mix is designed shall be increased by an amount necessary to satisfy the statistical requirement that the probability of any test being more than 500 PSI below or the average of any three (3) consecutive tests being below the specified compressive strength is 1 in 100. The required average strength shall be calculated by Criterion No. 3 of ACI 214 using the actual standard deviation.
5. All concrete which fails to meet the ACI requirements and these Specifications is subject to removal and replacement at no cost to the Owner.

D. Construction Tolerances: Set and maintain concrete forms and perform finishing operations so as to ensure that the completed Work is within the tolerances specified herein. Surface defects and irregularities are defined as finishes and are to be distinguished from tolerances. Tolerance is the specified permissible variation from lines, grades, or dimensions shown. Where tolerances are not stated in the Specifications, permissible deviations will be in accordance with ACI 117.

1. The following construction tolerances are hereby established and apply to finished walls and slab unless otherwise illustrated:

<u>Item</u>	<u>Tolerance</u>
Variation of the constructed linear outline from the established position in plan.	In 10 feet: ¼ inch In 20 feet or more: ½ inch
Variation from the level or from the grades shown.	In 10 feet: ¼ inch In 20 feet or more: ½ inch
Variation from the plumb.	In 10 feet: ¼ inch In 20 feet or more: ½ inch
Variation in the thickness of slabs and walls.	Minus ¼ inch; Plus ½ inch
Variation in the locations and sizes of slabs and wall openings.	Plus or minus ¼ inch

E. Floor Slab Surface Hardener:

1. Job Mockup: In a location designated by the Owner's Representative or Resident Project Representative, place a minimum 100 square feet floor mockup using materials and procedures proposed for use in the Project. Revise materials and procedures as necessary to obtain acceptable finish surface. Maintain the same controls and procedures used in the acceptable mockup throughout the Project.

2. Field Service: During job mockup and initial period of installation, the manufacturer of the surface hardener shall furnish the service of a trained, full-time representative to advise on proper use of the product. Notify surface hardener manufacturer at least three (3) days before initial use of the product.

3. Installer Qualifications: Installer shall have a minimum of three (3) years experience and shall be specialized in the application of dry shake surface hardeners.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

A. General:

1. All materials specified herein shall be classified by the Environmental Protection Agency as acceptable for potable water use within 30 days of application.
2. Materials shall be delivered, stored, and handled so as to prevent damage by water or breakage. Only one (1) brand of cement shall be used. Cement reclaimed from cleaning bags or leaking containers shall not be used. All cement shall be used in the sequence of receipt of shipments.

B. All materials furnished for the Work shall comply with the requirements of Sections 201, 203, and 204 of ACI 301, as applicable.

C. Storage of materials shall conform to the requirements of Section 2.5 of ACI 301 or the SSPWC.

D. Materials for concrete shall conform to the following requirements:

1. Cement shall be standard brand Portland Cement conforming to ASTM C 150 for Type V. A minimum of 85 percent of cement by weight shall pass a 325 screen. A single brand of cement shall be used throughout the Work, and before its use, the brand shall be acceptable to the Owner's Representative. The cement shall be suitably protected from exposure to moisture until used. Cement that has become lumpy shall not be used. Sacked cement shall be stored in such a manner so as to permit access for inspection and sampling. Certified mill test reports, including fineness, for each shipment of cement to be used shall be submitted to the Owner's Representative or Resident Project Representative if requested regarding compliance with these Specifications.

2. Water for mixing and curing shall be potable, clean, and free from objectionable quantities of silty organic matter, alkali, salts and other impurities. The water shall be considered potable, for the purposes of this Section, only if it meets the requirements of the local governmental agencies. Agricultural water with high total dissolved solids concentration (over 1,000 mg/l) shall not be used.
3. Aggregates shall be obtained from pits acceptable to the Owner's Representative, shall be nonreactive, and shall conform to ASTM C 33. Maximum size of coarse aggregate shall be as specified herein. Lightweight sand for fine aggregate will not be permitted.
 - a) Coarse aggregates shall consist of clean, hard, durable gravel, crushed gravel, crushed rock or a combination thereof. The coarse aggregates shall be prepared and handled in two or more size groups for combined aggregates with a maximum size greater than $\frac{3}{4}$ inch. When the aggregates are proportioned for each batch of concrete the two size groups shall be combined. See the Paragraph in Part 2 entitled "Trial Batch and Laboratory Tests" for the use of the size groups.
 - b) Fine aggregates shall be natural sand or a combination of natural and manufactured sand that are hard and durable. When tested in accordance with ASTM D 2419, the sand equivalency shall not be less than 75 percent for an average of three samples, nor less than 70 percent for an individual test. Gradation of fine aggregate shall conform to ASTM C 33, with 15 to 30 percent passing the number 50 screen and 5 to 10 percent passing the number 100 screen. The fineness modulus of sand used shall not be over 3.00.
 - c) Combined aggregates shall be well graded from coarse to fine sizes, and shall be uniformly graded between screen sizes to produce a concrete that has optimum workability and consolidation characteristics. Where a trial batch is required for a mix design, the final combined aggregate gradations will be established during the trial batch process.

- d) When tested in accordance with ASTM C 33, the ratio of silica released to reduction in alkalinity shall not exceed 1.0.
 - e) When tested in accordance with ASTM C 33, the fine aggregate shall produce a color in the supernatant liquid no darker than the reference standard color solution.
 - f) When tested in accordance with ASTM C 33, the coarse aggregate shall show a loss not exceeding 42 percent after 500 revolutions, or 10.5 percent after 100 revolutions.
 - g) When tested in accordance with ASTM C 33, the loss resulting after five cycles shall not exceed 10 percent for fine or coarse aggregate when using sodium sulfate.
4. Ready-mix concrete shall conform to the requirements of ASTM C 94.
5. Admixtures: All admixtures shall be compatible and by a single manufacturer capable of providing qualified field service representation. Admixtures shall be used in accordance with manufacturer's recommendations. If the use of an admixture is producing an inferior end result, discontinue use of the admixture. Admixtures shall not contain thiocyanates nor more than 0.05 percent chloride ion, and shall be nontoxic after 30 days.
- a) Set controlling and water reducing admixtures: Admixtures may be added at the Contractor's option to control the set, affect water reduction, and increase workability. The addition of an admixture shall be at no increase in cost to the Owner. The use of an admixture shall be subject to acceptance by the Owner's Representative. Concrete containing an admixture shall be first placed at a location determined by the Owner's Representative. Admixtures specified herein shall conform to the requirements of ASTM C 494. The required quantity of cement shall be used in the mix regardless of whether or not an admixture is used.

- 1) Concrete shall not contain more than one water-reducing admixture. Concrete containing an admixture shall be first placed at a location determined by the Owner's Representative.
- 2) Set controlling admixture shall be either with or without water-reducing properties. Where the air temperature at the time of placement is expected to be consistently over 80°F, a set retarding admixture such as Plastocrete by Sika Corporation; Pozzolith 300R by Master Builders; Daratard by W. R. Grace; or equal shall be used. Where the air temperature at the time of placement is expected to be consistently under 40°F, a noncorrosive set accelerating admixture such as Plastocrete 161FL by Sika Corporation; Pozzutec 20 by Master Builders; Daraset by W. R. Grace; or equal shall be used.
- 3) Normal range water reducer shall conform to ASTM C 494, Type A, WRDA 79 by W. R. Grace; Pozzolith 322-N by Master Builders; Plastocrete 161 by Sika Corporation; or equal. The quality of admixture used and the method of mixing shall be in accordance with the manufacturer's instructions and recommendations.
- 4) High range water reducer shall conform to ASTM C 494, Type F or G. Daracem 100 or WDRA 19 by W. R. Grace; Sikament FF or Sikament 86 by Sika Corporation; Rheobuild 1000 or Rheobuild 716 by Master Builders; or equal. High range water reducer shall be added to the concrete after all other ingredients have been mixed and initial slump has been verified. No more than 14 ounces of water reducer per sack of cement shall be used. Water reducer shall be considered as part of the mixing water when calculating water cement ratio.
- 5) If the high range water reducer is added to the concrete at the job site, it may be used in conjunction with the same water reducer added

at the batch plant. Concrete shall have a slump of 3 inches + ½ inch before adding the high range water reducing admixture at the job site. The high range water-reducing admixture shall be accurately measured and pressure injected into the mixer as a single dose by an experienced technician. A standby system shall be provided and tested before each day's operation of the job site system.

- 6) Concrete shall be mixed at mixing speed for a minimum of 30 mixer revolutions after the addition of the high range water reducer.
 - 7) Fly ash: Fly ash shall not be allowed.
6. Shrinking Reducing Agent Admixture: All Structural Concrete shall include 0.5 gallons, per cubic yard of concrete, of W.R. Grace Eclipse, or an approved equal.

2.02 CURING MATERIALS

- A. Materials for curing concrete as specified herein shall conform to the following requirements and ASTM C 309:
1. All curing compounds shall be white pigmented and resin based. Sodium silicate compounds shall not be allowed. Concrete curing compound shall be Spartan Cote Cure-Seal Hardener by the Burke Company; Super Rez Seal by Euclid Chemical Company; MB-429 as manufactured by Master Builders; or equal. Water-based resin curing compounds shall be used only where local air quality regulations prohibit the use of a solvent-based compound. Water-based curing compounds shall be Aqua Resincure by the Burke Company; Aqua-Cure by Euclid Chemical Company; Masterkure-W by Master Builders; or equal.
 2. Polyethylene sheet for use as a concrete curing blanket shall be white, and shall have a nominal thickness of 6 mils. The loss of moisture when determined in accordance with the requirements of ASTM C 156 shall not exceed 0.055 grams per square centimeter of surface.

3. Polyethylene-coated water proof paper sheeting for use as concrete curing blanket shall consist of white polyethylene sheeting free of visible defects, uniform in appearance, having a nominal thickness of 2 mils and permanently bonded to waterproof paper conforming to the requirements of Federal Specification UU-B-790A(1)(2). The loss of moisture, when determined in accordance with the requirements of ASTM C156, shall not exceed 0.055 gram per square centimeter of surface.
4. Polyethylene-coated burlap for use as concrete curing blanket shall be 4 mils thick, white opaque polyethylene film impregnated or extruded into one side of the burlap. Burlap shall weigh not less than 9 ounces per square yard. The loss of moisture, when determined in accordance with the requirements of ASTM C 156, shall not exceed 0.055 gram per square centimeter of surface.
5. Curing mats for use in Curing Method 6 as specified herein, shall be heavy shag rugs or carpets or cotton mats quilted at 4 inches on center. Curing mats shall weigh a minimum of 12 ounces per square yard when dry.
6. Evaporation retardant shall be a material such as Confilm as manufactured by Master Builders; Eucobar as manufactured by Euclid Chemical Company; or equal.

2.03 NONWATERSTOP JOINT MATERIALS

- A. Materials for nonwaterstop joints in concrete shall conform to the following requirements:
 1. Preformed joint filler shall be a nonextruding, resilient, bituminous type conforming to the requirements of ASTM D 1751.
 2. Mastic joint sealer shall be a material that does not contain evaporating solvents; that will tenaciously adhere to concrete surfaces; that will remain permanently resilient and pliable; that will not be affected by continuous presence of water and will not in any way contaminate potable water; and that will effectively seal the joints against moisture infiltration even when the joints are subject to movement due to expansion and contraction. The sealer shall be composed of special asphalts or similar materials blended with lubricating and plasticizing agents to form a tough, durable mastic

substance containing no volatile oils or lubricants and shall be capable of meeting the test requirements set forth hereinafter, if testing is required by the Owner's Representative.

2.04 MISCELLANEOUS MATERIALS

- A. Damp-proofing agent shall be an asphalt emulsion, such as Hydrocide 600 by Sonneborn; Damp-proofing Asphalt Coating by Euclid Chemical Company; Sealmastic by W. R. Meadows Inc., or equal.
- B. Bonding agents shall be epoxy adhesives conforming to the following products for the applications specified:
 - 1. For bonding freshly-mixed, plastic concrete to hardened concrete, Sikadur 32 Hi-Mod Epoxy Adhesive, as manufactured by Sika Corporation; Concesive Liquid (LPL), as manufactured by BASF/Master Builders; Sure Bond J58 as manufactured by Dayton Superior; or equal.
 - 2. For bonding hardened concrete or masonry to steel, Sikadur 31 Hi-Mod Gel as manufactured by Sika Corporation; Pro-Poxy 300 as manufactured by Unitex; MasterEmaco ADH 327 as manufactured by BASF/Master Builders; or equal

2.05 CONCRETE DESIGN REQUIREMENTS

- A. Mix Design:
 - 1. General: Concrete shall be composed of cement, admixtures, aggregates and water. These materials shall be of the qualities specified. The exact proportions in which these materials are to be used for different parts of the Work will be determined during the trial batch. In general, the mix shall be designed to produce a concrete capable of being deposited so as to obtain maximum density and minimum shrinkage and, where deposited in forms, to have good consolidation properties and maximum smoothness of surface. In mix designs, the percentage of sand of the total weight of fine and coarse aggregate shall not exceed 41 for hydraulic structures or 50 for all other structures, unless noted otherwise. The aggregate gradations shall be formulated to provide fresh concrete that will not promote rock pockets around reinforcing steel or embedded items.

The proportions shall be changed whenever necessary or desirable to meet the required results at no additional cost to the Owner. All changes shall be subject to review by the Owner's Representative.

2. Water-Cement Ratio and Compressive Strength: The minimum compressive strength and cement content of concrete shall be not less than that specified in the following table:

<u>Type of Work</u>	Min. 28-Day Compressive Strength (PSI)	Max Size Aggregate (in)	Minimum Cement Per CU YD (lb)	Max W/C Ratio (by weight)
Structural Concrete:				
Normal weight reinforced concrete (145 pcf)	5,000	3/4	658	0.45
Lean Concrete	4,500	3/4	611	0.45

NOTE: The Contractor is cautioned that the limiting parameters specified above are not a mix design. Additional cement or water-reducing agent may be required to achieve workability demanded by the Contractor's construction methods and aggregates. The Contractor is responsible for any costs associated with furnishing concrete with the required workability.

3. Adjustments to Mix Design: The mixes used shall be changed whenever such change is necessary or desirable to secure the required strength, density, workability, and surface finish and the Contractor shall be entitled to no additional compensation because of such changes.

B. Consistency:

1. The quantity of water entering into a batch of concrete shall be just sufficient, with a normal mixing period, to produce a concrete which can be worked properly into place without

segregation, and which can be compacted by the vibratory methods herein specified to give the desired density, impermeability and smoothness of surface. The quantity of water shall be changed as necessary, with variations in the nature or moisture content of the aggregates, to maintain uniform production of a desired consistency. The consistency of the concrete in successive batches shall be determined by slump tests in accordance with ASTM C 143. The slumps shall be as follows:

<u>Part of Work</u>	<u>Slump (in)</u>
All concrete, unless noted otherwise	4 inches + 1/2-inch
With high range water reducer added	5 inches + 1/2-inch

C. Trial Batch and Laboratory Tests:

1. Before placing any concrete, a testing laboratory approved by the Owner's Representative or Resident Project Representative will prepare a trial batch of each class of structural concrete, based on the preliminary concrete mixes submitted by the Contractor. During the trial batch the aggregate proportions may be adjusted by the testing laboratory using the two coarse aggregate size ranges to obtain the required properties. If one size range produces an acceptable mix, a second size range need not be used. Such adjustments shall be considered refinements to the mix design and shall not be the basis for extra compensation to the Contractor. All concrete shall conform to the requirements of this Section, whether the aggregate proportions are from the Contractor's preliminary mix design, or whether the proportions have been adjusted during the trial batch process. The trial batch will be prepared using the aggregates, cement and admixture proposed for the project. The trial batch materials shall be of a quantity such that the testing laboratory can obtain 3 drying shrinkage, and six compression test specimens from each batch. The cost, of not more than three laboratory trial batch tests for each specified concrete strength will be borne by the Contractor. The Contractor shall furnish and deliver the materials in steel drums to the approved testing laboratory. Any additional trial batch testing required shall be performed by the testing laboratory at no additional cost to the Owner.

2. The determination of compressive strength will be made by testing 6-inch diameter by 12 inch high cylinders; made, cured and tested in accordance with ASTM C 192 and ASTM C 39. Three compression test cylinders will be tested at 7 days and 3 at 28 days. The average compressive strength for the three cylinders tested at 28 days for any given trial batch shall not be less than 125 percent of the specified compressive strength.
3. A sieve analysis of the combined aggregate for each trial batch shall be performed according to the requirements of ASTM C 136. Values shall be given for percent passing each sieve.
4. In lieu of trial batch and laboratory tests specified in this Section, the Contractor may submit previously-designed, tested, and successfully-used concrete mixes, using materials similar to those intended for this project, together with a minimum of three certified test reports of the 28 day strength of the proposed concrete mix.

D. Shrinkage Limitation:

1. The maximum concrete shrinkage for specimens cast in the laboratory from the trial batch, as measured at 21 day drying age or at 28 day drying age shall be 0.036 percent or 0.042 percent, respectively. Use a mix design for construction that has first met the trial batch shrinkage requirements. Shrinkage limitations apply only to structural concrete.
2. The maximum concrete shrinkage for specimens cast in the field shall not exceed the trial batch maximum shrinkage requirement by more than 25 percent.
3. If the required shrinkage limitation is not met during construction, take any or all of the following actions, at no additional cost to the Owner for securing the specified shrinkage requirements. These actions may include changing the source of aggregates, cement and/or admixtures; reducing water content; washing of aggregate to reduce fines; increasing the number of construction joints, modifying the curing requirements; or other actions designed to minimize shrinkage or the effects of shrinkage.

E. Measurement of Cement and Aggregate:

1. The amount of cement and of each separate size of aggregate entering into each batch of concrete shall be determined by direct weighing equipment acceptable to the Owner's Representative.

2. Weighing Tolerances:

<u>Material</u>	<u>Percent of Total Weight</u>
Cement	1
Aggregates	3
Admixtures	3

F. Measurement of Water:

1. The quantity of water entering the mixer shall be measured by a suitable water meter or other measuring device of a type acceptable to the Owner's Representative or Resident Project Representative and capable of measuring the water in variable amounts within a tolerance of one percent. The water feed control mechanism shall be capable of being locked in position so as to deliver constantly any specified amount of water to each batch of concrete. A positive quick-acting valve shall be used for a cut-off in the water line to the mixer. The operating mechanism must be such that leakage will not occur when the valves are closed.

2.06 READY-MIXED CONCRETE

A. At the Contractor's option, ready-mixed concrete may be used meeting the requirements as to materials, batching, mixing, transporting, and placing as specified herein and in accordance with ASTM C 94, including the following supplementary requirements.

B. Ready-mixed concrete shall be delivered to the site of the Work, and discharge shall be completed within one and one-half hour (90 minutes) after the addition of the cement to the aggregates or before the drum has been revolved 250 revolutions, whichever is first.

C. Truck mixers shall be equipped with electrically-actuated counters by which the number of revolutions of the drum or blades may be readily verified. The counter shall be of the resettable, recording type, and shall be mounted in the driver's cab. The counters shall be actuated at the time of starting mixers at mixing speeds.

- D. Each batch of concrete shall be mixed in a truck mixer for not less than 70 revolutions of the drum or blades at the rate of rotation designated by the manufacturer of equipment. Additional mixing, if any, shall be at the speed designated by the manufacturer of the equipment as agitating speed. All materials including mixing water shall be in the mixer drum before actuating the revolution counter for determining the number of revolution of mixing.
- E. Truck mixers and their operation shall be such that the concrete throughout the mixed batch as discharged is within acceptable limits of uniformity with respect to consistency, mix, and grading. If slump tests taken at approximately the one-quarter (1/4) and three-quarter (3/4) points of the load during discharge give slumps differing by more than one inch (1") when the specified slump is 3 inches or less, or if they differ by more than 2 inches when the specified slump is more than 3 inches, the mixer shall not be used on the Work unless the causing condition is corrected and satisfactory performance is verified by additional slump tests. All mechanical details of the mixer, such as water measuring and discharge apparatus, condition of the blades, speed of rotation, general mechanical condition of the unit, and clearance of the drum, shall be checked before a further attempt to use the unit will be permitted.
- F. Each batch of ready-mixed concrete delivered at the job site shall be accompanied by a delivery ticket furnished to the Owner's Representative or Resident Project Representative in accordance with Subsection 03300-1.04B.
- G. The use of nonagitating equipment for transporting ready-mixed concrete will not be permitted. Combination truck and trailer equipment for transporting ready-mixed concrete will not be permitted. The quality and quantity of materials used in ready-mixed concrete and in batch aggregates shall be subject to continuous inspection at the batching plant by the Owner's Representative.

2.07 FLOOR HARDENER (SURFACE APPLIED)

- A. Surface hardener shall be a light reflective nonoxidizing metallic aggregate dry shake surface hardener.
 - 1. Surface hardener shall be premeasured, premixed and packaged at the factory.

2. Apply surface hardener at the rate of 1.8 to 2.5 lb per square foot.
 3. Surface hardener shall be Alumiplat[®], by Master Builders, Inc., or equal.
- B. Curing Compound shall meet the moisture retention requirements of ASTM C 309 and surface hardener manufacturer's recommendations.
- C. Monomolecular Film: Evaporation retarder shall be used to aid in maintaining concrete moisture during the early placement stages of plastic concrete. Evaporation retarder shall be as recommended by surface hardener manufacturer.

PART 3 - EXECUTION

3.01 PROPORTIONING AND MIXING

- A. Proportioning: Proportioning of the concrete mix shall conform to the requirements of Chapter 3, "Proportioning" of ACI 301.
- B. Mixing: Mixing of concrete shall conform to the requirements of Chapter 7 of said ACI 301 Specifications.
- C. Slump: Maximum slumps shall be as specified herein.
- D. Retempering: Retempering of concrete or mortar which has partially hardened shall not be permitted.

3.02 PREPARATION OF SURFACES FOR CONCRETING

- A. General: Earth surfaces shall be thoroughly wetted by sprinkling, before the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling up to the time of placing concrete thereon. The surface shall be free from standing water, mud, and debris at the time of placing concrete.
- B. Joints in Concrete: Concrete surfaces upon or against which concrete is to be placed, where the placement of the concrete has been stopped or interrupted so that, as determined by the Owner's Representative, the new concrete cannot be incorporated integrally with that previously placed, are defined as construction joints. The surfaces of horizontal joints shall be given a compacted, roughened surface for good bond. The joint surfaces shall be cleaned of all

laitance, loose or defective concrete, foreign material, and roughened to a minimum of ¼ inch amplitude. Such cleaning and roughening shall be accomplished by hydroblasting or sandblasting (exposing aggregate) followed by thorough washing. All pools of water shall be removed from the surface of construction joints, and the joint surface shall be coated with an epoxy-bonding agent, unless indicated otherwise, before the new concrete is placed.

- C. Placing Interruptions: When placing of concrete is to be interrupted long enough for the concrete to take a set, the working face shall be given a shape by the use of forms or other means, that will secure proper union with subsequent Work; provided that construction joints shall be made only where acceptable to the Owner's Representative.
- D. Embedded Items: No concrete shall be placed until all formwork, installation of parts to be embedded, reinforcement steel, and preparation of surfaces involved in the placing have been completed and accepted by the Owner's Representative or Resident Project Representative at least 4 hours before placement of concrete. All surfaces of forms and embedded items that have become encrusted with dried grout from concrete previously placed shall be cleaned of all such grout before the surrounding or adjacent concrete is placed.
- E. All inserts or other embedded items shall conform to the requirements herein.
- F. All reinforcement, anchor bolts, sleeves, inserts, and similar items shall be set and secured in the forms where illustrated on the Plans or by approved shop drawings and shall be acceptable to the Owner's Representative or Resident Project Representative before any concrete is placed. Accuracy of placement is the responsibility of the Contractor.
- G. Casting New Concrete Against Old: Where concrete is to be cast against old concrete (any concrete which is greater than 60 days of age), the surface of the old concrete shall be thoroughly cleaned and roughened by hydroblasting or sandblasting (exposing aggregate). The joint surface shall be coated with an epoxy bonding agent unless indicated otherwise by the Owner's Representative.
- H. No concrete shall be placed in any structure until all water entering the space to be filled with concrete has been properly cut off or has been diverted by pipes, or other means, and carried out of the

forms, clear of the Work. No concrete shall be deposited underwater nor shall the Contractor allow still water to rise on any concrete until the concrete has attained its initial set. Water shall not be permitted to flow over the surface of any concrete in such manner and at such velocity as will injure the surface finish of the concrete. Pumping or other necessary dewatering operations for removing ground water, if required, will be subject to the review of the Owner's Representative.

- I. Corrosion Protection: Pipe, conduit, dowels, and other ferrous items required to be embedded in concrete construction shall be so positioned and supported before placement of concrete that there will be a minimum of 2 inches clearance between said items and any part of the concrete reinforcement. Securing such items in position by wiring or welding them to the reinforcement will not be permitted.
- J. Openings for pipes, inserts for pipe hangars and brackets, and the setting of anchors shall, where practicable, be provided for during the placing of concrete.
- K. Anchor bolts shall be accurately set, and shall be maintained in position by templates while embedded in concrete.
- L. Cleaning: The surfaces of all metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar, and other foreign substances immediately before the concrete is placed.

3.03 HANDLING, TRANSPORTING AND PLACING

- A. General: Placing of concrete shall conform to the applicable requirements of Chapter 8 of ACI 301 and the requirements of this Section. No aluminum materials shall be used in conveying any concrete.
- B. Nonconforming Work or Materials: Concrete which upon or before placing is found not to conform to the requirements specified herein shall be rejected and immediately removed from the Work. Concrete which is not placed in accordance with these Specifications, or which is of inferior quality, shall be removed and replaced at no additional expense to the Owner.
- C. Unauthorized Placement: No concrete shall be placed except in the presence of duly authorized representative of the Owner's Representative. The Contractor shall notify the Owner's

Representative or Resident Project Representative in writing at least 48 hours in advance of placement of any concrete.

- D. Placement in Wall Forms: Concrete shall not be dropped through reinforcement steel or into any deep form, nor shall concrete be placed in any form in such a manner as to leave accumulation of mortar on the form surfaces above the placed concrete. In such cases, some means such as the use of hoppers and, if necessary, vertical ducts of canvas, rubber, or metal shall be used for placing concrete in the forms in a manner that it may reach the place of final deposit without separation. In no case shall the free fall of concrete exceed 4 feet below the ends of ducts, chutes, or buggies. Concrete shall be uniformly distributed during the process of depositing and in no case after depositing shall any portion be displaced in the forms more than 6 feet in horizontal direction. Concrete in forms shall be deposited in uniform horizontal layers not deeper than 2 feet; and care shall be taken to avoid inclined layers or inclined construction joints except where such are required for sloping members. Each layer shall be placed while the previous layer is still soft. The rate of placing concrete in forms shall not exceed 5 feet of vertical rise per hour. Sufficient illumination shall be provided in the interior of all forms so that the concrete at the places of deposit is visible from the deck or runway.
- E. Conveyor Belts and Chutes: All ends of chutes, hopper gates, and all other points of concrete discharge throughout the Contractor's conveying, hoisting and placing system shall be so designed and arranged that concrete passing from them will not fall separated into whatever receptacle immediately receives it. Conveyor belts, if used, shall be of a type acceptable to the Owner's Representative. Chutes longer than 50 feet will not be permitted. Minimum slopes of chutes shall be such that concrete of the specified consistency will readily flow in them. If a conveyor belt is used, it shall be wiped clean by a device operated in such a manner that none of the mortar adhering to the belt will be wasted. All conveyor belts and chutes shall be covered.
- F. Placement in Slabs: Concrete placed in sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the placement. As the Work progresses, the concrete shall be vibrated and carefully worked around the slab reinforcement, and the surface of the slab shall be screeded in an up-slope direction.
- G. Temperature of Concrete: The temperature of concrete when it is being placed shall be not more than 90°F nor less than 55°F for

sections less than 12 inches thick nor less than 50°F for all other sections. Concrete ingredients shall not be heated to a temperature higher than that necessary to keep the temperature of the mixed concrete, as placed, from falling below the specified minimum temperature. When the temperature of the concrete is 85°F or above, the time between the introduction of the cement to the aggregates and discharge at the Site shall not exceed 45 minutes. If concrete is placed when the weather is such that the temperature of the concrete would exceed 90°F, the Contractor shall employ effective means, such as precooling of aggregates and mixing water using ice or placing at night, as necessary to maintain the temperature of the concrete, as it is placed, below 90°F. The Contractor shall be entitled to no additional compensation on account of the foregoing requirements.

H. Cold Weather Placement:

1. Placement of concrete shall conform to ACI 306.1 - Standard Specification for Cold Weather Concreting, and the following.
2. Remove all snow, ice and frost from the surfaces, including reinforcement, against which concrete is to be placed. Before beginning concrete placement, thaw the subgrade to a minimum depth of 6 inches. All reinforcement and embedded items shall be warmed to above 32°F before concrete placement.
3. Maintain the concrete temperature above 50°F for at least 3 days after placement.

I. Hot Weather Placement:

1. Placement of concrete shall conform to ACI 305R - Hot Weather Concreting, and the following.
2. Only set retarding admixture shall be used in concrete when air temperature is expected to be consistently over 80°F.
3. The maximum temperature of concrete shall not exceed 90°F immediately before placement.
4. From the initial placement to the curing state, concrete shall be protected from the adverse effect of high temperature, low humidity, and wind.

3.04 PUMPING OF CONCRETE

- A. General: If the pumped concrete does not produce satisfactory end results, discontinue the pumping operation and proceed with the placing of concrete using conventional methods.
- B. Pumping Equipment: The pumping equipment must have two (2) cylinders and be designed to operate with one (1) cylinder only in case the other one is not functioning. In lieu of this requirement, the Contractor shall maintain a standby pump on the site during pumping.
- C. The minimum diameter of the hose (conduits) shall be in accordance with ACI 304.2R.
- D. Pumping equipment and hoses (conduits) that are not functioning properly, shall be replaced.
- E. Aluminum conduits for conveying the concrete shall not be permitted.
- F. Field Control: Concrete samples for slump, air content, and test cylinders will be taken at the placement (discharge) end of the line.

3.05 ORDER OF PLACING CONCRETE

- A. The order of placing concrete in all parts of the Work shall be acceptable to the Owner's Representative. In order to minimize the effects of shrinkage, the concrete shall be placed in units as bounded by construction joints. The placing of units shall be accomplished by placing alternate units in a manner such that each unit placed shall have cured at least 7 days for hydraulic structures and 3 days for all other structures before the contiguous unit or units are placed, except that the corner sections of vertical walls shall not be placed until the two (2) adjacent wall panels have cured at least 14 days for hydraulic structures and 7 days for all other structures.
- B. The surface of the concrete shall be level whenever a run of concrete is stopped. To ensure a level, straight joint on the exposed surface of walls, a wood strip at least $\frac{3}{4}$ inch thick shall be tacked to the forms on these surfaces. The concrete shall be carried about $\frac{1}{2}$ inch above the underside of the strip. About one (1) hour after the concrete is placed, the strip shall be removed and any irregularities in the edge formed by the strip shall be leveled with a trowel and all laitance shall be removed.

3.06 TAMPING AND VIBRATING

- A. As concrete is placed in the forms or in excavations, it shall be thoroughly settled and compacted, throughout the entire depth of the layer which is being consolidated, into a dense, homogeneous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pockets, and bringing only a slight excess of water to the exposed surface of concrete during placement. Vibrators shall be Group 3 (per ACI 309) high speed power vibrators (8,000 to 12,000 rpm) of an immersion type in sufficient number and with (at least one) standby units as required. Group 2 vibrators may be used only at specific locations when accepted by the Owner's Representative.
- B. Care shall be exercised in placing concrete around waterstops. The concrete shall be carefully worked by rodding and vibrating to make sure that all air and rock pockets have been eliminated. Where flat-strip type waterstops are placed horizontally, the concrete shall be worked under the waterstops by hand, making sure that all air and rock pockets have been eliminated. Concrete surrounding the waterstops shall be given additional vibration, over and above that used for adjacent concrete placement to assure complete embedment of the waterstops in the concrete.
- C. Concrete in walls shall be internally vibrated and at the same time rammed, stirred, or worked with suitable appliances, tamping bars, shovels, or forked tools until it completely fills the forms or excavations and closes snugly against all surfaces. Subsequent layers of concrete shall not be placed until the layers previously placed have been worked thoroughly as specified. Vibrators shall be provided in sufficient numbers, with standby units as required, to accomplish the results herein specified within 15 minutes after concrete of the prescribed consistency is placed in the forms. The vibrating head shall be kept from contact with the surfaces of the forms. Care shall be taken not to vibrate concrete excessively or to work it in any manner that causes segregation of its constituents.

3.07 FINISHING CONCRETE SURFACES

- A. General: Surfaces shall be free from fins, bulges, ridges, offsets, honeycombing, or roughness of any kind, and shall present a finished, smooth, continuous hard surface. Allowable deviations from plumb or level and from the alignment, profiles, and dimensions shown are defined as tolerances and are specified in Part 1, herein. These tolerances are to be distinguished from

irregularities in finish as described herein. Aluminum finishing tools shall not be used.

B. Formed Surfaces: No treatment is required after form removal except for curing, repair or defective concrete, and treatment of surface defects. Where architectural finish is required, it shall be as specified or as shown.

1. Surface holes larger than ½ inch in diameter or deeper than ¼ inch are defined as surface defects in basins and exposed walls.

C. Unformed Surfaces: After proper and adequate vibration and tamping, all unformed top surfaces of slabs, floors, walls, and curbs shall be brought to a uniform surface with suitable tools. Immediately after the concrete has been screeded, it shall be treated with a liquid evaporation retardant. The retardant shall be used again after each Work operation as necessary to prevent drying shrinkage cracks. The classes of finish specified for unformed concrete surfaces are designated and defined as follows:

1. FINISH U1 - Sufficient leveling and screeding to produce an even, uniform surface with surface irregularities not to exceed 3/8-inch. No further special finish is required.
2. FINISH U2 - After sufficient stiffening of the screeded concrete, surfaces shall be float finished with wood or metal floats or with a finishing machine using float blades. Excessive floating of surfaces while the concrete is plastic and dusting of dry cement and sand on the concrete surface to absorb excess moisture will not be permitted. Floating shall be the minimum necessary to produce a surface that is free from screed marks and is uniform in texture. Surface irregularities shall not exceed 1/4-inch. Joints and edges shall be tooled where shown or as determined by the Owner's Representative.
3. FINISH U3 - After the floated surface (as specified for Finish U2) has hardened sufficiently to prevent excess of fine material from being drawn to the surface, steel troweling shall be performed with firm pressure such as will flatten the sandy texture of the floated surface and produce a dense, uniform surface free from blemishes, ripples, and trowel marks. The finish shall be smooth and free of all irregularities.

4. FINISH U4 - Steel trowel finish (as specified for Finish U3) without local depressions or high points. In addition, the surface shall be given a light hairbroom finish with brooming perpendicular to drainage unless otherwise shown. The resulting surface shall be rough enough to provide a nonskid finish.
- D. Unformed surfaces shall be finished according to the following schedule:

UNFORMED SURFACE FINISH SCHEDULE

<u>Area</u>	<u>Finish</u>
Grade slabs and foundations to be covered with concrete or fill material	U1
Floors to be covered with grouted tile or topping grout	U2
Slabs which are water bearing with slopes 10 percent and less	U4
Sloping slabs which are water bearing with slopes greater than 10 percent	U4
Slabs not water bearing	U4
Slabs to be covered with built-up roofing	U2
Interior slabs and floors to receive architectural finish	U3
Top surface of walls	U4

- E. Floor Hardener (Surface Applied) - Required
1. Provide concrete with the following additional requirements:
 - a) Maximum slump of 4 inches when peak ambient temperatures are expected to be more than 65°F, and no more than 3 inches when ambient temperatures are below 65°F.
 - b) Maximum air content of 3 percent.

- c) Do not use calcium chloride or set-accelerating admixtures containing calcium chloride.
 - d) Do not use admixtures that increase bleeding.
 - e) Do not use fly ash.
2. After the concrete has been leveled and as soon as the concrete will support an operator and machine without disturbing the level or working up excessive fines, float the surface of the slab with a mechanical float fitted with float shoes. Following floating, apply 1/2 to 2/3 of the total amount of dry shake surface hardener so that a uniform distribution of surface hardener is obtained. The use of a mechanical spreader is recommended. Once the shake has absorbed sufficient moisture (indicated by the darkening of the shake), float the surface. Immediately apply the remaining 1/3 to 1/2 of the shake and allow to absorb moisture. Do not place dry shake on concrete surface when bleed water is present.
 3. Use finishing machines with detachable float shoes. Compact surface by a third mechanical floating if time and setting characteristics of the concrete will allow. Do not add water to the surface.
 4. As surface further stiffens, indicated by loss of sheen, hand or mechanically trowel with blades set relatively flat. Remove all marks and pinholes in the final raised trowel operation.
 5. Follow all application instructions of the floor surface hardener manufacturer.
 6. Cure finished floors using fill-forming curing compound recommended by surface hardener manufacturer. Uniformly apply curing compound over the entire surface at a coverage that will provide moisture retention in excess of the requirements of ASTM C 309. Maintain ambient temperature of 50° F or above during the curing period.
 7. Keep floors covered and free of traffic and loads for a minimum of 14 days after completion.

3.08 ARCHITECTURAL FINISH

A. General: Architectural finishes shall be required only where specifically called out on the Plans. In all other cases, the paragraph above, entitled "Finishing Concrete Surfaces", shall apply.

1. Immediately after the forms have been stripped, the concrete surface shall be inspected and any poor joints, voids, rock pockets, or other defective areas shall be repaired and all form-tie holes filled as indicated herein.
2. Architectural finishes shall not be applied until the concrete surface has been repaired as required and the concrete has cured at least 14 days.
3. All architecturally treated concrete surfaces shall conform to the accepted sample required herein in texture, color, and quality. It shall be the Contractor's responsibility to maintain and protect the concrete finish.

B. Smooth Concrete Finish:

1. The concrete surface shall be wetted, and a grout shall be applied with a brush. The grout shall be prepared by mixing one (1) part Portland Cement and one (1) part of fine sand that will pass a No. 16 sieve with sufficient water to give it the consistency of thick paint. The cement used in said grout shall be 1/2 gray and 1/2 white Portland Cement, as determined by the Owner's Representative. White Portland Cement shall be Atlas White or equal. Calcium chloride in the amount of 5 percent by volume of the cement shall be used in the brush coat. The freshly applied grout shall be vigorously rubbed into the concrete surface with a wood float filling all small air holes. After all surface grout had been removed with a steel trowel, the surface shall be allowed to dry and, when dry, shall be vigorously rubbed with burlap to remove completely all surface grout so that there is no visible paint-like film of grout on the concrete. The entire cleaning operation for any area shall be completed the day it is started, and no grout shall be left on the surface overnight.
2. Cleaning operations for any given day shall be terminated at panel joints. It is essential that the various operations be carefully timed to secure the desired effect which is a light-colored concrete surface of uniform color and texture without any appearance of a point or grout film.

3. In the event that improper manipulation results in an inferior finish, rub such inferior areas with carborundum bricks.
4. Before beginning any of the final treatment on exposed surfaces, treat in a satisfactory manner a trial area of at least 200 square feet in some inconspicuous place selected by the Owner's Representative or Resident Project Representative and preserve said trial area undisturbed until the completion of the job.

C. Sandblasted Concrete Finish:

1. Sandblasting shall be done in a safe manner acceptable to local authorities and per OSHA requirements. The sandblasting shall be a light sandblast to remove laitance and to produce a uniform fine aggregate surface texture with approximately 1/32 to 1/16 inch of surface sandblasted off. Corners, patches, form panel joints, and soft spots shall be sandblasted with care.
2. A 3 square foot sample panel of the sandblasted finish shall be provided by the Contractor for acceptance by the Owner's Representative or Resident Project Representative before starting the sandblasting Work. The sample panel shall include a corner, plugs, and joints and shall be marked after approval. All other sandblasting shall be equal in finish to the sample panel.
3. Protection against sandblasting shall be provided on all surfaces and materials not requiring sandblasting but within or adjacent to areas being sandblasted. After sandblasting, the concrete surfaces shall be washed with clean water and excess sand removed.

3.09 CURING AND DAMP-PROOFING

- A. General: All concrete shall be cured for not less than 14 days after placing, in accordance with the methods specified herein for the different parts of the Work, and described in detail in the following paragraphs:

<u>Surface To Be Cured or Damp-proofed</u>	<u>Method</u>
Unstripped forms	1
Wall sections with forms removed	6

Construction joints between footings and walls, and between floor slab and columns 2

Encasement concrete and thrust blocks 3

All concrete surfaces not specifically provided for elsewhere in this Paragraph 6

Floor slabs on grade 6

Slabs not on grade 6

- B. Method 1: Wooden forms shall be wetted immediately after concrete has been placed and shall be kept wet with water until removed. If steel forms are used the exposed concrete surfaces shall be kept continuously wet until the forms are removed. If forms are removed within 14 days of placing the concrete, curing shall be continued in accordance with Method 6, herein.
- C. Method 2: The surface shall be covered with burlap mats which shall be kept wet with water for the duration of the curing period, until the concrete in the walls has been placed. No curing compound shall be applied to surfaces cured under Method 2.
- D. Method 3: The surface shall be covered with moist earth not less than 4 hours, nor more than 24 hours, after the concrete is placed. Earthwork operations that may damage the concrete shall not begin until at least 7 days after placement of concrete.
- E. Method 4: The surface shall be sprayed with a liquid curing compound.
1. It shall be applied in accordance with the manufacturer's printed instructions at a maximum coverage rate of 200 square feet per gallon and in such a manner as to cover the surface with a uniform film which will seal thoroughly.
 2. Where the curing compound method is used, care shall be exercised to avoid damage to the seal during the curing period. Should the seal be damaged or broken before the expiration of the curing period, the break shall be repaired immediately by the new application of additional curing compound over the damaged portion.

3. Wherever curing compound may have been applied by mistake to surfaces against which concrete subsequently is to be placed and to which it is to adhere, said compound shall be entirely removed by wet sandblasting just before the placing of new concrete.
4. Where curing compound is specified, it shall be applied as soon as the concrete has hardened enough to prevent marring on unformed surfaces, and within 2 hours after removal of forms from contact with formed surfaces. Repairs required to be made to formed surfaces shall be made within the said 2 hour period; provided, however, that any such repairs which cannot be made within the said 2 hour period shall be delayed until after the curing compound has been applied. When repairs are to be made to an area on which curing compound has been applied, the area involved shall first be wet-sandblasted to remove the curing compound, following which repairs shall be made as specified herein.
5. At all locations where concrete is placed adjacent to a panel which has been coated with curing compound, the previously coated panel shall have curing compound reapplied to an area within 6 feet of the joint and to any other location where the curing membrane has been disturbed.
6. Before final acceptance of the Work, all visible traces of curing compound shall be removed from all surfaces in such a manner that does not damage surface finish.

F. Method 5:

1. Until the concrete surface is covered with curing compound, the entire surface shall be kept damp by applying water using nozzles that atomize the flow so that the surface is not marred or washed. The concrete shall be given a coat of curing compound in accordance with Method 4, herein. Not less than 1 hour nor more than 4 hours after the coat of curing compound has been applied, the surface shall be wetted with water delivered through a fog nozzle, and concrete-curing blankets shall be placed on the slabs. The curing blankets shall be polyethylene sheet, polyethylene-coated waterproof paper sheeting or polyethylene-coated burlap. The blankets shall be laid with the edges butted together and with the joints between strips sealed with 2 inch

wide strips of sealing tape or with edges lapped not less than 3 inches and fastened together with a waterproof cement to form a continuous watertight joint.

2. The curing blankets shall be left in place during the 14 day curing period and shall not be removed until after concrete for adjacent Work has been placed. Should the curing blankets become torn or otherwise ineffective, replace damaged sections. During the first 3 days of the curing period, no traffic of any nature and no depositing, temporary or otherwise, of any materials shall be permitted on the curing blankets. During the remainder of the curing period, foot traffic and temporary depositing of materials that impose light pressure will be permitted only on top of plywood sheets 5/8 inch minimum thickness, laid over the curing blanket. Add water under the curing blanket as often as necessary to maintain damp concrete surfaces at all times.

G. Method 6: This method applies to both walls and slabs.

1. The concrete shall be kept continuously wet by the application of water for a minimum period of at least 14 consecutive days, beginning immediately after the concrete has reached final set or forms have been removed or until the concrete surface is covered with the curing medium. The entire surface shall be kept damp by applying water using nozzles that atomize the flow so that the surface is not marred or washed.
2. Heavy curing mats shall be used as a curing medium to retain the moisture during the curing period. The curing medium shall be weighted or otherwise held in place to prevent being dislodged by wind or any other causes and to be substantially in contact with the concrete surface. All edges shall be continuously held in place.
3. The curing blankets and concrete shall be kept continuously wet by the use of sprinklers or other means both during and after normal working hours. The concrete shall be maintained in a cool condition from the heat of hydration and the solar heat of the sun.
4. Immediately after the application of water has terminated at the end of the curing period, the curing medium shall be removed, any dry spots shall be rewetted, and curing

compound shall be immediately applied in accordance with Method 4, herein.

5. Dispose of excess water from the curing operation to avoid damage to the Work.
- H. Damp-proofing: The exterior surface of all buried roof slabs shall be damp-proofed as follows:
1. Immediately after completion of curing the surface shall be sprayed with a damp-proofing agent consisting of an asphalt emulsion. Application shall be in two (2) coats. The first coat shall be diluted to 1/2 strength by the addition of water and shall be sprayed on so as to provide a maximum coverage rate of 100 square feet per gallon of dilute solution. The second coat shall consist of an application of the specified material, undiluted, and shall be sprayed on so as to provide a maximum coverage rate of 100 square feet per gallon. Damp-proofing material shall be as specified herein.
 2. As soon as the asphalt emulsion, applied as specified herein, has taken an initial set, the entire area thus coated shall be coated with whitewash. Any formula for mixing the whitewash may be used which produces a uniformly coated white surface and which so remains until placing of the backfill. Should the whitewash fail to remain on the surface until the backfill is placed, apply additional whitewash.

3.10 PROTECTION

- A. Protect all concrete against injury until final acceptance by the Owner.
- B. Fresh concrete shall be protected from damage due to rain, hail, sleet, or snow. Provide such protection while the concrete is still plastic and whenever such precipitation is imminent or occurring.

3.11 CURING IN COLD WEATHER

- A. Water curing of concrete may be reduced to 6 days during periods when the mean daily temperature in the vicinity of the worksite is less than 40°F; provided that, during the prescribed period of water curing, when temperatures are such that concrete surfaces may freeze, water curing shall be temporarily discontinued.

- B. Concrete cured by an application of curing compound will require no additional protection from freezing if the protection at 50°F for 72 hours is obtained by means of approved insulation in contact with the forms or concrete surfaces; otherwise the concrete shall be protected against freezing temperatures for 72 hours immediately following 72 hours protection at 50°F. Concrete cured by water curing shall be protected against freezing temperatures for 3 days immediately following the 72 hours of protection at 50°F.
- C. Discontinuance of protection against freezing temperatures shall be such that the drop in temperature of any portion of the concrete will be gradual and will not exceed 40°F in 24 hours. In the spring, when the mean daily temperature rises above 40°F for more than 3 successive days, the specified 72 hour protection at a temperature not lower than 50°F may be discontinued for as long as the mean daily temperature remains above 40°F; provided, that the concrete shall be protected against freezing temperatures for not less than 48 hours after placement.
- D. Where artificial heat is employed, special care shall be taken to prevent the concrete from drying. Use of unvented heaters will be permitted only when unformed surfaces of concrete adjacent to the heaters are protected for the first 24 hours from an excessive carbon dioxide atmosphere by application of curing compound; provided, that the use of curing compound for such surfaces is otherwise permitted by these Specifications.

3.12 TREATMENT OF SURFACE DEFECTS

- A. As soon as forms are removed, all exposed surfaces shall be carefully examined and any irregularities shall be immediately rubbed or ground in a satisfactory manner in order to secure a smooth, uniform, and continuous surface. Plastering or coating of surfaces to be smoothed will not be permitted. No repairs shall be made until after inspection by the Owner's Representative. In no case will extensive patching of honeycombed concrete be permitted. Concrete containing minor voids, holes, honeycombing, or similar depression defects shall have them repaired as specified herein. Concrete containing extensive voids, holes, honeycombing, or similar depression defects, shall be completely removed and replaced. All repairs and replacements herein specified shall be promptly executed by the Contractor at its own expense.
- B. Defective surfaces to be repaired shall be cut back from trueline in a minimum depth of ½ inch over the entire area. Feathered edges will not be permitted. Where chipping or cutting tools are not

required in order to deepen the area properly, the surface shall be prepared for bonding by the removal of all laitance or soft material, and not less than 1/32 inch depth of the surface film from all hard portions, by means of an efficient sandblast. After cutting and sandblasting, the surface shall be wetted sufficiently in advance of shooting with shotcrete or with cement mortar so that while the repair material is being applied, the surfaces under repair will remain moist, but not so wet as to overcome the suction upon which a good bond depends. The material used for repair proposed shall consist of a mixture of 1 sack of cement to 3 cubic feet of sand. For exposed walls, the cement shall contain such a proportion of Atlas White Portland Cement as is required to make the color of the patch match the color of the surrounding concrete.

- C. Holes left by tie-rod cones shall be reamed with suitable toothed reamers so as to leave the surfaces of the holes clean and rough. These holes then shall be repaired in an approved manner with dry-packed cement grout. Holes left by form-tying devices having a rectangular cross-section, and other imperfections having a depth greater than their least surface dimension, shall not be reamed but shall be repaired in an approved manner with dry-packed cement grout.
- D. All repairs shall be built up and shaped in such a manner that the completed Work will conform to the requirements of this Section, as applicable, using approved methods which will not disturb the bond, cause sagging, or cause horizontal fractures. Surfaces of said repairs shall receive the same kind and amount of curing treatment as required for the concrete in the repaired section.

3.13 PATCHING HOLES IN CONCRETE

A. Patching Small Holes:

1. Holes which are less than 12 inches in their least dimension and extend completely through concrete members, shall be filled as specified herein.
2. Small holes in members which are water-bearing or in contact with soil or other fill materials, shall be filled with nonshrink grout. Where a face of the member is exposed to view, the nonshrink grout shall be held back 2 inches from the finished surface. The remaining 2 inches shall then be patched according to the paragraph in Part 3 entitled - Treatment of Surface Defects.

3. Small holes through all other concrete members shall be filled with nonshrink grout, with exposed faces treated as above.

B. Patching Large Holes:

1. Holes which are larger than 12 inches in their least dimension, shall have a keyway chipped into the edge of the opening all around, unless a formed keyway exists. The holes shall then be filled with concrete as specified.
2. Holes which are larger than 24 inches in their least dimension and which do not have reinforcing steel extending from the existing concrete, shall have reinforcing steel set in grout in drilled holes. The reinforcing added shall match the reinforcing in the existing wall unless required otherwise by the Improvement Plans or approved shop drawings.

3.14 CARE AND REPAIR OF CONCRETE

- A. The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the Owner. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time before the final acceptance of the completed Work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the Contractor's expense.

END OF SECTION 03300

SECTION 03315 - GROUT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall provide grout in accordance with the Contract Documents.
- B. The following types of grout shall be covered in this Section:
 - 1. Cement Grout
 - 2. Packaged Grout
 - A. Nonshrink Grout: This type of grout is to be used wherever grout is illustrated in the Contract Documents unless another type is specifically referenced.
 - B. Epoxy Grout
 - C. Pump and Motor Grout
 - 3. Topping Grout and Concrete Fill

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. The Work of the following Sections apply to the Work of this Section. Other Sections, not referenced below, shall also apply to the extent required for proper performance of this Work.
 - 1. Section 03300 - Cast-in-Place Concrete.

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Commercial Standards:
 - 1. CRD-C 621 Corps of Engineers Specification for Non-Shrink Grout
- B. ASTM Standard in Building Codes:
 - 1. ASTM C 109: Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in or 50-mm Cube Specimens)

2. ASTM C 531: Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical Resistant Mortars, Grouts, and Monolithic Surfacing
3. ASTM C 579: Test Methods for Compressive Strength of Chemical Resistant Mortars, Grouts, and Monolithic Surfacing
4. ASTM C 827: Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixture
5. ASTM C 881: Specification for Epoxy-Resin-Base Bonding System for Concrete
6. ASTM C 882: Standard Test for Bond Strength of Epoxy-Resin Systems Used with Concrete
7. ASTM C 884: Standard Test Method for Thermal Compatibility between Concrete and an Epoxy-Resin Overlay
8. ASTM D 638: Standard Test Methods for Tensile Properties of Plastics
9. ASTM D 696: Test Method for Coefficient of Linear Thermal Expansion of Plastics
10. ASTM D 2471: Standard Test Methods for Gel Time and Peak Exothermic Temperature of Reacting Thermosetting Resins

1.04 CONTRACTOR SUBMITTALS

- A. The Contractor shall submit certified test results verifying the compressive strength, shrinkage, and expansion requirements indicated herein; and manufacturer's literature containing instructions and recommendations on the mixing, handling, placement and appropriate uses for each type of nonshrink and epoxy grout used in the Work in accordance with the requirements of the Special Conditions.

1.05 QUALITY ASSURANCE

- A. Construction Tolerances: Construction tolerances shall be as specified in the Section 03300 - Cast-in-Place Concrete, except as modified herein or elsewhere in the Contract Documents.

PART 2 - PRODUCTS

2.01 CEMENT GROUT

- A. Cement Grout: Cement grout shall be composed of one part cement, three parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white Portland Cement shall be blended with regular cement as needed. The minimum compressive strength at 28 days shall be 5,000 PSI.
- B. Cement grout materials shall be as specified in Section 03300 - Cast-in-Place Concrete.

2.02 PREPACKAGED GROUTS

- A. Nonshrink Grout:
 - 1. Nonshrink grout shall be a prepackaged, inorganic, nongas-liberating, nonmetallic, cement-based grout requiring only the addition of water. The manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of nonshrink grout indicated herein shall be that recommended by the manufacturer for the particular application.
 - 2. Class A nonshrink grouts shall have a minimum 28 day compressive strength of 6,000 PSI; shall have no shrinkage (0.0 percent) and a maximum 4.0 percent expansion in the plastic state when tested in accordance with ASTM C 827; and shall have no shrinkage (0.0 percent) and a maximum of 0.2 percent expansion in the hardened state when tested in accordance with CRD-C 621.
 - 3. Class B nonshrink grouts shall have a minimum 28-day compressive strength of 5,000 PSI and shall meet the requirements of CRD-C 621.

4. Application:

- a) Class A nonshrink grout shall be used for the repair of all holes and defects in concrete members which are water bearing or in contact with soil or other fill material, grouting under all equipment base plates, and at all locations where grout is indicated; except, for the applications of Class B nonshrink grout and epoxy grout indicated herein. Class A nonshrink grout may be used in place of Class B nonshrink grout for all applications.
- b) Class B nonshrink grout shall be used for the repair of all holes and defects in concrete members which are not water bearing and not in contact with soil or other fill material, grouting under all base plates for structural steel members, and grouting railing posts in place.

B. Epoxy Grout:

1. Epoxy grout shall be a pourable, nonshrink, 100 percent solids system. The epoxy grout system shall have three components: resin, hardener, and specially blended aggregate, all premeasured and prepackaged. The resin component shall not contain any nonreactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged. Epoxy grout shall be Epoxy Grout J55 by Dayton Superior, Sika or an approved equal.
2. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application.
3. The mixed epoxy grout system shall have a minimum working life of 45 minutes at 75°F.
4. The epoxy grout shall develop a compressive strength of 5,000 PSI in 24 hours and 10,000 PSI in 7 days when tested in accordance with ASTM C 579, Method B. There shall be

no shrinkage (0.0 percent) and a maximum 4.0 percent expansion when tested in accordance with ASTM C 827.

5. The epoxy grout shall exhibit a minimum effective bearing area of 95 percent. This shall be determined by a test consisting of filling a 2 inch diameter by 4 inch high metal cylinder mold covered with a glass plate coated with a release agent. A weight shall be placed on the glass plate. At 24 hours after casting, the weight and plate shall be removed and the void area in the plate measured. The surface of the grout shall be probed with a sharp instrument to locate all voids.
6. The peak exotherm of a 2-inch diameter by 4 inch high cylinder shall not exceed $95^{\circ}F$ when tested with $75^{\circ}F$ material at laboratory temperature. The epoxy grout shall exhibit a maximum thermal coefficient of 30×10^{-6} inches/inch/degree F when tested according to ASTM C 531 or ASTM D 696.
7. Application: Epoxy grout shall be used to embed all anchor bolts and reinforcing steel required to be set in grout, and for all other applications in the Contract Documents where grout type is not specifically indicated.
8. For crack repair, the Contractor shall use pressure injection epoxy grout as recommended by the manufacturer and approved by the Owner's Representative.

C. Grout for Pumps and Motors

1. Grout for pumps and motors shall be epoxy grouts meeting the following minimum requirements:
 - a) Creep shall be less than 0.005 in/in when tested by ASTM C 881 method. The test shall be at $70^{\circ}F$ and $140^{\circ}F$ with a load of 400 PSI.
 - b) Linear shrinkage shall be less than 0.080 percent and thermal expansion less than 17×10^{-6} in/in/degree F when tested by ASTM C 531.
 - c) The compressive strength shall be a minimum of 12,000 PSI in 7 days when tested by ASTM C 579 Method 8, modified.

- d) Bond strength of grout to Portland Cement concrete shall be greater than 2,000 PSI when using ASTM C 882 test method.
 - e) Grout shall pass the thermal compatibility test when overlaid on Portland Cement concrete using test method ASTM C 884.
 - f) Tensile strength and modulus of elasticity shall be determined by ASTM D 638. The tensile strength shall not be less than 1,700 PSI and the modulus of elasticity shall not be less than 1.8×10^6 PSI.
 - g) Gel time and peak exothermic temperature shall be determined by ASTM D 2471. Peak exothermic temperature shall not exceed $110^{\circ}F$ when a specimen 6 inches in diameter by 12 inches high is used. Gel time shall be at least 150 minutes.
 - h) The grout shall be suitable for supporting precision machinery subject to high impact and shock loading in industrial environments while exposed to elevated temperatures as high as $150^{\circ}F$, with a load of 2,000 PSI.
- 2. Primer, if required, shall conform to the written recommendations of the grout manufacturer.
 - 3. Surface preparations shall conform to the written recommendations of the grout manufacturer.
 - 4. Placement and Curing:
 - a) Placement and curing procedures shall be in accordance with the written recommendations of the grout manufacturer.
 - b) A grouting performance demonstration/training session shall be conducted by the grout manufacturer's representative prior to foundation and base plate preparation and the first grouting on site. This training session shall demonstrate proper preparation and installation methods and that the grouting material meets the strength requirements.

5. Grout shall be Escoweld, Chockfast Red Epoxy Grout as manufactured by Philadelphia Resin Corp.; Five Star DP Epoxy Grout as manufactured by Five Star Products, Inc.; or equal.

2.03 TOPPING GROUT AND CONCRETE FILL

- A. Grout for topping of slabs and concrete fill for built-up surfaces of tank, channel, and basin bottoms shall be composed of cement, fine aggregate, coarse aggregate, water, and admixtures proportioned and mixed as specified herein. All materials and procedures specified for normal concrete in Section 03300 - Cast-in-Place Concrete, shall apply except as noted otherwise herein.
- B. Topping grout and concrete fill shall contain a minimum of 564 pounds of cement per cubic yard with a maximum water cement ratio of 0.45. Where concrete fill is thicker than 3 inches, sitework concrete, as specified in Section 03300 - Cast-in-Place Concrete, may be used when accepted by the Owner's Representative.
- C. Coarse aggregate shall be graded as follows:

U.S. Standard <u>Sieve Size</u>	Percent by Weight <u>Passing</u>
1/2"	100
3/8"	90 - 100
No. 4	20 - 55
No. 8	5 - 30
No. 16	0 - 10
No. 30	0

- D. Strength: Minimum compressive strength of topping grout and concrete fill at the end of 28 days shall be 4,000 PSI.

2.04 CURING MATERIALS

- A. Curing materials shall be as specified in Section 03300 - Cast-in-Place Concrete for cement grout and as recommended by the manufacturer of prepackaged grouts.

2.05 MEASUREMENT OF INGREDIENTS

- A. Measurements for cement grout shall be made accurately by volume using containers. Shovel measurement shall not be allowed.
- B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

PART 3 - EXECUTION

3.01 GENERAL

- A. All surface preparation, curing, and protection of cement grout shall be as indicated in Section 03300 - Cast-in-Place Concrete. The finish of the grout surface shall match that of the adjacent concrete.
- B. The manufacturer of Class A nonshrink grout and epoxy grout shall provide on-site technical assistance to Contractor upon request.
- C. Base concrete or masonry must have attained its design strength before grout is placed, unless authorized by the Owner's Representative.
- D. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency is such that the grout is plastic and moldable but will not flow. Where "dry pack" is called for in the Contract Documents, it shall mean a grout of that consistency; the type of grout to be used shall be as indicated herein for the particular application.
- E. The slump for topping grout and concrete fill shall be adjusted to match placement and finishing conditions but shall not exceed 4 inches.

3.02 GROUTING PROCEDURES

- A. Prepackage Grouts: All mixing, surface preparation, handling, placing, consolidation, curing, and other means of execution for prepackaged grouts shall be accomplished according to the instructions and recommendations of the manufacturer.

B. Base Plate Grouting:

1. For base plates, the original concrete shall be blocked out or finished off a sufficient distance below the plate to provide for a minimum 1 inch thickness of grout or a thickness as indicated on the Plans.
2. After the base plate has been set in position at the proper elevation by steel wedges or double nuts on the anchor bolts, the space between the bottom of the plate and the original pour of concrete shall be filled with non-shrink-type grout. The mixture shall be of a trowelable consistency and tamped or rodded solidly into the space between the plate and the base concrete. A backing board or stop shall be provided at the back side of the space to be filled with grout. Where this method of placement is not practical or where required by the Owner's Representative, alternate grouting methods shall be submitted for acceptance by the Owner's Representative.

C. Topping Grout and Concrete Fill:

1. All mechanical, electrical, and finish Work shall be completed prior to placement of topping or concrete fill. The base slab shall be given a roughened textured surface by sandblasting or hydroblasting exposing the aggregates to ensure bonding to the base slab.
2. The minimum thickness of grout topping and concrete fill shall be one inch (1") unless otherwise specified by the Plans. Where the finished surface of concrete fill is to form an intersecting angle of less than 45° with the concrete surface it is to be placed against, a key shall be formed in the concrete surface at the intersection point. The key shall be a minimum of 3-1/2 inches wide by 1-1/2 inches deep.
3. The base slab shall be thoroughly cleaned and wetted prior to placing topping or concrete fill. No topping or concrete fill shall be placed until the slab is free from standing pools, ponds of water. A thin coat of neat Type II cement grout shall be broomed onto the surface of the slab just before topping or concrete fill placement. The topping or concrete fill shall be compacted by rolling or tamping, brought to established grade, and floated. Grouted concrete fill for tank and basin bottoms where scraping mechanism are to be installed shall be screeded by blades attached to the

revolving mechanism of the equipment in accordance with the procedures outlined by the equipment manufacturer after the grout is brought to the established grade.

4. Topping grout placed on sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the placement.
5. The surface shall be tested with a straight edge to detect high and low spots which shall be immediately eliminated. When the topping or concrete fill have hardened sufficiently, it shall be steel troweled to a smooth surface free from pinholes and other imperfections. An approved type of mechanical trowel may be used to assist in this operation, but the last pass over the surface shall be by hand-troweling. During finishing, no water, dry cement or mixture of dry cement and sand shall be applied to the surface.

3.03 CONSOLIDATION

- A. Grout shall be placed in such a manner, for the consistency necessary for each application, so as to assure that the space to be grouted is completely filled.

END OF SECTION 03315

SECTION 03730 - CONCRETE REHABILITATION

PART 1 – GENERAL

1.01 SUMMARY

- A. Horizontal Concrete Surface - This specification describes the patching or overlay of interior and/or exterior horizontal surfaces with a polymer- modified, portland cement mortar/concrete.
- B. Vertical Concrete Surface - This specification describes the patching of interior and/or exterior vertical or overhead surfaces with a polymer-modified, portland cement mortar.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. The Work of Division 3 - Concrete applies to the Work of this Section. The Protective Coating Notes on Plan Sheet 10 of the Project Plans shall also apply to the extent required for proper performance of this Work.

1.03 QUALITY ASSURANCE

- A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.
- B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative
- C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and

batch numbers. Damaged material must be removed from the site immediately.

- B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- C. Condition the specified product as recommended by the manufacturer.

1.05 JOB CONDITIONS

- A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40°F (5°C) and rising.
- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.

1.06 SUBMITTALS

- A. The contractor shall submit the following in compliance with the Special Conditions:
 - 1. Manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).

1.07 WARRANTY

- A. Provide a written warranty from the manufacturer against defects of materials for a period of five (5) years, beginning with date of substantial completion of the project.

PART 2 - PRODUCTS

1.01 MANUFACTURER

- A. Horizontal Concrete Surface - SikaTop 122 Plus, as manufactured by Sika Corporation or equal, is considered to conform to the requirements of this specification.
- B. Vertical Concrete Surface - SikaTop 123 Plus, as manufactured by Sika Corporation or equal, is considered to conform to the requirements of this specification.

1.02 MATERIALS

Horizontal Concrete Surface

- A. Polymer-modified Portland cement mortar:
1. Component A shall be a liquid polymer emulsion of an acrylic copolymer base and additives.
 - a. pH: 4.5-6.5
 - b. Film Forming Temperature: 73°F max.
 - c. Tear Strength: 950-psi min.
 - d. Elongation at Break: 500% min.
 - e. Particle Size: less than 0.1 micron
 2. Component A shall contain an organic, penetrating corrosion inhibitor which has been independently proven to reduce corrosion in concrete via ASTM G3 (half-cell potential tests). The corrosion inhibitor shall not be calcium nitrite, and shall have a minimum of 5 years of independent field testing to document performance on actual construction projects.
 3. Component B shall be a blend of selected portland cements, specially graded aggregates, admixtures for controlling setting time, water reducers for workability, and an organic accelerator.
 4. The materials shall be non-combustible, both before and after cure.
 5. The materials shall be supplied in a factory-proportioned unit.
 6. The polymer-modified, portland cement mortar must be placeable from 1/8-in. to 1-in. in depth per lift for horizontal applications.
- B. To prepare a polymer-modified portland cement concrete: aggregate shall conform to ASTM C-33. The factory-proportioned unit shall be extended with 42-lb. max. of a 3/8 in. (No.8 distribution per ASTM C-33, Table II) clean, well-graded, saturated surface dry aggregate, having low absorption and high density. Aggregate must be approved for use by the Engineer.

Vertical Concrete Surface

- A. Polymer-modified Portland cement mortar:
1. Component A shall be a liquid polymer emulsion of an acrylic copolymer base and additives.
 - a. pH: 4.5-6.5
 - b. Film Forming Temperature: 73°F max.
 - c. Tear Strength: 950-psi min.
 - d. Elongation at Break: 500% min.

- e. Particle Size: less than 0.1 micron
- 2. Component A shall contain an organic, penetrating corrosion inhibitor which has been independently proven to reduce corrosion in concrete via ASTM G3 (half-cell potential tests). The corrosion inhibitor shall not be calcium nitrite, and shall have a minimum of 5 years of independent field testing to document performance on actual construction projects.
- 3. Component B shall be a blend of selected portland cements, specially graded aggregates, admixtures for controlling setting time, water reducers for workability, and an organic accelerator.
- 4. The materials shall be non-combustible, both before and after cure.
- 5. The materials shall be supplied in a factory-proportioned unit.
- 6. The polymer-modified, portland cement mortar must be placeable from 1/8" to 1-1/2" in depth per lift for vertical applications and 1/8" to 1" in depth for overhead applications.

2.03 PERFORMANCE CRITERIA

The following tests were performed with the material and curing conditions @ 71°F – 75°F and 45-55% relative humidity.

Horizontal Concrete Surface

- A. Typical Properties of the mixed polymer-modified, portland cement mortar:
 - 1. Working Time: Approximately 30 minutes
 - 2. Finishing Time: 50-120 minutes
 - 3. Color: concrete gray
- B. Typical Properties of the cured polymer-modified, portland cement mortar:
 - 1. Compressive Strength (ASTM C-109 Modified)
 - a. 1 day: 3000 psi min. (20.7 MPa)
 - b. 7 day: 5500 psi min. (37.9 MPa)
 - c. 28 day: 7000 psi min. (48.3 MPa)
 - 2. Flexural Strength (ASTM C-293) @ 28 days: 2000 psi (13.8 MPa)

3. Splitting Tensile Strength (ASTM C-496) @ 28 days 750 psi (5.2 MPa)
4. Bond Strength (ASTM C-882 Modified) @ 28 days: 2200 psi (15.2 MPa)
5. The portland cement mortar shall not produce a vapor barrier.
6. Density(wet mix): 136 lbs. / cu. ft. (2.18 kg/l)
7. Permeability (AASHTO T-277 @ 28 days Approximately 500 Coulombs)

Vertical Concrete Surface

- A. Typical Properties of the mixed polymer-modified, portland cement mortar:
 1. Working Time: Approximately 10 – 15 minutes
 2. Finishing Time: 20 - 60 minutes
 3. Color: concrete gray
- B. Typical Properties of the cured polymer-modified, portland cement mortar:
 1. Compressive Strength (ASTM C-109 Modified)
 - a. 1 day: 3500 psi min. (24.1 MPa)
 - b. 7 day: 6000 psi min. (44.8 MPa)
 - c. 28 day: 7000 psi min. (48.3 MPa)
 2. Flexural Strength (ASTM C-293) @ 28 days: 2000 psi (13.8 MPa)
 3. Splitting Tensile Strength (ASTM C-496) @ 28 days: 900 psi (6.2 MPa)
 4. Bond Strength (ASTM C-882 Modified) @ 28 days: 2200 psi (15.2 MPa)
 5. The portland cement mortar shall not produce a vapor barrier.
 6. Density (wet mix): 132 lbs. / cu. ft. (2.2 kg/l)
 7. Permeability - AASHTO T-277 @ 28 days Approximately 500 Coulombs

PART 3 – EXECUTION

3.01 SURFACE PREPARATION

- A. Areas to be repaired must be clean, sound, and free of contaminants. All loose and deteriorated concrete shall be removed by mechanical means. Mechanically prepare the concrete substrate to obtain a surface profile of +/- 1/16" (CSP 5 or greater as per ICRI Guidelines) with a new exposed aggregate surface. Area to be patched shall not be less than 1/8" in depth.
- B. Where reinforcing steel with active corrosion is encountered, sandblast the steel to a white metal finish to remove all contaminants and rust. Where corrosion has occurred due to the presence of chlorides, the steel shall be high pressure washed after mechanical cleaning. Prime steel with 2 coats of 3-component steel reinforcement coating system, Sika Armatec 110 EpoCem or equal as directed by manufacturer.

3.02 MIXING AND APPLICATION

Horizontal Concrete Surface

- A. Mechanically mix in appropriate sized mortar mixer. Pour approximately 4/5 gal Component A into the mixing container. Add Component B while continuing to mix. Mix to a uniform consistency for a maximum of three minutes. Add remaining Component A to mix if a more loose consistency is desired. Should smaller quantities be needed, be sure the components are measured in the correct ratio and that the Component B is uniformly blended before mixing the components together. Mix only that amount of material that can be placed in 30 minutes. Do not retemper material.
- B. Mixing of the polymer-modified portland cement concrete: Pour all (1-gallon) of Component A into the mixing container. Add Component B while continuing to mix. Add correct amount of the pre-approved coarse aggregate, and continue mixing to a uniform consistency. Mixing time should be 3 minutes maximum.
- C. Placement Procedure: At the time of application, the substrate should be saturated surface dry with no standing water. Mortar and/or concrete must be scrubbed into substrate filling all pores and voids. While the scrub coat is still plastic, force material against edge of repair, working toward center. If repair area is too large to fill while scrub coat is still wet use 3-component steel reinforcement coating system, Sika Armatec 110 EpoCem or equal, in lieu of scrub coat. After filling, consolidate, then screed. Allow mortar or concrete to set to desired stiffness, then finish with

trowel, manual or power, for smooth surface. Broom or burlap drag for rough surface. Areas where the depth of the repair is less than 1-inch shall be repaired with polymer-modified portland cement mortar. In areas where the depth of the repair is greater than 1 inch, the repair shall be made with polymer-modified portland cement concrete.

- D. As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylene, a fine mist of water or a water-based* compatible curing compound. Moist curing should commence immediately after finishing and continue for 48 hours. Protect newly applied material from rain, sun, and wind until compressive strength is 70% of the 28-day compressive strength. To prevent from freezing cover with insulating material. Setting time is dependent on temperature and humidity.

*Pretesting of curing compound is recommended.

- E. Adhere to all procedures, limitations and cautions for the polymer-modified portland cement mortar in the manufacturers current printed technical data sheet and literature.

Vertical Concrete Surface

- A. Mechanically mix in an appropriate sized mortar mixer. Pour approximately 4/5 gal Component A into the mixing container. Add Component B while continuing to mix. Mix to a uniform consistency for a maximum of three minutes. Add remaining Component A to mix for desired consistency. Should smaller quantities be needed, be sure the components are measured in the correct ratio and that the Component B is uniformly blended before mixing the components together. Mix only that amount of material that can be placed in 10 - 15 minutes. Do not retemper material.
- B. Placement Procedure: At the time of application, the substrate shall be saturated surface dry with no standing water. Mortar must be scrubbed into substrate filling all pores and voids. While the scrub coat is still plastic, force material against edge of repair, working toward center. If repair area is too large to fill while scrub coat is still wet use Sika Armatec 110 EpoCem in lieu of scrub coat. After filling, consolidate then screed. Allow mortar to set to desired stiffness then finish with trowel for smooth surface. Wood float or sponge float for a rough surface. Areas where the depth of the repair area to sound concrete is greater than 1-1/2", the repair shall be made in lifts of 1-1/2" maximum thickness. The top surface of each lift shall be scored to produce a rough surface for the next lift. The preceding lift shall be allowed to reach final set before applying

fresh material. The fresh mortar must be scrubbed into the preceding lift.

- C. As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylene, a fine mist of water or a water-based* compatible curing compound. Moist curing should commence immediately after finishing and continue for 48 hours. Protect newly applied material from rain, sun, and wind until compressive strength is 70% of the 28-day compressive strength. To prevent from freezing cover with insulating material. Setting time is dependent on temperature and humidity.

*Pretesting of curing compound is recommended.

- D. Adhere to all procedures, limitations and cautions for the polymer-modified portland cement mortar in the manufacturers current printed technical data sheet and literature.

3.05 CLEANING

- A. The uncured polymer-modified portland cement mortar can be cleaned from tools with water. The cured polymer -modified portland cement mortar can only be removed mechanically.
- B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

END OF SECTION 03730

SECTION 11100 – GRIT CLASSIFIER

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Section covers design, supply, delivery, storage, installation, testing, training and commissioning of Grit Classifier and includes all necessary components to form a complete operating system. Furnish and install Grit Classifier as specified herein and as shown on the Contract Drawings, to separate, settle, wash, transport and discharge wastewater grit.

1.02 QUALITY ASSURANCE

- A. Equipment furnished under this Section shall be of a design and manufacture that has been successfully used in similar applications.
- B. Construct equipment primarily of non-corrosive materials to maximize service life and to minimize operating and maintenance costs.

1.03 WARRANTY

Provide Manufacturer's warranty covering all supplied equipment for one (1) year from date of substantial performance for repair or replacement of any mechanical or electrical portion of the originally supplied system which fails due to defective materials or workmanship. Multiple guarantees covering individual components in lieu of a single comprehensive guarantee will not be accepted.

1.04 CONTRACTOR SUBMITTALS

- A. Provide Shop Drawings in accordance with the Special Conditions for approval including but not limited to:
 - 1. General arrangement drawing that illustrates the layout of the equipment and principal dimensions
 - 2. Manufacturer's data including: dimensions, materials, sizes, weights, performance, fabrication assembly, installation instructions.

3. Parts list, layout, enclosure details, wiring diagrams for all control panels.
4. Structural calculations and specifications for anchoring and mounting the Grit Classifier to the existing Headworks Facility Concrete Slab as illustrated on the design drawings.
5. Descriptive, electrical, set-up and operation data on overload systems and on any switches and sensors mounted external to the control panels.
6. Operation and Maintenance data.

1.05 STANDARDS

- A. Unless specifically mentioned elsewhere, the equipment specified herein shall be manufactured with new materials and components of the highest quality available. The following codes and standards shall apply wherever applicable: UL: Underwriter's laboratory; AGMA: American Gear Manufacturer's Association; NEMA: National Electrical Manufacturer's Association; ASME: American Society of Mechanical Engineers.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Acceptable manufacturers include:
 1. Ovivo Water USA
 2. Smith and Loveless Inc.
 3. Or Approved Equal

2.02 GRIT CLASSIFIER

- A. GENERAL
 1. Provide Grit Classifier to accept grit slurry from the aerated grit chamber, operating in sequence, to settle, wash, transport and discharge grit by use of a fully enclosed shaftless or shafted conveyor screw. Contractor shall mount associated grit slurry piping to the grit classifier inlet.

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2. As the grit classifier is to replace an existing unit, the equipment supplier is to confirm that the hydraulic headloss through their proposed grit classifier is low enough to be fed from the existing air lift pump system.

B. DESIGN AND PERFORMANCE

The Grit Classifier shall be designed for a Design Wastewater Flow of 250,000 gallons per day and Average Flow of 75,000 gallons per day. The grit classifier shall be configured and capable of being installed in the space allocated per the design drawings.

The Manufacturer is to provide structural calculations and specifications for anchoring and mounting the Grit Classifier to the existing Headworks Facility Concrete Slab as illustrated on the design drawings.

C. SCREW ASSEMBLY

1. Screw may be shaftless (or shafted if required)
2. For shafted screws:
 - a. The Shafted Screw shall be manufactured from one (1) concentric flight formed from carbon plate and welded to form a single spiral.
 - b. The final portion of screw shall be hard faced.
3. For shaftless screws:
 - a. Fabricate screw assembly consisting of inner and outer steel flatbars shop welded to form a shaftless screw. The final portion of screw shall be hard faced.
 - b. Design finished screw with a torsion rating equal to at least 150% of the drive unit's nameplate torque rating.
 - c. Provide an aligned flange plate on the screw drive end and an aligned, matching flange plate on a carbon steel drive shaft to make a bolted connection for ease of removal.

D. DRIVE SYSTEM

1. Provide shop assembled and tested hollow-shaft gearmotor, minimum 90% efficiency, mounted on trough end, consisting of

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an AGMA II Class, minimum 1.4 design SF, with direct connected, maximum 1800 rpm, NEMA design B, minimum 1.15 SF, class F insulation severe duty motor.

2. Motor shall be 480 V, 3 Ph, 60 Hz, rated for Class 1 Division 2 hazardous area.
3. Size gearmotor for starting and continuously operating the conveyor under normal conditions without overloading.

E. SCREW TROUGH

1. Enclose conveyor screw in a u-shaped trough of length and details as compatible with the space and configuration shown on the Contract Drawings.
2. Support screw assembly upper end by the drive gear reducer and provide replaceable wear bars or lower bearing to support the screw in the u-trough.
3. Provide u-trough with bolted sectional covers fully covering trough

F. SETTLING TANK

1. Each grit classifier shall comprise a self-supporting settling tank and integral conveyor screw u-trough.
2. Include with each grit classifier: a 2" diameter drain pipe with plug; an overflow outlet pipe; a height adjustable overflow weir; bolted sectional covers fully covering the settling tank apart from inlet connections.

G. AIR SEPERATOR

1. Air separators constructed of 316 stainless steel shall be provided in order to release air from the fluid mixture pumped out of the grit well. One unit shall be installed on each airlift discharge line (4" Nom. Diameter). The accumulated air shall escape through a vent located on top of the air separator. The grit and water shall fall through an orifice at the bottom of the separator. Provide Victaulic joints for vent and bottom orifice connection, provide flanged connection to air lift discharge line.

2.03 ACCESSORIES

A. NAMEPLATES

1. Provide each equipment item with a stainless steel identification plate.

B. ANCHOR BOLTS

1. Provide 316 stainless steel anchor bolts per Manufacturer's anchoring and mounting specifications.

C. LIFTING LUGS

1. Provide lugs for lifting of the equipment as required.

2.04 FACTORY FINISHING

- A. Supply non-stainless and non-galvanized fabricated steel components cleaned and prepared according to SSPC-SP6 and shop painted with a self-priming, chemical resistant epoxy finish paint system.

- B. Supply drive system components with Manufacturer's standard wash down duty finish.

PART 3 - EXECUTION

3.01 MANUALS

- A. See Section 01730 – Operation and Maintenance Manuals for requirements.

3.02 INSTALLATION

- A. Install, adjust as required, test and place equipment into operation in accordance with these specifications and the Manufacturer's recommendations.

3.03 TESTING AND COMMISSIONING

- A. Complete testing, commissioning and training for grit classifier in accordance with Section 01660 – Mechanical Equipment – Installation and Start-up.

- B. Complete the following additional testing for the grit classifier during commissioning:
1. Confirm that grit classifier runs in correct sequence with existing grit removal system.
 2. Confirm that shock relays are set properly to protect the mechanical equipment from damage during a jammed condition.
 3. Confirm that motor overloads are set properly to protect the drive motor from overheating upon an overload condition.
 4. Confirm that the spacing between the screw flights and the screw trough is per specifications.
 5. Confirm that all bearings have been lubricated and any automated greasing/lubricator systems are in operation.

END OF SECTION 11100

SECTION 15050 – BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Plans and general provisions of Contract, including General and Supplementary Conditions, apply to work of this section.
- B. This Section includes the following:
 - 1. Basic mechanical materials and methods to complement other Division 15 Sections.
 - 2. Pipe and pipe fitting material.
 - 3. Concrete equipment base construction requirements.
 - 4. Equipment nameplate data requirements.
 - 5. Field-fabricated metal and wood equipment supports.
 - 6. Installation requirements common to equipment specification sections.
 - 7. Cutting and patching.
 - 8. Touch-up painting and finishing.

1.02 RELATED WORK SPECIFIED ELSEWHERE

The following section contains requirements that relate to this section:

- A. Division 1
- B. Division 15

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Comply with reference specifications of the General Requirements.

1.04 SUBMITTALS

- A. Submittals shall be in accordance with the Special Conditions.

PART 2 - PRODUCTS

2.01 PIPE AND PIPE FITTINGS

Refer to individual piping system specification Sections for pipe and fitting materials and joining methods.

2.02 JOINING MATERIALS

- A. Refer to individual piping system specification Sections for special joining materials not listed below.
- B. Pipe Flange Gasket Materials: Suitable for the chemical and thermal conditions of the piping system condition.
- C. Flange Bolts and Nuts: ASME B18.2.1, except where other material is indicated.
- D. Solder Filler Metal: ASTM B 32.
- E. Flanged, Ductile-Iron Pipe Gasket, Bolts, and Nuts: AWWA C110, rubber gasket, stainless steel bolts and nuts.
- F. Couplings: Iron body sleeve assembly, fabricated to match outside diameters of pipes.
- G. Copper tubing: ASME B18.2.1, except where other material is indicated. Wire solders only; paste mixed solder not permitted.
- H. Flux: As recommended by manufacturer of solder.

2.03 PIPING SPECIALTIES

- A. Mechanical Sleeve Seals: Modular, watertight, mechanical type. Components include interlocking synthetic links shaped to continuously fill annular space between pipe and sleeve.
- B. Sleeves: The following materials are for wall, floor, slab, and roof penetrations:
 - 1) Steel Sheet-Metal: 24 gage or heavier, galvanized sheet metal, round tube closed with welded longitudinal joint.
 - 2) Steel Pipe: ASTM A 53, Type E, Grade A, Schedule 40, galvanized, plain ends.

3) Cast Iron: Cast or fabricated “wall pipe” equivalent to ductile-iron pressure pipe, having plain ends and integral water stop, except where other features are specified.

4) Wall Penetration Systems: Wall sleeve assembly, consisting of housing, gaskets, and pipe sleeve, with mechanical-joint end conforming to AWWA C110 and 1 plain pipe-sleeve end.

5) Cast-Iron Sleeve Fittings: Commercially-made, sleeve having integral clamping flange, with clamping ring, bolts, and nuts for membrane flashing.

2.04 IDENTIFYING DEVICES AND LABELS

- A. Manufacturer’s standard products of categories and types required for each application as referenced in other Division Sections.
- B. Equipment Nameplates: Metal nameplate with operational data engraved or stamped; permanently fastened to equipment.
 - 1) Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data.
 - 2) Location: An accessible and visible location.
- C. Lettering and Graphics: Coordinate manes, abbreviations, and other designations used in identification, with corresponding designations indicated.

PART 3 - EXECUTION

3.01 PIPING SYSTEMS – COMMON REQUIREMENTS

- A. General: Install piping as described below, except where system Sections specify otherwise.
- B. Drawings (plans, schematics, and diagrams) indicate general location and arrangement of piping systems. Install piping as indicated, except where deviations to layout are approved on coordination drawings.
- C. Install piping at indicated slope.
- D. Install components having pressure rating equal to or greater than system operating pressure.

- E. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.
- F. Install piping free of sags and bends.
- G. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.
- H. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.
- I. Install piping to allow application of insulation plus 1-inch clearance around insulation.
- J. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
- K. Install fittings for changes in direction and branch connections.
- L. Install couplings according to manufacturer's printed instructions.
- M. Install sleeves for pipes passing through concrete and masonry walls, concrete floor and roof slabs, and where indicated.
- N. Above Grade, Exterior Wall, Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.
- O. Below Grade, Exterior Wall, Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.
- P. Below Grade, Exterior Wall, Pipe Penetrations: Install ductile-iron wall penetration system sleeves according to manufacturer's printed installation instructions.
- Q. Verify final equipment locations for roughing-in.
- R. Piping Connections: Except as otherwise indicated make piping connections as specified below.

- 1) Install unions, in piping 2 inches and smaller, adjacent to each valve and at final connection to each piece of equipment having 2-inches or smaller threaded pipe connection.
- 2) Install flanges, in piping 2-1/2-inches and larger, adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.
- 3) Dry Piping Systems (Gas, Compressed Air, and Vacuum): Install dielectric unions and flanges to connect piping materials of dissimilar metals.
- 4) Wet Piping Systems (Water and Steam): Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.02 EQUIPMENT INSTALLATION – COMMON REQUIREMENTS

- A. Install equipment to provide the maximum possible headroom, where mounting heights are not indicated.
- B. Install equipment according to approved submittal data.
- C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, except where otherwise indicated.
- D. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.
- E. Install equipment giving right-of-way to piping systems installed at a required slope.

3.03 LABELING AND IDENTIFYING

- A. Piping Systems: Install pipe markers on each system. Include arrows showing normal direction of flow and as indicated in other Division sections.
- B. Equipment: Install engraved plastic laminate sign or equipment marker on or near each major item of mechanical equipment.

- C. Duct Systems: Identify air supply, return, exhaust, intake, and relief ducts with duct markers; or provide stenciled signs and arrows, showing duct system service and direction of flow.

3.04 PAINTING AND FINISHING

- A. Refer to the Protective Coating Notes on Plan Sheet 10 for field painting requirements.
- B. Damage and Touch-Up: Repair marred and damaged factory painted finishes with materials and procedures to match original factory finish.

3.05 CONCRETE BASES

- A. Construct concrete equipment bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit. Follow supported equipment manufacturer's setting templates for anchor bolt and tie locations. Use concrete and reinforcement as specified in Division 3 Section "Cast-In-Place Concrete."

3.06 ERECTION OF METAL SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
- B. Field Welding: Comply with AWS D1.1 "Structural Welding Code - Steel."

3.07 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage to support and anchor mechanical materials and equipment.
- B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

3.08 CUTTING AND PATCHING

- A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for mechanical installations. Perform cutting and patching as specified in other section.
- B. Repair cut surfaces to match adjacent surfaces.

3.09 TEST AND TESTING

- A. General: Tests shall be required by various Sections under other Division Sections, as well as by this Section.
- B. Tests may be required in case of materials and equipment substitutions.
- C. Piping Tests:
 - 1) Perform engineering tests required to demonstrate that operation of mechanical systems and their parts are in accordance with Specifications covering each item or system, and furnish materials, instruments and equipment necessary to conduct such tests. Tests shall be made in presence of the Engineer, and the representatives of any governmental agency having jurisdiction. Work shall not be concealed or covered until required approvals are obtained.
 - 2) Should Contractor refuse or neglect to perform any test required by Specifications, the Engineer may perform such tests and Contractor shall pay charges in connection therewith.
 - 3) Systems shall be pressure tested in accordance with Pipe Test Schedule below. Pipe test shall show no loss in pressure after a minimum duration of 4 hours at test pressures indicated.
 - 4) Repair of damage to pipes and their appurtenances, or to any other structures resulting from or caused by these tests, shall be performed by Contractor.
- D. Pipe Testing Schedule:

System Tested	Test Pressure (psig)	Test With:
Vent and roof drain (except pipes running under a slab or underground)	Fill with water to top of highest vent, allow to stand two hours, or longer, as directed by Inspector.	Water

Hot water heating system piping	150	Water
Domestic water piping (metallic)	200	Water
Gas piping (steel threaded or plastic)	60 (both tests)	Air
Gas piping (steel welded)	100 (both tests)	Air
Refrigeration Suction Freon R407C Puron R410A	150 250	Nitrogen & Freon
Refrigeration Liquid & Hot Gas Piping Freon R407C Puron R410A	150 300	Nitrogen & Freon

E. Operational Tests:

- 1) Before operating any equipment or systems, a thorough check shall be made to determine that all systems have been flushed and cleaned as required and that all equipment has been properly installed, aligned, lubricated, and serviced.

Factory instructions shall be checked to see that installations have been made accordingly and that recommended lubricants have been used in all bearings, gearboxes, crankcases, and similar equipment. Particular care shall be used in lubricating bearings to avoid damage by over-lubrication and blowing out seals. Equipment shall also be checked for any damage that may have occurred during shipment, after delivery, or during installation. In event of any damage, equipment shall be replaced, renewed, or repaired at Contractor's expense.

- 2) Contractor shall provide, maintain, and pay costs for equipment, instruments, and operating personnel as required for all tests hereinafter specified.

- 3) Contractor shall pay for electric energy and fuel required for tests.
- 4) Any final adjustment to equipment or systems shall meet specified performances requirements.
- 5) Any equipment, system, or work found deficient during any test shall be replaced or corrected. Retest and obtain approval from the Engineer.

F. Project Completion Tests:

- 1) Upon completion of Mechanical work, or such a time prior to completion as may be determined by the Engineer, all mechanical equipment and systems shall be operated and tested for a period of at least 5 consecutive 8-hour days to demonstrate satisfactory over-all operation of building or project as a completed unit. Tests shall include operation of heating, ventilating, and air conditioning equipment and systems for a period of not less than 2, 8-hour, days at not less than 90% of full, specified heating and cooling capacities.
- 2) Tests shall commence after preliminary balancing and adjustments to equipment and systems have been completed, and all running equipment has been checked and thoroughly lubricated.

END OF SECTION 15050

SECTION 15140 – SUPPORTS AND ANCHORS

PART 1 – GENERAL

Appropriate galvanized steel supports and anchors (mounted on a concrete pedestal if applicable) shall be provided as necessary to support the above-grade and exposed pipelines and equipment as specified herein and in accordance with the contract documents.

1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. This section is Division-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 making reference to supports and anchors specified herein.

1.02 SUMMARY:

- A. Extent of supports and anchors required by this section is indicated on drawings and/or specified in other Division-15 sections.
- B. Types of supports and anchors specified in this section include the following:
 - 1. Horizontal-Piping Hangers and Supports.
 - 2. Vertical-Piping Clamps.
 - 3. Hanger-Rod Attachments.
 - 4. Building Attachments.
 - 5. Saddles and Shields.
 - 6. Miscellaneous Materials.
 - 7. Roof Equipment Supports.
 - 8. Anchors.
 - 9. Equipment Supports.
- C. Supports and anchors furnished as part of factory-fabricated equipment, are specified as part of equipment assembly in other Division-15 sections.

1.03 QUALITY ASSURANCE:

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of supports and anchors, of types and sizes required,

whose products have been in satisfactory use in similar service for not less than 5 years.

1.04 SUBMITTALS:

The contractor shall submit the following in compliance with the Special Conditions:

- A. Product Data: Submit manufacturer's technical product data, including installation instructions for each type of support and anchor.
- B. Shop Drawings: Submit manufacturer's assembly-type shop drawings for each type of support and anchor, indicating dimensions, weights, required clearances, and methods of assembly of components.
- C. Maintenance Data: Submit maintenance data and parts list for each type of support and anchor. Include this data, product data, and shop drawings in maintenance manual; in accordance with requirements of Division 1.

1.05 REFERENCES:

- A. Codes and Standards:
 - 9. Code Compliance: Comply with applicable building, mechanical and plumbing codes pertaining to product materials and installation of supports and anchors.
 - 10. UL and FM Compliance: Provide products which are UL-listed and FM approved.
 - 11. MSS Standard Compliance:
 - a. Provide pipe hangers and supports of which materials, design, and manufacture comply with MSS SP-58.
 - b. Select and apply pipe hangers and supports, complying with MSS SP-69.
 - c. Fabricate and install pipe hangers and supports, complying with MSS SP-89.

- d. Terminology used in this section is defined in MSS SP-90.

PART 2 - PRODUCTS

2.01 HORIZONTAL-PIPING HANGERS AND SUPPORTS:

- A. General: Except as otherwise indicated, provide factory- fabricated horizontal piping hangers and supports complying with MSS SP-58, of one the following MSS types listed, selected by Installer to suit horizontal-piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper-plated hangers and supports for copper-piping systems.
- B. Adjustable Steel Clevises Hangers: MSS Type 1. (For suspension of non-insulated or insulated stationary pipe lines; ½" to 30".)
- C. Steel Double Bolt Pipe Clamps: MSS Type 3. (For suspension of pipe requiring up to 4" of insulation and where flexibility of clamp is desirable; ¾" to 24.)
- D. Steel Pipe Clamps: MSS Type 4. (For suspension of cold pipe lines or hot lines where little or no insulation is required; ½" to 24.)
- E. Pipe Hangers: MSS Type 5. (For suspension of piping when off-center closure allowing installation of hanger before erection of piping is desired; ½" to 4".)
- F. Adjustable Swivel Pipe Rings: MSS Type 6. (For suspension of non-insulated stationary pipe lines; ¾" to 8".)
- G. Adjustable Steel Band Hangers: MSS Type 7. (For suspension of non-insulated stationary pipe lines; ¾" to 8".)
- H. Adjustable Band Hangers: MSS Type 9. (For suspension of non-insulated stationary pipe lines; ½" to 8".)
- I. Adjustable Swivel Rings, Band Type: MSS Type 10. (For suspension of non-insulated stationary pipe lines; 3/8" to 8".)

- J. Split Pipe Rings: MSS Type 11. (For suspension of non-insulated pipe lines; 3/8" to 3")
- K. Extension Split Pipe Clamps: MSS Type 12. (For suspension of non-insulated stationary pipe lines; 3/8" to 3.)
- L. U-Bolts: MSS Type 24. (For support of heavy load; 1/2" to 30".)
- M. Clips: MSS Type 26. (For support of uninsulated piping not subject to expansion or contraction.)
- N. Pipe Saddle Supports: MSS Type 36, including steel pipe base-support and cast-iron floor flange. (To support pipe for floor stanchion, using floor flange to secure stanchion to floor 4" to 36".)
- O. Pipe Stanchion Saddles: MSS Type 37, including steel pipe base support and cast-iron floor flange. (To Type 36 except U-bolt provided for retaining pipe.)
- P. Vee Bottom Clevis Hanger: With continuous 18 gauge galvanized steel support channel (for support for PVC and polypropylene piping) similar to B-line figure B3106V.

2.03 VERTICAL-PIPING CLAMPS:

- A. General: Except as otherwise indicated, provide factory-fabricated vertical-piping clamps complying with MSS SP-58, of one of the following types listed, selected by Installer to suit vertical piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Select size of vertical piping clamps to exactly fit pipe size of bare pipe. Provide copper-plated clamps for copper-piping systems.
- B. Two-Bolt Riser Clamps: MSS Type 8. (For support and steadying of pipe risers; 3/4" to 20". Also, supports pipe covering or insulation.)
- C. Four-Bolt Riser Clamps: MSS Type 42. (When longer ends are required for riser clamps.)

2.04 HANGER-ROD ATTACHMENTS:

- A. General: Except as otherwise indicated, provide factory-fabricated hanger-rod attachments complying with MSS SP-58, of one of the following MSS types listed, selected by Installer to suit horizontal-piping hangers and building attachments, in accordance with MSS SP-69 and manufacturer's published product information. Use only

one type by one manufacturer for each piping service. Select size of hanger-rod attachments to suit hanger rods. Provide copper-plate hanger-rod attachments for copper-piping systems.

- B. Steel Turnbuckles: MSS Type 13. (For adjustment up to 6" for heavy loads.)
- C. Steel Clevises: MSS Type 14. (For use on high temperature piping installations.)
- D. Swivel Turnbuckles: MSS Type 15. (For use with split pipe rings, MSS type 11.)
- E. Malleable Iron Sockets: MSS Type 16. (For attaching hanger rod to various types of building attachments.)

2.05 BUILDING ATTACHMENTS:

- A. General: Except as otherwise indicated, provide factory-fabricated building attachments complying with MSS SP-58, of one the following MSS types listed, selected by Installer to suit building substrate conditions, in accordance with MSS SP-69 and manufacturer's published product information. Select size of building attachments to suit hanger rods. Provide copper-plated building attachments for copper-piping systems.
- B. Concrete Inserts: MSS Type 18. (For upper attachment for suspending pipe hangers from concrete ceiling.)
- C. Top Beam C-Clamp: MSS Type 19. (Use under roof installations with bar joist construction, for attachment to top flange of structural shape.)
- D. Side Beam or Channel Clamps: MSS Type 20. (For attachment to bottom flange of beams, channels, or angles.)
- E. Center Beam Clamps: MSS Type 21. (For attachment to center of bottom flange of beams.)
- F. Welded Beam Attachments: MSS Type 22. (For attachment to bottom of beams where loads are considerable and rod sizes are large.)
- G. C-Clamps: MS Type 23. (For attachment to structural shapes.)

- H. Top Beam Clamps: MSS Type 25. (For attachment to top of beams when hanger rod is required tangent to edge of flange.)
- I. Side Beam Clamps: MSS Type 27. (For attachment to bottom of steel I-beams.)
- J. Steel Beam Clamps W/Eye Nut: MSS Type 28. (Same as Type 28 with link extensions.)
- K. Linked Steel Clamps W/EYE Nut: MSS Type 29. (Same as Type 28 with link extensions.)
- L. Malleable Beam Clamps: MSS Type 30. (For attachment to structural steel.)
- M. Steel Brackets: One of the following for indicated loading:
 - 1. Light Duty: MSS Type 31, to 570 pounds.
 - 2. Medium Duty: MSS Type 32, to 1,500 pounds.
 - 3. Heavy Duty: MSS Type 33, to 3,000 pounds.
- N. Side Beam Brackets: MSS Type 34. (For use on sides of steel or wooden beams.)
- O. Plate Lugs: MSS Type 57. (For attachment to steel beams where flexibility at the beam is desired.)
- P. Horizontal Travelers: MSS Type 58. (For supporting piping systems subject to linear horizontal movements where head room is limited.)

2.06 SADDLES AND SHIELDS:

- A. General: Except as otherwise indicated, provide saddles or shields under piping hangers and supports, factory-fabricated, for all insulated piping. Size saddles and shields for exact fit to mate with pipe insulation.
- B. Protection Saddles: MSS Type 39; fill interior voids with segments of insulation matching adjoining insulation.
- C. Protection Shields: MSS Type 40; of length recommended by manufacturer to prevent crushing of insulation.

- D. Thermal Hanger Shields: Constructed of 360 degrees insert of high density, 100 psi, water-proofed calcium silicate, encased in 360 degrees sheet metal shield. Provide assembly of same thickness as adjoining insulation.
- E. Manufacturer: Subject to compliance with requirements, provide thermal hanger shields of one of the following, or approved equal:
 - 1. Elcen Metal Products Co.
 - 2. Pipe Shields, Inc.

2.07 MANUFACTURERS OF HANGERS AND SUPPORTS:

- A. Manufacturer: Subject to compliance with requirements, provide hangers and supports of one of the following, or approved equal:
 - 1. Kin-Line, Inc.
 - 2. Fee & Mason Mfg. Co.; Div Figgie International
 - 3. ITT Grinnel Corp.
 - 4. B-Line Inc.
 - 5. Ellen Metal Products

2.08 HIGH HUMIDITY AND OUTSIDE AREAS: Use cadmium plated or galvanized hangers, channels, angle iron, attachments, rods, nuts, bolts and other accessories in press room, truck area, and other high humidity areas and for supports located exposed outside.

2.09 MISCELLANEOUS MATERIALS:

- A. Metal Framing: Provide products complying with NEMA STD ML 1.
- B. Steel Plates, Shapes and Bars: Provide products complying with ASTM A 36.
- C. Cement Grout: Portland cement (ASTM C 150, Type I or Type III) and clean uniformly graded, natural sand (ASTM C 404, Size No. 2). Mix at a ratio of 1.0 part cement to 3.0 parts sand, by volume, with minimum amount of water required for placement and hydration. Use SikaGrout for non-shrink applications.
- D. Heavy Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS standards.
- E. Pipe Guides: Provide factory-fabricated guides, of cast semi- steel or heavy fabricated steel, consisting of bolted two- section outer cylinder and base with two-section guiding spider bolted tight to

pipe. Size guide and spiders to clear pipe and insulation (if any), and cylinder. Provide guides of length recommended by manufacturer to allow indicated travel.

2.10 ROOF EQUIPMENT SUPPORTS:

- A. General: Construct roof equipment supports, unless detailed otherwise, using minimum 18-ga galvanized steel with fully mitered and welded corners, 3" cant, internal bulkhead reinforcing, integral base plates, pressure treated wood nailer, and 18-ga galvanized steel counterflashing.
- B. Configuration: Construct to sizes as indicated or dictated by equipment, compensate for slope in roof so top of support is dead level.
- C. Manufacturer: Subject to compliance with requirements, provide roof equipment supports of one of the following, or approved equal:
 - 1. Custom Curb, Inc.
 - 2. Pate Co.
 - 3. Thycurb Div.; Thybar Corp.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Examine areas and conditions under which supports and anchors are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable

3.02 PREPARATION:

- A. Proceed with installation of hangers, supports and anchors only after required building structural work has been completed in areas where the work is to be installed. Correct inadequacies including (but not limited to) proper placement of insets, anchors and other building structural attachments.
- B. Prior to installation of hangers, supports, anchors and associated work, Installer shall meet at project site with Contractor, installer of each component of associated work, inspection and testing agency representatives (if any), installers of other work requiring coordination with work of this section and Owner's Representative for purpose of reviewing material selections and procedures to be

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followed in performing the work in compliance with requirements specified.

3.03 INSTALLATION OF BUILDING ATTACHMENTS:

- A. Install building attachments at required locations within concrete or on structural steel for proper piping support. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert securely to forms. Where concrete with compressive strength less than 2500 psi is indicated, install reinforcing bars through the openings at the tops of inserts.

3.04 INSTALLATION OF HANGERS AND SUPPORTS:

- A. General: Install hangers, supports, clamps and attachments to rigidly support piping properly from building structure; comply with MSS SP-69. Arrange for grouping of parallel runs of horizontal piping to be supported together on trapeze type hangers where possible. Install supports with maximum spacings complying with MSS SP-69. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.
- B. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories. Except as otherwise indicated for exposed continuous pipe runs, install hangers and supports of same type and style as installed for adjacent similar piping.
- C. Prevent electrolysis in support of copper tubing by the use of hangers and supports which are copper plated, or by isolating with foam rubber covering.
- D. Provisions for Movement:
- E. Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
- F. Install supports within 2 feet of non-vertical flex connectors.

- G. Load Distribution: Install hangers and supports so that piping living and dead loading and stresses from movement will not be transmitted to connected equipment.
- H. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ANSI B31 Pressure Piping Codes are not exceeded.
- I. Insulated Piping: Hangers shall not come in contact with pipe where pipe is specified to be insulated.
- J. Clamps: Attach clamps, including spacers (if any), to piping with clamps project through insulation; do not exceed pipe stresses allowed by ANSI B31.
- K. Shields: Where low-compressive-strength insulation or vapor barriers are indicated on cold water piping, install galvanized steel protective shields. Install calcium silicate blocks (12" long minimum) at support points.
- L. Saddles: where insulation without vapor barrier is indicated, install protection saddles.

3.05 INSTALLATION OF ANCHORS:

- A. Install anchors at proper locations to prevent stresses from exceeding those permitted by ANSI B31, and to prevent transfer for loading and stresses to connected equipment.
- B. Fabricate and install anchor by welding steel shapes, plates and bars to piping and to structure. Comply with ANSI B31 and with AWS standards.
- C. Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions, to limit movement of piping and forces to maximums recommended by manufacturer for each unit.
- D. Anchor Spacings: Where not otherwise indicated, install anchors at ends of principal pipe-runs, at intermediate points in pipe-runs between expansion loops and bends. Make provisions for preset of anchors as required accommodating both expansion and contraction of piping.

3.06 EQUIPMENT SUPPORTS:

- A. Provide concrete housekeeping bases for all floor mounted equipment furnished as part of the work of Division 15. Size bases to extend a minimum of 4" beyond equipment base in any direction; and 4" above finished floor elevation. Construct of reinforced concrete, roughen floor slab beneath base for bond, and provide steel rod anchors between floor and base. Locate anchor bolts using equipment manufacturer's templates. Chamfer top and edge corners.
- B. Provide structural steel stands to support equipment not floor mounted or hung from structure. Construct of structural steel members or steel pipe and fittings. Provide factory-fabricated tank saddles for tanks mounted on steel stands.
- C. Furnish roof equipment supports to Contractor for installation as part of work of Division 7, as applicable; not work of this section.

3.07 ADJUSTING AND CLEANING:

- A. Hanger Adjustment: Adjust hangers so as to distribute loads equally on attachments.
- B. Support Adjustment: Provide grout under supports so as to bring piping and equipment to proper level and elevations.
- C. Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

END OF SECTION 15140

SECTION 15141 - PROCESS PIPE AND FITTINGS

PART 1 - GENERAL

1.1 WORK INCLUDED:

This section covers furnishing, laying, jointing, and testing of process pipe for the headworks, including fittings, special castings and appurtenant work, as indicated on the drawings and as specified.

1.2 RELATED WORK:

- A. Division 15 - Mechanical

1.3 QUALITY ASSURANCE:

- A. All pipe and fittings shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured.
- B. The Owner reserves the right to have any or all pipe, fittings, and special castings inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or tests shall be at the Owner's expense.

1.4 REFERENCES:

The following standards form a part of this specification and indicate the minimum standards required:

American National Standards Institute (ANSI)

ANSI A21.4 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water

ANSI A21.10 Ductile-Iron and Gray-Iron Fittings, 3-inches through 48-inches, for Water and Other Liquids

ANSI A21.11 Rubber Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

ANSI A21.15 Flanged Ductile-Iron Pipe with Threaded Flanges

ANSI A21.50 Thickness Design of Ductile-Iron Pipe

ANSI A21.51 Ductile-Iron Pipe, Centrifugally Cast in Metal or Sand-Lined
Molds for Water or Other Liquids

ANSI A21.53 Ductile-Iron Compact Fittings, 3 inch Through 16 inch., for
Water and Other Liquids.

American Water Works Association (AWWA)

AWWA C606 Standard for Grooved and Shouldered
Joints

AWWA C651 Standard for Disinfecting Water Mains

American Society for Testing and Materials (ASTM)

ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated (Galvanized)
Welded and Seamless

ASTM A307 Low-Carbon Steel, Externally and Internally Threaded
Standard Fasteners

1.5 SUBMITTALS:

- A. Shop drawings shall consist of manufacturer's scale drawings, cuts, or catalogs including descriptive literature and complete characteristics and specifications and code requirements. Shop drawings shall be submitted for the ductile iron pipe, type of joint, fittings, couplings, filling rings, and lining and coating in accordance with specifications.
- B. Sworn certificates shall be furnished to the Engineer verifying the results of tests called for in subsection 1.03, Quality Assurance.

PART 2 - PRODUCTS

2.1 DUCTILE IRON PIPE:

- A. All ductile iron pipe shall be designed in accordance with ANSI A21.50 and shall be manufactured in accordance with ANSI A21.51.
- B. Pipe for use with sleeve type couplings shall be as specified above except that the ends shall be plain (without bells or beads). The ends shall be cast or machined at right angles to the axis.

- C. Pipe for use with grooved type couplings shall have ends grooved in accordance with AWWA C606.
- D. Pipe thickness class, unless otherwise indicated:
 - 1. Minimum thickness class shall be Class 53 for use with threaded flanges.
 - 2. For grooved couplings, minimum thickness class shall be Class 53 for pipe smaller than 18-inches and Class 56 for pipe 18-inches and larger.
- E. Machined surfaces shall be cleaned and coated with a suitable rust-preventative coating at the shop immediately after being machined.
- F. The inside of pipe and fittings shall be given a cement lining and bituminous seal coat in accordance with ANSI A2I.4. The thickness of lining shall be double that specified in the above referenced specification.

2.2 LINING AND COATING:

- A. The inside of pipe and fittings shall be given a cement lining and asphaltic seal coat in accordance with AWWA C104. The thickness of the lining shall be double that specified in AWWA C104.
- B. The outside of pipe and fittings shall be coated with the standard asphaltic coating specified under the appropriate AWWA Standard Specification for pipe and fittings.
- C. Machined surfaces shall be cleaned and coated with a suitable rust preventative coating at the shop immediately after being machined.

2.3 JOINTS:

- A. Flanged joints shall conform to ANSI A2I.15 except that special drilling or tapping shall be provided as necessary to ensure correct alignment and bolting.
- B. Flanged pipe shall use long-hub flanges which shall be screwed on tight at the foundry by machine before they are faced and drilled.

2.4 FITTINGS:

- A. Fittings for grit slurry piping shall be "Slurry Fittings" as manufactured by Creative Urethanes, Winchester, VA or approved equal.
- B. Fittings shall conform to the requirements of ANSI A2I.10 and shall be of a pressure classification at least equal to that of the pipe with which they are used.

- C. Flanged fittings shall be faced and drilled in accordance with ANSI A21.10 except that special drilling or tapping shall be provided as necessary to ensure correct alignment and bolting.
- D. Provide ductile-iron grooved-end fittings conforming to ANSI A21.10 for center-to-face dimensions.
 - 1. End preparation for grooved-ends conforming to AWWA C606 for flexible or rigid joints as required by type of joint.
 - 2. Minimum wall thickness of grooved fittings 12-inch and smaller conforming to ANSI A21.53.
 - 3. Minimum wall thickness of grooved fittings larger than 12-inch conforming to ANSI A21.10.
- E. Fittings shall be provided with standard bosses where so indicated.
- F. Fittings shall be flanged to mate with ductile iron pipe.

2.5 SLEEVE TYPE COUPLINGS:

- A. To ensure correct fitting of pipe and couplings, all flexible couplings and accessories shall be furnished by the supplier of the pipe and shall be of a pressure rating at least equal to that of the pipeline in which they are to be installed.
- B. Flexible couplings shall be Style 38 by Dresser Mfg. Div., Bradford, PA; Style 441 Smith-Blair, Inc., San Francisco, CA; R.H. Baker & Co., Inc., Huntington Park, CA; Clow Corporation, Rochester, NY; or approved equal products.
- C. All couplings shall be furnished with the pipe stop removed.
- D. Couplings shall be provided with gaskets of a composition suitable for exposure to the liquid within the pipe.

2.6 GROOVED COUPLINGS:

- A. Couplings shall conform to AWWA C606.
- B. Minimum pipe wall thickness shall be as specified under "Pipe For Use With Couplings."
- C. Unless otherwise indicated, when grooved couplings are used, joint to be of rigid type with pipe grooves cut to bring pipe ends together. Beam strength of joint

shall be equal to or greater than that of flanged joint. Flexible type joint to be used only as specified or indicated.

- D. Where grooved couplings are indicated to provide for expansion or flexibility, cut pipe grooves to provide necessary expansion or flexibility.

2.7 WALL PENETRATIONS:

A. RESTRAINED:

1. Where restrained wall penetrations are called for on the drawings, wall pipe castings with integral water stops shall be used. Outside surfaces of castings to be encased in concrete shall not be painted or coated.
2. OMNI*SLEEVE as manufactured by Sigma, Cream Ridge, NJ, or approved equal shall be an accepted alternate when installed with retainer (tie) rods.
3. Wall sleeves with mechanical seals only will not be allowed in lieu of castings.

B. NON-RESTRAINED:

Where non-restrained wall penetrations are called for on the drawings, mechanical seals shall fill the space between the process pipe and the pipe sleeve to create a water tight seal. Mechanical seal shall be Link-Seal by Thunderline Corporation, Wayne, Michigan; OMNI*SLEEVE, by Sigma of Cream Ridge, NJ; or approved equal.

2.8 FILLING RINGS:

The Contractor shall provide suitable filling rings where the layout of the flanged piping is such as to necessitate their use. In materials, workmanship, facing and drilling, such rings shall conform to the 125-lb. ANSI Standard. Filling rings shall be of suitable length with nonparallel faces and corresponding drilling if necessary, to ensure correct assembly of the adjoining piping or equipment.

2.9 GASKETS, BOLTS, AND NUTS:

- A. For flanged joints, gaskets shall be a minimum of 1/8-inch thick full face gaskets.
- B. Gaskets shall be of a composition suitable for exposure to the liquid within the pipe.
- C. Flanged joints shall be either made with bolts, bolt studs with a nut on each end, or studs with nuts where the flange is tapped. The number and size of bolts shall conform to the same ANSI Standard as the flanges. Bolts and nuts shall, except as otherwise specified or noted on the drawings, be heavy hex Grade B

conforming to ASTM A307. Bolt studs and studs shall be of the same quality as machine bolts.

2.10 JOINT RESTRAINT:

- A. Where indicated or necessary to prevent joints or flexible couplings from pulling apart under pressure, suitable socket pipe clamps, tierods, and bridles shall be provided. Bridles and tierods shall be at least 3/4-inch diameter except where they replace flange bolts of smaller size, in which case they shall be fitted with a nut on each side of the pair of flanges. The socket clamps and tierods or bridles shall be coated with an approved primer paint after assembly, or, if necessary, prior to assembly.

2.11 HANGERS AND SUPPORTS

- A. The Contractor shall furnish and install all supporting devices necessary or required to support all piping, valves and appurtenances in a safe, firm and substantial manner at the locations indicated or as required in a manner to prevent the loads of piping, valves and appurtenances from being carried on pumps, pipes or other equipment.
- B. Isolation valves in horizontal pipelines shall be installed with shaft in horizontal position so that with valve in open position the isolation mechanism (plug for plug valves) is located in the upper part of the valve body. The valves shall be oriented so that with valve in closed position; the isolation mechanism (plug for plug valves) is at the upstream end of the valve.
- C. Install hangers and supporting devices necessary or required to hold all piping, valves and appurtenances in a safe, firm and substantial manner at the positions indicated or as directed and in a manner to prevent the loads of valves and appurtenances from being carried on pumps or other equipment
- D. Refer to section 15140 – Supports and Anchors for additional information and details.

PART 3 - EXECUTION

3.1 HANDLING AND CUTTING PIPE:

- A. Any pipe or fitting which has a damaged lining, scratched or marred machine surface, and/or abrasion of the pipe coating or lining shall be rejected and removed from the job site.
- B. Any fitting showing a crack and any fitting or pipe which has received a severe blow that may have caused an incipient fracture, even though no such fracture

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can be seen, shall be marked as rejected and removed at once from the work.

- C. In any pipe showing a distinct crack and in which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portions, if so approved, may be cut off by and at the expense of the Contractor before the pipe is laid so that the pipe used may be perfectly sound. The cut shall be made in the sound barrel at a point at least 12-inches from the visible limits of the crack.
- D. Except as otherwise approved, all cutting shall be done with a machine suitable for cutting ductile iron pipe. Hydraulic squeeze cutters are not acceptable. Travel type cutters or rotary type abrasive saws may be used. All cut ends shall be examined for possible cracks caused by cutting.
- E. The Contractor's attention is directed to the fact that damage to the lining of pipe or fittings will render them unfit for use; he shall use the utmost care in handling and installing lined and coated pipe and fittings to prevent damage. Protective guards shall not be removed until the pipe is to be installed.
- F. Lined and coated pipe and fittings shall be assembled and installed with approved packing or gaskets of the type recommended by the pipe manufacturer for the particular lining used.
- G. Castings to be encased in masonry or concrete shall be accurately set with the bolt holes, if any, carefully aligned. OMNI*SLEEVE shall be installed per manufacturer's instructions.
- H. Immediately prior to being set, castings shall be thoroughly cleaned of all rust, scale and other foreign matter.

3.2 INSTALLING PIPE AND FITTINGS:

- A. No defective pipe or fittings shall be laid or placed in the piping, and any piece discovered to be defective after having been laid or placed shall be removed and replaced by a sound and satisfactory piece.
- B. Pipes and fittings shall be subjected to a careful inspection and a hammer test just before being installed.
- C. Before the pieces are assembled, rust-preventive coatings shall be removed from machined surfaces. Pipe ends, sockets, sleeves, housings, and gaskets shall be thoroughly cleaned and all burrs and other defects shall be carefully smoothed.
- D. Each pipe and fitting shall be cleared of all debris, dirt, etc., before being laid and shall be kept clean until accepted in the completed work.

- E. Flanged joints shall be made up tight, care being taken to prevent undue strain upon pump nozzles, valves, and other pieces of equipment.
- F. Pipe and fittings shall be laid accurately to the lines and grades indicated on the drawings or as required by the Engineer. Care shall be taken to ensure good alignment both horizontally and vertically.
- G. Castings to be encased in masonry shall be accurately set with the bolt holes, if any, carefully aligned.
- H. Immediately prior to being set, castings shall be thoroughly cleaned of all rust, scale and other foreign material.

3.3 ASSEMBLING SLEEVE TYPE COUPLINGS:

- A. Prior to the installation of flexible couplings, the pipe ends shall be cleaned thoroughly for a distance of 8-inches. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6-inches from the end, and the middle ring shall be placed on the already laid pipe and until it is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid. The gaskets and followers shall then be pressed evenly and firmly into the middle ring flares.
- B. After the bolts have been inserted and all nuts have been made up finger tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts.
- C. The correct torque as indicated by a torque wrench shall not exceed 90 foot-pounds.

3.4 ASSEMBLING GROOVED COUPLINGS

- A. Clean grooves and other parts.
- B. Coat ends of pipe and outside of gasket with soft soap or silicone and slip gasket over one pipe end.
- C. Bring pipes to correct position and center gasket over pipe ends with lips against pipe.
- D. Place housing section, insert bolts and tighten nuts until housing sections are in metal-to- metal contact.
- E. If grooves must be cut in the field, the equipment used shall be as

recommended by the coupling manufacturer. Finished grooves shall comply with AWWA C606.

3.5 PIPING SUPPORT:

- A. The Contractor shall furnish and install all supports necessary to hold the piping and appurtenances in a firm, substantial manner at the lines and grades indicated on the drawings or specified. Pipe supports shall be furnished with one shop coat of rust inhibitive primer.
- B. All pipe and appurtenances connected to equipment shall be supported in such a manner as to prevent any strain being imposed on the equipment. When manufacturers have indicated requirements that piping loads shall not be transmitted to their equipment, the Contractor shall submit a certification from the manufacturer stating that such requirements have been complied with.
- C. Piping within buildings shall be adequately supported from floors, walls, ceilings or beams. Supports from the floor shall be by approved saddle stands, or suitable concrete piers as indicated or approved. Pipe saddles shall be shaped to fit the pipe with which they will be used and shall be capable of screw adjustment. Brick and concrete piers shall conform accurately to the bottom one-third to one-half of the pipe. Piping along walls shall be supported by approved wall brackets with attached pipe rolls or saddles or by wall brackets with adjustable hanger rods. For piping supported from the ceiling, approved rod hangers of a type capable of screw adjustment after erection of the piping and with suitable adjustable concrete inserts or beam clamps shall be used.

3.6 TAPPED CONNECTIONS:

- A. Tapped connections in pipe and fittings shall be made so as to provide a watertight joint and adequate strength against pullout. The maximum size of taps in pipe or fittings without bosses shall not exceed that listed in the appropriate table of the Appendix to the ANSI A21.51, based on 3 full threads for ductile iron.
- B. Where the size of the connection exceeds that given above, a boss shall be provided on the pipe barrel and the tap shall be made in the flat part of the intersection of the run and branch of a tee or cross, or the connection shall be made by means of a tapped tee, branch fitting and tapped plug or reducing flange, or tapping tee and tapping valve, all as indicated or approved.
- C. All drilling and tapping of ductile iron pipe shall be done normal to the longitudinal axis of the pipe; fittings shall be drilled and tapped similarly, as appropriate. Drilling and tapping shall be done only by skilled mechanics. Tools used shall be adapted to the work and in good condition so as to produce good, clean-

cut threads of the correct size, pitch, and taper.

3.7 PRESSURE AND LEAKAGE TESTS:

- A. Prior to the pressure and leakage tests, the piping shall be thoroughly cleaned of all dirt, dust, oil, grease and other foreign material. This work shall be done with care to avoid damage to linings and coating.
- B. Except as otherwise required by the Engineer, all pipelines shall be given combined pressure and leakage tests in sections of approved length. The Contractor shall furnish and install suitable temporary testing plugs or caps; all necessary pressure pumps, pipe connections, meters, gates, and other necessary equipment; and all labor required. The Owner or Engineer may monitor the tests using their own gages.
- C. Subject to approval and provided that the tests are made within a reasonable time considering the progress of the project as a whole, and the need to put the section into service, the Contractor may make the tests when he desires.
- D. The section of pipe to be tested shall be filled with water of approved quality, and all air shall be expelled from the pipe. If hydrants and blow offs are not available at high points for releasing air, the Contractor shall make the necessary taps at such points, including required excavation and backfilling, and shall plug said holes after completion of the test.
- E. The section under test shall be maintained full of water for 24 hours prior to the combined pressure and leakage test being applied.
- F. The pressure and leakage test shall consist of first raising the water pressure (based on the elevation of the lowest point of the section under test, corrected to the gage location) to a pressure in pounds per square inch numerically equal to the pressure rating of the pipe. If the Contractor cannot achieve the specified pressure and maintain it for a period of one hour, the section shall be considered as having failed to pass the pressure test.
- G. Following or during the pressure test, the Contractor shall conduct a leakage test by metering the flow of water into the pipe while maintaining pressure equal to the pressure rating of the pipe. If the average leakage during a two-hour period exceeds a rate of 11.6 gallons per inch of diameter per 24 hours per mile of pipeline, the section shall be considered as having failed the leakage test.
- H. If the section fails to pass the pressure and leakage test, the Contractor shall do everything necessary to locate, uncover, and repair or replace the defective pipe, fitting, or joint, all at his own expense and without extension of time for completion of the work. Additional tests and repairs shall be made until the section passes the specified test.

- I. If, in the judgment of the Engineer, it is impracticable to exactly follow the foregoing procedure, modifications in the procedure may be made as required and approved. The Contractor will still be responsible for providing a line, which satisfies the above leakage and pressure requirements.

END OF SECTION 15141

SECTION 15142 - STAINLESS STEEL PROCESS PIPE AND FITTINGS

PART 1 - GENERAL

1.1 WORK INCLUDED:

- A. This Section specifies all process stainless steel pipe, including fittings, valves and appurtenant work, as indicated on the drawings and as specified herein.
- B. The contractor shall furnish all materials, tools, equipment, transportation, labor, supervision and incidentals required to supply, store, install, clean, and test the stainless steel pipe & fittings as shown on the drawings and as specified herein.

1.2 RELATED WORK:

- A. DIVISION 15.

1.3 QUALITY ASSURANCE:

- A. All pipe and fittings shall be inspected and tested at the mill as required by the standard specifications to which the material is manufactured.
- B. The Owner reserves the right to have any or all pipe, fittings, and special castings inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or tests shall be at the Owner's expense.

1.4 REFERENCES:

- A. The following standards form a part of this specification and indicate the minimum standards required for air service valves and appurtenances:

American Society for Testing and Materials (ASTM)

ASTM A48 Standard Specification for Gray Iron

Castings.

ASTM A126 Standard Specification for Gray Iron Castings for Valves,
Flanges and Pipe Fittings.

ASTM A159 Standard Specification for Automotive Gray Iron Castings.

ASTM A240	Standard Specification for Heat Resisting Chromium and Chromium- Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels.
ASTM A276	Standard Specification for Stainless Steel Bars and Shapes.
ASTM A436	Standard Specification for Austenitic Gray Iron Castings.
ASTM A536	Standard Specification for Ductile Iron Castings.
ASTM B30	Standard Specification for Copper-Base Alloys in Ingot Form.
ASTM B62	Standard Specification for Composition Bronze or Ounce Metal Castings
	American Water Works Association (AWWA)
AWWA C504	Rubber-Seated Butterfly Valves
AWWA C508	Swing-Check Valves for Waterworks Service, 2-in (50mm Through 24-in (600mm) NPS
	American National Standards Institute (ANSI)
ANSI B2.1	Specifications, Dimensions, Gauging for Taper and Straight Pipe Threads (except dry seals).
ANSI B16.1	Cast Iron Pipe Flanges and Flanged Fittings
ANSI B 16-10	Face-to-Face and End-to-End Dimensions of Valves
ANSI B 16.1 04	Butterfly Valves
	Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS)
MSS-SP-6 1	Pressure Testing of Steel Valves.
MSS-SP-67	Butterfly Valves.
MSS-SP-71	Cast Iron Swing Check Valves, Flanges and Threaded Ends.
MSS-SP-80	Bronze Gate, Globe, Angle and Check Valves.
MSS-SP-82	Valve Pressure Testing Methods

MSS-SP-98 Protective Coatings for the Interior of Valves, Hydrants and Fittings.
 National Electrical Manufacturers Association (NEMA)
 Underwriters Laboratories (UL)
 Factory Mutual (FM)
 American Iron and Steel Institute (AISI)

B. The following standards form a part of this specification and indicate the minimum standards required for stainless steel process pipe, fittings and appurtenances for air service:

- American Society for Testing and Materials (ASTM)
- ASTM A240 Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels
- ASTM A312 Seamless and Welded Austenitic Stainless Steel Pipes
- ASTM A403 Wrought Austenitic Stainless Steel Pipe Fittings
- ASTM A530 General Requirements for Specialized Carbon and Alloy Steel Pipe
- ASTM A743 Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion-Resistant, for General Application
- ASTM A774 As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures
- ASTM A778 Welded, Unannealed Austenitic Stainless Steel Tubular Products American National Standards Institute (ANSI)
- ANSI B 16.1 Cast Iron Pipe Flanges and Flanged Fittings.
- ANSI B16.9 Factory-Made Wrought Steel Buttwelding Fittings.
- ANSI B36.19 Stainless Steel Pipe
- American Water Works Association (AWWA)
- AWWA C111 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and

Fittings.

AWWA C210 Standard for Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.

American Society of Mechanical Engineers (ASME)
ASME B3 1.1 Power Piping.

American Welding Society (AWS)

- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.5 MANUFACTURERS QUALIFICATIONS:

All shop fabricated stainless steel pipe and fittings shall be furnished by a single fabricator who is fully experienced, reputable, qualified and regularly engaged for a minimum of 10 years in the manufacture and fabrication of light wall stainless steel piping. The pipe and fittings shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these specifications. Stainless steel pipe and fittings shall be as manufactured by Douglas Brothers, Portland, ME; Felker Brothers Mfg. Co., Marshfield, WI; or approved equal.

1.6 SUBMITTALS:

- A. Prior to fabrication, the Contractor shall submit to the Engineer for review, six copies of complete shop drawings. Shop drawings shall consist of manufacturer's scale drawings, cuts or catalogs including descriptive literature and complete characteristics, and code requirements. Shop drawings shall be submitted for the stainless steel pipe showing type of joint, fittings, couplings, filling rings, and lining and coating in accordance with the specifications.
- B. Submit for review and approval piping layouts, schedules, shop fabrication drawings, specifications, catalog cuts and other data necessary to show conformance of the complete piping systems to these specifications. The submittal shall include dimensions, fittings, locations of equipment, valves, and appurtenances, joint locations and details, types and locations of supports, coordination with all other work and existing conditions, and all other pertinent technical specifications for the piping systems to be furnished.
- C. Shop fabrication spool drawings shall show alloys, diameters, pipe wall thickness, fittings, branches, flanges and other joint preparation details, dimensions, and other appurtenances to be supplied.
- D. Letter certifying that all metals are compatible with each other. It is the

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requirement of the Contractor to confirm that all metals are compatible.

- E. Chemical and physical reports on the stainless steel.
- F. Sworn certificates of inspection and testing of all pipe and fittings at the foundry.
- G. Written report certifying testing of all stainless steel process pipe.

1.7 SYSTEM DESCRIPTION

- A. Piping shall be installed in those locations as shown on the Drawings.
- B. The equipment and materials specified herein are intended to be standard types of stainless steel pipe and fitting for use in transporting air.
- C. Stainless steel piping for the system listed below shall be designed for the following conditions:

System: Low Pressure Air

- 1. Material: 316 Stainless Steel
- 2. Operating Pressure: 0 to 10 psi
- 3. Test Pressure: 15 psi
- 4. Flow Velocity: 0 to 400 feet per minute (fpm)
- 5. Temperature: ambient

1.8 DELIVERY, STORAGE AND HANDLING

- A. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe and fittings. Pipe and fittings shall not be dropped. Pipe and fittings shall be examined before installation and no piece shall be installed which is found to be defective.
- B. In handling the pipe, wide cushioned slings or other devices and methods acceptable to the Engineer shall be used. No uncushioned ropes, chairs, wedges or levers shall be used in handling the pipe, fittings and couplings.
- C. If any defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe by the Contractor, at the Contractor's own expense. All pipe and fittings shall be thoroughly cleaned before installation and shall be kept clean until they are put into service.

PART 2 - PRODUCTS

2.1 STAINLESS STEEL PIPE:

- A. Unless otherwise called for, stainless steel pipe and fittings 3-inches or larger shall be manufactured and welded to ASTM A774 and ASTM A778, from sheet and plate manufactured in the United States conforming to ASTM A240 Type TP 316 stainless steel. Pipe shall be manufactured to nominal pipe sizes as listed in ANSI B36.19 Table 2. Pipes shall be provided with a No. 1 finish or better.
- B. The pipe and fittings shall be supplied in the following nominal wall thicknesses:
- | | |
|-----------------------------|---------------------|
| Tubing 1/2 inch to 4 inches | #16 USS Gauge |
| 2-1/2 inches to 8 inches | Schedule 5 |
| 10 inches to 12 inches | #12 USS Gauge Sheet |
| 14 inches to 18 inches | #11 USS Gauge Sheet |
| 20 inches | #10 USS Gauge Sheet |
| 24 inches to 36 inches | 3/16-inch Plate |
| 42 inches to 48 inches | 1/4-inch Plate |
| 54 inches to 60 inches | 5/16-inch Plate |
- C. Pipe shall be die-formed or rolled true to dimension and round. Tolerances for length, inside and outside diameter and straightness shall conform to ASTM A530. All stainless steel shall be extra low carbon (0.03% maximum) and shall meet all applicable ASTM standards. All stainless steel shall be line marked showing type, gauge, and heat numbers. The two edges of sheet shall be brought to line so as not to leave a shoulder on the inside of the pipe. Ends of pipe and fittings shall be perpendicular to the longitudinal axis. Longitudinal seams on pipe and fittings shall be welded by either the tungsten gas or the metallic-gas method. The interior welds shall be smooth, even and shall not have an internal bead higher than 1/16-in. All pieces shall be marked with gauge and type of stainless steel and with the initials of the inspector marked on the inside of each piece, at each end.
- D. Fittings shall be smooth curve type. Fittings shall conform to ANSI B16.9 with wall thickness at least as thick as pipe. Fittings shall be reinforced as required to withstand the specified internal pressure and provide structural integrity.
- E. Field joints shall be flanged or plain end for couplings specified herein. No field welding of pipe joints shall be permitted.
- F. Flanges shall be only be used where shown on the Drawings and where approved by the Engineer. Flanges for pipe 4-in and smaller shall be of the type of stainless steel as the pipeline, and shall be welded directly to the pipe

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end, and shall be drilled to the 125 lb ANSI B 16.1 standard. Flanges for pipe larger than 4-in shall have stub ends or rolled angle rings of the type of stainless steel as the pipeline welded to the pipe end, with suitable gaskets between the mating surfaces and joined through the use of 125 lb rated back-up flanges, drilled to ANSI B 16.1, and made of Type 304 stainless steel. Where the pipe stub is to pass through a sleeve during installation, a split-type back up flange shall be used. Bolts, washers, nuts and other hardware for flange bolting shall be Type 304 stainless steel.

- G. Gaskets for flanged connections shall be a minimum of 1/16-in thick and shall be BUNA-N.
- H. Shop fabricated multiple output headers may be used in lieu of individual flanged fittings.
- I. Wall pipes shall have integral shop welded wall stops.
- J. All stainless steel pipe and fittings shall be pickled at the point of manufacture, scrubbed and washed until all discoloration is removed in accordance with ASTM A380.
- K. Pipe ends shall be prepared for couplings or other type ends where required by transport and handling limitations, where required by the support layout requirements and where noted or directed by the Engineer in the field. Plain end pipe may be coupled with "Pressfit"-style connectors, for pipe/tubing sizes 1-1/2 in and smaller, manufactured by the Victaulic Co. or by the use of grooved end couplings. Grooving (or built-up ends for Schedule 5S or 10S pipe) shall be of the coupling manufacturers standard type. Split ring, grooved end coupling shall not be used for digester gas piping. The contractor is responsible for ensuring rigidity of joints where required. All normal pipe joints at valves, appurtenances, etc, shall be flanged, drilling per ANSI B16.1, Class 125.
- L. Shop welding of fabrications shall be done according to the procedures and by welders certified per ASME Section IX. Welds shall be by an inert gas shielding process using only extra low carbon filler metals. Welds shall have a bead height of no more than 1/16-in. Butt welds shall have 100 percent penetration to the interior or backside of the weld joint. Cross-sectional thickness of welds shall be equal or greater than that of the parent metal.
- M. Where shown on the Drawings or where approved by the Engineer, plain end pipe shall be joined by all stainless steel sleeve type couplings of Type 304 L stainless steel. Couplings shall be Style 38 as manufactured by Dresser Manufacturing Division of Dresser Industries; coupling 411 as manufactured by Smith Blair, Inc. or equivalent couplings manufactured by Depend-O-Lok Co.; or equal. Buried low-pressure air piping shall be plain end, joined at maximum 20 ft intervals and at fittings with sleeve type couplings. Couplings

shall be restrained joint and shall allow at least 2 degrees angular deflection and at least 3/8-inch axial motion of adjoining pipe sections.

- N. Where shown on the Drawings or where approved by the Engineer in the field, restrained flanged coupling adaptors shall be used to connect plain end pipe to equipment, appurtenances and valves. Flanged coupling adaptors shall be of the Type 304L stainless steel and shall comply with AWWA C207. Flanged coupling adapters shall be manufactured by Dresser Manufacturing Division of Dresser Industries; Smith Blair, Inc. or equal. Gaskets shall be Viton.
- O. Pipeline expansion joints for interior low pressure air piping, exterior above grade low pressure air piping shall be located as shown on the drawings and/or as recommended by the manufacturer.
- P. Slip-on rings of 316 stainless steel for flanges shall be furnished for all connections to valves, meters, equipment, and other associated items.
- Q. Flanged joints in air piping shall have rubber or neoprene gaskets.
- R. Pipe hanger components, in contact with tube or pipe lines, shall be of 300 series stainless steel or approved fiberglass materials.
- S. Diameter tolerances and wall thickness tolerances of tubular products shall conform to ASTM A530.
- T. During fabrication and installation, care shall be taken to avoid contact of stainless steel pipe with carbon steel chain, wire-ropes, tools, structural elements, etc., to insure against contamination of the stainless steel by non-stainless steel, and consequent rusting of imbedded non-stainless steel.
- U. Completed pipelines shall be washed with steam or hot water to remove any dirt, grease or other contaminants accumulated during transport, or handling on the construction site. Potable water pipes shall also be pressure tested and disinfected in accordance with these specifications prior to start-up.
- V. Pipes shall be straight within maximum of 1/16-inch deviation over 10 feet and shall slope to the drain connection as shown on the drawings or directed by the Engineer in the field.

2.2 DIELECTRIC CONNECTORS:

- A. Dielectric pipe fittings/insulators and unions shall be used to prevent galvanic action wherever valves or piping of dissimilar metals connect. This shall be particularly the case for copper, brass and bronze piping connecting to cast iron or steel piping systems.
- B. Dielectric unions shall be used for 2-in and smaller connections. Steel union

nuts shall meet ASTM A575 requirements. The steel or ductile iron connection end shall have a steel body and shall have accurately machined taper tapped pipe threads in accordance with ASME B2.1. The copper connection end shall be a copper solder joint that meets requirements of ASTM B88.

- C. Dielectric flange unions shall be used for connections 2-1/2-in and larger. Cast iron flanges shall meet ASTM A126; the copper solder end shall meet ASTM B62 and the pipe thread shall meet ASME B2.1.
- D. Dielectric unions and flange unions shall be as manufactured by Epco Inc., or equal.
- E. Flange insulating kits shall be as acceptable to the Engineer, as manufactured by GPT or equal.
- F. Dielectric pipe nipples are not acceptable.
- G. In no case shall metallic threads be inserted into non-metallic pipe; also, non-metallic threads shall not be threaded into metallic piping.

2.3 PLUGS AND CAPS:

- A. Provide standard plug or cap as required for testing; plugs and caps shall be suitable for permanent service.
- B. Plug or cap or otherwise cover all piping work in progress using caps furnished by the pipe supplier, or other acceptable caps or covers. Work in progress shall be covered at the end of each work day.
- C. Provide plastic bolt-hole insert caps for all flush-mounted bolting, including flush-mounted flanges and flush-mounted exterior mechanical joints.

2.4 MISCELLANEOUS ADAPTORS:

- A. Between different types of pipe and/or fittings special adapters may be required to provide proper connection. Some of these may be indicated on the Drawings or specified with individual types of pipe or equipment. However, it is the Contractor's responsibility to ensure proper connection between various types of pipe, to structures and between pipe and valves, gates, fittings and other appurtenances. Provide all adapters as required, whether specifically noted or not.
- B. As required, these adapters shall be suitable for direct bury, with proper dielectric insulation and as a minimum, if metallic (not stainless steel or galvanized), with two coats of Coal Tar Epoxy.

2.5 SERVICE CLAMPS:

- A. Service clamps for outlet sizes up to 2-in shall have malleable or ductile iron bodies, which extend at least 160 degrees around the circumference of the pipe, and shall have neoprene gaskets cemented to the saddle body. Bodies shall be tapped for IPS. Clamps shall be of the double strap design. Service clamps shall be Style 91 by Dresser Industries, Inc.; Smith Blair; Mueller or equal.
- B. Service clamps for outlet sizes 4-in through 12-in where the outlet size is not greater than half the size of the main pipe shall have ductile iron bodies and a neoprene circular cross section O- ring gasket confined within the body. Outlet shall be AWWA C110 flange or AWWA C111 mechanical joint as required for the application. Straps shall be alloy steel, minimum 1/4-in by 1-1/2-in in cross section and fabricated with 3/4-in threaded ends. Service clamps shall be Fig. A-10920 or A-30920 by American Cast Iron Pipe Company or equal.

2.6 FLEXIBLE CONNECTORS AND COUPLINGS:

A. General

- 1. All connectors, couplings, gaskets and appurtenances shall be of a composition suitable for exposure to the media within the pipe as well as the anticipated temperatures and pressures for the application.
- 2. Where flexible connectors are indicated on the Drawings, they are provided to permit pipe dismantling for equipment removal and to provide for minor misalignment, which may occur in pipe installation. Any of the following flexible connectors may be used by the Contractor for these locations subject to the characteristics of the connector.
- 3. At other locations where such misalignment may occur, use these connectors; harnessed and restrained where the piping is pressured.

B. Sleeve Couplings

- 1. Provide plain end type ends for pipes to be joined by sleeve couplings as stipulated in AWWA C201 and in accordance with the provisions of AWSI/AWWA C219-9.
 - a. Join welds on ends by couplings without pipe stops. Grind flush to permit slipping coupling in at least one direction to clear pipe joint.
 - b. Outside diameter and out-of-round tolerances shall be within limits specified by coupling manufacturer.
 - c. Provide lugs in accordance with ASTM A36.

- d. Provide hardened steel washers in accordance with ASTM A325.
- e. Plastic plugs shall be fitted in coupling to protect bolt holes.
- f. Nuts and bolts
 - 1) Provide bolts and bolt-studs in accordance with ASTM A307 and ANSI B1.1 with hexagonal or square heads, coarse thread fit, threaded full length with ends chamfered or rounded.
 - 2) Project ends 1/4-in beyond surface of nuts.
 - 3) Hexagonal nuts with dimensions in accordance with ANSI B18.2 and coarse threads in accordance with ANSI B1.1.
- 2. Middle ring of each mechanical coupling shall have a thickness at least equal to that specified for size of pipe on which coupling is to be used and shall not be less than 10-in long for pipe 30-in and larger and not less than 7-in long for pipe under 30-in in diameter except where the design of the coupling permits the coupling to be self-restraining. Omit pipe stop from inner surface of middle rings of couplings whenever necessary to permit removal of valves, flowmeters and other installed equipment.
- 3. Clean and shop prime with manufacturer's standard rust inhibitive primer.
- 4. Furnish gaskets of a composition suitable for exposure to the service media and expected temperature ranges and pressures.
- 5. Anchor sleeve-coupled joints with harness bolts. Weld harness lugs to steel pipe; provide retainer for lugs coupled to pipe flanges for ductile iron pipe.
 - a. Joint harness bolts shall be of sufficient length; with harness lugs placed so that coupling can be slipped at least in one direction to clear joint. Provide harnesses of sufficient number and strength to withstand test pressure.
 - b. Each harness shall have a minimum of two 5/8-in diameter bolts.
 - c. Harness shall be in accordance with AWWA M-11.
- 6. Unless otherwise specified with the individual type of pipe, sleeve couplings (mechanical couplings) shall be IAC Style 411; Dresser Style 38, similar models by Baker or equal, with the pipe stop removed or equal by Depend-O-lok.

7. In addition to those locations noted on the Drawings, sleeve couplings shall be provided on all piping where it connects with a structure or buried directly under a structure at the structure's expansion joints. Special treatment will be required where pipe is encased in concrete, utilizing minimum 3-in thick Styrofoam placed perpendicular to the horizontal centerline of the coupling.
8. Sleeve couplings on stainless steel piping systems shall be of Type 304 stainless steel. Alternative couplings for stainless steel piping systems shall be as manufactured by Depend-O-Lok.
9. The couplings shall be made of the same material and to the same test pressure as the connecting pipes.

C. Split or Grooved Couplings

1. Split couplings shall be cast in two or more parts. When secured together with ASTM A183 bolts and nuts, couplings shall engage grooved or shouldered pipe ends and encase an elastomeric gasket to create a pipe seal. Gasket material shall be as recommended by the manufacturer for the service required and shall be equal to or better than the gasket material specified for the pipeline.
2. Split couplings shall be as manufactured by Victaulic Company of America; Gustin-Bacon or equal. Numbers below refer to Victaulic Co. items, for reference only.
3. Unless otherwise specified with the individual type of

pipe: Flexible split ring couplings shall be:

- a. Grooved ends - Style 77
- b. Shouldered ends - Style 44

Rigid split ring couplings shall be:

- a. Grooved ends - rigid groove with Style 31 couplings on ductile iron less than 36-in diameter with sufficient wall thickness per AWWA C606, on standard groove with Style 07 coupling on manufactured steel or other pipe.
 - b. Shouldered ends - Style 44 coupling on ductile iron over 16-in diameter or without sufficient wall thickness per AWWA C606 or on manufactured steel pipe or thin wall stainless steel pipe.
4. Ductile iron pipe for use with split-type coupling joints shall have radius grooved ends conforming to AWWA C606. Pipe shall have grooved ends

to provide either a rigid joint or flexible joint as shown on the Drawings and as specified herein. Flexible joint grooving shall permit expansion and contraction, and angular deflection. Rigid joint grooving shall allow no angular or linear movement. Minimum pipe wall thickness for grooved pipe shall be as specified by the coupling manufacturer.

5. Grooved couplings for steel and stainless steel piping shall have roll grooving, machine-grooving, or ring collars fully welded to the pipe or fittings.
6. Rigid split couplings may be substituted for flanges if specified in the individual pipe sections or directed by the Engineer in the field based on field conditions. The substitution shall be subject to the added restraint requirements as recommended by the manufacturer or requested by the Engineer.
7. Certain minimum thickness of pipe walls are required by AWWA C606 and coupling manufacturers for use of various type split couplings with certain pipes. Utilize at least those minimum wall thicknesses required (unless a greater thickness is specified or required in the individual pie specifications) with split couplings.
8. If minimum pipe wall thicknesses do not meet minimum requirements for grooving, then a shouldered end treatment with couplings as noted shall be utilized.

D. Flanged Adaptors

1. Flanged adaptor connections for grooved or shouldered end pipe compatible with split couplings at fittings, valves and equipment shall be VIC-Flange Style 341 as by the Victaulic Company of America; Gustin-Bacon or equal.
2. Flanged adaptor connections for plain end pipe at fittings, valves and equipment shall be Dresser Style 127 or 128, similar models by Smith-Blair; Baker or equal.
3. No ferrous metals shall be permitted to contact stainless steel pipe.

E. Equipment Flexible Connectors

1. The flexible connectors shall be expansion/vibration joints of the single arch type of butyl rubber construction with carcass of high-grade woven cotton or suitable synthetic fiber and individual solid steel ring reinforcement. Soft rubber fillers shall be integrally cured into the arches to provide a smooth flow path to prevent settling of material into the arch. Joints shall be constructed to pipeline size and to meet working pressures

and corrosive conditions similar to the line where installed. Joints shall have full faced fabric reinforced butyl flanges integral with the body. Provide harnessing on all flexible connections.

2. Split steel or ductile iron back-up rings shall be provided to ensure a good joint. Rings shall be designed for mating with ANSI minimum 150 lb flanges. All joints shall be hot dipped galvanized and not painted.
3. Expansion/vibration joints shall be furnished with control (harness) units. Harness units shall consist of minimum two drilled plates, stretcher bolts, and rubber washers backed by metal washers. The stretcher bolts shall prevent over- elongation of the joint. Extra nuts shall be provided on the stretcher bolts on the inside of the plate to prevent overcompression. The exact placement of overcompression nuts shall be determined by the supplier and shall be labeled permanently and directly on the joint body. All nuts, bolts and plates shall be galvanized.
4. The manufacturer of the expansion joints shall be a member of the Rubber Expansion Joint Division of the Fluid Sealing Association. Expansion joints shall be Style 1025 filled arch by General Rubber Corp., South Hackensack, NJ or similar products of Mercer Rubber; Goodall Rubber; Garlock; Red Valve Co., Inc.; Proco Products Inc., Stockton, CA or equal.
5. In addition to other locations shown on the Drawings, expansion joints shall be utilized in all exposed piping, within 1-ft of a building expansion joint, and on the suction and discharge side of all positive displacement pumps, compressors and rotating machinery, as close to the unit as possible.

2.7 EXPANSION JOINTS:

A. General

1. All expansion joints, gaskets and appurtenances shall be of a composition suitable for exposure to the media within the pipe as well as the anticipated temperatures and pressures for the application.
2. Expansion joints shall be provided where indicated on the Drawings, recommended by the manufacturer or directed by the Engineer in the field.
3. At other locations where such misalignment may occur, use these connectors; harnessed and restrained where the piping is pressured.

B. Single- and Multiple-Arch Type

1. The expansion joints shall be of the rubber spool type, soft rubber filled with single-, double-, or triple-arch steel reinforced expansion joint, unless otherwise indicated.
2. The rubber used shall be suited for service with wastewater and/or wastewater sludge, including three-ply abrasion resistant liner.
3. Provide galvanized retaining rings to mate with adjacent pipe flanges.
4. The expansion joints shall be designed for the axial movements required for the application along with the maximum axial force required to compress the joint. The joints shall prevent axial, lateral and rotational movement and vibration from being transmitted to the piping and equipment and shall be suitable for the piping test pressure where installed.
5. Provide guides for each expansion joint with written instructions for location and for installation.

C. Bellows Style

1. Expansion joints shall be hydraulically formed (with dies on the outside only) and having only longitudinal seam welds. These seams shall have the same strength, physical properties and thickness as the parent metal without grinding. Expansion joints, bellow, and internal sleeves shall be made of Type 304 stainless steel with carbon steel flanges at each end. The entire inside length of the expansion joint shall be straight. Manufacturer to provide lifting lugs at each flange for ease in handling and removal sheet metal coverage for any expansion joint.
2. Expansion joints shall be designed to prevent rotational movement and vibration from being transmitted to the piping and equipment and shall be suitable for the piping test pressure where installed.
3. Hinged or Gimbal expansion joints shall be used at horizontal and vertical bends in strict accordance with the standards of the EJMA, Inc.
4. Drilling and facing of flanges shall match or be suitable for use with equipment or companion flanges.
5. Guides shall be furnished with all bellows style expansion joints.
6. Manufacturer shall warrant this product to be suitable for the proposed conditions and shall furnish drawings for approval giving materials of construction, including gauge of corrugated element, maximum test pressure force to compress joint, bellows spring rate, shear force and end moment due to calculated traverse only. Manufacturer shall also

furnish evidence of completing cycle life testing for the maximum diameter to be installed and shall indicate such assured cycle life test results on material submitted for approval.

D. Flexible Metal Hose

1. Flexible metal hose shall be constructed of corrugated inner tubing of tin-bronze or Type 321 stainless steel and shall have an outer shield of wire-braid of either tin-bronze or Type 321 stainless steel.
2. The flexible hose connectors shall have a length not less than five times the nominal pipe diameter.
3. Flexible hose connectors shall be manufactured by Flexonics; Metraflex or equal.

2.8 PRESSURE GAUGES FOR AIR SERVICE:

- A. Bosses, connections, or nipples for gauges shall be provided as acceptable to the Engineer. Unbossed tappings shall not be acceptable, unless three full pipe threads are engaged.
- B. Gauges shall be furnished as part of a complete factory assembly, including gauge, snubber, and liquid fill, bar stock ball isolation valve and threaded stainless steel piping.
- C. The pressure gauges shall be liquid filled and read 0 to 30 psi and shall have a 300 series stainless steel/aluminum case and shall be 4-1/2-in nominal diameter with a Type 316 stainless steel Bourdon tube and a 300 series stainless steel movement. The socket shall be 1/2-in NPT Type 316 stainless steel with a bottom connection. Gauges shall have an accuracy of at least plus or minus 0.25 percent of scale. Gauges shall be furnished with needle valve isolation. The gauge shall be furnished complete with all tubing, fittings, adapters, shutoff valves and common gauge panel required for a complete gauge installation.
- D. Gauges shall be furnished from standard ranges of the manufacturer, with dual range (ft and psi) scales, per schedule prepared by the Contractor and reviewed for approval by the Engineer.
- E. Gauges as well as all appurtenances shall be of a composition suitable for exposure to the media within the pipe as well as the anticipated temperatures and pressures for the application.
- F. Gauges shall be suitable for external use in all weather conditions and shall be weatherproof.

- G. Gauges for air service shall be manufactured by Wika Instrument Corporation, Lawrenceville, GA or equal.

2.9 FILLING RINGS:

The Contractor shall provide suitable filling rings where the layout of the flanged piping is such as to necessitate their use. In materials, workmanship, facing and drilling, such rings shall conform to the I25-lb. ANSI Standard. Filling rings shall be of suitable length with nonparallel faces and corresponding drilling if necessary, to ensure correct assembly of the adjoining piping or equipment.

2.10 GASKETS, BOLTS, AND NUTS:

- A. For flanged joints, gaskets shall be a minimum of 1/8-inch thick full face gaskets.
- B. Gaskets shall be of a composition for exposure to the media within the pipe as well as the anticipated temperatures and pressures for the application.
- C. Flanged joints shall be made with either bolts, bolt studs with a nut on each end, or studs with nuts where the flange is tapped. The number and size of bolts shall conform to the same ANSI Standard as the flanges. Bolting material shall, except as otherwise specified or noted on the drawings, be 316 stainless steel, with bolts conforming to ASTM F593. Bolt studs and studs shall be of the same quality as machine bolts.

2.11 JOINT RESTRAINT:

Where indicated on the drawings or necessary to prevent joints or flexible couplings from pulling apart under pressure, suitable socket pipe clamps, tie rods, and bridles shall be provided. Bridles and tie rods shall be at least 3/4-inch diameter except where they replace flange bolts of smaller size, in which case they shall be fitted with a nut on each side of the pair of flanges. The socket clamps and tie rods or bridles shall be coated with an approved primer paint after assembly, or, if necessary, prior to assembly. All materials shall be a minimum grade 304 stainless steel.

2.12 CHECK VALVES:

- A. Check valves shall be full bore for low pressure drop and be of the compact wafer design for fitting between ANSI flanges and have a working pressure of 200 psi. The doors shall be spring loaded, normally closed by means of one or more stainless steel torsion springs.
- B. Check valves shall have cast iron bodies, stainless steel pin and spring and two semicircular aluminum bronze plates. The plates shall be spring-loaded and have Buna- N or Viton, O-ring type seals along the seating surface.

- C. Flow from the blower shall cause the doors to open and upon blower shutdown, the torsion spring(s) shall force the doors to close. Seating in the body shall be resilient and air tight. The sealing element shall be Buna-N compression molded to the body. The valve exterior shall be painted Phenolic Primer Red Oxide for resistance to corrosion. The materials shall be certified to conform to ASTM specifications.
- D. Check valves as well as all appurtenances shall be of a composition suitable for exposure to the media within the pipe as well as the anticipated temperatures and pressures for the application.
- E. The check valve shall be as manufactured by Mission Valve and Pump Co., Houston, TX, DeZurik, or equal.

2.13 BUTTERFLY VALVES FOR AIR SERVICE:

- A. Valves and appurtenances shall have the name of the maker, nominal size, flow directional arrows, working pressure for which they are designed and standard referenced, cast in raised letters or indelibly marked upon some appropriate part of the body.
- B. Unless otherwise noted, items shall have a minimum working pressure of 150 psi or be of the same working pressure as the pipe they connect to, whichever is higher and suitable for the pressures noted where they are installed.
- C. Provide all special adaptors as required to ensure compatibility between valves, appurtenances and adjacent pipe.
- D. Valves and actuators located outdoors but not within a building; within maximum 2-ft above liquid; in vaults; or where otherwise noted shall be especially designed for submerged service where water may completely submerge the valve and operator. All other units shall be as a minimum weather tight. Valves and actuators designed for submerged service shall have stainless steel or bronze bolts and hardware.
- E. For each valve specified to be manufactured, tested and/or installed in accordance with AWWA and other standards, submit an affidavit of compliance with the appropriate standards, including certified results of required tests and certification of proper installation.
- F. Valves shall be wafer style, except for dead end service, where flanged valves shall be used. The valve shall be fitted with a 10-position memory stop.
- G. Valve body shall be cast iron ASTM A126 Class B. Disc shall be bronze, semi-steel or ductile iron ASTM A536 with a disc edge of Monel, Type 316 stainless

steel, or welded nickel machined to a smooth surface. Valve shall have an air profile (undercut) disc. Resilient seats shall be reinforced Nordel (EPDM).

- H. All valves shall be furnished with self lubricated bearings of TFE coated stainless steel. Shaft seals shall be provided to prevent air leakage and to protect bearings from internal or external corrosion. Use EPDM or Buna-N O-rings or self adjusting packing.
- I. Shafts shall be one piece and shall be of Type 316L stainless steel. Shafts shall be finish ground and polished to minimize bearing and shaft seal wear. Shafts of 4-in and larger valves shall have a non-adjustable thrust collar.
- J. Valves 8-in and smaller shall have 10-position levers. All manually actuated valves 10- in and larger shall be operated using a geared actuator. All units to have adjustable open and closed position stops with provision to prevent accidental adjustment changes. Operating shaft shall be supported axially and radially at input end by permanently lubricated bronze thrust and sleeve bearings. Actuators for throttling service shall conform to AWWA C504.
- K. Butterfly valves as well as all appurtenances shall be of a composition suitable for exposure to the media within the pipe as well as the anticipated temperatures and pressures for the application.
- L. Butterfly valves for air service shall meet ANSI B16.104 and MSS-SP-67, except as modified herein and shall be as manufactured by DeZurik, Keystone or approved equal.

2.14 VALVE ACTUATORS FOR AIR SERVICE:

- A. The valve manufacturer shall supply and integrally, rigidly mount all actuators, including any type of manual or powered actuators, on valves at the factory. The valves and their individual actuators shall be shipped as a unit.
- B. Unless otherwise noted, valves shall be manually actuated. Valves shall have an operating wheel, handle or lever mounted on the operator.
- C. Except as otherwise shown on the Drawings or specified herein, all valves 3-in diameter or larger, with the valve center line located 7-ft or more above the operating floor, shall be provided with chain wheel operators complete with chain guides and hot dipped galvanized steel chain, which loop within 4-ft of the operating floor.
- D. All actuators shall be capable of moving the valve from the full open to full close position and in reverse and holding the valve at any position part way between full open or closed.
- E. Each operating device shall have cast on it the word "OPEN" and an arrow

indicating the direction of operation. The direction to open the valve shall be counterclockwise.

- F. Floor boxes for operating nuts recessed in concrete shall be standard cast iron type, cast-in-place, with fastening top by Clow or equal.
- G. Stem guides shall be of the adjustable wall bracket type, bronze bushed, with maximum spacing of 10-ft as manufactured by Clow; Rodney Hunt or equal. Extended operating nuts and/or stems shall have universal joints and pin couplings, if longer than 10-ft and a rating of at least five times the maximum operating torque. Stem adaptors shall be provided.
- H. Where required by the installation, or as specified, provide the following: extended stem; floor stand and hand wheel; position indicator and etched or cast arrow to show direction of rotation to open the valve; resilient, moisture-resistant seal around stem penetration of slab.
- I. Gear Actuators
 - 1. Unless otherwise noted, gear actuators shall be provided for the following: all valves of larger than 8-in nominal diameter; all buried valves with operating shaft mounted horizontally (butterfly, plug, etc); where specified and/or indicated on the Drawings; where manual operator effort is greater than 80 ft-lbs rim pull.
 - 2. Gear actuators shall be of the worm or helical gear type with output shaft perpendicular to valve shaft, having a removable hand wheel mounted on the output shaft. Unless noted they shall conform to AWWA C504, but except with butterfly valves, need not be certified.
 - 3. Actuators shall be capable of being removed from the valve without dismantling the valve or removing the valve from the line.
 - 4. Gearing shall be machine-cut steel designed for smooth operation. Bearings shall be permanently lubricated, with bronze bearing bushings provided to take all thrusts and seals and to contain lubricants. Housings shall be sealed to exclude moisture and dirt, allow the reduction mechanisms to operate in lubricant and be of the same material as the valve body.
 - 5. Manual operator input effort to the hand wheel shall be a maximum of 40 ft-lbs for operating the valve from full open to full close, under any conditions. Gear actuators shall indicate valve position and have adjustable stops. Maximum hand wheel size shall be 24-in diameter.
- J. All position indication and direction of opening arrows shall be embossed,

stamped, engraved, etched or raised decals.

- K. Unless otherwise noted, all valves larger than 3-in nominal diameter shall be provided with position indicators at the point of operation.

2.15 HANGERS AND SUPPORTS

- A. The Contractor shall furnish and install all supporting devices necessary or required to support all piping, valves and appurtenances in a safe, firm and substantial manner at the locations indicated or as required in a manner to prevent the loads of piping, valves and appurtenances from being carried on pumps, pipes or other equipment.
- B. Isolation valves in horizontal pipelines shall be installed with shaft in horizontal position so that with valve in open position the isolation mechanism (plug for plug valves) is located in the upper part of the valve body. The valves shall be oriented so that with valve in closed position; the isolation mechanism (plug for plug valves) is at the upstream end of the valve.
- C. Install hangers and supporting devices necessary or required to hold all piping, valves and appurtenances in a safe, firm and substantial manner at the positions indicated or as directed and in a manner to prevent the loads of valves and appurtenances from being carried on pumps or other equipment.
- D. Refer to Section 15140 – Supports and Anchors for additional information and

details.

PART 3 – EXECUTION

3.1 INSTALLATION OF AIR SERVICE PIPING:

- A. All pipe and fittings shall be installed true to grade and alignment and pipe anchorage and/or restraint shall be provided where required. Manufacturer's instructions shall be strictly followed.
- B. All pipe and fitting shall be protected from dirt, dust, oil, grease and other foreign matter during installation to prevent damage to pipe and to assure no foreign matter is left in the piping.
- C. To assemble the joints in the field, thoroughly clean all joint surfaces and gaskets, if any, with soapy water before assembly. Bolts shall be tightened alternately, evenly to the manufacturer's specified torques. Under no condition shall extension wrenches or pipe-over-handle ratchet wrenches be used to secure greater leverage. All electrical bonding or insulation shall be installed as joints are made up.

- D. Fittings, in addition to those shown on the Drawings, shall be provided if required.
- E. Sleeves of the proper size shall be installed for all pipes passing through floors or walls as shown on the Drawings.
- F. When cutting of pipe is required, the cutting shall be done by machine neatly, without damage to the pipe. Cut ends shall be smooth and at right angles to the axis of the pipe.
- G. After installation, stainless steel pipelines shall be washed clean with steam or hot water to remove any foreign material picked up during transport.
- H. Piping shall be pitched to low points and shall be provided with condensate drains. Condensate drains shall be as recommended by the manufacturer and approved by the Engineer. At a minimum condensate drains shall include a $\frac{3}{4}$ " tap and $\frac{3}{4}$ " stainless steel ball valve. The condensate drains shall be tapped at locations as to allow the entire contents of the pipe to drain.
- I. Buried pipelines shall be installed in conformance with AWWA C600 for water mains.
- J. Pipe supports and expansion joints shall be installed in accordance with the manufacturers recommendations.
- K. Field repair of buried pipe coating shall be in accordance with the specified requirements in AWWA C210.

3.2 INSTALLATION OF AIR SERVICE COUPLINGS:

A. Expansion Joints and Flexible Connectors

1. Piping systems shall be aligned prior to installation of expansion fittings. Alignment shall be provided by fitting a rigid pipe spool in place of the expansion joint. Prior to testing of the piping system, the pipe spool shall be replaced with the specified expansion or flexible fitting.
2. In addition to the locations noted on the Drawings and in PART 2, expansion fittings and anchors shall be located and spaced as specified by the Expansion Joint Manufacturer's Association. The expansion joints/flexible connectors shall not be installed during times of temperature extreme or in a fully compressed or fully expanded condition.

B. Sleeve Couplings

1. Unless otherwise required by the manufacturer's instructions, prior to

installation of sleeve couplings, the pipe ends shall be cleaned thoroughly for a distance of at least 12-in. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6-in from the end, the middle ring shall be placed on the already installed pipe and shall be inserted into the middle ring flair and brought to proper position in relation to the pipe already installed. The gaskets and followers shall then be pressed evenly and firmly into the middle ring flares.

2. After the bolts have been inserted and all nuts have been made up fingertight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint by use of a torque wrench of the appropriate size and torque for the bolts.
3. The correct torque as indicated by a torque wrench shall not exceed 75 ft-lb for 5/8-in bolts and 90 ft-lb for 3/4-in bolts.
4. If a wrench other than a torque wrench is used, it should be no longer than 12-in so that when used by the average person the above torque values shall not be exceeded.
5. To prevent sleeve couplings from pulling apart under pressure, a suitable harnessing or flange clamp assembly shall be provided and installed where shown on the Drawings, directed by the Engineer or required elsewhere under Division 15 concerning anchorage.

C. Split Couplings

1. Prior to assembly of split couplings, grooves or shoulders of the pipe as well as other parts shall be thoroughly cleaned. The ends of the pipes and outside of the gaskets shall be moderately coated with petroleum jelly, cup grease, soft soap, or graphite paste and the gasket shall be slipped over one pipe end. After the other pipe has been brought to the correct position, the gasket shall be centered properly over the pipe ends with the lips against the pipes. The housing sections then shall be placed.
2. Ensure that the joints are fully extended after the rings are in place and prior to tightening the bolts. After the bolts have been inserted, the nuts shall be tightened until the housing sections are firmly in contact, as required by the manufacturer, without excessive bolt tension or strain on the pipe.

D. Pipeline Appurtenances

1. All pipeline appurtenances shall be installed as required and in accordance with the manufacturer's recommendations, as acceptable to the Engineer.

2. Gauges, meters and similar in-line items shall be isolated from testing pressures in excess of the rated pressure of the assembly.
3. Use Teflon tape on all screwed fittings.

E. Flanged Joints

Make flanged joints with bolts; bolt studs with nut on each end; or studs with nuts where one flange is tapped. Use number and size of bolts conforming to same ANSI Standard as flanges. Before flanges pieces are assembled, remove rust resistant coating from machined surfaces, clean gaskets and smooth all burrs and other defects. Make up flanged joints tight, care being taken to prevent undue strain upon valves or other pieces of equipment.

3.3 WELDING:

- A. Welding shall be in accordance with ANSI B31 and AWS B3.0.

- 3.4 Install welding fittings on all welded lines. Make changes in direction and intersection of lines with welding fittings. Do not miter pipes to form elbows or notch straight runs to form tees, or any similar construction. Do not employ welder who has not been fully qualified in above specified procedure and so certified by approved welding bureau or similar locally recognized testing authority.

3.5 FIELD PAINTING:

- A. Final field painting for all stainless steel pipe shall only include bands, labels and flow arrows.

3.6 PIPING SUPPORT:

- A. The Contractor shall furnish and install all supports necessary to hold the piping, valves and appurtenances in a firm, substantial manner at the lines and grades indicated on the drawings or specified.
- B. All piping, valves and appurtenances connected to equipment shall be supported in such a manner as to prevent any strain being imposed on the equipment. When manufacturers have indicated requirements that piping loads shall not be transmitted to their equipment, the Contractor shall submit a certification from the manufacturer stating that such requirements have been complied with.

3.7 INSTALLATION AIR SERVICE VALVES AND MANUAL OPERATIONAL DEVICES:

- A. All valves and appurtenances shall be installed per the manufacturer's instructions in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the Engineer before they are installed.
- B. Install all brackets, extension rods, guides, the various types of operators and appurtenances as shown on the Drawings, or otherwise required. Before setting these items, check all Drawings and figures, which have a direct bearing on their location. The Contractor shall be responsible for the proper location of valves and appurtenances during the construction of the work.
- C. All materials shall be carefully inspected for defects in construction and materials. All debris and foreign material shall be cleaned out of openings, etc. All valve flange covers shall remain in place until connected piping is in place. All operating mechanisms shall be operated to check their proper functioning and all nuts and bolts checked for tightness. Valves and other equipment, which do not operate easily, or are otherwise defective, shall be repaired or replaced at no additional cost to the Owner.
- D. Where installation is covered by a referenced standard, installation shall be in accordance with that standard, except as herein modified, and the Contractor shall certify such. Also note additional requirements in other parts of this Section.
- E. Unless otherwise noted, joints for valves and appurtenances shall be made up utilizing the same procedures as specified under the applicable type connecting pipe joint and all valves and other items shall be installed in the proper position as recommended by the manufacturer. The contractor shall be responsible for verifying manufacturers' torquing requirements for all valves.
- F. Unless otherwise noted, all operational devices shall be installed with the units of the factory, as shown on the Drawings or as acceptable to the Engineer to allow accessibility to operate and maintain the item and to prevent interference with other piping, valves and appurtenances.
- G. For manually operated valves 3-in in diameter and smaller, valve operators and indicators shall be rotated to display toward normal operation locations.
- H. Floor boxes, valve boxes, extension stems and low floor stands shall be installed vertically centered over the operating nut, with couplings as required and the elevation of the box top shall be adjusted to conform with the elevation of the finished floor surface or grade at the completion of the Contract. Boxes and stem guides shall be adequately supported during concrete pouring to maintain vertical alignment.

3.8 OPERATIONS AND MAINTENANCE TOOLS AND DEVICES FOR AIR SERVICE VALVES:

- A. Special tools and the manufacturer's standard spare parts, if required for normal operation and maintenance, shall be supplied with the equipment.
- B. Provide all special tools required for normal maintenance. Tools shall be packaged in a steel case, clearly and indelibly marked on the exterior to indicate equipment for which tools are intended.
- C. Provide to the Owner a list of all spare and replacement parts with individual prices and location where they are available. Prices shall remain in effect for a period of not less than one year after start-up and final acceptance.

3.9 CLEANUP:

After installation, completed lines shall be cleaned with Oakite deoxidizer or similar deoxidizer as recommended by the manufacturer to remove all foreign matter, construction stains or shop markings. Cleaned lines shall be rinsed clear with steam or hot water.

3.10 PRESSURE AND LEAKAGE TESTING OF AIR PIPING:

- A. Test all pipelines for water/gas tightness as specified. Furnish all labor, testing plugs or caps, pressure pumps, pipe connections, gauges and all other equipment required. Testing shall be performed in accordance with one or more of the testing procedures below. All testing shall be performed in the presence of the Engineer.
- B. Repair faulty joints or remove defective pipe and fittings and replace as approved by the Engineer. Retest until acceptable.

HYDROSTATIC TEST

This test shall be used to hydrostatically test piping systems for structural integrity and leaks as referred to in paragraph 3.10A. The test shall be performed at ambient temperature unless otherwise specified.

1.0 TEST FLUID

Water should be used as the test fluid whenever possible. In those systems where water cannot be used the test fluid may be either the one to be used in the system or the one agreed upon by the Engineer and the Contractor.

2.1 TEST EQUIPMENT

2.2 Water - Of sufficient capacity to deliver the required test pressure.

- 2.3 Strainer - On inlet side of the pump to prevent foreign matter from entering the system.
- 2.4 Valves - Shall be provided on the suction and discharge side of the pump.
- 2.5 Heater - To allow heating of the test fluid when elevated temperatures are required for test.
- 2.6 Relief Valve - Set at a pressure to relieve at 20 to 25 percent above the required test pressure.
- 2.7 Pressure Gauge(s) - Capable of reaching 50 percent over the test pressure. These should be located at the pump discharge and any other place deemed convenient by the Contractor.
- 2.8 Pressure gauges and relief valves shall be checked for accuracy before use in test procedures.

3.1 PREPARATION FOR TEST

- 3.2 Determine the fluid to be used for the test and, if other than ambient temperature is required, what the test temperature will be.
- 3.3 When a fluid other than water is used for a test, the equipment used for the test shall be of a material compatible with the test fluid. Normally this would be equal to the piping material.
- 3.4 Vents shall be provided at the high points of the system and drains provided where means of venting or draining do not exist.
- 3.5 Remove or block off, all relief valves, rupture discs, alarms, control instruments, etc, that shall not be subjected to the test pressure.
- 3.6 All discs, balls, or pistons from check valves shall be removed if they interfere with filling of the system. Open all valves between inlet and outlet of the section to be tested.
- 3.7 Connect pump and provide temporary closures for all of the external openings in the system. Use caution to ensure that the closures are properly designed and strong enough to withstand the test pressure.
- 3.8 All joints, including welds, are to be left uninsulated and exposed for examination during test.
- 3.9 A joint previously tested in accordance with this Section may be covered or insulated.
- 3.10 Piping designed for vapor or gas shall be provided with additional temporary supports, if necessary, to support the weight of the test liquid.
- 3.11 Expansion joints shall be provided with temporary restraint for additional pressure under test or shall be isolated from the test.
- 3.12 Flanged joints, where blanks are inserted to isolate equipment during the test, need not be tested.

4.0 TEST PRESSURE

The hydrostatic test pressure shall be 1-1/2 times the design operating pressure unless otherwise specified in the System Section.

5.1 TEST PROCEDURE

- 5.2 Allow the test fluid to enter the system. Open vents to allow displacement of all entrapped air. For all pipelines exceeding 500-ft in length, the maximum rate of filling shall be limited to that which produces a maximum nominal flow velocity of one foot per second in the pipe to be tested.
- 5.3 Close vents and restrict personnel in the test area to those involved in the test.
- 5.4 Raise the pressure slowly with the pump until the predetermined test pressure is reached. Maintain pressure for two hours, keeping personnel at a safe distance.
- 5.5 Reduce the pressure about 20 percent and hold it at that point while the entire system is carefully inspected for leaks, cracks, or other signs of defects.
- 5.6 If defects are found, the pressure shall be released, the system drained, the defects corrected and the test repeated.
- 5.7 After a satisfactory test has been completed, the line shall be drained.

6.1 FLUSHING

- 6.2 Lines tested with water shall be completely drained.
- 6.3 Lines shall be flushed, after test.

7.1 TEST RECORDS

- 7.2 Maintain records of all tests performed.
- 7.3 Test records shall include:
 - A. Date of Testing
 - B. Identification of Piping Tested
 - C. Test Fluid
 - D. Test Pressure
 - E. Test Equipment
 - F. Test Results
 - G. Signatures of Contractor and Engineer

- 7.4 If leaks are found, they shall be noted, on the record. After correction, retest as specified for original test.
- 7.5 Records of test shall be maintained by the Contractor and furnished to the Engineer. Number of copies shall be as specified or required by the Engineer

SERVICE PRESSURE TEST

SCOPE: This test shall be used to test piping systems using service pressure and the fluid for which the system is used. It shall not be used to test piping systems that comply with ANSI B31.

1.0 TEST FLUID

The fluid for which the system is designed shall be the test fluid except that water shall be used for gas or vapor systems, unless not suitable as a test fluid. If water is not suitable for testing a gas or vapor system, see Pneumatic Test specified below.

2.0 TEST EQUIPMENT

A pressure gauge capable of registering 25 psi over the design pressure shall be installed down-stream from the supply shut-off valve if one is not included in the system.

3.0 PREPARATION FOR TEST

Insulated lines shall have all joints left exposed until completion of the test.

4.0 TEST PRESSURE

The test pressure shall be equal to the maximum pressure that the line will be subjected to under normal operating conditions or 150 percent of the maximum pressure that the line will be subjected to under normal operating conditions, as directed by the Engineer.

5.1 TEST PROCEDURE

5.2 Liquids

- A. See that all personnel not involved in the test vacate the area.
- B. Allow the system fluid to enter the system slowly while venting the air at the extreme far and uppermost points. For all pipelines exceeding 500-ft in length, the maximum rate of filling shall be limited to that which produces a maximum nominal flow velocity of one foot per second in the pipe to be tested.
- C. When the system is full and all air is vented, close the vents.
- D. Allow the pressure in the system to build up to the full line pressure.
- E. Inspect entire system for leaks.

5.3 Gas or Vapor

- A. See that all personnel not involved in the test vacate the area.
- B. In systems that do not have a pressure gauge near the main shut-off valve, a gauge shall be installed.
- C. Allow the system fluid to enter the system slowly until the full

- operating pressure is reached.
- D. Shut off main supply valve. Observe the gauge for 15 minutes. The pressure gauge shall not drop during this time.
 - E. If the gauge drops, indicating the presence of leaks, the systems shall be inspected visually and, if necessary, with soap suds or commercially available leak detectors to locate the leak(s).
- 5.4 If leaks are found, the lines shall be relieved of pressure, purged if necessary and repaired. Tests shall be repeated for repaired sections.

6.1 TEST RECORDS

- 6.2 Records shall be maintained of all tests performed.
- 6.3 Test records shall include:
- A. Date of Testing
 - B. Identification of Piping Tested
 - C. Test Fluid
 - D. Test Pressure
 - E. Test Equipment
 - F. Test Results
 - G. Signatures of Contractor and Engineer
- 6.4 If leaks are found, they shall be noted on the record. After correction, retesting is required.
- 6.5 Test records shall be maintained by the Contractor and furnished to the Engineer. Number of copies shall be as specified or required by the Engineer.

PNEUMATIC TEST

SCOPE: This procedure for pneumatic test of piping systems shall be used when water, or other liquid, cannot be introduced into the line, or as a supplement to a hydrostatic test. IT SHALL NOT BE USED TO TEST NON-METALLIC (PLASTIC) PIPE.

1.1 GENERAL

- 1.2 There is a hazard in using gases for test fluids because of their compressibility.
- 1.3 Gases shall never be used unless there is ample justification and always in a safe manner. See Section 3.0.

2.1 TEST GASES & PRESSURES

- 2.2 Compressed air shall normally be used. Other gases may be used when specified or directed by the Engineer.
- 2.3 Test pressures shall be between 110 and 150 percent of the anticipated maximum operating pressure unless otherwise specified in the Piping or System Sections, or as directed by the Engineer, but not exceeding 100 psig and not less than 5 psig at the highest point in the system.

3.1 SAFETY

- 3.2 All pneumatic tests shall be done under the supervision of Contractor and in the presence of the Engineer.
- 3.3 New Construction: The Engineer's permission shall be secured before testing.
- 3.4 Only those people actively participating in the test shall be allowed in the test area.
- 3.5 Safety glasses and hard-hats must be worn.

4.1 EQUIPMENT

- 4.2 Building supply air to deliver the required test pressure if available, or Contractor shall provide a compressor capable of the required test pressure.
- 4.3 Valves shall be provided on the discharge side of the pump.
- 4.4 Relief valve to relieve at 10 to 15 percent over the test pressure.
- 4.5 Pressure Gauge(s) capable of reaching 50 percent over the test pressure. A gauge shall be located on the pump discharge and other location as required.

5.1 TEST PROCEDURE

- 5.2 Increase the pressure in the line gradually, in steps, to the specified pressure. Checks shall be made at 5 psig intervals until the test pressure is reached using sound, soap solution or a drop in indicated pressure.
- 5.3 When the specified pressure for the test is reached, shut off the valve in the supply line from the pump.
- 5.4 Maintain the test pressure long enough to visually inspect all joints or a minimum of 60 minutes. There shall be no drop in the test pressure in this time.
- 5.5 Leaks shall be repaired and the line retested. All leaks shall be noted on the Test Record form.
- 5.6 After satisfactory completion of the test, vent the line and allow it to return to atmospheric pressure. Connection can then be made to the supply line.

6.1 TEST RECORDS

- 6.2 Records shall be maintained of all tests performed.
- 6.3 Test records shall include:
 - A. Date of Testing
 - B. Identification of Piping Tested
 - C. Test Fluid
 - D. Test Pressure
 - E. Test Equipment
 - F. Test Results
 - G. Signatures of Contractor and Engineer
- 6.4 If leaks are found, they shall be noted on the record. After correction, retesting is required.
- 6.5 Test records shall be maintained by the Contractor and furnished to the Engineer. Number of copies shall be as specified or required by the Engineer.

END OF SECTION 15142

SECTION 15615 - VALVES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The Contractor shall provide all tools, supplies, materials, equipment, and labor necessary for furnishing, epoxy coating, installing, adjusting, and testing of all valves, check valves, solenoid valves and appurtenant work, complete and operable, in accordance with the requirements of the Contract Documents. Where buried valves are illustrated on the Plans, the Contractor shall furnish and install valve boxes to grade, with covers, extensions, and position indicators.
- B. The provisions of this Section shall apply to all valves and valve operators specified in the various Sections of Divisions 15 of these Specifications except where otherwise specified in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Divisions 15 - Mechanical

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Comply with the reference specifications of the General Requirements.
- B. Comply with the current provisions of the following Codes and Standards.

ANSI B 16.1 Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800

ANSI B 16.5 Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys

ANSI/ASME B 1.20.1	General Purpose Pipe Threads (inch)
ANSI/ASME B 31.1	Power Piping
ASTM A 36	Specification for Structural Steel
ASTM A 48	Specification for Gray Iron Castings
ASTM A 126	Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A 536	Specification for Ductile Iron Castings
ASTM B 61	Specification for Steam or Valve Bronze Castings
ASTM B 62	Specification for Composition Bronze or Ounce Metal Castings
ASTM B 148	Specification for Aluminum-Bronze Castings
ASTM B 584	Specification for Copper Alloy Sand Castings or General Applications
ANSI/AWWA C 500	Gate Valves for Water and Sewage Systems
ANSI/AWWA C 504	Rubber-Seated Butterfly Valves
ANSI/AWWA C 506	Backflow Prevention Devices - Reduced Pressure Principle and Double Check Valves Types
ANSI/AWWA C 507	Ball Valves 6 inches through 48 inches
AWWA C 508	Swing-Check Valves for Waterworks Service, 2 inches Through 24 inches NPS
ANSI/AWWA C 509	Resilient-Seated Gate Valves for Water and Sewage Systems

AWWA C 550	Protective Interior Coatings for Valves and Hydrants
SSPC-SP-5	White Metal Blast Cleaning
MSS-SP-70	Manufacturers Standardization Society of the Valve and Fitting Industry; Cast Iron Gate Valves. Flanged and Threaded Ends

1.4 CONTRACTOR SUBMITTALS

- A. Submittals shall be made in accordance with the Special Conditions and General Requirements.
- B. The following submittals and specific information shall be provided.
 1. Shop Drawings: Shop drawings of all valves and operators including associated wiring diagrams and electrical data, shall be furnished as specified in General Requirements. Submit for approval the following:
 - a. Manufacturer's literature, illustrations, paint certifications, specifications, detailed drawings, data and descriptive literature on all valves and appurtenances.
 - b. Deviations from Contract Documents
 - c. Engineering data including dimensions, materials, size and weight.
 - d. Fabrication, assembly and installation drawings.
 - e. CV values, head loss curves, and as required, calculations.
 - f. Special tools list.
 2. Operation and Maintenance Manuals:
 - a. Submit complete installation, operation and maintenance manuals including test reports, maintenance data and schedules, description of operation, and spare parts information.

- b. Furnish Operation and Maintenance Manuals in conformance with the requirements of the General Requirements.
3. Shop Tests: Hydrostatic tests shall be performed, when required by the valve specifications included herein.
4. Certificates: Where specified or otherwise required by Engineer, submit Test Certificates and Certificates of Compliance with AWWA standards and other specifications, especially where it concerns the suitability of the materials of construction for the particular application.

1.5 QUALITY ASSURANCE

- A. Valve Testing: Valves shall be shop tested per manufacturer's recommendations and applicable AWWA/ANSI specifications prior to shipment. Manufacturer's certification that valves have been shop tested shall be submitted for approval 30 days prior to scheduled shipment.
- B. Bronze Parts: Where specified, all interior bronze parts of valves shall conform to the requirements of ASTM B 62, or, where not subject to dezincification, to ASTM B 584.
- C. Shop Inspection: Shop inspection of valve construction, testing and coating shall be witnessed and approved by the ENGINEER. All valves will be shop inspected unless otherwise waived in writing by the Engineer.
- D. The Contractor shall demonstrate that each valve installed as a part of a piping system will operate under field conditions in a manner consistent with the design of the system. All testing of valves shall be witnessed and approved by the Engineer.
- E. All adjustments, calibration, and/or testing shall be done in the presence of the Engineer.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site to ensure uninterrupted progress of the Work. Deliver anchorage devices, which are to be embedded in cast-in-place concrete, in ample time to not delay the Work.
- B. All boxes, crates and packages shall be inspected by Contractor upon delivery to the site. Contractor shall notify Engineer if any loss or damage exists to equipment or components. Replace loss and repair damage to new condition, in accordance with

manufacturer's instructions.

- C. Store materials to permit easy access for inspection and identification. Keep all material off the ground, using pallets, platforms or other supports. Protect steel members and packaged materials from corrosion and deterioration.
- D. Provide full-face protectors of waterproof material fastened to each side of the valve body to protect joints and the valve interior.

PART 2 - PRODUCTS

2.1 GENERAL VALVE REQUIREMENTS

- A. General: The Contractor shall furnish all valves, operators, actuators, valve-operating units, stem extensions, and other accessories as shown or specified. All valves shall have the name of the manufacturer and the site of the valve cast on the body or bonnet or shown on a permanently attached plate in raised letters. All valves shall be new and of current manufacture. All valves, 6 inch and larger, shall have operators with position indicators.
- B. Valve Flanges: The flanges of valves shall be in accordance with Division 15.
- C. Valve Stems: Except where otherwise specified, valves with motorized operators shall have stems conforming to ASTM A 276 Type 316 stainless steel with minimum tensile strength of 95,000 psi, and a minimum yield point of 75,000 PSI, and elongation of 25% in 2 inches. Manually operated valves shall have silicon-bronze stems conforming to ASTM B 584-875, having minimum tensile strength of 60,000 PSI, a minimum yield point of 24,000 PSI, and elongation of 16% in 2 inches. Where subject to dezincification, manually operated valve stems shall be of bronze conforming to ASTM B 62, containing no more than 5% zinc, nor more than 2% aluminum.
- D. Protective Coating: Except where otherwise specified, ferrous surfaces, exclusive of stainless steel surfaces, in the water passages of all valves 4 inch and larger, as well as the exterior surfaces of all submerged, buried or aboveground valves and operators, shall be fusion bonded epoxy. Flange faces of valves shall not be coated. The valve manufacturer shall certify in writing that such coating has been applied and tested in the manufacturing plant prior to shipment, in accordance with these Specifications.

E. Valve Operators:

1. Valve operators shall be provided for specific valves as required by the specification section.

G. Nuts and Bolts: All nuts and bolts on valve flanges and supports shall be coated with a fluoropolymer as manufactured by Tripac (Tripac 2000 Blue), or an approved equal. All bolts on valve bonnets and exterior valve hardware shall be Type 316 stainless steel.

2.2 RESILIENT SEATED GATE VALVES

Resilient seated gate valves shall conform to AWWA C 509, latest edition. The wedge shall be fully encapsulated in the elastomer, including the guides. The brass stem nut shall be rigidly enclosed in the wedge to maintain alignment. The valve body shall be composed of ductile iron.

The stem shall have two (2) O-rings and a wiper above the collar and one (1) O-ring below the collar. Stem seals must be replaceable with the valve under pressure.

The stem material shall be standard bronze. Stainless steel (ANSI-420) shall also be acceptable for use as an alternative.

The waterway shall be full size to allow for tapping use; no cavities or depressions shall be permitted in the seat area.

Valve body and bonnet shall be electrostatically applied, fusion bonded, epoxy coated both inside and out by the valve manufacturer. The coating shall meet the requirements of AWWA C 550, latest edition. Coating shall be applied only at the valve manufacturer's facilities. Exterior hardware shall be composed of Type 316 stainless steel.

The bonnet bolts shall not be exposed to the environment.

O-ring style seals shall be used as gaskets on the bonnet and on the stuffing box. The below grade valves shall be supplied with a standard 2 inch operating nut. All valves shall be wrapped with a polyethylene material.

The valves shall be an AFC, CLOW, AVK, Waterous, M&H Valve Company, or Mueller resilient wedge gate valve or an approved equal. All valves shall be resilient wedge gate valves.

2.3 BUTTERFLY VALVES

A. General:

All butterfly valves shall be of the rubber-seated tight-closing type. They shall meet or exceed AWWA Standard C 504.

Both valve ends shall be mechanical-joint (or other, as available) per AWWA Standard C 111. Accessories (bolts, glands and gaskets) shall be supplied by the valve manufacturer.

Available Manufacturers: Subject to compliance with requirements, manufacturers offering butterfly valves which may be incorporated into the work are:

- a. Bray
- b. Pratt
- c. Dezurik
- d. Clow
- e. Or Equal.

All valves must use full AWWA C 504 Class 150B valve shaft diameter, and full Class 150B underground-service-operator torque rating throughout entire travel, to provide capability for operation in emergency service. All valves shall be NSF approved.

B. Valve:

Valve body shall be composed of ductile iron with 18-8 Type 304 stainless steel body seat. Valve vane shall be ductile iron, having rubber seat mechanically secured with an integral 18-8 stainless steel clamp ring and 18-8 stainless steel self-locked screws.

Rubber seat shall be a full-circle 360 degree seat not penetrated by the valve shaft. For valves 4" - 12", the valve shaft shall be one piece, extending full size through the entire valve. Valve shaft shall be 304 stainless steel. Packing shall be O-ring cartridge designed for permanent duty in underground service. For 14 inches and larger valve shaft shall be 18-8 stainless steel stub shaft design keyed to the vane with stainless steel taper pins.

Body Type: All butterfly valves shall be of the rubber-seated tight-closing type. They shall meet or exceed AWWA Standard C 504.

Valve ends shall be: As noted in the Plans.

Wafer: Suitable for installation between 125# or 150# ASA flanges (available 4 inch through 20 inch).

Flanged: Short body valves per Table 2 of AWWA Spec C 504. Flanges shall be 125# ANSI (available all sizes). Also flanged by MJ in 6 inch, 8 inch and 16 inch sizes.

Mechanical Joint: Both ends of valve shall be "MJ" per AWWA C 111. "MJ" accessories (bolts, glands, gaskets) must be supplied by valve manufacturer (available all sizes - also flanged by MJ in 6 inch, 8 inch, 12 inch and 16 inch sizes). Both ends of valve shall be "MJ" per AWWA C111. "MJ" accessories (bolts, glands, gaskets) shall be supplied by valve manufacturer (available all sizes - also flanged by MJ in 6 inch, 8 inch, 12 inch and 16 inch sizes).

C. Operator:

Valve operator shall be of the traveling-nut type, sealed, gasketed, and lubricated for underground service. It shall be capable of withstanding an overload input torque of 450 ft. lbs at full-open or full-closed position without damage to the valve or valve operator. It shall be designed for submergence in water to 25 feet head pressure for up to 72 hours.

Valve shall be capable of easy closure by one man using standard valve key, even under emergency line-break conditions as severe as those that would cause a valve maximum opening torque requirement of as much as two times AWWA Class 150B.

All valves shall open left (clockwise to close), and be equipped with 2 inch AWWA operating nut.

Crank, Handwheel or Chainwheel: All manual operators for service other than underground shall have position indicator and shall be totally enclosed and permanently lubricated. In any event, a maximum pull of 80 pounds on the crank or wheel shall produce full Table 1 output torque throughout entire travel. Operators shall full-closed positions without damage to valve or operator. Operators shall be of the "traveling-nut" type. All valves shall open left (clockwise to close).

Cylinder: Cylinder operator shall be of the base mounted configuration. Cylinder barrel shall be of molybdenum-disulfide lined glass fiber reinforced epoxy tubing, to provide a corrosion-free, self-lubricated high strength barrel. Rod seal shall be of urethane, molybdenum-disulfide filled, to provide a self-lubricated, long life seal.

Piston rod shall be of hard chromium plated 18-8 stainless steel, and shall be top and bottom guided in a heavy cast iron mechanism housing for positive alignment. Guiding shall be accomplished by

bronze bearings at ends of housing straddling all side loads improved in operation. Entire operator including piston rod shall be fully enclosed. Operator shall produce full AWWA Standard C 504 Table 1 output torque throughout entire travel for Class (25A) (25B) (75B) (150B) with a minimum supply pressure of PSI (water) (air) (oil).

D. Coating:

Standard coating shall be universal primer. Coating shall be applied to entire valve body and vane before final assembly.

Valve body shall be electrostatically applied, fusion bonded, epoxy coated to all surfaces of valve body and vane to an average minimum film thickness of 5 mils, conforming to AWWA C 550 Standard. Coating shall be applied only at the valve manufacturer's facilities. Exterior valve hardware shall be composed of Type 316 stainless steel hardware for butterfly valve flanges shall consist of flouropolymer coated hardware as manufactured by Tripac (Tripac 2000 Blue) or an approved equal.

2.4 SOLENOID VALVES

A. Solenoid valves shall be of the size, type, and class shown and shall be designed for not less than 50 PSI working pressure. Valves for water, air, or gas service shall have brass or bronze body with screwed ends, stainless steel trim and spring, Teflon or other resilient seals with material best suited for the temperature and fluid handled. Solenoid valves in corrosive environment shall have stainless steel bodies. For chemicals and all corrosive fluids, solenoid valves with Teflon bodies and springs or other suitable materials shall be used. General purpose enclosures for indoors shall be NEMA type 2. For explosion proof, corrosive, special purpose, or outdoor locations NEMA type 4, 7, 8, 9, 9E, 9F, or 9G enclosures shall be used, as applicable. All coil ratings shall be for continuous duty. For electrical characteristics see electrical drawings or specifications.

2.5 STAINLESS STEEL VALVES

A. General:

1. All valves shall be furnished and installed as illustrated on the Plans.

B. Fasteners: All bolts, nuts, and washers shall be made of Type 316 stainless steel.

C. Ball Valves:

1. Sizes 1/2" - 2 1/2":
 - a. Class: 900 PSI, Screwed.
 - b. Type: Full port.
 - c. Body: 316 Stainless Steel ASTM A 351.
 - d. Ball: 316 Stainless Steel.
 - e. Seat: Reinforced PTFE Fire Safe.
 - f. Stem: 316 Stainless Steel.
 - g. Operator: Manual, Lever.

09 Eccentric Plug Valves

A. General:

1. Eccentric plug valves, ANSI Class 125.
 - a. Valves 2½ to 12 inches shall be rated 175 psig for bi-directional bubbletight shutoff.
 - b. Valves 14 inches and larger shall be rated 150 psig for bi-directional bubble tight shutoff.
2. Meet AWWA C517-PLUG Valves Standard.

B. Body:

1. The body shall be constructed from ASTM A126, Class B cast iron and shall be rated ANSI Class 125. End connections shall be flanges, integrally cast with the body, and shall conform to ANSI B16.1 Class D.

C. Plug:

1. The plug shall be constructed from ASTM A536, Grade 65-45-12 ductile iron. The plug shall be one-piece construction, and shall be encapsulated with an elastomer. The elastomer shall be EPDM for temperatures greater than 225 degrees F, and Buna-N for all other services. The plug shall provide full bi-directional shutoff capability. The CLOSED position travel stop for the plug shall be externally adjustable.

D. Seat:

1. The seat shall be 90 percent nickel alloy, welded into the body. The seat thickness shall be minimum 0.125 inch thick. Screwed or sprayed seats are not acceptable.

E. Stem Seal:

1. The stem seal shall be a self-adjusting elastomer U-cup design. The stem seal elastomer shall be same as the plug elastomer. O-rings are not acceptable.

F. Bearings:

1. The bearings shall be replaceable sleeve type, constructed from sintered, oil impregnated ASTM A743, Grade CF8M, type 316 stainless steel. Bearings shall be permanently lubricated.

G. Grit Seal:

1. A PTFE flat compression washer shall be provided at the top and bottom of the plug to prevent grit from entering the bearing area and thus an increase in bearing to shaft friction. O-ring style grit seals are not acceptable.

H. Flow Way:

1. For valves 2½ to 12 inches, the flow way shall be round, 100 percent area, full port design. For valves greater than 12 inches, the flow way shall be round or rectangular. As a minimum, flow coefficients for valves through 54” shall comply with the following table:

Valve Size	2½”	3”	4”	5”	6”	8”	10”	12”
Minimum Cv	420	680	1190	2000	2400	4600	5800	9100
Valve Size	14”	16”	18”	20”	24”	30”	36”	42”
Minimum Cv	8,505	9,365	11,196	16,131	21,343	36,445	47,871	92711
Valve Size	48	54						
Minimum Cv	102201	107125						

I. Direction:

1. Counterclockwise to open.

J. Operators:

1. Manual operators shall be lever for valves 4” and smaller.
2. Manual operators shall be totally enclosed worm gears for valves 6” and larger. Above ground valves shall have a hand wheel and position indication. Buried valves shall have a 2” operating nut and be totally enclosed and sealed for buried service.

K. Manufacturer, or equal:

1. Model: 601
Milliken Millcentric
Southwest Valve and Equipment.
www.southwestvalve.com
2. Pratt Ballcentric (Southwest Valve and Equipment)

PART 3 - EXECUTION

3.1 VALVE INSTALLATION

- A. General: All valves, operating units, controls, stem extensions, valve boxes, and accessories shall be handled in a manner to prevent any injury to any part of the valve. Valves shall be installed in accordance with the manufacturer's written instructions and as shown and specified. All valves shall be adequately braced to prevent warpage and bending under the intended use. Valves shall be firmly supported to avoid undue stresses on the pipe. All valves shall be installed so that the valve stems are plumb.
- B. Access: All valves shall be installed to provide easy access for operation, removal, and maintenance and to avoid conflicts between valve operators and structural members or handrails.
- C. Valve Accessories:
 1. Where combinations of valves, sensors, switches, and controls are specified, it shall be the responsibility of the Contractor to properly assemble and install these various items so that all systems are compatible and operating properly. The relationship between interrelated items shall be clearly noted on Shop drawing submittals.
 2. Valve operators and controls are to be installed where specified and designated on the Plans. The Contractor is responsible for installation of the correct valve operator and control as specified to provide a complete piping system as specified.
- D. All valves shall be field tested following installation to demonstrate that the valve operates under field conditions in a manner consistent with the design of the system.
- E. All testing of valves shall be witnessed and approved by the Engineer.

- F. The Contractor shall demonstrate that each valve operator and control installed as a part of a piping system will operate under field conditions as designed and in the manner for which the operator was specified.

END OF SECTION 15615

BORREGO WATER DISTRICT

Wastewater Treatment Plant Rehabilitation

ADDENDUM NO. 01

Date: 1/27/2021
To: Prospective Bidders/Plan Holders
From: David Dale, PE
BWD District Engineer
Telephone: 760-767-5806
Email: ddale@borregowd.org

This addendum forms a part of the contract documents and modifies the original bidding documents. Addenda shall be noted as received and acknowledged on Bid Proposal form when submitted as outlined in the Bid Package referenced above.

Failure to properly acknowledge all Addenda on the Bid Form may be cause for rejection of bid.

Total 2 pages

1. Advertisement – Borrego Water District (BWD), located at 806 Palm Canyon Drive, Borrego Springs, California is hereby soliciting construction bids including DVBE, MBE, WBE and Section 3 contractors. The project, Wastewater Treatment Plant Rehabilitation, is located along Borrego Springs Road in Borrego Springs, San Diego County. This is a federal and state funded project with both State DIR and Davis Bacon Prevailing Wage requirements. Estimated start date is May 2021. Bids must be submitted by 3/2/21 at 2:00 p.m. Interested bidders must contact the BWD at 760-767-5806 or see the BWD website at www.borregowd.org for the link to plans and specifications. All Contractors are required to register with DIR <https://efiling.dir.ca.gov/PWCR/> in accordance with SB 854 “Public Registration Bill”.
2. Attached are the State of California DIR and the Davis-Bacon Wage Determinations.
3. Bids will be received until **Tuesday, March 2, 2021 at 2:00 p.m.**, at which time the bids will be opened and read aloud publicly.
4. There will be a NON-MANDATORY pre-bid meeting on **Tuesday February 9th, 2021 at 10:30 a.m.**, at the Borrego Water District Wastewater Treatment Facility located at 2861 Borrego Springs Road, Borrego Springs, CA 92004.

5. Questions regarding this project shall be submitted no later than Tuesday, February 16th, 2021 at 3:00pm. Submit questions to David Dale PE, at ddale@borregowd.com or 760-767-5806.
6. Note on the proposal form an acknowledgement (by hand) of this Addendum.

END OF ADDENDUM 1

BORREGO WATER DISTRICT
BOARD OF DIRECTORS MEETING
JANUARY 26, 2021
AGENDA ITEM II.D

January 21, 2021

TO: Board of Directors
FROM: Diana Del Bono, Administration Manger
SUBJECT: Review Lien Policy 2021-01-01

RECOMMENDED ACTION:

Approve Lien Policy 2021-01-01

ITEM EXPLANATION:

Lien Policy 2021-01-01 gives clarity on the standard practice that the Borrego Water District currently does which is placing liens on the property if a customer does not pay their water bill when they sell their property. This lien gets paid when the property sells. We are adding to the policy the ability to send delinquent amounts to the County to be placed on the individuals tax roll. This gives the District a guarantee that the amount will be paid and not have the delinquency sitting on the books for an extended amount of time.

NEXT STEPS:

1. Review Documents and Accept

FISCAL IMPACT:

1. Less delinquent amounts on the books.

ATTACHMENTS:

1. Lien Policy 2021-01-01

BORREGO WATER DISTRICT
POLICY STATEMENT

SUBJECT: Lien of property for delinquent charges
NO: 2021-01-01
ADOPTED:

PURPOSE

In the event that a water bill becomes delinquent, the District will apply the Discontinuation of Water Service for Nonpayment Policy (2020-01-01). Discontinuation of water service for nonpayment is considered the final phase of the collection procedure and will be instituted only after sufficient notification, and when all other reasonable alternatives have been exhausted. If the collection procedures have failed, the District will then move into the lien process to collect any past due amounts.

Except as specifically stated herein, this Policy applies to all District water service users.

POLICY

A. Whenever charges for water to property remain delinquent and unpaid for 60 days or more as of July 1st of any year, the District shall notify the holder of title to the property, by certified mail, that the delinquent and unpaid charges may become a lien on the property pursuant to the California Water District Law, including Water Code section 37212, and Admin. Code section 6.13, C9.

B. A list of all properties having delinquent charges unpaid for 60 days or more on July 1st of any year shall be provided to the board of directors at the regular board meeting in July with recommendation as to whether tax liens should be filed in each account.

C. Any delinquencies receiving board authority for tax lien shall be supplied to the county, on or before August 1st, for placement on the tax rolls in accordance with the county's fixed charge special assessment schedule.

D. In addition to the procedures outlined above, the District may, in its discretion, at any time, secure the amount of any unpaid charges for water or other services by recording with the county recorder a certificate specifying the amount of such charges and the name and address of the person liable. Recording this certificate creates a lien upon all real property in the county owned by the person, and has the force, priority and effect of a judgment lien. The water meter will also be subject to removal and new installation fees will apply for a new meter to be placed.

E. Tax lien amounts which have been transferred to the tax rolls as described in section C above will be removed from the utility bills. The water meter will also be subject to removal and new installation fees will apply for a new meter to be placed.

Reconnection of Water Service

Customers whose water service has been discontinued may contact the District by telephone or in person regarding restoration of service. A reconnection fee of the amount specified in the Schedule of Rates and Fees will be required in addition to any past-due charges, meter installation fees and/or other applicable charges. These fees and charges must be paid prior to reconnection.

BORREGO WATER DISTRICT
BOARD OF DIRECTORS MEETING
JANUARY 26, 2021
AGENDA ITEM II. E

January 21, 2021

TO: Board of Directors

FROM: Geoffrey Poole, General Manager

SUBJECT: BWD Board Committee Assignments – K Dice

RECOMMENDED ACTION:

Discuss and set Committee Appointments

ITEM EXPLANATION:

President Dice would like to discuss the Board preferences regarding Committee Appointments for the next 2-year period.

NEXT STEPS:

1. TBD

FISCAL IMPACT:

1. N/A

ATTACHMENTS:

1. None

BORREGO WATER DISTRICT
BOARD OF DIRECTORS MEETING
JANUARY 26, 2021
AGENDA ITEM II.F.1

January 21, 2021

TO: Board of Directors

FROM: Geoffrey Poole, General Manager

SUBJECT: Interim Borrego Springs Subbasin Watermaster Board – D Duncan/K Dice

RECOMMENDED ACTION:

Discuss Watermaster Issues

ITEM EXPLANATION:

Director Duncan and Dice will provide a verbal update on pertinent issues, as needed.

NEXT STEPS:

1. TBD

FISCAL IMPACT:

1. N/A

ATTACHMENTS:

1. None

RISK MANAGEMENT COMMITTEE
Risk Management Report– L Brecht V1.1

Insurance

The District is a member of the Association of California Water Agencies Joint Powers Insurance Authority (JPIA). The JPIA is a risk-pooling self-insurance authority, created under provisions of California Government Code Sections 6500 et. seq. The purpose of the JPIA is to arrange and administer programs of insurance for the pooling of self-insured losses and to purchase excess insurance coverage. The District participates in the self-insurance programs of the JPIA as follows:

Property Loss - Provides for full value replacement of real and personal property owned by the District in the event of a loss. Actual cash value on licensed vehicles, mobile equipment and Hypalon reservoir covers. The JPIA pools for the first \$100,000 and has purchased excess coverage.

General and Auto Liability - Insured up to \$60 million per occurrence; the Authority is self-insured up to \$500,000 and excess insurance coverage has been purchased. The general and auto liability program has no deductible.

Public Officials 'Liability - Insured up to \$60 million per occurrence; the JPIA is self-insured up to \$500,000 and excess insurance coverage has been purchased.

Fidelity Bond - Insured up to \$1,000,000 per occurrence with a \$100,000 deductible.

Workers 'Compensation - Insured up to the statutory limits; the JPIA is self-insured up to \$2 million and excess insurance coverage has been purchased. Employer's liability is insured up to \$4 million.

Difference in Conditions - Provides coverage on a repair or replacement basis against loss of District property caused by earthquake or flood, up to \$25 million with a \$25,000 deductible.

[add cyber security insurance info here]

Groundwater Water Levels and Water Quality Changes Risk Management

The groundwater level monitoring network includes 23 dedicated monitoring wells and 27 extraction wells. Of the 50 wells in the network, 46 are monitored for groundwater levels, 30 are monitored for water quality, and 19 are monitored for production. Manual groundwater level measurements are collected in the spring and fall of each year to track seasonal groundwater trends. Groundwater quality monitoring includes sampling, on average, 30 wells on a semi-annual basis to determine and track groundwater quality trends. Wells are monitored for potential contaminants of concern (COCs). The COCs include arsenic, fluoride, nitrate, sulfate and total dissolved solids (TDS).

[needs detail on timely data sharing to BWD from Watermaster]

Air Pollution from Subbasin Fallowing Program Risk Management

[needs detail addressing short, medium, and long-term management of fallowed properties]]

Flood Risk Management

BWD has a flood risk reduction assessment policy and engages a professional engineering firm to periodically assess that BWD's flood risk reduction facilities at Rams Hill are maintained to meet the specific flood risk objectives for such facilities.

[needs detail]

Improperly Abandoned Wells in Subbasin Risk Management

[needs substantive detail]

Cyber Security Risk Management

BWD has a robust cybersecurity policy and engages in ongoing and periodic intrusion detection services performed by a professional cyber security firm for both exterior and interior hacking threats.

[needs detail]

COVID-19 Risk Management

The national COVID-19 public health emergency presents a range of challenges, including ensuring level of service, assisting low-income customers, and assuring responsible financial management of the District. The BWD Board shares its customers' concerns about the coronavirus. The District's primary public health responsibility is to continue providing safe water for its customers to drink and use. The District's treatment process effectively removes viruses, including COVID-19, and the District is testing it regularly to assure it continues to meet federal and state drinking water standards. BWD has suspended all turn-offs for nonpayment, to ensure everyone continues to have access to potable water for washing hands and cleaning. The District has cancelled all meetings or gatherings for non-essential purposes during this emergency, and are holding public meetings via the internet. BWD has also closed our lobby to the public to protect our office staff and implemented social distancing for our field staff. Additionally, all our staff have paid sick leave and if they have been exposed to the virus or are symptomatic are told to stay home from work.

Item IV.A
FINANCIAL REPORTS
DECEMBER 2020





TREASURER'S REPORT December 2020

	Bank	Carrying	Fair	<u>% of Portfolio</u>		Rate of	Maturity	Valuation
	Balance	Value	Value	Current	Actual	Interest		Source
Cash and Cash Equivalents:								
Demand Accounts at CVB/LAIF								
General Account/Petty Cash	\$ 4,148,491	\$ 3,953,920	\$ 3,953,920	55.27%		0.00%	N/A	CVB
Payroll Account	\$ 31,968	\$ 13,360	\$ 13,360	0.19%		0.00%	N/A	CVB
MMA (Bond Funds)	\$ 859,287	\$ 988,216	\$ 988,216	13.81%		2.22%	N/A	CVB
CIP Bond Funds Checking	\$ 140,458	\$ 140,458	\$ 140,458	1.96%		0.00%	N/A	CVB
LAIF	\$ 2,057,787	\$ 2,057,787	\$ 2,057,787	28.77%		2.45%	N/A	LAIF
Total Cash and Cash Equivalents	\$ 7,237,992	\$ 7,153,742	\$ 7,153,742	100.00%				
Facilities District No. 2017-1A-B								
Special Tax Bond- Rams Hill -US BANK	\$ 469,593	\$ 469,593	\$ 469,593					
Total Cash,Cash Equivalents & Investments	\$ 7,707,585	\$ 7,623,335	\$ 7,623,335					

Cash and investments conform to the District's Investment Policy statement filed with the Board of Directors on June 24, 2019

Cash, investments and future cash flows are sufficient to meet the needs of the District for the next six months.

Sources of valuations are CVB Bank, LAIF and US Trust Bank.

Jessica Clabaugh, Finance Officer

**Borrego Water District
Cash Flow
December 2020**

	6/23/2020 ADOPTED BUDGET 2020-2021	Actual December 2020	Projected December 2020	Difference Explanations	Actual YTD 2020-2021
WATER REVENUE					
Residential Water Sales	884,704	72,602	60,425		532,981
Commercial Water Sales	455,153	36,742	31,087		255,458
Irrigation Water Sales	207,629	12,685	14,181		134,987
GWM Surcharge	177,564	13,700	12,128		103,320
Water Sales Power Portion	475,237	37,783	32,459		284,218
TOTAL WATER COMMODITY REVENUE:	2,200,286	173,513	150,280		1,310,965
Readiness Water Charge	1,240,486	101,170	100,853		606,899
Meter Install/Connect/Reconnect Fees	1,768	-	144		7,778
Backflow Testing/installation	5,228	-	50		294
Bulk Water Sales	2,501	459	203		2,980
Penalty & Interest Water Collection	34,850	150	2,833	No Penalty(CV)	1,340
TOTAL WATER REVENUE:	3,485,119	275,291	254,362		1,930,255
PROPERTY ASSESSMENTS/AVAILABILITY CHARGES					
641500 1% Property Assessments	55,000	22,748	4,583		30,801
641502 Property Assess wtr/swr/flid	75,000	5,978	6,250		9,582
641504 Water avail Standby	91,000	22,908	7,583		44,393
641503 Pest standby	14,000	2,617	1,167		4,552
TOTAL PROPERTY ASSES/AVAIL CHARGES:	235,000	54,251	19,583		89,329
SEWER SERVICE CHARGES					
Town Center Sewer Holder fees	199,983	20,275	16,387		121,649
Town Center Sewer User Fees	98,847	8,305	8,100		49,833
Sewer user Fees	293,189	24,314	24,024		148,335
TOTAL SEWER SERVICE CHARGES:	592,018	52,894	48,510		319,816
OTHER INCOME					
Interest Income	76,000	-	4,000		7,157
TOTAL OTHER INCOME:	76,000	-	4,000		7,157
TOTAL INCOME:	4,388,137	382,436	326,455		2,346,557
CASH BASIS ADJUSTMENTS					
Decrease (Increase) in Accounts Receivable		(192,438)			
TOTAL CASH BASIS ADJUSTMENTS:		(192,438)			
TOTAL OPERATING INCOME RECEIVED:	4,388,137	189,999			

<u>EXPENSES</u>	<u>ADOPTED BUDGET 2020-2021</u>			<u>Actual Q1 2020-2021</u>
<u>MAINTENANCE EXPENSE</u>				
R & M Buildings & Equipment	250,000	7,943	20,833	63,405
R & M - WTF	120,000	4,187	10,000	17,519
Telemetry	10,000	-	833	3,914
Trash Removal	5,500	1,263	458	3,636
Vehicle Expense	18,000	606	1,500	6,962
Fuel & Oil	<u>35,000</u>	<u>3,021</u>	<u>2,917</u>	<u>17,092</u>
TOTAL MAINTENANCE EXPENSE:	438,500	17,020	36,542	112,528
<u>PROFESSIONAL SERVICES EXPENSE</u>				
Tax Accounting (Taussig)	3,000	-	250	883
Administrative Services (ADP)	3,000	281	250	1,798
Audit Fees (Leaf & Cole)	17,000	2,715	-	19,585
Computer billing (Accela/Parker)/Cyber Security	31,000	4,787	2,583	24,177
Financial/Technical Consulting (Raftelis/Fieldman)	80,000	2,775	6,667	35,801
Engineering (Dudek)	35,000	(6,120)	2,917	4,233
District Legal Services (BBK)	45,000	7,519	3,750	29,604
Air Quality Study	43,551	-	-	43,551
Grant Acquisitions (TRAC) 17170+17180	30,000	-	2,500	4,523
Testing/lab work (Babcock Lab/Water Quality Monitoring)	24,000	4,241	2,000	11,997
Regulatory Permit Fees (SWRB/DEH/Dig alerts/APCD)	<u>36,500</u>	<u>1,383</u>	<u>3,042</u>	<u>15,924</u>
TOTAL PROFESSIONAL SERVICES EXPENSE:	348,051	17,581	23,958	192,074
<u>INSURANCE EXPENSE</u>				
ACWA/JPIA Program Insurance	60,000	-	-	78,833
ACWA/JPIA Workers Comp	<u>18,000</u>	-	-	<u>8,479</u>
TOTAL INSURANCE EXPENSE:	78,000	-	-	87,312
<u>DEBT EXPENSE</u>				
Compass Bank Note 2018A/B	388,939	-	-	354,071
Pacific Western Bank 2018 IPA	<u>499,406</u>	-	-	<u>415,559</u>
TOTAL DEBT EXPENSE:	888,345	-	-	782,963
<u>PERSONNEL EXPENSE</u>				
Board Meeting Expense (board stipend/board secretary)	23,000	1,813	1,917	10,743
Salaries & Wages (gross)	930,000	81,499	77,500	503,178
Salaries & Wages offset account (board stipends/staff projec	(80,000)	(10,435)	(6,667)	(58,825)
Consulting services/Contract Labor	10,000	-	833	1,625
Taxes on Payroll	23,700	1,777	1,975	10,762
Medical Insurance Benefits	212,700	19,614	17,725	113,115
Calpers Retirement Benefits	210,000	12,699	17,500	76,507
Conference/Conventions/Training/Seminars	<u>18,000</u>	-	1,500	<u>1,346</u>
TOTAL PERSONNEL EXPENSE:	1,347,399	106,967	112,283	658,450

<u>EXPENSES(Con't)</u>	ADOPTED BUDGET 2020-2021			Actual Q1 2020-2021
OFFICE EXPENSE				
Office Supplies	24,000	1,947	2,000	10,521
Office Equipment/ Rental/Maintenance Agreements	50,000	1,261	4,167	7,557
Postage & Freight	15,000	2,459	1,250	7,649
Taxes on Property	3,300	-	-	2,611
Telephone/Answering Service/Cell	20,000	1,555	1,667	9,132
Dues & Subscriptions (ACWA/CSDA)	23,000	12,232	1,917	13,603
Printing, Publications & Notices	2,500	140	208	896
Uniforms	7,000	812	583	3,590
OSHA Requirements/Emergency preparedness	5,500	116	458	1,113
TOTAL OFFICE EXPENSE:	150,300	20,522	12,250	56,671
UTILITIES EXPENSE				
Pumping-Electricity	325,000	20,469	27,083	158,071
Office/Shop Utilities	6,000	163	500	4,240
TOTAL UTILITIES EXPENSE:	331,000	20,632	27,583	162,311
GROUNDWATER MANAGEMENT EXPENSE				
Pumping Fees	123,888	-	-	61,944
Physical Solution Development	-	-	-	-
Physical Solution Reimbursement (42,800 rcvd in FY2020)	(57,200)	-	(4,766)	(86,917)
Stipulation Legal	185,000	19,963	7,083	216,240
Stipulation Legal Reimbursements (24,400 rcvd in FY2020)	(40,600)	-	(3,383)	(12,321)
Interim Judgement Legal Support	-	-	3,750	-
Interim Judgement Technical Support	45,000	3,536	3,750	92,363
Misc. & Contingency	20,000	-	1,667	-
BPA Transactions that meet CEQA requirements	5,000	-	417	-
TOTAL GWM EXPENSE:	281,088	23,499	8,518	209,365
TOTAL EXPENSES:	3,862,682	206,220	221,134	2,261,674
CASH BASIS ADJUSTMENTS				
Decrease (Increase) in Accounts Payable	-	103,944	-	214,127
Increase (Decrease) in Inventory	-	(730)	-	10,565
TOTAL CASH BASIS ADJUSTMENTS:	-	103,213	-	224,692
TOTAL OPERATING EXPENSES PAID:	3,862,682	309,434	-	2,486,366
NET OPERATING INCOME RECEIVED:	613,846	(119,435)	105,321	(139,809)

<u>CIP PROJECTS</u>	<u>ADOPTED BUDGET 2020-2021</u>	<u>Actual Q1 2020-2021</u>
<u>CASH FUNDED - WATER</u>		-
Bending Elbow Pipeline Project	380,000	2,319
SCADA Replacement	100,000	-
Facilities Maintenance - Office Interior	15,000	-
Emergency System Repairs	60,000	-
Replace Twin Tanks (Moved from GRANT)	630,000	-
Engineering/Construction Management Consulting	25,000	-
TOTAL CASH CIP EXPENSES WATER:	1,210,000	2,319
<u>CASH FUNDED - SEWER</u>		-
Oxygen Injection at Borrego Valley Rd Pump	20,000	-
Difusers at Sludge Holding Tank (Completed from R&M)	-	-
Manhole Replacement/Refurbishments	43,000	-
Engineering/Construction Management Consulting	18,000	-
TOTAL CASH CIP EXPENSES SEWER:	81,000	-
CASH FUNDED - Short Lived Asset Replacement Progra	405,000	
TOTAL CASH FUNDED CIP EXPENSES:	1,696,000	2,319
<u>CASH RECAP</u>		
Net Operating Income	613,846	(119,435)
Total Budgeted Cash CIP	(1,696,000)	(2,319)
Bond Funded CIP Shortfall	(772,738)	-
Period Reserves Adjustment	(1,854,892)	(121,754)
Cash Beginning of Period	5,984,000	4,940,394
Projected Cash Balance at Period End	4,170,301	4,818,641
FY Reserves Target	7,710,218	7,710,218
Reserves Surplus/(Shortfall)	(3,539,917)	(2,891,577)
<u>DEBT & GRANT ACCOUNTING</u>		
<u>GRANT(PROP 1) FUNDED CIP - WATER</u>		
Replace Twin Tanks (Changed to CASH)		
Replace Wilcox Diesel Motor (Push to FY22)		-
Replace Indianhead Reservoir (Push to FY22)		-
Rams Hill #2, recoating (Push to FY22)		-
TOTAL GRANT CIP EXPENSES WATER:	0	-
Grant Proceeds Received	454,000	-
<u>GRANT(PROP 1) FUNDED CIP - SEWER</u>		
Plant-Grit removal at the headworks	214,000	-
Clarifier Upgrade/Rehabilitation	240,000	-
TOTAL GRANT CIP EXPENSES SEWER:	454,000	-
TOTAL GRANT CIP EXPENSES:	454,000	-
<u>BOND FUNDED CIP - WATER</u>		
De Anza Pipeline Replacement Project	430,000	11,093
Production Well 2 Investigation and Construction	1,250,000	596
Replace 30 fire hydrants 17160	540,000	-
Phase 1 Pipeline Project - 17120	0	12,139
Production Well #1 ID4-Well #9-17110	-	-
BVR Pipeline for SDGE	-	40
Replace 5 well discharge manifolds and electric panel upgra	0	-
Management Consulting Water (Bond CIP)	0	-
TOTAL BOND FUNDED WATER CIP:	2,220,000	23,869
<u>BOND FUNDED CIP - SEWER</u>		
Miscellaneous Sewer System Improvements	410,000	-
Gravity Main Replacement - BSR	-	5,497
TOTAL SEWER BOND FUNDED CIP:	410,000	5,497
TOTAL BOND FUNDED CIP EXPENSES:	2,630,000	29,365
<u>BOND PROCEEDS RECAP</u>		
Bond Balance at beginning of period (07/01/2020)	1,857,262	1,159,134
Less Bond Expenditures	(2,630,000)	(29,365)
Bond Balance at end of period (06/30/2020)	(772,738)	1,129,769



ASSETS

	BALANCE SHEET December 31, 2020 <small>(unaudited)</small>	BALANCE SHEET November 30, 2020 <small>(unaudited)</small>	MONTHLY CHANGE <small>(unaudited)</small>
CURRENT ASSETS			
Cash and cash equivalents	\$ 6,025,067.41	\$ 5,948,834.46	\$ 76,232.95
Accounts receivable from water sales and sewer charges	\$ 705,266.23	\$ 411,480.67	\$ 293,785.56
Inventory	\$ 119,163.48	\$ 119,893.81	\$ (730.33)
Prepaid expenses	\$ -	\$ -	\$ -
TOTAL CURRENT ASSETS	\$ 6,849,497.12	\$ 6,480,208.94	\$ 369,288.18
RESTRICTED ASSETS			
Debt Service:			
Deferred amount of COP Refunding	\$ -	\$ -	\$ -
Unamortized bond issue costs	\$ 125,185.22	\$ 125,185.22	\$ -
Viking Ranch Refinance issue costs	\$ (19,564.91)	\$ (19,564.91)	\$ -
Deferred Outflow of Resources-CalPERS	\$ 311,059.00	\$ 311,059.00	\$ -
Total Debt service	\$ 416,679.31	\$ 416,679.31	\$ -
Trust/Bond funds:			
Investments with fiscal agent -CFD 2017-1	\$ 469,592.96	\$ 67,434.21	\$ 402,158.75
2018 Certificates of Participation to fund CIP Projects	\$ 1,128,674.76	\$ 1,129,429.83	\$ (755.07)
Total Trust/Bond funds	\$ 1,598,267.72	\$ 1,196,864.04	\$ 401,403.68
TOTAL RESTRICTED ASSETS	\$ 2,014,947.03	\$ 1,613,543.35	
UTILITY PLANT IN SERVICE			
Land	\$ 2,246,187.15	\$ 2,246,187.15	\$ -
Flood Control Facilities	\$ 4,287,340.00	\$ 4,287,340.00	\$ -
Capital Improvement Projects	\$ 1,170,701.11	\$ 1,157,289.07	\$ 13,412.04
Bond funded CIP Expenses	\$ 1,448,972.36	\$ 1,435,680.15	\$ 13,292.21
Sewer Facilities	\$ 6,175,596.99	\$ 6,175,596.99	\$ -
Water facilities	\$ 14,104,596.13	\$ 14,104,596.13	\$ -
General facilities	\$ 1,007,563.15	\$ 1,007,563.15	\$ -
Equipment and furniture	\$ 597,312.57	\$ 597,312.57	\$ -
Vehicles	\$ 675,446.88	\$ 675,446.88	\$ -
Accumulated depreciation	\$ (13,140,494.34)	\$ (13,140,494.34)	\$ -
NET UTILITY PLANT IN SERVICE	\$ 18,573,222.00	\$ 18,546,517.75	\$ 26,704.25
OTHER ASSETS			
Water rights -ID4	\$ 185,000.00	\$ 185,000.00	\$ -
TOTAL OTHER ASSETS	\$ 185,000.00	\$ 185,000.00	
TOTAL ASSETS	\$ 27,622,666.15	\$ 26,825,270.04	\$ 797,396.11



Balance sheet continued

	BALANCE SHEET December 31, 2020 (unaudited)	BALANCE SHEET November 30, 2020 (unaudited)	MONTHLY CHANGE (unaudited)
LIABILITIES			
CURRENT LIABILITIES PAYABLE FROM CURRENT ASSETS			
Accounts Payable	\$ 51,238.28	\$ 155,181.96	\$ (103,943.68)
Accrued expenses	\$ 188,643.94	\$ 188,643.94	\$ -
Deposits	\$ 44,818.19	\$ 42,500.00	\$ 2,318.19
TOTAL CURRENT LIABILITIES PAYABLE FROM CURRENT ASSETS	\$ 284,700.41	\$ 386,325.90	\$ (101,625.49)
CURRENT LIABILITIES PAYABLE FOM RESTRICTED ASSETS			
Debt Service:			
Accounts Payable to CFD 2017-1	\$ 469,592.96	\$ 67,433.88	\$ 402,159.08
TOTAL CURRENT LIABILITIES PAYABLE FROM RESTRICTED ASSETS	\$ 469,592.96	\$ 67,433.88	\$ 402,159.08
LONG TERM LIABILITIES			
2018A & 2018B Refinance ID4/Viking Ranch	\$ 2,243,337.48	\$ 2,243,337.48	\$ -
2018 Certificates of Participation to fund CIP Projects	\$ 4,613,000.00	\$ 4,613,000.00	\$ -
Net Pension Liability-CalPERS	\$ 891,132.00	\$ 850,153.00	\$ 40,979.00
Deferred Inflow of Resources-CalPERS	\$ 22,588.00	\$ 34,862.00	\$ -
TOTAL LONG TERM LIABILITIES	\$ 7,770,057.48	\$ 7,741,352.48	\$ 28,705.00
TOTAL LIABILITIES	\$ 8,524,350.85	\$ 8,195,112.26	\$ 329,238.59
FUND EQUITY			
Contributed equity	\$ 9,611,814.35	\$ 9,611,814.35	\$ -
Retained Earnings:			
Unrestricted Reserves/Retained Earnings	\$ 9,486,500.95	\$ 9,018,343.43	\$ 468,157.52
Total retained earnings	\$ 9,486,500.95	\$ 9,018,343.43	\$ 468,157.52
TOTAL FUND EQUITY	\$ 19,098,315.30	\$ 18,630,157.78	\$ 468,157.52
TOTAL LIABILITIES AND FUND EQUITY	\$ 27,622,666.15	\$ 26,825,270.04	\$ 797,396.11

To: BWD Board of Directors
 From: Jessica Clabaugh
 Subject: Consideration of the Disbursements and Claims Paid
 Month Ending December 31, 2020



Vendor disbursements paid during this period:		\$ 248,803.85
Significant items:		
Babcock	Lab Services	\$ 4,201.00
CalPERS		\$ 12,699.07
Employee Health Benefits		\$ 21,083.54
Ramona Disposal	Garbage Collection	\$ 4,794.02
SC Fuels	Fuel For District Vehicles	\$ 3,020.75
SDGE	December Payments	\$ 20,631.68
Capital Projects/Fixed Asset Outlays:		
Dynamic Consulting Engineers	BOND Pipeline I Engineering	\$ 23,110.00
Empire Southwest	Large Equipment Repair	\$ 4,962.75
Xylem Water Solutions	Liftstation Pump Rebuild	\$ 3,846.36
Total Professional Services for this Period:		
ACWA	Annual Dues	\$ 11,900.00
BBK	General	\$ 8,235.50
BBK	Watermaster	\$ 472.00
BBK	Groundwater Rights Litigation	\$ 79,181.35
Dudek	Subbasin TAC Support	\$ 1,171.25
Leaf & Cole, LP	Audit Progress Billing	\$ 2,715.00
Ronald G Holoway	Mapping, Production Reports, etc.	\$ 2,775.00
Travis Parker	Server Upgrades	\$ 3,501.08
Payroll for this Period:		
Gross Payroll		\$ 81,449.48
Employer Payroll Taxes and ADP Fee		\$ 280.65
Total		\$ 81,730.13

BOARD REPORT

December 2020



34282	1109	ABILITY ANSWERING/PAGING SER	12/15/2020	230.00
34265	1092	ACWA	12/07/2020	11,900.00
34290	1266	AFLAC	12/30/2020	1,468.86
34302	1001	AMERICAN LINEN INC.	01/05/2021	812.23
34303	61	AT&T MOBILITY	01/05/2021	536.28
34304	9529	AT&T-CALNET 3	01/05/2021	453.43
34322	9255	BABCOCK LABORATORIES	01/12/2021	4,201.00
34315	10884	BEST BEST & KRIEGER ATTORNEYS A	01/11/2021	28,396.24
34323	10900	BORREGO AUTO PARTS & SUPPLY CC	01/12/2021	212.99
34291	1201	BORREGO LANDFILL	12/30/2020	195.11
34316	31	BORREGO SPRINGS CHAMBER OF CO	01/11/2021	150.00
34305	11085	BORREGO SPRINGS WATER LLC	01/05/2021	8.00
34317	11085	BORREGO SPRINGS WATER LLC	01/11/2021	79.82
34292	1037	BORREGO SUN	12/30/2020	140.00
34293	9054	COUNTY OF SAN DIEGO DEPT ENVIRC	12/30/2020	1,383.00
1186	48	COUNTY OF SAN DIEGO DEPT OF PUB	01/12/2021	452.50
34284	1222	DEBBIE MORETTI	12/15/2020	122.00
34324	96	DISH	01/12/2021	61.74
34294	9640	DUDEK	12/30/2020	1,171.25
1187	1447	DYNAMIC CONSULTING ENGINEERS	01/12/2021	23,110.00
34295	1094	EMPIRE SOUTHWEST	12/30/2020	4,962.75
34325	1094	EMPIRE SOUTHWEST	01/12/2021	547.65
1184	1136	HOME DEPOT CREDIT SERVICES	01/11/2021	469.46
34318	1136	HOME DEPOT CREDIT SERVICES	01/11/2021	1,040.64
34283	11021	J & T Tire and Auto	12/15/2020	264.10
34306	1022	JAMES HORMUTH DE ANZA TRUE VAL	01/05/2021	80.34
34297	9385	JOHNSON CONTROLS SECURITY SOLI	12/30/2020	240.94
34298	11063	LEAF & COLE LLP	12/30/2020	2,715.00
34319	11090	LUPE'S GARDENING MAINTENANCE IN	01/11/2021	585.00
34264	1000	MEDICAL ACWA-JPIA	12/07/2020	21,993.98
1185	1208	PACIFIC PIPELINE SUPPLY INC	01/11/2021	307.09
34320	1208	PACIFIC PIPELINE SUPPLY INC	01/11/2021	573.98
34307	11083	QUADIENT FINANCE USA, INC.	01/05/2021	2,000.00
34308	11095	QUADIENT INC	01/05/2021	458.50
34296	11097	R. GREG HOLLOWAY	12/30/2020	2,775.00
34309	9633	RAMONA DISPOSAL SERVICE	01/05/2021	3,970.02
34326	9633	RAMONA DISPOSAL SERVICE	01/12/2021	824.00
34263	UB*00051	ROD & ALEXIA HALLER	12/07/2020	39.77
34299	1065	SAN DIEGO GAS & ELECTRIC	12/30/2020	20,631.68
34285	11067	SC FUELS	12/15/2020	664.59
34300	11067	SC FUELS	12/30/2020	1,119.78
34310	11067	SC FUELS	01/05/2021	1,236.38
34321	1059	STAPLES CREDIT PLAN	01/11/2021	1,156.08
34301	9581	TRAVIS PARKER	12/30/2020	3,501.08
34311	9581	TRAVIS PARKER	01/05/2021	681.20
34286	35	U.S. POSTAL SERVICE	12/15/2020	120.00
34312	3000	U.S.BANK CORPORATE PAYMENT SYS	01/05/2021	1,016.17
34313	1023	UNDERGROUND SERVICE ALERT	01/05/2021	18.25
34327	1100	VERIZON WIRELESS	01/12/2021	268.13
34328	1623	WENDY QUINN	01/20/2021	162.50
34287	92	XEROX FINANCIAL SERVICES	12/15/2020	754.00
34288	9602	XYLEM WATER SOLUTIONS USA,INC	12/15/2020	3,846.36
34314	11050	ZITO MEDIA	01/05/2021	265.78
Report Total (53 checks):				154,374.65

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1			BOND CIP FUNDS											
2			RECONCILIATION-FY 2019/2021											
3								Well 12-17100/	Prod Well	Pipeline Project	Prod Well	Sewer Inspect	Firehydrants	
4								4-5 Well upgrades	#1 ID4-9	Phase 1/2	#2	Club Cir 17150		
5				Bond Proceeds	Interest paid	Cost of Issuance	Misc.	10117140	10117110	10117120/17200	10117130	La Casa	10117160	
6														Totals
7														
8		07/10/18	Pacific Western Bank-Loan Proceeds	\$ 5,586,000.00										\$ 5,586,000.00
9		07/10/18	Cost of Issuance	\$ (68,707.13)										\$ (68,707.13)
10		07/17/18	US Bank Interest Fee			\$ 1,700.00								\$ (1,700.00)
11		07/17/18	Nixon Peabody-Cost of issuance			\$ 10,000.00								\$ (10,000.00)
12		07/17/18	Kutok Rock-Cost of Issuance			\$ 10,000.00								\$ (10,000.00)
13		07/20/18	MMA Interest paid		\$ 2,282.99									\$ 2,282.99
14		07/31/18	MMA Interest paid		\$ 693.25									\$ 693.25
15		08/01/18	Grant Thornton-Cost of Issuance			\$ 1,500.00								\$ (1,500.00)
16		08/01/18	Brandis Tallman-Cost of Issuance			\$ 17,500.00								\$ (17,500.00)
17		08/01/18	Fieldman, Rolapp & Assoc.-Cost of Issuance			\$ 50,231.67								\$ (50,231.67)
18		08/01/18	Best Best & Krieger-Cost of Issuance			\$ 55,000.00								\$ (55,000.00)
19		08/31/18	MMA Interest paid		\$ 4,683.02									\$ 4,683.02
20		09/31/18	MMA Interest paid		\$ 4,535.86									\$ 4,535.86
21		10/31/18	MMA Interest paid		\$ 4,690.98									\$ 4,690.98
22		11/30/18	MMA Interest paid		\$ 6,498.24									\$ 6,498.24
23		12/31/18	MMA Interest paid		\$ 8,125.10									\$ 8,125.10
24		12/31/18	Fed-x Bond issuance costs			\$ 62.02								\$ (62.02)
25		01/31/19	Dudek-Construction Mgmt Prod well #2					\$ 8,295.00						\$ (8,295.00)
26		01/31/19	BBK-Review Bid documents					\$ 855.50	\$ 3,635.00					\$ (4,490.50)
27		01/31/19	Harland Check order-partial charge					\$ 70.12	\$ 70.13	\$ 70.13				\$ (210.38)
28		01/31/16	MMA Interest paid		\$ 9,878.83									\$ 9,878.83
29		02/28/19	BBK-Review final specs Pipeline #1						\$ 306.00					\$ (306.00)
30		02/28/19	BBK-Finalize Bid documents					\$ 2,657.00	\$ 1,799.50	\$ 1,453.50				\$ (5,910.00)
31		02/28/19	Dudek-Construction Mgmt Prod well #1					\$ 11,535.00		\$ 8,422.50				\$ (19,957.50)
32		02/28/19	MMA Interest paid		\$ 8,529.85									\$ 8,529.85
33		03/31/19	Dudek-Construction Mgmt					\$ 5,467.50		\$ 7,232.50				\$ (12,700.00)
34	1007	03/31/19	Dudek-Construction Mgmt					\$ 5,264.68		\$ 5,006.25				\$ (10,270.93)
35	1006	03/31/19	BBK-Review Bid documents					\$ 740.00	\$ 879.00	\$ 867.50				\$ (2,486.50)
36		03/31/19	MMA Interest paid		\$ 9,460.57									\$ 9,460.57
37			Reallocate interest to Admin 7122		\$ (59,378.69)									\$ (59,378.69)
38			Well 12 repairs from O&M to Bond funds-check #32867					\$ 13,537.82						\$ (13,537.82)
39			Well 12 repairs from O&M to Bond funds-check #32970					\$ 82,640.56						\$ (82,640.56)
40		04/04/19	Big J Fencing-Fencing for Well ID4 Well 9					\$ 16,975.00						\$ (16,975.00)
41		04/08/19	BBK					\$ 561.00	\$ 1,377.00	\$ 535.50				\$ (2,473.50)
42		04/08/19	Hidden Valley Pump-Well 12/Well 5/Well 16 Transfer switch					\$ 36,033.00						\$ (36,033.00)
43		04/08/19	Hidden Valley Pump-Well 12/Well 5/Well 16/11 Transfer switch					\$ 253,731.68						\$ (253,731.68)
44		04/23/19	Dudek-Construction Management					\$ 3,690.00		\$ 1,927.50				\$ (5,617.50)
45		04/23/19	Fed-x -Mailing of NOE to County New Well #1					\$ 30.53						\$ (30.53)
46		04/23/19	Pacific Pipe-well 12					\$ 1,337.83						\$ (1,337.83)
47		05/29/20	Pacific Pipeline					\$ 38.45						\$ (38.45)
48		05/20/19	Well 12 repairs transferred from Admin					\$ 83,223.56						\$ (83,223.56)
49		05/29/19	Hidden Valley Pump-Electric panel well 12					\$ 2,503.88						\$ (2,503.88)
50		05/29/19	DeAnza Ready Mix-Road base well 12					\$ 1,547.09						\$ (1,547.09)
51		05/29/19	Dynamic Consulting-Phase 1 & 2 Pipeline						\$ 71,010.00					\$ (71,010.00)
52		05/29/19	Bobs Trailer-Office trailer Well 1 ID4-9 and well 2					\$ 4,500.00		\$ 4,500.00				\$ (9,000.00)
53		05/29/19	Pacific Pipe-well 12					\$ 12,635.88						\$ (12,635.88)
54	1022	05/29/19	BBK-bid review					\$ 612.00	\$ 153.00					\$ (765.00)
55		05/29/19	Big J Fencing-Fencing for Well ID4 Well 9					\$ 16,975.00						\$ (16,975.00)
56		05/29/19	De Anza Ready Mix					\$ 700.38	\$ 40,057.36					\$ (40,757.74)
57		05/29/19	Dudek-investigation of second production well							\$ 2,672.50				\$ (2,672.50)
58		05/29/19	Hidden Valley Pump-ID1 well 8 repairs					\$ 3,086.18						\$ (3,086.18)
59		05/29/19	Pacific Pipe-construction supply line					\$ 498.23						\$ (498.23)
60		05/29/19	Southwest Pump-construction of well 4-9					\$ 104,500.00						\$ (104,500.00)
61		05/29/19	State of California-Fee for Bond cost			\$ 1,396.50								\$ (1,396.50)
62		06/10/19	Deanza Ready Mix-Road base well 4-9					\$ 2,116.53						\$ (2,116.53)
63		06/10/19	Hidden Valley Pump-Step down transformer well 4-9					\$ 8,292.37						\$ (8,292.37)
64	1033	06/10/19	US Bank-Remote office supplies well 4-9					\$ 891.56		\$ 809.51				\$ (1,701.07)
65		06/18/19	BBK-Correspondence to A&R							\$ 127.50				\$ (127.50)
66		06/18/19	Dudek-Costruction management well 4-9					\$ 20,697.01						\$ (20,697.01)
67		06/18/19	One Eleven Services-Construction Mgmt well 4-9					\$ 4,500.00						\$ (4,500.00)
68		07/01/19	Southwest Pump-construction of well 4-9					\$ 543,866.73						\$ (543,866.73)
69		07/03/19	Hidden Valley Pump-Well 5 Manual Transfer Switch					\$ 399.00						\$ (399.00)
70		07/03/19	Pacific Pipe-Fire hydrant extensions									\$ 1,378		\$ (1,377.80)
71		07/08/19	De Anza Ready Mix-Concrete well 12					\$ 658.01						\$ (658.01)
72		07/08/19	De Anza Ready Mix-Concrete well 5					\$ 344.21						\$ (344.21)
73		07/08/19	Hidden Valley Pump-Well 5 pull pump replace bowls/video					\$ 141,472.45						\$ (141,472.45)

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1			BOND CIP FUNDS											
2			RECONCILIATION-FY 2019/2021											
3								Well 12-17100/ 4-5 Well upgrades	Prod Well #1 ID4-9 10117110	Pipeline Project Phase 1/2 10117120/17200	Prod Well #2 10117130	Sewer Inspect Club Cir 17150 La Casa 10117210	Firehydrants 10117160	
4				Bond Proceeds	Interest paid	Cost of Issuance	Misc.							
5														
74	1042	07/25/19	BBK-Review A&R contract							\$ 765.00				\$ (765.00)
75		07/25/19	Dudek-Construction Management Well 4-9						\$ 45,827.52					\$ (45,827.52)
76		07/25/19	Pacific Pipe-Fire hydrants										\$ 21,826	\$ (21,825.77)
77	1045	07/25/19	One Eleven Services-Construction Mgmt well 4-9						\$ 1,690.00		\$ 475.00			\$ (2,165.00)
78		07/25/19	Southwest Pump-construction of well 4-9						\$ 67,022.50					\$ (67,022.50)
79		08/12/19	Hack-Chlorine well 4-9						\$ 849.62					\$ (849.62)
80		08/19/19	Dudek-Construction Management Well 4-9						\$ 22,521.09					\$ (22,521.09)
81		08/20/19	Insitu-Transducer rental well 4-9						\$ 454.72					\$ (454.72)
82		08/27/19	BBK-Review A&R Bond							\$ 535.50				\$ (535.50)
83		08/31/20	Returned Parts					\$ (1,947.86)						\$ 1,947.86
84		09/04/19	Insitu-Transducer rental well 4-9						\$ 429.93					\$ (429.93)
85		09/04/19	SDGE-Electrict well 4-9						\$ 1,060.00					\$ (1,060.00)
86		09/04/19	Southwest Pump-construction of well 4-9						\$ 55,029.85					\$ (55,029.85)
87		09/04/19	US Bank Charge card-chlorine well 4-9						\$ 125.93					\$ (125.93)
88		09/09/19	Pacific Pipe-Supplies Double O Pipeline project							\$ 26,476.36				\$ (26,476.36)
89		09/16/19	Terry Robertson-Double O Pipeline replacement							\$ 491,504.35				\$ (491,504.35)
90		09/23/19	Dudek-Construction Management well 4-9						\$ 31,886.86					\$ (31,886.86)
91		09/23/19	Insitu-Transducer rental well 4-9						\$ 74.35					\$ (74.35)
92		09/23/19	Pacific Pipe-Meter boxes lids-Double O project							\$ 4,582.64				\$ (4,582.64)
93		09/30/19	BBK-Review change order A&R							\$ 204.00				\$ (204.00)
94	1061	09/30/19	Dudek-Construction Management Well 4-9								\$ 1,260.00			\$ (1,260.00)
95	1062	10/08/19	Dudek-Construction Management Well 4-9						\$ 4,305.00					\$ (4,305.00)
96	1063	10/08/19	Southwest Pump-construction of well 4-9						\$ 44,548.38					\$ (44,548.38)
97	1064	10/16/19	Dudek-Construction Management Well 4-9						\$ 17,778.75					\$ (17,778.75)
98	1064	10/16/19	Dudek-investigation of second production well								\$ 600.00			\$ (600.00)
99	1065	10/16/19	Pacific Pipe-Well 5 upgrade					\$ 5,553.49						\$ (5,553.49)
100	1066	10/21/19	McCalls Meters-Meters for Pipeline phase 1							\$ 11,636.47				\$ (11,636.47)
101	1067	10/21/19	Pacific Pipeline Supply-Tools/supplies well 5 upgrade					\$ 577.94						\$ (577.94)
102	1068	10/21/19	Jeffrey Smith-Appraisal well #2 site investigation								\$ 1,000.00			\$ (1,000.00)
103	1069	10/29/19	Jerry Rolwing-Well #2 site investigation								\$ 3,750.00			\$ (3,750.00)
104	1070	11/05/19	Brax company-materials well 5					\$ 166.04						\$ (166.04)
105	1071	11/05/19	Manuel Rodrigues-DeAnza concrete-Well 5					\$ 740.72	\$ 710.18					\$ (1,450.90)
106	1072	11/12/19	Downstream-video/clean Club Circle									\$ 92,804.00		\$ (92,804.00)
107	1073	11/18/19	Dudek-Construction Management well 4-9						\$ 360.00					\$ (360.00)
108	1074	11/18/19	Pacific Pipe-Materials for Well 11/Well 16					\$ 12,532.02						\$ (12,532.02)
109	1075	11/18/19	Jerry Rolwing-Well #2 site investigation								\$ 250.00			\$ (250.00)
110	1076	11/16/19	Brax company-ID4-9 electric hook-up						\$ 146,691.66					\$ (146,691.66)
111	1077	11/26/19	Pacific Pipe-Well 11 upgrades					\$ 2,810.62						\$ (2,810.62)
112	1078	12/11/19	Freight Charge					\$ 623.29						\$ (623.29)
113	1079	12/23/19	BBK-real property acquisition-Well #2								\$ 265.50			\$ (265.50)
114	1080	12/20/19	DeAnza Ready mix-Road base Well 4-9						\$ 1,377.22					\$ (1,377.22)
115	1081	12/20/19	Pacific Pipe-Well 16 upgrades					\$ 5,904.65						\$ (5,904.65)
116	1082	12/23/19	Brax-Well repairs					\$ 1,539.07	\$ 270,188.02					\$ (271,727.09)
117	1083	12/27/19	Brax-Work in Well 4-9						\$ 62,963.13					\$ (62,963.13)
118	1084	12/27/19	DeAnzaReady mix-concrete for kicker					\$ 688.42	\$ 553.41					\$ (1,241.83)
119	1085	01/03/20	Best Best & Krieger-Bond work review							\$ 586.50	\$ 62.04		\$ 640	\$ (1,288.54)
120	1086	01/28/20	Automated Water Treatment-chlorinator well4-9						\$ 1,044.75					\$ (1,044.75)
121	1087	01/28/20	David Taussig-Debt reporting costs				\$ 905.00							\$ (905.00)
122	1088	01/28/20	McCalls Meters-Meter for well ID4-9						\$ 3,694.50					\$ (3,694.50)
123	1089	01/28/20	Pacific Pipe-Parts for well 4-9						\$ 11,981.64					\$ (11,981.64)
124	1090	02/10/20	DeAnzaReady mix-concrete for kicker well9						\$ 651.20					\$ (651.20)
125	1091	02/10/20	Grainger-Exhaust Fan Well 9						\$ 359.99					\$ (359.99)
126	1092	02/10/20	Pacific Pipe-Hydrants, Well 9						\$ 1,160.74				\$ 17,742	\$ (18,902.83)
127	1093	02/12/20	Best Best & Krieger								\$ 206.50			\$ (206.50)
128	1094	02/12/20	Jerome C Rowling								\$ 250.00			\$ (250.00)
129	1095	02/25/20	Dynamic Consulting-Phase 1 & 2 Pipeline							\$ 38,140.00				\$ (38,140.00)
130	1096	02/25/20	Pacific Pipe-Hydrants							\$ 3,112.63			\$ 950	\$ (4,062.61)
131	1097	03/09/20	Fredericks Services Inc										\$ 18,965	\$ (18,965.00)
132	1099	03/23/20	Home Depot										\$ 510	\$ (510.17)
133	1098	03/23/20	Best Best & Krieger							\$ 1,206.00	\$ 1,386.50			\$ (2,592.50)
134	1100	03/16/20	Pacific Pipeline - Hydrants										\$ 9,711	\$ (9,711.27)
135	1101	03/23/20	Fredericks Services Inc										\$ 20,324	\$ (20,324.00)
136	1102	03/23/20	Pacific Pipeline Supply - Hydrants										\$ 23,810	\$ (23,809.97)
137	1103	03/23/20	Jerry Rolwing-Well #9 Water Sample						\$ 500.00					\$ (500.00)
138		06/27/10	Pacific Pipeline - Extra parts to Inventory										\$ (379)	\$ 379.47
139	1104	04/07/20	Pacific Pipeline Supply - Hydrants										\$ 12,816	\$ (12,816.43)
140	1105	04/07/20	Terry Robertson-Double O Pipeline replacement + RET							\$ 150,136.65				\$ (150,136.65)
141	1106	04/07/20	US Bank - AC & Awning for Portable Office						\$ 4,377.05					\$ (4,377.05)

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1			BOND CIP FUNDS									Sewer Inspect		
2			RECONCILIATION-FY 2019/2021					Well 12-17100/ 4-5 Well upgrades 10117140	Prod Well #1 ID4-9 10117110	Pipeline Project Phase 1/2 10117120/17200	Prod Well #2 10117130	Club Cir 17150 La Casa 10117210	Firehydrants 10117160	
3				Bond Proceeds	Interest paid	Cost of Issuance	Misc.							
4														
5														
142	1107	04/13/20	DeAnza Ready Mix - Concrete for Hydrants										\$ 597	\$ (596.74)
143	1108	04/13/20	Home Depot										\$ 2,124	\$ (2,124.37)
144	1109	04/13/20	Fredericks Services Inc										\$ 25,395	\$ (25,395.00)
145	1110	04/21/20	Pacific Pipeline Supply										\$ 27,709	\$ (27,708.72)
146	1111	04/28/20	Dudek								\$ 2,385.00			\$ (2,385.00)
147	1112	04/28/20	Fredericks Services Inc										\$ 24,399	\$ (24,399.00)
148	1113	05/05/20	Borrego Landfill										\$ 177	\$ (176.65)
149	1114	05/05/20	Pacific Pipeline Supply										\$ 28,324	\$ (28,324.07)
150	1115	05/12/20	DeAnza Ready Mix										\$ 1,302	\$ (1,302.38)
151	1116	05/12/20	Home Depot										\$ 877	\$ (877.33)
152	1117	05/19/20	Fredericks Services Inc										\$ 25,379	\$ (25,379.00)
153	1118	05/19/20	Pacific Pipeline Supply										\$ 1,164	\$ (1,163.76)
154	1119	05/26/20	BBK								\$ 4,484.50			\$ (4,484.50)
155	1120	05/26/20	Dudek								\$ 2,690.00			\$ (2,690.00)
156	1121	06/04/20	Aggregate Products Inc. - Asphalt										\$ 996	\$ (995.62)
157	1122	06/04/20	Borrego Landfill										\$ 206	\$ (205.61)
158	1123	06/04/20	Brax Company - Underground electric & Panels					\$ 60,000.00						\$ (60,000.00)
159	1124	06/04/20	Fredericks Services Inc										\$ 25,457	\$ (25,457.00)
160	1125	06/04/20	Pacific Pipeline										\$ 31,956	\$ (31,955.72)
161	1126	06/09/20	DeAnza Ready Mix										\$ 597	\$ (596.74)
162	1127	06/09/20	Home Depot										\$ 879	\$ (878.96)
163	1128	06/09/20	Pacific Trans Environmental										\$ 605	\$ (604.95)
164	1129	06/18/20	Fredericks Services Inc										\$ 10,244	\$ (10,244.00)
165	1130	06/22/20	Downstream-Video manhole #8 to #4 by La Casa									\$ 2,680		\$ (2,680.00)
166	1131	06/22/20	Fredericks Services Inc										\$ 26,697	\$ (26,697.00)
167	1132	07/07/20	Home Depot						\$ 1,944					\$ (1,944.11)
168	1133	07/14/20	Brax Company, Inc.					\$ 110,809						\$ (110,808.81)
169	1134	07/14/20	De Anza Ready Mix										\$ 353	\$ (352.83)
170	1135	07/14/20	Dudek								\$ 2,100			\$ (2,100.00)
171	1136	07/14/20	Pacific Pipeline										\$ 25,139	\$ (25,138.57)
172	1137	07/16/20	Brax Company, Inc.					\$ 1,000						\$ (1,000.00)
173	1138	07/16/20	Fredericks Services Inc										\$ 27,464	\$ (27,464.00)
174	1139	07/28/20	Dudek						\$ 1,648		\$ 2,833			\$ (4,480.00)
175	1140	08/10/20	De Anza Ready Mix										\$ 353	\$ (352.83)
176	1141	08/10/20	Downstream Services									\$ 20,569		\$ (20,569.44)
177	1142	08/10/20	Home Depot						\$ 1,152				\$ 693	\$ (1,844.91)
178	1143	08/10/20	Pacific Pipeline					\$ 113					\$ 30,019	\$ (30,131.34)
179	1144	08/17/20	Downstream Services									\$ 4,008		\$ (4,008.00)
180	1145	08/17/20	Fredericks Services Inc										\$ 36,917	\$ (36,917.00)
181	1146	08/25/20	Dudek								\$ 6,547			\$ (6,547.35)
182	1147	08/25/20	Pacific Pipeline										\$ 3,271	\$ (3,270.58)
183	1148	08/25/20	Fredericks Services Inc										\$ 6,152	\$ (6,152.00)
184	1149	09/08/20	Pacific Pipeline Supply, Inc.										\$ 600	\$ (599.95)
185	1150	09/14/20	Fredericks Services Inc										\$ 29,559	\$ (29,559.00)
186	1151	09/14/20	Landmark Consultants, Inc							\$ 7,916				\$ (7,916.40)
187	1152	09/14/20	Pacific Pipeline Supply, Inc.							\$ 31			\$ 219	\$ (249.36)
188	1153	09/21/20	Dudek								\$ 6,816			\$ (6,816.18)
189	1154	09/21/20	McCalls Meters, Inc							\$ 2,687				\$ (2,687.29)
190	1155	09/21/20	Pacific Pipeline Supply, Inc.							\$ 6,896				\$ (6,895.73)
191	1156	09/21/20	Rove Engineering							\$ 142,653				\$ (142,653.00)
192	1157	09/29/20	Downstream Services									\$ 11,539		\$ (11,539.26)
193	1158	09/29/20	Joe's Paving										\$ 7,555	\$ (7,555.18)
194	1159	09/29/20	Landmark Consultants, Inc							\$ 7,517				\$ (7,516.80)
195	1160	10/13/20	Downstream Services								\$ 2,980			\$ (2,980.00)
196	1161	10/13/20	Landmark Consultants, Inc							\$ 4,180				\$ (4,180.00)
197	1162	10/13/20	Pacific Pipeline							\$ 2,613				\$ (2,612.77)
198	1163	10/20/20	County of SD Public Works							\$ 4,887				\$ (4,887.00)
199	1164	10/20/20	DeAnza Ready Mix										\$ 298	\$ (298.00)
200	1165	10/20/20	Dudek								\$ 7,184			\$ (7,184.00)
201	1166	10/22/20	Downstream Services									\$ 4,008		\$ (4,008.00)
202	1167	10/27/20	A-1 Irrigation							\$ 165				\$ (164.61)
203	1168	10/27/20	DeAnza Ready Mix					\$ 2,793						\$ (2,793.09)
204	1169	10/27/20	Landmark Consultants, Inc							\$ 4,439				\$ (4,438.80)
205	1170	11/05/20	Brax Company					\$ 11,769						\$ (11,768.96)
206	1171	11/05/20	Pacific Pipeline					\$ 1,793		\$ 2,956			\$ (697)	\$ (4,052.28)
207	1172	11/05/20	Pacific Trans Environmental										\$ 3,308	\$ (3,307.80)
208	1173	11/09/20	Brax Company					\$ 682						\$ (681.84)
209	1174	11/09/20	Downstream Services									\$ 2,783		\$ (2,782.50)

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1														
2			BOND CIP FUNDS									Sewer Inspect		
3			RECONCILIATION-FY 2019/2021									Club Cir 17150	Firehydrants	
4												La Casa		
5				Bond Proceeds	Interest paid	Cost of Issuance	Misc.	Well 12-17100/ 4-5 Well upgrades 10117140	Prod Well #1 ID4-9 10117110	Pipeline Project Phase 1/2 10117120/17200	Prod Well #2 10117130	10117210	10117160	
210	1175	11/13/20	SD County							\$ 3,258				\$ (3,258.00)
211	1176	11/13/20	Downstream Services									\$ 12,258		\$ (12,258.00)
212	1177	11/30/20	Dudek								\$ 10,698			\$ (10,697.50)
213	1178	11/30/20	Landmark Consultants, Inc							\$ 3,072				\$ (3,072.00)
214	1179	11/30/20	McCalls Meters							\$ 1,510				\$ (1,509.58)
215	1180	11/30/20	Pacific Pipeline							\$ 620				\$ (619.68)
216	1181	11/30/20	Rove Engineering							\$ 262,712				\$ (262,712.00)
217	1182	12/07/21	Pacific Pipeline Supply							\$ 357				\$ (356.87)
218	1183	12/15/21	SD County							\$ 398				\$ (398.20)
223														
224														
225			BOND FUND BALANCE	\$ 5,517,293	\$ -	\$ 147,390	\$ 905	\$ 853,096	\$ 1,608,927	\$ 1,266,268	\$ 88,204	\$ 153,629	\$ 534,577	\$ 864,296
228														
229										12/31/2021	MMA			\$ 988,216
230										12/31/2021	Checking			\$ 140,458
231										12/31/2021	Total Bond funds Balance			\$ 1,128,675

Borrego Water District
 Groundwater Management Expenses
 FYE 2021



Month	(54810) BBK <u>Stipulated</u>	Legal BBK/JT <u>GWM</u>	Watermaster <u>BWD Staff</u>	DUDEK	Wendy Quinn Minutes	Meter Testing	Staff Allocation	Conf/Classes Misc.	Jerry Consulting	G/LTotal
July 2020	16,175.77	7,611.00	3,900.54				7,801.08	9.99	125.00	35,623.38
Aug 2020	31,872.40	1,684.95		18,001.25	62.50		3,852.30	9.99		55,483.39
Sept 2020	23,410.10		1,198.00			2,025.00	600.00	9.99		27,243.09
Oct 2020	39,471.76		153.33	43,754.76				9.99		83,389.84
Nov 2020	79,653.35			2,476.25				9.99	1,125.00	83,264.59
Dec 2020	19,962.74	914.50	880.32	1,171.25			560.00	9.99		23,498.80
Total	210,546.12	10,210.45	6,132.19	65,403.51	62.50	2,025.00	12,813.38	59.94	1,250.00	308,503.09

Item IV.B
Water and Wastewater Operations Report
December 2020





BORREGO WATER DISTRICT

DECEMBER 2020

WATER OPERATIONS REPORT

<u>WELL</u>	<u>TYPE</u>	<u>FLOW RATE</u>	<u>STATUS</u>	<u>COMMENT</u>
ID1-8	Production	350	In Use	
ID1-10	Production	300	In Use	
ID1-12	Production	900	In Use	
ID1-16	Production	750	In Use	
Wilcox	Production	80	In Use	Diesel backup well for ID-4
ID4-4	Production	400	In Use	
ID4-11	Production	900	In Use	Diesel engine drive exercised monthly
ID4-18	Production	150	In Use	
ID5-5	Production	850	In Use	

System Problems: All production wells are in service. All reservoirs are in operating condition.

WASTEWATER OPERATIONS REPORT

Rams Hill Wastewater Treatment Facility serving ID-1, ID-2 and ID-5 Total Cap. 0.25 MGD (million gallons per day):

Average flow: 64235 (gallons per day)

Peak flow: 89800 gpd THURSDAY, DECEMBER 24- 2020



BORREGO WATER DISTRICT

RAMS HILL WASTEWATER TREATMENT FACILITY

4861 Borrego Springs Rd, BORREGO SPRINGS, CA 92004
(760) 767-5806 FAX (760) 767-5994

01//06/2021

CALIFORNIA REGIONAL WATER QUALITY
CONTROL BOARD – REGION 7
73-720 FRED WARING DR. SUITE 100
PALM DESERT, CA. 92260

Attn: Adriana Godinez/WRCE

RE: DECEMBER 2020 Borrego Springs WWTP

Dear Adriana,

Please find attached the DECEMBER 2020 monthly monitoring reports and Nitrate Study Lab results for Borrego springs district WWTP.

We are pleased to inform you that there's no known violations for this month.

If you have any questions please contact ROGELIO MARTINEZ/WT-III. (760)419-2764.

Respectfully,

Rogelio Martinez/ water plant operator III

CC: Geoff Poole/GM

MONTHLY REPORT: R.H.W.T.F

MONTH: DECEMBER

YEAR: 2020

BORREGO WATER DISTRICT,
RAMS HILL WASTEWATER TREATMENT FACILITY,
4861 BORREGO SPRINGS ROAD,
BORREGO SPRINGS, CA 92004
760-767-5806; phone
760-767-5994; fax

COMMENTS: THERE ARE NO SPILLS TO REPORT FOR DECEMBER 2020; THE FLOW REPORT IS ATTACHED.

Submitted by: ROGELIO MARTINEZ/BWD TO: GEOFF POOLE/BWD;
Date:01/06/2021

DEC 2020	DAILY FLOW GAL.	TOTAL FLOW GAL.
1	67100	41753500
2	60000	41813600
3	58700	41872300
4	75100	41947500
5	70200	42017800
6	70900	42088800
7	60200	42149100
8	57400	42206600
9	52400	42259100
10	55100	42314200
11	53500	42367800
12	58500	42426400
13	61200	42487700
14	58000	42545700
15	56800	42602500
16	56800	42659400
17	53400	42712800
18	64700	42777500
19	57000	42834500
20	55600	42890100
21	55100	42945300
22	59200	43004500
23	65200	43069800
24	89800	43159700
25	72700	43232500
26	81500	43314100
27	88100	43402300
28	72400	43474800
29	64300	43539200
30	68100	43607400
31	72300	43679800

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION**

WDID NO.: **7A 37 0125 001**
ORDEF NO.: **R7-2019-0015**

**MONITORING AND REPORTING
BORREGO WATER DISTRICT - RAMS HILL WWTF
MONTH: DECEMBER
YEAR: 2020**

REPORTING FREQUENCIES: MONTHLY

DECEMBER

TYPE OF SAMPLE:	INFLUENT			PONDS		
CONSTITUENTS:	Flow	BOD	TSS	DO	pH	Freeboard
FREQUENCY:	Daily	Monthly	Monthly	Twice Monthly	Twice Monthly	Twice Monthly
DESCRIPTION:	Measurement	Grab	Grab	Grab	Grab	Measurement
UNITS:	gpd	mg/L	mg/L	mg/L	s.u.	ft
REQUIREMENTS						
30-DAY MEAN:						
MAXIMUM:						
MINIMUM:						
DATE OF SAMPLE	DECEMBER					
1	67100	88	100	8.46	8.86	3.5
2	60000					
3	58700					
4	75100					
5	70200					
6	70900					
7	60200					
8	57400					
9	52400					
10	55100					
11	53500					
12	58500					
13	61200					
14	58000					
15	56800			8.95	8.81	3.5
16	56800					
17	53400					
18	64700					
19	57000					
20	55600					
21	55100					
22	59200					
23	65200					
24	89800					
25	72700					
26	81500					
27	88100					
28	72400					
29	64300					
30	68100					
31	72300					
30-DAY MEAN	64235	88	100	8.71	8.84	3.5
MAXIMUM	89800	88	100	8.95	8.86	3.5
MINIMUM	52400	88	100	8.46	8.81	3.5

I declare under the penalty of law that I personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: *Frogela White*
Date: 01-06-2021

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION**

WDID NO.: 7A 37 0125 001
ORDER NO.: R7- 2019-0015

**MONITORING AND REPORTING
BORREGO WATER DISTRICT - RAMS HILL WWTF
MONTH: DECEMBER
YEAR: 2020**

REPORTING FREQUENCY MONTHLY

DECEMBER

TYPE OF SAMPLE:	EFFLUENT					
CONSTITUENTS:	BOD	TSS	SS	T. Nitrogen	TDS	pH
FREQUENCY:	Twice Monthly	Twice Monthly	Twice Monthly	Twice Monthly	Twice Monthly	Twice Monthly
DESCRIPTION:	Grab	Grab	Grab	Grab	Grab	Grab
UNITS:	mg/L	mg/L	ml/L	mg/L	ml/L	mg/L
REQUIREMENTS						
30-DAY MEAN:						
MAXIMUM:						
MINIMUM:						
DATE OF SAMPLE						
1	0.0	6.0	0.0	6.7	500	9.06
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15	0.0	2.0	0.0	11.0	490	8.96
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
30-DAY MEAN	0.0	4.0	0.0	8.9	495	9.01
MAXIMUM	0.0	6.0	0.0	11.0	500	9.06
MINIMUM	0.0	2.0	0.0	6.7	490	8.96

I declare under the penalty of law that I personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: Rogelio M. [Signature]
Date: 01-06-2021

Item IV.C
Water Production/Use Records
December 2020





BORREGO WATER DISTRICT

WATER PRODUCTION SUMMARY

DECEMBER 2020

DATE	WATER USE	WATER PROD	WATER %NRW	ID4 USE	ID4 PROD	ID4 %NRW	TOTAL USE	TOTAL PROD
Dec-18	16.14	22.36	27.80	71.19	80.13	11.16	87.33	102.49
Jan-19	14.91	16.84	11.47	58.48	64.29	9.04	73.39	81.13
Feb-19	14.99	16.06	6.70	58.89	66.49	11.42	73.88	82.55
Mar-19	15.35	15.75	2.51	55.83	62.48	10.65	71.18	78.23
Apr-19	20.31	20.97	3.18	90.96	98.41	7.57	111.26	119.38
May-19	23.79	25.13	5.33	83.92	92.63	9.41	107.70	117.76
Jun-19	36.31	37.19	2.36	93.43	96.69	3.37	129.74	133.88
Jul-19	44.09	45.49	3.08	115.58	123.04	6.07	159.67	168.53
Aug-19	37.02	38.56	3.99	111.63	114.37	2.39	148.65	152.92
Sep-19	40.68	39.71	-2.45	109.34	120.76	9.45	150.03	160.47
Oct-19	34.33	35.76	3.99	118.92	123.91	4.03	153.25	159.66
Nov-19	27.05	28.10	3.76	94.68	103.96	8.92	121.73	132.06
Dec-19	13.51	14.99	9.82	59.08	64.93	9.01	72.59	79.91
Jan-20	16.96	17.70	4.20	69.52	74.80	7.06	86.48	92.50
Feb-20	16.19	16.83	3.78	65.77	69.21	4.97	81.96	86.04
Mar-20	19.63	21.05	6.71	65.62	70.22	6.55	85.26	91.27
Apr-20	14.68	15.60	5.84	68.77	76.03	9.55	83.46	91.63
May-20	22.22	23.30	4.60	88.23	95.25	7.37	110.45	118.54
Jun-20	54.17	53.21	-1.80	108.31	123.77	12.49	162.48	176.98
Jul-20	36.88	39.91	7.60	102.30	118.18	13.44	139.18	158.09
Aug-20	34.92	36.30	3.78	110.63	126.05	12.23	145.56	162.35
Sep-20	35.53	36.29	2.09	124.86	138.15	9.62	160.40	174.44
Oct-20	29.33	30.82	4.82	106.65	119.87	11.04	135.98	150.69
Nov-20	23.24	24.22	4.08	96.10	102.72	6.45	119.33	126.94
Dec-20	18.42	19.21	4.12	84.75	92.74	8.62	103.16	111.95
12 Mo. TOTAL	322.19	334.43	4.15	90.96	100.58	9.11	1413.68	1541.42

Totals reflect Water (ID1 & ID3) and ID4 (ID4 & ID5). Interties to SA3 are no longer needed to be separated. ID4 and SA5 are combined because all water production is pumped from ID4. All figures are in Acre Feet of water pumped.

NON-REVENUE WATER SUMMARY (%)

DATE	WATER	ID-4	ID-5	DISTRICT-WIDE AVERAGE
Dec-20	4.12	8.62	N/A	6.37
12 Mo. Average	4.15	9.11	N/A	6.63