



FALLBROOK PUBLIC UTILITY DISTRICT

FALLBROOK WATER RECLAMATION PLANT

HEADWORKS COVER REPLACEMENT

JOB No. 3115

SPECIFICATIONS

FALLBROOK WRP HEADWORKS COVER REPLACEMENT
SECTION 00010
TABLE OF CONTENTS

ATTACHMENTS
TECHNICAL SPECIFICATIONS

Table of Contents

DIVISION 1

01000	GENERAL REQUIREMENTS
01025	MEASUREMENT & PAYMENT
01070	ABBREVIATIONS
01115	CONSTRUCTION SEQUENCE
01291	SCHEDULE OF VALUES
01310	PRECONSTRUCTION MEETINGS
01311	PROJECT COORDINATION
01312	PROGRESS MEETINGS
01321	PROGRESS SCHEDULE

DIVISION 2

02050	DEMOLITION
-------	------------

DIVISION 13

13120	FIBERGLASS REINFORCED PLASTIC FLAT TANK COVERS
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PLANS AND DRAWINGS

SECTION 01000

GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 DEFINITIONS

Wherever the following terms or pronouns occur in these Standard Specifications or in related documents, the intent and meaning shall be interpreted as follows:

- A. **"Approved Plans"** shall mean the official plans, profiles, typical cross-sections, working drawings, detail drawings, or exact reproductions thereof, approved by the District and other appropriate government agencies, which show the locations, character, dimensions, and details of the work required to construct the specified public improvements.
- B. **"Approved Materials List"** shall mean the listing of those materials reviewed, tested, and allowed for use by the District for installation of its facilities (which may include potable water, recycled water and sewer facilities).
- C. **"Board"** shall mean the Board of Directors of the District of jurisdiction.
- D. **"Contractor"** shall mean the independent person, firm, corporation or partnership with whom the District or Developer contracts for the performance of the work or any part thereof covered by the Approved Plans and these Standard Specifications. Instructions or information given by the District to the Contractor's superintendent or agent on the Project shall be considered as having been given to the Contractor.
- E. **"District"** shall mean the Utility District of jurisdiction.

For the unique purpose of these Standard Specifications, District shall also refer to the District's representative(s) acting within the scope of the particular duties entrusted to them.

The District shall resolve any and all issues which may arise with regard to the quality or acceptability of approved materials furnished or work performed, to the manner of performance and rate of progress of the work and shall answer all questions relating to the interpretation of the Standard Drawings, the Approved Plans, the job specifications, if any, and these Standard Specifications as well as the acceptable fulfillment of the Contract on the part of the Developer.

- F. **"District Engineer"** or **"Engineer"** shall mean the District's Chief Engineer, or the District's General Manager, acting either directly or through properly authorized agents, such agents acting severally within the scope of the particular duties entrusted to them.
- G. **"Inspector"** shall mean the District's authorized agent whose duties shall include those defined elsewhere within these Standard Specifications, but who shall not direct the work being performed.
- H. **"Engineer of Work"** shall mean a Civil Engineer or Structural Engineer registered or licensed in California who is qualified to act as an agent of the District

- I. **"Project"** or the **"Work"** shall mean the public improvement to be constructed in whole or part within the boundaries of the District.
- J. **"Standard Drawings"** shall mean the standard details issued by the District for construction of District facilities.
- K. **"Water Agencies' Design Guide"** or **"Water Agencies' Standards Design Guide"** or **"Design Guide"** shall mean the current version of the Fallbrook Public Utilities District Standards Design Guidelines for Potable Water, Recycled Water and Sewer Facilities as adopted and published by the District.
- L. **"Water Agencies' Standards"** or **"Water Agencies' Standard Specifications"** or **"Standard Specifications"** shall mean the current version of the Water Agencies' Standard Specifications for Potable Water, Recycled Water and Sewer Facilities as adopted and published by the member agencies of the Water Agencies' Standards Committee.

1.02 LICENSE

The Contractor installing any new facilities or performing work on existing facilities within the District shall possess, prior to the start of the Project, a License, defined by the latest edition of the California Contractor's License Law and Reference Book, as:

- A. Class A or C-34 for water pipeline installations.
- B. Class A or C-42 for sewer pipeline installations.
- C. Class A for major water and sewer facilities such as pump stations, reservoirs and treatment plants.

Any Contractor possessing a license other than a Class A must receive written approval from the District prior to initiating the work.

1.03 OPERATIONS IN PUBLIC RIGHT-OF-WAY

Work in public right-of-way shall be done in accordance with the requirements of the permit issued by the public agency in whose right-of-way the work is located, in addition to the requirements of the Approved Plans and Standard Specifications. If a permit is not required, the work shall conform to the standards of the public agency involved in addition to conforming to the Approved Plans and Standard Specifications.

1.04 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS & PERMITS

The Contractor shall abide by the conditions of the Regional Water Quality Control Board, General Construction Activity Storm Water Permit and the project Storm Water Pollution Prevention Plan (SWPPP). Contractor shall obtain necessary Storm Water permits

1.05 REFERENCE STANDARDS

The reference standards of the organizations listed below form a part of these Standard Specifications to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise stated.

	<u>AGENCY</u>	<u>ADDRESS</u>
AASHTO	American Association of State Highway and Transportation Officials	444 N. Capital St. Washington, D.C. 20004
ACI	American Concrete Institute	P.O. Box 19150 Detroit, MI 48219
ANSI	American National Standards Institute	1430 Broadway New York, NY 10018
ASA	American Standards Association	70 East 45th Street New York, NY 10017
ASME	American Society of Mechanical Engineers	345 E. 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials	1916 Race Street Philadelphia, PA 19103
AWS	American Welding Society	550 N.W. Le Jeune Rd. Miami, FL 33135
AWWA	American Water Works Association, Inc.	6666 W. Quincy Ave. Denver, CO 80235
CAL/ OSHA	State of California Occupational Safety and Health Administration	1006 Fourth Street Sacramento, CA 95814
CFR	Code of Federal Regulations	Office of Federal Register National Archives Administration Washington, D.C. 20408
CRSI	Concrete Reinforcing Steel Institute	228 N. La Salle St. Chicago, IL 60601
CSLB	Contractors State License Board	9821 Business Park Dr. Sacramento, CA 95827
NACE	National Association of Corrosion Engineers	1440 South Creek Dr. Houston, TX 77084
NFPA	National Fire Protection Agency	Battery March Park Quincy, MA 02269
NSF	National Sanitation Foundation	P.O. Box 130140 Ann Arbor, MI 48113
SDG&E	San Diego Gas and Electric Company	101 Ash Street San Diego, CA 92102
SSPC	Steel Structures	4400 Fifth Ave.

GENERAL REQUIREMENTS

	Painting Council	Pittsburgh, PA 1521
	<u>AGENCY</u>	<u>ADDRESS</u>
SSPWC	Standard Specifications for Public Works Construction (Greenbook)	Joint Cooperative Committee c/o Associated General Contractors of California 1255 Corporate Center Dr., Suite 100 Monterey Park, CA 91754
UBC	Uniform Building Code	International Conference of Building Officials 5360 Workman Mill Rd. Whittier, CA 90601
UNI-B	Uni-Bell PVC Pipe Association	2655 Villa Creek Dr., Ste. 155 Dallas, TX 75234
UPC	Uniform Plumbing Code	International Conference of Plumbing and Mechanical Officials 20001 E. Walnut Dr. South Walnut, CA 91789

1.06 ORDER OF PRECEDENCE

The Approved Plans, together with District Standard Specifications, shall govern the work to be done. Anything indicated in the Standard Specifications but not shown on the Approved Plans, or shown on the Approved Plans but not indicated in the Standard Specifications, shall be of like effect as though shown or indicated in both. In resolving inconsistencies between the Approved Plans and the various sections of the Standard Specifications, the order of precedence shall be as follows:

1. Technical Specifications (Standard Specifications Sections 2 through 16)
2. Appendices to the Standard Specifications
3. Standard Drawings
4. Approved Plans
5. Approved Materials Lists
6. General Specifications (Standard Specifications Section 1)
7. Reference Standards

Figure dimensions on drawings shall take precedence over scale dimensions. Detailed drawings shall take precedence over general drawings. The Contractor shall immediately notify District if any conflict, inconsistency, omission, error, or ambiguity is discovered between the Approved Plans and the various sections of the Standard Specifications.

1.07 EXAMINATION OF APPROVED PLANS, SPECIFICATIONS, AND SITE

The Contractor shall carefully examine the site of the proposed work, the Approved Drawings, the Specifications, and all other pertinent documents. Contractor shall be satisfied as to the character, quality and quantities of work to be furnished, and as to the requirements of the Approved Plans and these Standard Specifications. The District will not be liable for any loss sustained by the Contractor as a result of any variance between conditions as shown on the Approved Plans and the actual conditions revealed during the progress of the work or otherwise.

1.08 QUALITY OF WORK AND MATERIALS

The work shall be performed in a thorough, worker-like manner in accordance with the Approved Plans and these Standard Specifications. All work shall conform to the lines and grades shown on said plans.

At least one member of the Contractor's workforce who is thoroughly familiar with the specified requirements of work and who is completely trained and experienced in the construction skills necessary for satisfactory completion of the work shall be present at the site, directing the work, at all times.

Adequate number of skilled workers and sufficient and appropriate equipment shall be present at the site prior to commencing daily construction operations.

The Engineer shall inform the Contractor if any person in the employ of the Contractor fails to or refuses to comply with the requirements of these Specifications, or appears to the Engineer to be incompetent or unfit, or acts in a disorderly, improper or unsafe manner. It shall be the Contractor's responsibility to dismiss any such person from the work site or take any other action deemed appropriate by the Contractor.

All equipment, materials, and supplies to be incorporated in the work shall be new. All equipment, material and supplies shall be produced in a good and worker-like manner. Materials to be used within the scope of work on the project shall be those listed in the current Approved Materials List. When the quality of a material, process, or article is not specifically set forth in the Approved Materials List, the Approved Plans, or the Specifications, the best available quality of the material, process, or article shall be provided.

The Contractor may offer as substitution any material, process, or article substantially equal or better in every respect to that so indicated or specified; provided, however, that if the material, process, or article offered by the Contractor is not, in the opinion of the District, substantially equal or better in every respect to that specified, then the Contractor must furnish the material, process, or article specified or one that in the opinion of the District is substantially equal or better in every respect.

1.09 SHOP DRAWING PROCEDURES

- A. Unless amended by job specifications, Contractor shall submit Two (2) hard copies and one Electronic copy of all shop drawings, submittals, and manufacturer's cut sheets detailing the methods and materials intended for use on the project. Submittals shall be consecutively numbered, shall be accompanied by a transmittal letter marked with the number and title of the submittal, name of the project, name and address of the supplier, along with contact persons for same, and shall be checked by and marked with the approval of the Contractor. In addition, any submittals that deviate from the requirements of the Contract shall be clearly noted and explained in the transmittal letter.
- B. District will review the submittals so provided, and will return the submittals marked to indicate that submittals are approved or must be returned for revision. Unless amended

by job specifications, District shall be allowed a minimum of ten (10) working days for the review of submittals. Submittals returned for revision must be corrected as noted and developer must re-submit shop drawings as noted above until approved by District. Review and approval of shop drawings by District shall not relieve developer of the responsibility for executing the work in accordance with these Standard Specifications, using proper methods of construction, nor from furnishing materials or work required but not indicated on the submittals.

- C. Construction shall not begin on relevant portions of the work until shop drawing submittals have been approved by District. Shop drawings shall be submitted in a timely manner so as not to delay construction of the work.

1.10 MATERIALS

All materials shall be new and unused, of the quality defined in the Specifications, and approved by the District Engineer. All materials to be used within a specific project and intended for equivalent uses shall be identical as to manufacturer and model number. Materials not identical as to manufacturer and model number to those approved by the District Engineer, materials that are damaged, or materials that are otherwise unacceptable to the District Engineer shall be rejected and immediately removed from the job site.

- A. Job-specific approval of materials not shown on the Approved Materials List is solely at the discretion of the District Engineer, and materials so approved shall not be construed as approved for general use. For job-specific consideration of materials not shown on the Approved Materials List, the shop drawing procedures outlined within this Section Requirements shall be followed.

1.11 PRE-CONSTRUCTION CONFERENCE

- A. The Contractor shall schedule a Pre-Construction Conference with the District's Inspection Department at least fourteen (14) days prior to beginning any water or sewer work in the field. As a minimum, the attendees at this conference shall include:
 - 1. The design engineer.
 - 2. The Contractor's Superintendent.
 - 3. Contractor's Competent Person.
 - 4. The District Inspector.
- B. In addition, the following persons shall be invited to the Pre-Construction conference upon request of the District:
 - 1. A representative of the Agency of Jurisdiction.
 - 2. Representative(s) of other utility companies.
- C. The purpose of this meeting is to review the plans for the project relative to the requirements of the District's Standard Specifications, the Approved Plans, and the Approved Materials List. The Contractor shall be prepared to discuss, in detail, the project schedule, and shall provide the District with any schedules, submittals, lists, permits, or other information required by the Engineer, by these Standard Specifications or by the job specifications.

1.12 INSPECTION

All work and materials furnished shall be subject to inspection for compliance with these Standard Specifications and all other appropriate specifications.

The Contractor shall make application to the District for inspection at least five (5) days in advance of starting any work. Inspectors shall be recognized as authorized agents of the District, and their duties shall be to evaluate materials used and work performed. Instructions given by the Inspector shall be respected and executed by the Contractor.

The District shall at all times have access to the work wherever it is in preparation or progress and the Contractor shall provide proper facilities for such access and for inspection. The Contractor shall provide adequate safe means by which to inspect the work.

Failure or oversight of any Inspector to condemn defective materials at the time of use, or to condemn improper work at the time it is performed, shall not diminish the Contractor's obligations to meet the requirements of the Approved Plans and these Standard Specifications. The Contractor shall remove and replace any faulty materials and work at no additional cost to the District upon discovery of the defects or upon receipt of notice from the District to do so.

Defective work or material may be rejected prior to the date of acceptance of the work notwithstanding that such defective work or material may have been previously inspected. Acceptance shall not constitute approval of latent defects or waiver of maintenance requirements.

Any work covered up or otherwise rendered inaccessible without approval or consent of the District must, if required by the District, be uncovered for examination at the Contractor's expense. Any work done in the absence of the Inspector without written permission shall be subject to rejection.

1.13 TESTING LABORATORY SERVICES

- A. The Contractor shall engage testing firms to provide the various testing required for the project. Soils testing is typically required for projects, but concrete testing or other types of testing may additionally be required. The testing firm shall provide a competent, on-site Soils Technician to perform the various compaction testing required for the project. All tests shall be performed at the direction of the Soils Technician and in a manner acceptable to the District. Soils testing shall be performed in accordance with Section 02223 of these Standard Specifications.
- B. Prior to the District's acceptance of the project, a report of all soils tests taken shall be submitted to the District in accordance with Section 02223 of these Standard Specifications.

1.14 CONSTRUCTION STAKING AND PRESERVATION OF MONUMENTS

The Contractor shall perform all surveying and provide all GPS coordinate data to the District. The Contractor shall use the County's high precision GPS control network and shall provide the data using the same basis of coordinates used to prepare the Plans.

Staking of the various public improvements required shall be performed by the Contractor's surveyor. Generally, stakes for alignment and grade shall be set at 7.6m (25') intervals. The survey shall conform to the lines, grades, and dimensions shown on the Approved Plans. The

District shall give an account of the adequacy, readability, and frequency of the stakes provided and shall comment on any remedies required.

The Contractor shall preserve all monuments, benchmarks, survey marks, and stakes. In case of their removal or destruction by Contractor or its employees, agents or subcontractors, the Contractor shall be liable for the cost of their replacement.

1.15 ENVIRONMENTAL CONTROL

The Contractor shall abide by all applicable local, state and federal regulations, and by the conditions of the Regional Water Quality Control Board.

The Contractor shall provide effective measures where necessary to prevent operations from producing dust in an amount damaging to property or causing a nuisance as determined by the District. The Contractor shall be responsible for any damage due to dust originating from its operations.

The Contractor shall anticipate and correct any erosion problem arising from its operations.

1.16 PUBLIC SAFETY AND TRAFFIC CONTROL

- A. The Contractor shall at all times conduct operations in a manner causing the minimum obstruction and inconvenience to public traffic. The Contractor shall not interfere with the normal operation of public transit vehicles unless otherwise authorized. Open trenches and excavations shall be provided with adequate barricades in accordance with the approved traffic control plan or the requirements of the agency of jurisdiction. At night, lights shall mark all open work and obstructions. The Contractor shall install and maintain all signs, lights, flares, barricades, traffic plates, railings, runways, stairs, bridges and other equipment necessary to safeguard the public. Safety instructions received from governmental authorities shall be followed, but compliance with such instructions shall not diminish the Contractor's responsibility or liability for accidents to workers or damage or injury to persons or property.

In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work, and the Contractor shall fully comply with all state, federal, and other laws, rules, regulations, and orders relating to the safety of workers and others.

The right of the District to conduct construction review or observation of the Contractor's performance does not include review or observation of the adequacy of the Contractor's safety measures in, on, or near the construction site.

The Contractor shall take immediate action to correct any condition adversely affecting public safety.

- B. The Contractor shall submit a traffic control plan to the County of San Diego and shall obtain approval prior to starting the work.

1.17 PROTECTION OF EXISTING FACILITIES

- A. The Contractor's attention is directed to the possible existence of pipe and other underground improvements that may or may not be shown on the Approved Plans. Once discovered, the Contractor shall preserve and protect all such improvements whether

shown on the Approved Plans or not. The Contractor shall provide and install suitable safeguards, and shall be responsible for the care and protection of all existing sewer and water pipe, electrical and telephone conduits, gas mains, culverts, or other above-ground or below-ground facilities or structures which may be encountered in or near the area of work. It shall be the responsibility of the Contractor to notify each agency of jurisdiction and utility company and to make arrangements for location of facilities prior to beginning construction. In the event of damage to existing facilities during the progress of the work, such facilities shall be replaced or restored to original condition, as determined by District, at the Contractor's expense.

- B. The Contractor shall be responsible for determining in advance the location, elevation, alignment and pipe type and size of all existing pipelines to which connections are to be made. Potholing to determine location will be allowed only after providing the District with three (3) day's advance notice. The Contractor is required to contact Underground Service Alert (USA) at 1-800-227-2600 or 1-800-422-4133 for mark-out of all utilities in the area of the work.
- C. If the Contractor, either before commencing work or during the course of the work, finds any discrepancy between specifications or drawings and the physical conditions at the site of the work, Contractor shall promptly notify the District in writing of such discrepancy.

1.18 PROTECTION OF LANDSCAPING

- A. The Contractor shall be responsible for the protection of all trees, shrubs, fences, and other landscape items adjacent to or within the work area, unless specific removals are indicated on the Approved Plans.
- B. In the event of damage to landscape items, including the thickness of topsoil, the Contractor shall replace the damaged items in kind, in a manner satisfactory to the District and the Developer.
- C. When pipelines are proposed within planted or otherwise improved areas in public or private easements, the Contractor shall restore such areas to original condition after completion of the work.
- D. When pipelines are proposed within unimproved areas, the ground surface shall be dressed smooth to the contour of the original ground and left in a neat, presentable condition, free of cleared vegetation, rubbish and other construction wastes. Rocks and clumps that cannot be readily covered by spreading shall be hauled away and disposed of by the Contractor.
- E. Unimproved areas disturbed during construction of the pipeline shall be hydro seeded in accordance with these Standard Specifications.

1.19 PUBLIC UTILITIES

- A. In case it should be necessary to relocate or temporarily maintain the property of any public utility or any other property, and it is understood that the cost of such relocation or temporary maintenance is not required to be borne by the owner of the utility or property, the Contractor shall bear all expenses incidental to the removal or temporary maintenance of such property in a manner satisfactory to said owner. It is understood that in such cases, the utility or property owner has the option of doing such work with his or her own forces, or permitting the work to be performed by the Contractor.

- B. The right is reserved to the State, County, City, District or utility owners to enter at any time upon any street, alley, right of way or easement for the purpose of making changes for maintenance or repairs to their property necessitated by the Contractor's work.

1.20 UTILITIES CROSSING WATER, RECYCLED WATER OR SEWER FACILITIES

Wherever new utilities cross under or over water, recycled water or sewer facilities, the minimum vertical separation shall be 300mm (12") unless otherwise approved by the District Engineer. All new utilities crossing under or over water, recycled water or sewer facilities shall remain exposed until inspected and approved by the District Engineer. Wherever new utilities cross under or over water, recycled water or sewer facilities, backfill and compaction within the limits of the water, recycled water, or sewer facility trench width shall be in strict conformance with the backfill and compaction requirements specified herein.

1.21 HORIZONTAL SEPARATION OF UTILITIES PARALLELING WATER, RECYCLED WATER OR SEWER FACILITIES

Wherever new utilities parallel water or sewer facilities, the minimum horizontal separation shall be such that 36" of undisturbed soil separates adjacent trench edges, and a minimum of 6' separates pipelines, unless otherwise approved by the District Engineer.

1.22 PROTECTION OF WORKERS IN TRENCH EXCAVATION

Whenever work involves trench excavation, the Contractor shall provide all necessary shoring, bracing, sloping, or other provisions to be made for worker protection from hazard of caving ground during the excavation. If such plan varies from the shoring system standards established by the Construction Safety Orders of the Division of Industrial Safety, a Civil Engineer or Structural Engineer registered in the State of California shall prepare the plans.

Contractor shall comply with the Safety Orders of California, Code of Regulations: Title 8, Section 1539 (Excavation, Trenches, Earthwork).

1.23 WORK WITHIN CONFINED SPACES

The Contractor shall comply with all Federal and State regulations for confined space entry. Work inside confined spaces as defined by the applicable regulations shall not be undertaken until all the tests and safety provisions of the Code of Federal Regulations 1910.146, and the Safety Orders of the California Code of Regulations Title 8 Article 108 sections 5156 et seq. for confined space entry have been performed and the area is verified as safe to enter.

1.24 CONSTRUCTION EQUIPMENT

The Contractor shall furnish appropriate construction equipment to perform the work in accordance with the Approved Plans and Specifications. Such equipment shall be in a good state of repair and shall be maintained in such state during the progress of the work. In no case shall the manufacturer's rating or capacity limitations for any equipment be exceeded.

1.25 STORAGE OF MATERIALS

All materials for use in the work shall be stored by the Contractor in such manner as to prevent damage from exposure to the elements, admixture of foreign materials, or from any other cause. The Contractor shall be entirely responsible for damage or loss by weather or other causes. The Material Safety Data Sheets (MSDS) for all products to be used in the work shall be kept on-site by the Contractor, and the material manufacturer's recommendations for proper storage of its products shall be strictly followed.

Materials shall not be stored on District property without the written permission of the Engineer. The Contractor shall be responsible to provide its own storage area or property. Materials for use on the work shall be stored on private property only as allowed by law and with the written permission of the property owner, and a copy of such permission shall be provided to the District. In addition, a release letter signed by said property owner and stating that materials are no longer stored on the property and that Contractor has restored the area to original condition is required prior to the filing of the Notice of Completion.

1.26 HOURS OF WORK

The normal hours of work shall be between the hours of 7:30 a.m. and 4:30 p.m., Monday through Friday, excepting District-recognized holidays or as modified by Permits. The District shall receive written notice 5 days prior to any proposed change in work hours. In no case shall any work be performed outside of the normal working hours indicated above without prior approval by the District. Work hours associated with shutdowns shall be per Section 01115.

1.27 WATER AND POWER FOR CONSTRUCTION PURPOSES

Water for construction purposes:

- A. The Agency will provide water service at no cost to the contractor personnel, including construction water.
- B. Location of meter will be determined during the Pre-Construction Meeting and placed by District before start of Work
- C. Damage caused to the meter will be charged to the Contractor.
- D. Water for construction purposes outside the District's service area shall be obtained from the District within which the project lies.

Contractor shall make all arrangements for electrical power required during construction.

1.28 HOUSEKEEPING DURING CONSTRUCTION AND FINAL CLEAN-UP

- A. The Contractor shall provide suitable drainage and shall erect such temporary structures as are necessary to protect the work or materials from damage. The Contractor shall rebuild, repair, restore, and make good all injuries, losses, or damages to any portion of the work or the materials occasioned by any cause before the acceptance of the work by District and shall bear the expense thereof.
- B. The Contractor shall, at all times during the course of the work, maintain work areas and all adjacent properties and public access roads free from accumulations of waste, debris, rubbish or construction materials.
- C. The Contractor shall conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

- D. Dry materials and rubbish shall be moistened to prevent blowing dust. Loads of excavated materials leaving the site or being imported to the site shall be covered or moistened to prevent blowing dust.
- E. Upon completion of the work, and before making application for acceptance of the work, the Contractor shall clean all rights-of-way, streets, borrow pits, and all other grounds occupied by him in connection with the work. All rubbish, excess materials, temporary structures and equipment shall be removed. All parts of the work shall be left in a neat and presentable condition, as determined by the Engineer, prior to acceptance of the work by District.

1.29 HAZARDOUS WASTE AND UNKNOWN PHYSICAL CONDITIONS

If conditions listed below are found during construction, or if any other conditions are found during construction that may be detrimental to the District's facilities being constructed, or to the health and safety of the public, the Contractor shall promptly notify the District.

- A. Material that the Contractor or Engineer believes may be hazardous waste, as defined in Section 25117 of the Health and Safety Code, and is thus required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law. If such material is discovered, Contractor shall immediately cease work and shall not disturb the job site except as required to protect public safety.
- B. Subsurface or latent physical conditions at the site differing from those indicated.
- C. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided in the Contract.

The Contractor shall promptly inform the District of any such conditions found during construction. The District shall investigate the conditions, and if it finds that the conditions do materially differ from those shown or expected, or do involve material that may be hazardous waste, Contractor shall cease work in the impacted area. If material that may be hazardous waste is discovered, the Developer shall insure that the appropriate government agencies are contacted prior to any further work being performed and that a solution is implemented.

1.30 WORK TO BE DONE

The work to be done consists of furnishing all materials, equipment, labor and all other items necessary for the construction and installation of a complete facility as shown on the Approved Plans and in accordance with these Standard Specifications. In some instances, the District may furnish certain materials and services, which will be expressly called out on the Approved Plans.

The District's approval of the plans prepared by a Private Engineer denotes agreement with the plans as prepared and is not an acceptance of responsibility as to accuracy. The Private Engineer shall be responsible for any errors, coordination with other agencies/utilities and interpretation of plans. The intent is that the completed Work shall be in general conformance with the Approved Plans and in accordance with the requirements of these Standard Specifications.

1.31 SCHEDULE

The Contractor shall submit for approval a detailed schedule of work as described in Specification Section 01115, Construction Sequence.

1.32 CHANGES TO THE WORK

If the District, due to conditions that change during the progress of the work, determines it impracticable for the Contractor to strictly comply with the Approved Plans or the Standard Specifications, the District may prescribe a modification of requirements. The District may at any time during the life of the project, by written order, make such changes as it may find necessary in the design, line, grade, form, location, dimensions, plan or material of any part of the work originally specified or shown on the Approved Plans.

1.33 RECORD DRAWINGS

- A. During the course of the work, the Contractor shall keep accurate and updated records of the changes made to the work. The changes may be dictated by field conditions, unknown obstructions, design oversight, or other circumstances determined to be in the best interest of the District.
- B. At the end of the project, the Contractor shall provide the District with two sets of prints, with all changes redlined. In addition to the field changes, the correct location of all water and sewer services and driveway centerlines with stations shall be indicated. The District's field representative shall verify that all changes have been included. All revisions will be incorporated.
- C. Owner to do final verification survey and draw As-Builts based on redlined drawings provided by the Contractor.

1.34 PROJECT CLOSEOUT AND FINAL ACCEPTANCE

The District's Board of Directors or designee shall be responsible for final acceptance of all projects. The following items of work shall be completed prior to final acceptance by District:

- A. The project has been completed in accordance with the Approved Plans, the job specifications and these Standard Specifications.
- B. Final inspection has been performed by District. Any "punch list" items generated by preliminary inspection shall have been completed.
- C. Record drawings reflecting any changes to the project have been submitted to the District's Inspection Department in accordance with these Standard Specifications.
- D. A Soils Test Report has been submitted to the District in accordance with Section 02223 of these Standard Specifications.
- E. All aspects of the Construction Agreement have been completed to the satisfaction of the District.

Following final acceptance by the District, the District will prepare a Notice of Completion and will have such Notice recorded by the County Recorder.

1.35 WARRANTY

- A. The work shall be guaranteed against failure due to defective materials or workmanship for a period of one (1) year from the recording date of the Notice of Completion. The one-year warranty period shall not, in any way, affect the liability of any party for latent or patent defects allowed for under State law.
- B. All repairs shall be made pursuant to the Development Agreement with the District and in accordance with the District's Rules and Regulations and current Standard Specifications.

1.36 WARRANTY INSPECTION

The District will perform a warranty inspection prior to the expiration of the one-year warranty period. The Developer will be notified in writing of any deficiencies revealed by this inspection. The warranty bond will not be released until the required repairs are completed. If the warranty inspection is satisfactory, the District will release the warranty bond at the end of the one-year warranty period.

PART 2 MATERIALS
"Not Used"

PART 3 EXECUTION
"Not Used"

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section defines the Lump Sum Prices listed in the Bid Schedule, and the manner in which they will be used to determine measurement and payment for all items included in the Bid Schedule. Parts 2 and 3 of this section describe the procedures required to be followed for monthly progress payments to the CONTRACTOR.
- B. Payment for all items of the Bid Schedule shall include all compensation to be received by the CONTRACTOR for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of WORK being described, as necessary to complete the various items of the WORK all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, including Safety and Health Requirements of the California Division of Industrial Safety and the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs shall be included in the prices named in the Bid Schedule for the various items of WORK.
- C. Monthly pay requests are due by the 10th of each month. Failure of the CONTRACTOR to submit his pay request by this date may be cause for the rejection of the pay request. If rejected, the CONTRACTOR will have to resubmit his pay request the next month. Should the submittal date fall on a holiday or weekend day during the month then the CONTRACTOR shall consider the next working day as the due date.

1.02 MEASUREMENT AND PAYMENT

- A. General: This article defines the manner and method to develop the Lump Sum bid amounts of all items identified in the Bid Schedule. Bid amounts will include all plant, equipment, tools, materials, labor, service, and all other items required to complete the WORK included in the Contract unless specifically excluded by this section. WORK required for which no separate bid item is identified will be considered as a subsidiary obligation of the CONTRACTOR, and the cost therefore shall be included in the most applicable bid item.

- A. Total Bid Price Contract Required WORK includes

Payment for Mobilization/Demobilization shall constitute full compensation for completion of all mobilization, demobilization and insurance associated with construction activities for Contractor required efforts furnishing and constructing all facilities, complete as defined within these Contract Documents.

Payment for general construction shall constitute full compensation for completion of all supervision, planning, design, engineering and all construction and permit fees associated with construction activities for Contractor required efforts furnishing and constructing all facilities, complete as defined within these Contract Documents.

PART 2 - PRODUCTS

2.01 GENERAL PROGRESS PAYMENT REQUIREMENTS

- A. Earned value is derived from the current status of the CONTRACTOR Construction Schedule as determined by the monthly schedule status submittals. Each schedule status submittal is reviewed and approved by the District prior to the CONTRACTOR obtaining approval for the Summary of Earned Values or quantities installed and the Application for Payment.

PART 3 - EXECUTION

3.01 MONTHLY REVIEWS/APPLICATION FOR PAYMENT

- A. Monthly review meetings between the CONTRACTOR and the District will be held within 7 days prior to the payment application date designated by the District. Prior to the monthly review meeting, the CONTRACTOR will submit the record of approved quantities installed and a signed application for payment showing a Summary of Earned Values for the reporting and payment period so that the District can compare earned values to available status data. The CONTRACTOR shall make any adjustments to the Master Record Documents, updated schedule, and payment applications deemed necessary. Upon completion of the adjustments the District will sign the payment request.

END OF SECTION

SECTION 01070

ABBREVIATIONS

PART 1 GENERAL

1.01 DESCRIPTION

This section describes abbreviations and how they are used in these specifications and on the Approved Drawings.

1.02 REFERENCED STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for.

CSI TD-2-4	-	Construction Specifications Institute Abbreviations
SSPWC	-	Standard Specifications for Public Works Construction "Greenbook"

1.03 DESCRIPTION

- A. When references are made in these specifications to the standards, specifications, or other published data of various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only.
- B. If an abbreviation is not listed below it shall be as described in Document TD-2-4 of the Construction Specifications Institute (CSI).
- C. Where the use of the San Diego Area Standard Specifications for Public Works Construction "Greenbook" or Regional Standard Drawings are required, reference should be made to the SSPWC for the use and description of abbreviations.
- D. Abbreviations can have more than one meaning. The abbreviation shall be considered with respect to different disciplines where the context in which each is used makes the meaning clear.
 1. Example:
 - a. FF means "finish floor" when referring to a floor slab.
 - b. FF means "flat face" when referring to a pipe flange.
- E. Discrepancies shall be noted and brought to the District's attention for interpretation.

1.04 LIST OF ABBREVIATIONS

The following list of abbreviations is for use in these Standard Specifications and the Approved Plans:

<u>ABBREVIATION</u>	<u>TERMS</u>
A	Ampere/Area
AA	Aluminum Association
AASHTO	American Association of State Highway and Transportation Officials
AB	Anchor Bolt/Aggregate Base
ABAN	Abandoned
ABC	Asphalt Base Course
AC	Acre/Asphalt Concrete/Alternating Current
ACI	American Concrete Institute
ACP	Asbestos-Cement Pipe
ACU	Access Door
AE	Architect-Engineer
AFF	Above Finished Floor
AGG	Aggregate
AI	The Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction, Inc.
AISI	American Iron and Steel Institute
AL	Aluminum
AMB	Ambient
AMP	Ampere
ANG	Angle
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
APWA	American Public Works Association
ARCH	Architecture/Architectural
ARV	Air-Release Valve
ARVV	Air-Release and Vacuum Valve
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPH	Asphalt
ASSY	Assembly
ASTM	American Society for Testing and Materials
ATS	Automatic Transfer Switch
AVE	Avenue
AVG	Average
AWG	American Wire Gage
AWS	American Welding Society
AWWA	American Water Works Association
BB	Back-to-Back
BC	Beginning of Curve/Back of Curb/Bare Copper
BEG	Begin
BETW	Between
BF	Blind Flange
BHP	Brake Horsepower
BK	Back/Brake
BKR	Breaker
BL	Building
BLK	Block
BLVD	Boulevard
BM	Bench Mark/Beam
BO	Blowoff
BOP	Bottom of Pipe

<u>ABBREVIATION</u>	<u>TERMS</u>
BOT	Bottom
BP	Baseplate
BRG	Bearing
BRNZ	Bronze
BTN	Button
BTU	British Thermal Unit
BUR CBL	Buried Cable
BFV	Butterfly Valve
BVC	Begin Vertical Curve
BW	Block Wall
C	Conduit/Celsius/Civil Drawings/Copper
CAB	Crushed Aggregate Base
CAP	Capacity
CB	Catch Basin/Circuit Breaker
CC	Cooling Coil
C-C	Center-to-Center
CCB	Concrete Block
CCP	Concrete Cylinder Pipe
CD	Cross Drain/Condensate Drain/Ceiling Diffuser
CEM	Cement
CF	Cubic Feet/Curb Face
CFH	Cubic Feet per Hour
CFM	Cubic Feet per Minute
CFS	Cubic Feet per Second
CG	Construction Grade
C&G	Curb and Gutter
CHG	Change
CHKD PL	Checkered Plate
CI	Cast Iron
CIP	Cast In Place/Cast-Iron Pipe
CISP	Cast Iron Soil Pipe
CISPI	Cast-Iron Soil Pipe Institute
CJ	Construction Joint
CL	Centerline/Class/Clearance/Chlorine
CLIP	Concrete Lined In-Place Steel Pipe
CLR	Clear
CMLC	Cement-Mortar Lined & Coated Steel Pipe
CMLSP	Cement-Mortar Lined Steel Pipe
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
CMU	Concrete Masonry Unit
CO	Cleanout/Conduit Only
COL	Column
COMM	Communication
COMP	Composite
COMPL	Complete
CONC	Concrete
CONN	Connection
CONST	Construct or Construction
CONT	Continuous
CONTR	Contractor
COORD	Coordinate/Coordinated
COP	Copper
COR	Corner
CORP	Corporation

<u>ABBREVIATION</u>	<u>TERMS</u>
CP	Cathodic Protection
CPLG	Coupling
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard, US Department of Commerce
CT	Center Top/Current Transformer
CTG	Coating
CTR	Center
CULV	Culvert
CU YD, CY	Cubic Yard
CYL	Cylinder
D	Degree of Curvature
DB	Direct Buried/Decibel
DBL	Double
DC	Direct Current
DEPT	Department
DET	Detail/Detour
DG	Decomposed Granite
DI	Drop Inlet
DIA	Diameter
DIAG	Diagonal
DIM	Dimension
DIMJ	Ductile-Iron Mechanical Joint
DIP	Ductile-Iron Pipe
DIPRA	Ductile-Iron Pipe Research Association
DISCH	Discharge
DIST	Distance
DMH	Drop Manhole
DN	Down
DR	Drain/Door
DSL	Diesel
DWG	Drawing
DWY	Driveway
E	East/Electrical Drawings
EA	Each
EC	End of Curve
ECC	Eccentric
ED	External Distance
EE	Each End
EF	Each Face/Exhaust Fan
EFF	Efficiency
EFL	Effluent
EGL	Energy Grade Line
EL	Elevation/Each Layer
E/L	Easement Line
ELEC	Electric
ELP	Elliptical
ENC	Encasement or Encased
ENCL	Enclosure
ENG	Engine
ENGR	Engineer
EOS	Equivalent Opening Size
EP	Edge of Pavement/Explosion Proof
EPA	Environmental Protection Agency (Federal)

<u>ABBREVIATION</u>	<u>TERMS</u>
EQ	Equation
EQL	Equal
ESMT	Easement
EST	Estimate or Estimated
ETC	And so Forth
EVC	End Vertical Curve
EW	Each Way
EXC	Excavate or Excavation
EXP	Expansion
EXST	Existing
EXT	Exterior/Extension
F	Fahrenheit/Floor
FAB	Fabricate
FBRBD	Fiberboard
FC	Foot-Candle
FCO	Floor Cleanout
FCV	Flow Control Valve
FD	Floor Drain
FDN	Foundation
FE	Flanged End/Fence
Fed Spec	Federal Specification
FF	Finished Floor/Flat Face
FG	Finished Grade
FH	Fire Hydrant
F&I	Furnish and Install
FIG	Figure
FIP	Female Iron Pipe Thread
FIT	Fitting
FL	Floor/Flow Line
FLG	Flange
FM	Force Main/Factory Mutual
FMH	Flexible Metal Hose
FNSH	Finish
FOC	Face of Concrete
FPC	Flexible Pipe Coupling
FPM	Feet per Minute
FPS	Feet per Second
FPUD	Fallbrook Public Utility District
FS	Finished Surface/Floor Sink/Federal Specifications
FSTNR	Fastener
FT	Feet
FTG	Footing
FUT	Future
G	Gas/General Drawings/Gram
GA	Gage
GAL	Gallon
GALV	Galvanized
GB	Grade Break
GDR	Guard Rail
GR	Grooved End
GENL	General
GFI	Ground Fault Interrupter
GM	Gas Main

<u>ABBREVIATION</u>	<u>TERMS</u>
GND	Ground
GPD	Gallons per Day
GPM	Gallons per Minute
GR	Grade
GSKT	Gasket
GUT	Gutter
GV	Gate Valve
H	Humidistat/Horizontal
HARN	Harness
HB	Hose Bib
HD	Heavy Duty
HDPE	High-Density Polyethylene Pipe
HGL	Hydraulic Grade Line
HGT	Height
HMWPE	High-Molecular Weight Polyethylene
HORIZ	Horizontal
HP	Horsepower/High Pressure
HPT	High Point
HR	Hour/Handrail
HS	High Strength
HV	Hose Valve
HVAC	Heating, Ventilating, and Air Conditioning
HW	Headwall/Hot Water
HWL	High Water Level
HWY	Highway
HYDR	Hydraulic
HZ	Hertz (cycles per second)
I	Intersection Angle/Instrumentation Drawings
ICBO	International Conference of Building Officials
ID	Inside Diameter
IE	Invert Elevation
IN	Inches
INCL	Include
INL	Inlet
INSUL	Insulating
INSTL	Install or Installation
INT	Interior
INTR	Intersection
INV	Invert
I/O	Inlet/Outlet
IP	Iron Pipe
IPS	Iron Pipe Size
IPT	Iron Pipe Thread
IRR	Irrigation
JB	Junction Box
JCT	Junction
JN	Join
JT	Joint
KG	Kilogram
KM	Kilometer
KIPS	Thousands of Pounds

<u>ABBREVIATION</u>	<u>TERMS</u>
KPA	Kilopascal
KV	Kilovolt
KW	Kilowatt
KWH	Kilowatt-Hour
KWHM	Kilowatt-Hour Meter
L	Length of Curve/Long/Landscaping Drawings
LATL	Lateral
LB	Pound
LCL	Local
LF	Linear Foot
LNDSCL	Landscaping
LOCN	Location
LP	Light Pole
LPT	Low Point
LR	Long Radius
LS	Lift Station
LT	Left/Light
LWC	Lightweight Concrete
LWIC	Lightweight Insulating Concrete
LWL	Low Water Level
M	Mechanical Drawings/Meter
MATL	Material
MAX	Maximum
MB	Machine Bolt/Megabyte/Millibars
MC	Metal Channel
MCM	Thousand Circular Mils
ME	Machined End
MECH	Mechanical
MFR	Manufacturer
MG	Million Gallons / mg = milligram
MGD	Million Gallons Per Day
MH	Manhole
MHZ	Megahertz
MI	Malleable Iron/Mile
MIL	Military Specifications
MIL-	Military Specification (leading symbol)
MIN	Minimum
MIP	Male Iron Pipe Thread
MISC	Miscellaneous
MJ	Mechanical Joint
MM	Millimeter
MO	Motor Operator/Motor Operated/Masonry Opening
MOD	Modification
MON	Monument
MOT	Motor
MOV	Motor Operated Valve
MSDS	Material Safety Data Sheet
MSL	Mean Sea Level
MTD	Mounted
N	North/Neutral/Nitrogen
NA	Not Applicable
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards

<u>ABBREVIATION</u>	<u>TERMS</u>
N & C	Nail and Cap
NC	Normally Closed
NCV	Normally Closed Valve
NE	Northeast
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFC	National Fire Code
NFPA	National Fire Protection Association
NIC	Not in Contract
NIP	Nipple
NO	Number/Normally Open
NOM	Nominal
NPT	National Pipe Taper
NRS	Non-Rising Stem
NSF	National Sanitation Foundation
NTS	Not to Scale
NW	Northwest
NWL	Normal Water Level
OA	Overall/Outside Air
OC	On Center/Overcurrent
OD	Outside Diameter
OE	Or Equal
OF	Outside Face
OFCI	Owner-Furnished Contractor-Installed
OFCR	Owner-Furnished Contractor-Relocated
OPER	Operator
OPNG	Opening
OPP	Opposite
OSHA	Occupational Safety and Health Administration, U.S. Department of Labor, as defined in the General Conditions
O TO O	Out to Out
OUTL	Outlet
OVFL	Overflow
OVHD	Overhead
P	Pole
PARA	Paragraph
PB	Push Button/Pull Box
PC	Point of Curvature/Programmable Controller
PCA	Portland Cement Association
PCC	Point of Compound Curvature/Portland Cement Concrete
PDMWD	Padre Dam Municipal Water District
PE	Plain End/Polyethylene/Professional Engineer
PEN	Penetration
PG	Pressure Gage
PI	Point of Intersection
PJTN	Projection
PKWY	Parkway
PL	Plate/Property Line
PLATF	Platform
PLF	Pounds per Lineal Foot
PM	Parcel Map
PNL	Panel
PO	Push-On

<u>ABBREVIATION</u>	<u>TERMS</u>
POB	Point of Beginning
POC	Point of Connection
PE	Polyethylene
POR	Portion
PP	Power Pole/Polypropylene
PPB	Parts Per Billion
PPM	Parts Per Million
PR	Pair
PRC	Point of Reverse Curve
PRESS	Pressure
PRL	Parallel
PRPSD	Proposed
PRVC	Point of Reverse Vertical Curve
PSI	Pounds Per Square Inch
PSIG	Pounds Per Square Inch Gage
PSF	Pounds Per Square Foot
PT	Point of Tangency
PV	Plug Valve
PVC	Polyvinyl Chloride/Point of Vertical Curvature
PVI	Point of Vertical Intersect
PVMT	Pavement
PWR	Power
Q	Flow Rate
QTY	Quantity
R	Right/Radius
RAF	Return Air Fan
RC	Reinforced Concrete
RCP	Reinforced Concrete Pipe
RCPA	Reinforced Concrete Pipe Arch
RD	Road
RDC	Reduce
RDCR	Reducer
RDWY	Roadway
REF	Reference
REINF	Reinforce or Reinforced
RELOC	Relocate
REQD	Required
RES	Reservoir
REV	Revise/Revision
RF	Raised Face
RH	Relative Humidity
RJ	Restrained Joint
RND	Round
RM	Record Map
ROS	Record of Survey
RPM	Revolutions Per Minute
RS	Road Survey
RSD	Regional Standard Drawings
RST	Reinforcing Steel
RT	Right
R/W	Right-of-Way
RWGV	Resilient-Wedge Gate Valve

<u>ABBREVIATION</u>	<u>TERMS</u>
S	South
SAE	Society of Automotive Engineers
SAN	Sanitary
SC	Seal Coat
SCADA	Supervisory Control and Data Acquisition
SCFM	Standard Cubic Feet Per Minute
SCHED	Schedule
SCRN	Screen
SD	Storm Drain
SD CO	San Diego County
SDG	Siding
SE	Southeast
SECT	Section
SF	Square Feet
SGL	Single
SH	Sheet/Sheeting/Shielded
SHT	Sheet
SIM	Similar
SKWK	Sidewalk
SLP	Slope
SLV	Sleeve
SM	Sheet Metal
SOL	Solenoid
SOV	Solenoid-Operated Valve
SP	Space/Steel Pipe/Static Pressure/Spare/Stand Pipe
SPCG	Spacing
SPEC	Specification
SPLC	Splice
SPRT	Support
SQ	Square
SS	Sanitary Sewer
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction
SS	Stainless Steel
ST	Street
STA	Station
STBY	Standby
STD	Standard
STK	Stake
STL	Steel
STR	Straight
STRL	Structural
STRUCT	Structure
STS	Storm Sewer
SURF	Surface
SW	Southwest
SWG	Swing
SYMM	Symmetrical
SYS	System
T	Ton/Tangent Length of Curve
TAN	Tangent
T/B	Top of Beam
TB	Top of Bank/Terminal Board
T&B	Top and Bottom

<u>ABBREVIATION</u>	<u>TERMS</u>
TBG	Tubing
TBM	Temporary Bench Mark
TC	Top of Curb
TDH	Total Dynamic Head
TDS	Total Dissolved Solids
TEL	Telephone
TEMP	Temperature/Temporary
THB	Thrust Block
THD	Thread or Threaded
THH	Thrust Harness
THK	Thick
TO	Turnout
T/O	Top of
TOC	Top of Concrete/Top of Curb
TOP	Top of Pipe
TOS	Top of Slab
TOT	Total
TP	Telephone Pole
TRD	Thread
TRA	Tie Rod Assembly
TS	Tube Sheet
TYP	Typical
UBC	Uniform Building Code
UD	Underdrain
UG	Underground
UL	Underwriters Laboratories, Inc.
ULT	Ultimate
UON	Unless Otherwise Noted
UPC	Uniform Plumbing Code
UTC	Underground Telephone Cable
UTIL	Utilities
V	Vent/Valve/Volt/Vertical
VAC	Vacuum/Volts, Alternating Current
VC	Vertical Curve
VEL	Velocity
VERT	Vertical
VFD	Variable Frequency Drive
VOL	Volume
VPC	Vertical Point of Curve
VPI	Vertical Point of Intersection
VPT	Vertical Point of Tangency
W	West/Watt/Wide/Water/Wire
W/	With
WADG	Water Agencies' Design Guide
WAS	Water Agencies' Standards
WASC	Water Agencies' Standards Committee
WE	Weld End
WG	Water Gage
WL	Waterline
WLD	Welded
WM	Water Meter
W/O	Without
WP	Waterproof/Working Point

<u>ABBREVIATION</u>	<u>TERMS</u>
WSE	Water Surface Elevation
WSP	Water Stop
WT	Weight
WTR	Water
WWF	Welded Wire Fabric
WWM	Woven Wire Mesh
WWR	Welded Wire Reinforcement
YCO	Yard Cleanout
YD	Yard
YP	Yield Point
YR	Year
YS	Yield Strength

PART 2 MATERIALS

"NOT USED"

PART 3 EXECUTION

"NOT USED"

END OF SECTION

SECTION 01115

CONSTRUCTION SEQUENCE

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

The Work of this Section shall include, but not be limited to, furnishing all schedules, copies, updates and all other items required to complete the Project in accordance to the Contract Documents.

1.2 CONTRACTOR SUBMITTALS

- A. Within 30 days from the Notice to Proceed, the Contractor shall submit a detailed written sequencing plan, including a schedule that describes the Contractor's proposed work schedule and sequence of work to complete the specified work. The plan shall clearly identify all required operational considerations in order to install new equipment taking into consideration the conditions and constraints identified in Section 1.3. The Contractor shall not be allowed to start any work activities involving without the District's prior approval of the written sequencing plan.

- B. The construction schedule shall include the following as a minimum:
 - 1. The order that the work/segments shall be done and the total duration required.

 - 2. A detailed description of each component of work/task to be performed, when that work will occur and how many hours it will take to perform each component. The Contractor shall be fully responsible for the management of drainage, flushing, and other discharge waters associated with this project.

1.3 SEQUENCE OF WORK

- A. The Contractor sequencing plans shall be prepared based on the following conditions and constraints :
 - 1. The Contractor shall not operate any District equipment or valves. District staff shall be responsible for the operation of the valves and appurtenances. The ability to sequence the Contractor's construction will be directly limited by the resources available from the District to operate the District's valves and appurtenances. The contractor shall provide the District with two weeks' advance notice for any planned work. This will enable the District to accommodate the planned work.

2. As shown in the attached Exhibit 2: Shutdown/Isolation Plan, the Contractor plans shall accommodate the following conditions:
 - A. Area 1: Approximately 24 sf. Isolation is not possible. Cover must be installed while headworks is operating.
 - B. Area 2: Approximately 30 sf. Area can be isolated.
 - C. Area 3: Approximately 40 sf. Isolation is not possible. Cover must be installed while headworks is operating.
 - D. Area 4: Approximately 770 sf. Area can be bypassed.
 - E. Area 5: Approximately 152 sf. Isolation is not possible. Cover must be installed while headworks is operating.
 - F. Area 6: Approximately 12 sf. Area can be isolated.
 - G. Area 7: Approximately 12 sf. Area can be isolated.

3. Due to age and condition of existing slide gates, some leakage from closed gates may be encountered in each area. For those areas that must be installed while operating, the headworks typically runs with at least 3 feet of freeboard.

PART 2 - MATERIALS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01291

SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Submit to ENGINEER for acceptance a Schedule of Values that allocates cost to each item of the Work. Schedule of Value list of line items shall correspond to each aspect of the Work, establishing in detail the portion of the Contract Price allocated to each major component of the Work.
- B. Upon request of ENGINEER, support values with data that substantiate their correctness.
- C. Submit preliminary Schedule of Values to ENGINEER for initial review. CONTRACTOR shall incorporate ENGINEER's comments into the Schedule of Values and resubmit to ENGINEER. ENGINEER may require corrections and re-submittals until Schedule of Values is acceptable.
- D. Schedule of Values and the Progress Schedule updates specified in Section 01321, Progress Schedule, shall be basis for preparing each Application for Payment. Schedule of Values may be used as a basis for negotiating price of changes, if any, in the Work.
- E. Include in Schedule of Values unit price payment items with their associated quantity. Provide in the Schedule of Values detailed breakdown of unit prices when required by ENGINEER.
- F. Requirements for preliminary Schedule of Values and Schedule of Values are:
 - 1. Schedule of Values shall show division of Work between CONTRACTOR and Subcontractors. Line items for Work to be done by Subcontractor shall include the word, "(SUBCONTRACTED)".
 - 2. Schedule of Values shall include breakdown of costs for materials and equipment, installation, and other costs used in preparing the Bid by CONTRACTOR and each Subcontractor. List purchase and delivery costs for materials and equipment for which CONTRACTOR may apply for payment as stored materials.
 - 3. Include separate amounts for each Specification Section in the Contract Documents by structure, building, and work area.
 - 4. Identify each line item with number corresponding to the associated Specification Section number. List sub-items of major products or systems, as appropriate or when requested by ENGINEER.
 - 5. Sum of individual values shown on the Schedule of Values shall equal the total of associated payment item. Sum of payment item totals in the Schedule of Values shall equal the Contract Price.
 - 6. Include in each line item a directly proportional amount of CONTRACTOR's overhead and profit. Do not include overhead and profit as separate item(s).
 - 7. Include separate line item for each allowance, and for each unit price item

8. Include line item for bonds and insurance, in amount not exceeding 2.0 percent of the Contract Price. This may be applied for in the first Application for Payment.
9. Include separate line items under each appropriate payment item for mobilization and demobilization. Document for ENGINEER the activities included in mobilization and demobilization line items.
 - a. Mobilization will be limited to 2 percent of the Contract Price, and will be paid in 2 payments, each of 50 percent of total amount for mobilization.
 - b. Demobilization shall be at least 2 percent of the Contract Price and shall be included with the Application for Payment following Substantial Completion, or other schedule accepted by ENGINEER.
10. Schedule of Values shall include an itemized list of Work by work area, as applicable.
11. Submit Schedule of Values on 8.5-inch by 11-inch white paper, using the continuation sheets of the Application for Payment.

1.2 SUBMITTALS

- A. Informational Submittals: Submit the following:
 1. Submit to ENGINEER 3 copies of Schedule of Values.
 2. Content of Schedule of Values submittals shall conform to Article 1.1 of this Section.
 3. Time Frames for Submittals:
 - a. Submit preliminary Schedule of Values within ten days of date that the Contract Times commence running in accordance with the Notice to Proceed.
 - b. Submittal of the Schedule of Values shall be in accordance with the General Conditions. ENGINEER will not accept Applications for Payment without an acceptable Schedule of Values.
 - c. When required by ENGINEER, promptly submit updated Schedule of Values to include cost breakdowns for changes in the Contract Price.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01310

PRE-CONSTRUCTION MEETINGS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. A pre-construction conference will be held for the Project. CONTRACTOR shall attend the conference prepared to discuss all items on the agenda. The representatives present for each party shall be authorized to act on their behalf.
- B. Purpose of the conference is to designate responsible personnel, establish working relationships, and establish administrative provisions for the Project. Matters requiring coordination will be discussed and procedures for handling such matters will be established.
- C. Date, Time and Location: Conference will be held after execution of the Contract and before Work starts at the Site. ENGINEER will determine the date, time, and location of the conference and advise the interested and involved parties.
- D. ENGINEER will distribute an agenda, preside at the conference, and prepare and distribute meeting minutes to all meeting participants and others as requested.
- E. CONTRACTOR shall provide data required and contribute appropriate items for discussion. Unless previously submitted to ENGINEER, CONTRACTOR shall bring to the conference a draft of each of the following:
 - 1. Progress Schedule.
 - 2. List of required Shop Drawings and submittals.
 - 3. Schedule of Values.
 - 4. CONTRACTOR'S Site-specific health and safety plan.
 - 5. List of emergency contact information.

1.2 REQUIRED ATTENDANCE

- A. Conference shall be attended by CONTRACTOR'S project manager, Site superintendent, and major Subcontractors and major equipment Suppliers, as CONTRACTOR deems appropriate.
- B. Other attendees will be representatives of:
 - 1. OWNER.
 - 2. ENGINEER.
 - 3. Governmental agencies having control or responsibility, if available.
 - 4. Utility companies.
 - 5. Others as requested by OWNER, CONTRACTOR, or ENGINEER.

1.3 AGENDA

- A. Agenda: A complete agenda will be furnished to CONTRACTOR prior to the conference. However, CONTRACTOR shall be prepared to discuss the following:
 - 1. Designation of responsible personnel.

2. Communications and correspondence.
3. Shutdown Coordination.
4. Emergency contact information.
5. Review of scope of Work.
6. Review of Contract Times, Milestones, and completion dates.
7. Subcontractors.
8. Progress Schedule.
9. Schedule of Values.
10. Project coordination and coordination with OWNER'S operations.
11. Progress meetings.
12. Submittals and Shop Drawings: processing and schedule of submittals
13. Substitutions.
14. Payments, retainage, payrolls, and Substantial Completion.
15. Processing of Field Orders and Change Orders.
16. Use of premises, security, housekeeping, safety, CONTRACTOR'S responsibility for safety and first aid procedures, Site access.
17. Field offices, trailers, temporary facilities.
18. Storage of materials.
19. Construction photographs.
20. Record drawings.
21. Clarifications.
22. Requirements for copies of Contract Documents and availability.
23. Layouts and surveys.
24. Hours of Work and overtime.
25. Permits.
26. Insurance in force.
27. Disposal of demolition materials and Dewatering.
28. Project Water and Location of Construction Meter
29. Next meeting.
30. General discussion and questions.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01311

PROJECT COORDINATION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. As more fully set forth in of the General Conditions, CONTRACTOR shall coordinate the Work, including his Subcontractors and Suppliers, as required to complete the Work within the Contract Times.
- B. As set forth in the General Conditions, CONTRACTOR shall cooperate with and coordinate the Work with other CONTRACTORS, including utility service companies or OWNER'S employees performing Work at the Site.
- C. CONTRACTOR will not be responsible or liable for damage unless it is through the negligence of CONTRACTOR.
- D. CONTRACTOR shall also coordinate the Work with the others to assure compliance with schedules.
- E. CONTRACTOR shall attend and participate in all project coordination and progress meetings and report on the progress of all Work and compliance with Progress Schedules.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01312

PROGRESS MEETINGS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Progress meetings will be held throughout the Project. CONTRACTOR shall attend each meeting prepared to discuss all items on the agenda. The representatives present for each party shall be authorized to act on their behalf.
- B. Date and Time:
 - 1. Regular Meetings: Bi-weekly on a day and time agreeable to OWNER, ENGINEER, and CONTRACTOR.
 - 2. Other Meetings: As required.
- C. Place: FPUD office.
- D. OWNER will preside at meetings and prepare and distribute meeting minutes to all meeting participants and others as requested.
- E. CONTRACTOR shall provide data required including, at each meeting, a minimum of five (5) copies of each of the following handouts:
 - 1. List of work accomplished since the previous meeting.
 - 2. Schedule of Work (with specific starting and ending dates for each task) planned until the next meeting.
 - 3. "Look-ahead" schedule of Work for major shutdowns, major equipment installations, and other important Milestones.
 - 4. When applicable, list of upcoming, planned time off (with dates) for personnel with significant roles on the Project, and the designated contact person in their absence.

1.2 MINIMUM ATTENDANCE

- A. CONTRACTOR:
 - 1. CONTRACTOR'S project manager.
 - 2. CONTRACTOR'S site superintendent.
 - 3. When needed for the discussion of a particular agenda item, CONTRACTOR shall require representatives of Subcontractors or Suppliers to attend a meeting.
- B. OWNER's representative, as required.
- C. Others, as appropriate.

1.3 AGENDA

- A. Agenda will include, but will not necessarily be limited to, the following:
1. Review and comment on minutes of previous meeting.
 2. Review of progress since the previous meeting.
 3. Planned progress and shutdowns for next period.
 4. Review of overall project schedule, including off-site fabrication and delivery schedules and corrective measures, if required.
 5. Review of status of critical submittals, including Shop Drawings and Applications for Payment.
 6. Review of CONTRACTOR Requests for Information (RFI).
 7. Review of change issues and change orders.
 8. Problems, conflicts and observations.
 9. Quality standards and control.
 10. Coordination between parties.
 11. Safety concerns.
 12. Permits.
 13. Construction photographs.
 14. Record drawings.
 15. Punch list status.
 16. Other business.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01321

PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section describes the Progress Schedule requirements to be performed by CONTRACTOR.
- B. ENGINEER's acceptance of the Progress Schedule, and comments or opinions concerning the various scheduling documents and reports shall not control CONTRACTOR's independent judgment concerning means, methods, techniques, sequences and procedures of construction that CONTRACTOR employs. CONTRACTOR is solely responsible for meeting the Contract Time(s).
- C. Payment for progress or mobilization will not be paid to CONTRACTOR until the 90-day Bar Chart is accepted. Refer to Paragraph 1.2.A., below.
- D. All Activities of CONTRACTOR shall be scheduled and monitored by use of a Bar Chart Progress Schedule. CONTRACTOR shall provide a Bar Chart Progress Schedule for Work done under this Contract, in accordance with this Section, and the sequence and progress of the Work requirements included under Section 01110 - Summary of Work, Section 01143 - Coordination with OWNER's Operations, and the Construction Sequence Diagram.
- E. In the preparation of the Progress Schedule, CONTRACTOR shall take into consideration submittal requirements and approval time, delivery times for equipment and materials, Subcontractors' work, availability and abilities of workman, weather conditions, any restrictions in operations at the Site, and all other factors that may affect completion of the Work within the Contract Times.
- F. In addition to construction, network Activities shall include the submittal and approval of samples of materials, Shop Drawings and fabrication of special materials. It shall include collection and submittal of all documents and proofs of compliance required by the Contract Documents for final inspection and acceptance of the Work.

1.2 PROGRESS SCHEDULE SUBMITTAL

- A. No later than 28 calendar days after the Notice to Proceed, CONTRACTOR shall submit to the ENGINEER the complete Progress Schedule in Bar Chart format. The first submittal of the Progress Schedule is the preliminary Progress Schedule. ENGINEER and CONTRACTOR shall meet bi-weekly to review the progress of the development of the Progress Schedule. Lack of progress in the development of the Progress Schedule shall be cause for suspension of any progress payment. The Progress Schedule will be reviewed by the ENGINEER within 14 calendar days of receipt or request for adjustment. A meeting, or meetings, may be required with the CONTRACTOR during this period in order to expedite acceptance or adjustment.

Any adjustments required after this period shall be made and resubmitted by CONTRACTOR within 14 calendar days.

- B. If, in the preparation of the Progress Schedule, CONTRACTOR reflects a completion date or milestone date different than that specified in the Contract Documents, this in no way voids the dates set therein. The dates as specified in the Contract Documents govern. Where the Progress Schedule reflects a completion date or milestone date earlier than specified, the ENGINEER may accept such Progress Schedule with CONTRACTOR specifically understanding that no claim for an adjustment in Contract Times or Contract Price shall be brought against the OWNER as the result of CONTRACTOR's failure to complete the Work by the earlier date shown on the Progress Schedule.

1.3 UPDATING THE PROGRESS SCHEDULE

- A. Updates:
 - 1. CONTRACTOR shall update the Bar Chart Schedule on a monthly basis.
 - 2. Revisions and additions to the accepted progress schedule shall be submitted in PDF format and two hard copies each 11-inch by 17-inch.

1.4 TIME IMPACT ANALYSIS FOR CHANGE ORDERS, DELAYS, AND TIME EXTENSIONS

- A. Change Orders, Delays, and Time Extensions:
 - 1. When a Change Order is proposed by the ENGINEER or CONTRACTOR, or delays are experienced, CONTRACTOR shall submit a Time Impact Analysis illustrating the influence of each Change Order or delay on any specified intermediate Milestone date(s) or Contract completion date. Each Time Impact Analysis shall demonstrate how the CONTRACTOR proposes to incorporate the change(s) or delay(s) into the Progress Schedule.
- B. Submittal:
 - 1. Each Time Impact Analysis shall be submitted within 3 calendar days after a delay occurs or a notice of change or proposed Change Order is given to CONTRACTOR. In cases where CONTRACTOR does not submit a Time Impact Analysis for a specific change or delay within the specified period of time, it shall be mutually agreed that no time extension is required.
- C. Evaluation:
 - 1. Final evaluation of each Time Impact Analysis by the ENGINEER will be made within 7 calendar days after receipt, unless subsequent meetings and negotiations are necessary. Adjustments in the Contract Times will be made only by Change Order.

1.5 RECOVERY SCHEDULE

- A. In the event that an updated Progress Schedule indicates that the Project, or a Milestone requirement, falls 14 or more work days behind schedule and there is no excusable delay or change to support a time extension, CONTRACTOR shall prepare and submit a Recovery Schedule for acceptance by the ENGINEER.

CONTRACTOR shall revise logic or durations to show the Project on schedule. The Recovery Schedule shall be submitted 7 calendar days after the updated Progress Schedule is submitted.

- B. CONTRACTOR shall provide additional manpower, equipment, or materials or shall work additional shifts, or expedite procurement to complete Activities within the specified Milestones or Contract Times , at no additional cost to the OWNER. Upon acceptance of the Recovery Schedule by the ENGINEER, CONTRACTOR shall incorporate it into the current Progress Schedule.
- C. Lack of Action:
 - 1. CONTRACTOR's refusal, failure, or neglect to take appropriate recovery action or to submit a written Recovery Schedule shall constitute reasonable evidence that CONTRACTOR is not prosecuting the Work, or separable part, with the diligence that will ensure its completion within the applicable Contract Times. Such lack of action shall constitute sufficient basis for the OWNER to exercise remedies available under the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 02050

DEMOLITION

PART 1 GENERAL

1.01 WORK OF THIS SECTION

- A. The CONTRACTOR shall furnish all materials, equipment, and labor necessary to perform and complete demolition of existing valves, piping, appurtenances, pavement, sidewalk, curb and gutter, etc.

1.02 RELATED SECTIONS

Specification Section 01000.

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. The WORK of this Section shall comply with the current edition of the Uniform Building Code.
- B. 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).

1.04 CONTRACTOR SUBMITTALS

- A. The CONTRACTOR shall submit a demolition schedule which shall provide a complete coordination schedule for demolition work including shut-off and continuation of utility services before the start of the demolition. The schedule shall indicate proposed methods and operations of facility demolition, and provide a detailed sequence of demolition and removal work to ensure uninterrupted operation of occupied areas.
- B. Before completion of the Work, the CONTRACTOR shall submit an Affidavit of Legal Disposal attesting to the lawful disposal of all demolished materials.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 GENERAL

- A. Structures shall be demolished and removed in compliance with SSPWC subsection 306-5 and the requirements indicated herein.

3.02 POLLUTION CONTROL

- A. Water sprinkling, temporary enclosures, chutes, and other suitable methods shall be used for dust suppression in compliance with SSPWC Section 7.
- B. Water shall not be used when it creates hazardous or objectionable conditions such as flooding, erosion, sedimentation, or pollution.

3.03 PROTECTION

- A. Safe passage of persons around the area of demolition shall be provided. Operations shall be conducted to prevent injury to people and damage to adjacent buildings, structures, and other facilities in compliance with SSPWC Section 7.
- B. Interior and exterior shoring, bracing, or supports shall be provided to prevent movement, settlement or collapse of structures to be demolished.
- C. Existing landscaping materials, structures, and appurtenances which are not to be demolished shall be protected and maintained as necessary and in accordance with SSPWC Section 7.
- D. Unless otherwise indicated, the CONTRACTOR shall protect and maintain all utilities in the proximity of the facilities to be demolished.
- E. The CONTRACTOR shall protect nearby existing equipment from dust caused by demolition activities by covering, drop-curtains, and other similar methods.

3.04 DISPOSAL OF NON-FRIABLE ASBESTOS

- A. If non-friable asbestos cement pipe (ACP) is identified, the CONTRACTOR shall employ adequate care to maintain the pipe in a non-friable condition. Removal of ACP shall be in whole sections where possible. Cutting or breaking of ACP to facilitate removal shall be in compliance with California Regulations, Title 8, Section 5208. At a minimum, the CONTRACTOR shall follow the following requirements for ACP that is to be cut or broken:
 - 1. The CONTRACTOR shall evacuate the area of unauthorized and untrained personnel, post warning signs, and provide a demarcation zone and adequate barriers to keep unauthorized personnel out of the area.
 - 2. The CONTRACTOR shall provide personal protective equipment consisting at least of a respirator and disposable clothing to asbestos accredited workers performing the cutting or breaking of ACP. Respiratory protection shall be in accordance with the requirements of California Regulations, Title 8, Section 5414.
 - 3. The area to be cut or broken shall be adequately wetted with amended water to reduce fiber emission. The method employed by the CONTRACTOR shall minimize fiber release. Power saw cutting will not be allowed. All related debris from the cutting or breaking of ACP shall be considered friable. The CONTRACTOR shall dispose of friable material in accordance with California Regulations Title 22.
 - 4. All waste generated and ACP shall be wrapped in 6 mil polyethylene sheeting or bags and shall be properly transported and disposed of.

3.05 DISPOSAL OF FRIABLE ASBESTOS

- A. Friable asbestos-containing material is defined as material that can be crumbled, pulverized, or reduced to powder by hand pressure. All friable asbestos-containing materials shall be considered as hazardous waste and shall be transported by a licensed hazardous waste hauler. Friable asbestos containing materials shall be disposed of at an approved hazardous waste landfill.
- B. Upon discovery of friable asbestos, the CONTRACTOR shall immediately notify the CONSTRUCTION MANAGER.

3.06 BELOW-GRADE DEMOLITION

- A. All pipes must be confirmed out of service by District before cutting. Abandoned pipe shall be filled by Controlled Low Strength Material 20 feet each direction where the pipe is modified to remove from service.
- B. Structures designated on the plans to be removed shall be removed to the full depth of the structure, including its foundation.
- C. Contractor shall install temporary bulkheads & valves as required for construction sequencing.
- D. Below-grade areas and voids resulting from demolition of structures shall be completely filled to a minimum compaction of 95%.
- E. After fill and compaction, surfaces shall be graded to meet adjacent contours and to provide flow to surface drainage structures, or as indicated.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

- A. Demolition and removal of debris shall be conducted to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities which shall not be closed or obstructed without permission from the DISTRICT. Alternate routes shall be provided around closed or obstructed traffic ways.
- B. Site debris, rubbish, and other materials resulting from demolition operations shall be removed and disposed of in compliance with all laws and regulations. Burning of removed materials from demolished structures will not be permitted.

3.08 PATCHING AND REPAIRING

- A. The CONTRACTOR shall provide patching, replacing, repairing, and refinishing of damaged areas involved in demolition as necessary to match the existing adjacent areas.
- B. The CONTRACTOR shall repair all damages caused to adjacent facilities by demolition at no additional cost to the DISTRICT.

3.09 CLEANING

- A. During and upon completion of Work, the CONTRACTOR shall promptly remove unused tools and equipment, surplus materials, rubbish, debris, and dust and shall leave areas affected by the Work in a clean condition.
- B. The CONTRACTOR shall clean adjacent structures and facilities of dust, dirt, and debris caused by demolition and return adjacent areas to condition existing prior to start of Work.
- C. The CONTRACTOR shall clean and sweep the affected portions of roads, streets, sidewalks and passageways daily.

END OF SECTION

SECTION 13120

FIBERGLASS REINFORCED PLASTIC FLAT TANK COVERS

PART 1 GENERAL

1.01 DESCRIPTION

This specification section addresses the materials, installation and testing for fiberglass reinforced plastic (frp) flat tank covers, including tank cover deck panels, structural supports, flashing and trip, fasteners and anchors, gaskets, accessories and appurtenances.

1.02 REFERENCE STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for:

ASTM D638	Standard Test Method for Tensile Properties of Plastics
ASTM D790	Standard Test Method for Flexural Properties of Plastics
ASTM D695	Standard Test Method for Compressive Strength of Plastics
ASTM E84	Standard Test Method for Surface Burning Characteristics of Plastics

1.03 SUBMITTALS

The Contractor shall furnish submittals in accordance with Section 1 General Conditions. Submittals are required for the following:

- A. Submit shop drawings in accordance with FPUD Standard Specifications including layouts, product description, connection and framing details, fastener types, and spacing.
- B. Shop Drawings shall be submitted and approved prior to manufacture of the cover.
- C. Submit material certifications.

1.04 PERFORMANCE TESTING

- A. Submit shop drawings in accordance with FPUD Standard Specifications including layouts, product description, connection and framing details, fastener types, and spacing.
- B. Shop Drawings shall be submitted and approved prior to manufacture of the cover.
- C. Submit material certifications.

1.05 DESIGN CRITERIA

- A. Design Loads shall comply with local codes with combined loads determined by Allowable Stress Method.
 - a. Dead + Live Load = 50 psf
 - b. Deck panels: Individual unit weight plus other materials attached to and supported by deck panels.
 - c. Structure: Cover structure weight plus other material attached to and supported by cover structure.

- B. Design Limits:
 - a. Dead + Live Load: Limit = $L/180$ (min); Factor of Safety = 2.5
 - b. Wind Uplift less Dead Load: Deflection Limit = $L/60$; Factor of Safety = 1.88
 - c. Personnel Load: Cover shall be capable of supporting a 300 lb. concentrated load over a 2.5 SF area located at mid-span maximum deflection of $5/8$ " or L/D of 180. Compliance shall be demonstrated by full-scale testing with certification by an independent, registered P.E

- C. Air Leakage shall not exceed .3 CFM/SF at negative pressure of 0.2 Inches of water column for a 5 minute duration per testing conducted by a certified agency.

- D. Cover Panel Removability:
 - a. Each cover panel shall be removable without having to remove any adjacent cover panels.
 - b. Each cover panel shall be removable vertically and without cutting of a cover component.
 - c. Standard panel width shall be 30"

PART 2 MATERIALS

2.01 GENERAL

Fiberglass reinforced plastic (FRP) structural components including cover panels, beams, and framing shall be manufactured by pultrusion process. Contact molded, hand-laid up or filament wound fiberglass materials are not acceptable as structural components.

2.02 TANK COVER PANELS

- A. Resin type for FRP tank cover decking shall be UV stabilized isophthalic polyester. Orthothalic (general purpose) polyester is not acceptable.

- B. Glass fiber reinforcements shall be 50% (min) of the material weight.

- C. Materials shall be fire retardant and have a flame spread rating of 25 or less per ASTM E84.

- D. Materials shall exhibit these Physical Properties (at a minimum):

Tensile Strength	30,000 psi	ASTM D 638
Flexural Strength	30,000 psi	ASTM D 790

Flexural Modulus	1,690,000 psi	ASTM D 790
Compressive Strength	30,000 psi	ASTM D 695
Izod Impact (Notched)	25	ASTM D 256
Water Absorption	.25% max	ASTM D 570

- E. Cover panels shall be sealed at side-laps with EPDM gasket. Side-lap gaskets shall be factory installed and oriented vertically so they are compressed when the locking channel is placed into position.
- F. The top of the tank cover decking shall be flat with factory applied, non-skid, and UV resistant surface.
- G. Color of deck panels shall be standard gray.

2.03 ACCESS HATCHES

- A. Access hatches shall be raised with one-leaf hatch door and fabricated from pultruded fiberglass components.
- B. Access hatches and framing shall fit inside a single deck panel so individual deck panels with hatches can be removed without affecting adjacent panels.
- C. Underside of raised hatch lids shall be sealed with factory installed, 3/8" diameter neoprene bulb gasket. Perimeter hatch curb shall be sealed to decking surface with adhesive sealant.
- D. Hatches shall have a stainless steel gas piston hold open device. Gas Piston shall be designed to aid in the opening the hatch and hold open hatch once locked in place.
- E. Hatch lids shall have factory applied non-skid, UV resistant surface with plastic or stainless steel lift handles.
- F. View port hatches, if indicated on drawings, shall be 12 inches square or less.
- G. Hatch openings shall be factory cut in cover decking panel by manufacturer.

2.04 FRP STRUCTURAL FRAMING

- A. Resin type for FRP beams and framing members shall be vinyl ester.
- B. Glass fiber reinforcements shall be 50% (min) of the material weight.
- C. Structural components shall be fire retardant and have a flame spread rating of 25 or less per ASTM E84.
- D. All connections shall be made with metallic angles or plates (the use of FRP for making connections shall not be allowed) attached to FRP beams or fastening connections shall be 316 Stainless Steel.

2.05 FLUSH MOUNTING COVER

Ledger angle shall be FRP or stainless steel. If FRP ledger angle is used a safety factor of 6 should be used in determining the size of the angle. If Stainless steel ledger angle is used it should be .25" minimum thickness and 316 SS.

2.06 FLASHING AND TRIM

- A. Fiberglass flashing shall be isophthalic polyester with dimensions, and profile as shown on the drawings.
- B. Non-radius end flashing shall be factory attached to individual deck panels.
- C. Flashing with a radius or at the perimeter of a circular tank shall be a separate part and field attached by the installing contractor.
- D. Slide gate flashings shall be aluminum brush type.

2.07 AIR VENTS AND CONNECTIONS

- A. FRP gooseneck ventilation piping with bird screen shall be provided by cover manufacturer.
- B. FRP stub-vent connections with a blind flange shall be provided by cover manufacturer. Connections shall extend at least 6 inches from top of tank cover deck.

2.08 PIPE PENETRATIONS

- A. Existing or new pipe penetrations shall be retrofitted by contractor to penetrate cover at a 90-degree angle.
- B. Pipe penetrations shall be flashed in the field with a Sealtite retrofit, zipper type, pipe flashing or equal as provided by cover manufacturer.

2.09 HARDWARE

- A. Fasteners, anchorage, hinges, and other structural accessories located on underside of cover shall be 316 Stainless Steel.
- B. Perimeter flashing anchors, concrete anchors, or other hardware not exposed to the inside environment of the tank shall be 304 Stainless Steel.
- C. Fasteners to attach tank cover decking to structural supports shall be 316 Stainless Steel.

2.10 GASKETS AND SEALANTS

- A. All panel side laps and perimeter conditions shall be gasketed.
- B. Gaskets under flashing with a radius and at perimeter of circular tanks shall be installed by the contractor.
- C. Adhesive sealant shall be applied by contractor at various locations as required by manufacturer for odor containment.

2.11 MANUFACTURERS

- A. The standard for design, characteristics, and performance shall be XL3 Cover System as manufactured by Enduro Composites, Inc. or approved equal.

PART 3 EXECUTION

A.01 INSTALLATION

- A. Before placing and attaching components, the erector must confirm alignment and location of bearing plates, surfaces, brackets, saddles, etc. All bearing surfaces must be clean and free of debris.
- B. Before placing secondary framing members or deck, the erector must check the alignment and location of supports.
- C. Erection shall proceed according to sequence shown on the approved drawings.
- D. If applicable, contractor shall install structural members, beam seats or ledger angles in locations shown on the approved drawings. Contractor shall assemble trusses as required.
- E. Position FRP tank cover beams (if applicable) in locations, as shown on the manufacturer's drawings. Field modifications (cuts, copes, holes, etc.) other than work shown on the drawings are not allowed without the manufacturer's written consent.
- F. Anchor FRP beams and adjust tank cover components into final position with proper bearing and alignment at joints, laps, and supports before fastening. Refer to manufacturer's installation instructions for proper fastener selection, fastener location, driving techniques, and pertinent information for fastening equipment.
- G. Starting at the end shown on the manufacturer's drawings, position and place cover deck panels in locations as shown. Field modifications (cuts, copes, holes, etc.) other than work shown on the drawings are not allowed without the manufacturer's written consent.
- H. Fasten or anchor FRP cover deck panels into location as shown on the drawings.
- I. Place and attach flashing as shown on the manufacturer's drawings.

3.02 MATERIAL HANDLING

- A. At time of delivery, all materials shall be inspected for shipping damage. The freight company and manufacturer shall be notified immediately of any damage or quantity shortages.
- B. The contractor shall protect FRP materials from cuts, scratches, gouges, abrasions, and impacts. When lifting FRP materials, spreader bars shall be used (not wire slings unless materials are fully protected). FRP components shall not be dragged across one another unless separated by a non-scratching spacer.

3.03 QUALITY ASSURANCE

- A. Contractor shall be responsible for verifying all field dimensions for development of manufacturer's drawings.
- B. Contractor shall review and confirm in writing the approval of manufacturer's drawings.
- C. The supplier of the tank cover system must be the manufacturer and fabricator of the fiberglass components utilized on this pre-engineered tank cover system. The supplier and manufacturer of the fiberglass components shall take full responsibility for the products, materials and design. In addition, a certification letter from the manufacturer identified to be the material source shall state that the manufacturer takes full responsibility for the design and use of the products specified. No split responsibility of the product manufacturing, fabrication, design or quality of the fiberglass components purchased by the contractor from a manufacturer shall be acceptable, implied or expressed, with regard to the tank cover system provided on this project
- D. Within the last five years, tank cover manufacturer shall have completed a minimum of fifteen (15) projects of similar type as those required in this scope.
- E. System supplier shall be ISO9001 certified, and shall manufacture and fabricate all FRP components in their own facility.

END OF SECTION