EXHIBIT 2 - TECHNICAL SPECIFICATIONS

SEE ATTACHED.

8/13/18

Doc. No. **Document Title** **Doc. Date**

SECTION 00 01 10

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WORK COVERED BY CONTRACT DOCUMENTS

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A. Section Includes

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2. Work Covered by Contract Documents.
3. Cash Allowances.
4. Owner-Furnished Products.
5. Document Management Software
6. Work Sequence.
7. Work Guidelines.
8. Coordination of Work.
9. Contractors Use of Premises.
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11. Alternate Construction Methods.
12. Utility Lines.
13. Warranty.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

1.2 MEASUREMENT AND PAYMENT (NOT USED)

1.3 SUBMITTALS (NOT USED)

1.4 DEFINITIONS

A. Mobilization Area: For Work at facilities, an area, defined on the Contract Drawings, for Contractor staging and storage of construction equipment, tools, products, and spare parts.

1.5 WORK COVERED BY CONTRACT DOCUMENTS

A. Work of the contract is the removal and inspection of the pumping equipment and materials for San Jacinto River Authority Woodlands Division Water Well No. 34 as specified in Section 02673.

1.6 CASH ALLOWANCES

A. Contractor's cost for administering services, overhead, profit and other expenses contemplated for the allowance shall be included in the Contract Price and not in the allowance.

B. Whenever costs are more or less than the stipulated allowance, the Contract Price shall be adjusted accordingly via Change Order, see Specification Section 01 26 63 – Change Orders. The amount of the Change Order shall be the difference between actual costs and the amount of the allowance stated in the Bid or Proposal.

1.7 OWNER-FURNISHED PRODUCTS

A. Items furnished by the Owner for installation and final connection by Contractor:

1. Water will be furnished via a 2-inch water tap at the project site.

B. Contractor's Responsibilities:

1. Arrange and pay for product delivery to site.
2. Receive and unload products at site; jointly with Owner's Representative, inspect for completeness or damage.
3. Handle, store, install, and finish products.
4. Repair or replace damaged items.

1.8 DOCUMENT MANAGEMENT SOFTWARE

A. Contractor and the Owner's Representative shall be given the applicable number of Document Management System user names and passwords.

B. Contractor shall use the Owner's internet based document management system to transmit its documents to the Owner's Representative, including but not limited to Requests for Information (RFIs), shop drawing submittals, applications for payment, and letters of correspondence. Refer to Specification Section 01 33 00 – Submittals. The document management software should be able to automatically notify all team members of a submittal upload regardless of the originator, i.e. contractor, Principal Architect/Engineer, Owner's Representative, or Owner. Notification of new uploads should go to all team members regardless if they are the Principal Architect/Engineer or not, i.e. sub-consultants for construction management & inspection, but are not tasked as the Principal Architect/Engineer.

C. A minimum of one (1) and a maximum of three (3) accounts on the document management system will be provided by the Owner. Additional accounts may be requested by the Contractor.

D. Each account will allow one (1) user to access the document management system. Training on the document management system will be provided by the Owner as requested by the Contractor at a mutually agreed upon date and location.

1.9 WORK SEQUENCE

A. Data for all facilities and utilities shown were taken from available plans, record drawings, and/or utility maps made available from several sources. Actual field locations of facilities and utilities may vary from that shown on the Drawings. Contractor shall make a complete and independent verification of utility locations prior to submittal of subsequent shop drawings. Unless otherwise approved by the Owner's Representative, work shall not continue at locations where there is a conflict with existing utilities.

B. Construction disturbing traffic shall be conducted during off-peak hours, 9:00 a.m. to 4:00 p.m. weekdays and/or weekends 7:00 p.m. Friday to 4:00 a.m. Monday. Exception to these times, if necessary, shall be sought during the permit application process. Continue work in areas using same construction schedule during following, consecutive days and/or weekends until work is completed.

1.10 WORK GUIDELINES

A. Maintain local driveway access to public schools, residential and commercial properties adjacent to work areas at all times. Provide temporary driveway access in accordance with Specification Sections 01 55 26 – Traffic Control and 01 14 19 – Use of Premises. Coordinate work and schedule with impacted business owners, schools, and residents in conjunction with the Owner, well in advance of commencing the Work in the area(s) of the impacted entities.

B. Contractor shall adhere to each privately owned and operated utility company's construction guidelines when constructing the proposed Work adjacent-to or across each such entities wet or dry utility.

C. Contractor shall coordinate its Work with the respective pipeline companies' at all proposed utility crossings. See appropriate Contract Drawings for additional and /or related information.

D. Obtain right-of-entry agreement(s), insurance, crossing permit(s), and other documentation as required or deemed necessary by each utility or pipeline company or other such entity at no additional cost to the Owner.

E. Contractor shall coordinate its Work schedule with those utility companies who require a representative of their company to be present (onsite) during the construction adjacent-to or across their wet or dry utility.

F. Site restoration at all crossings shall be performed immediately upon completion of the Work. Restoration shall be performed in accordance with all applicable Specification Sections and utility company requirements.

G. Hand dig within one (1) foot of underground service lines (public or private).

H. Contractor shall bear the sole responsibility for damage to existing traffic cables resulting from its construction activities. The Contractor shall be responsible for the repair of damaged traffic cables including the re-cabling of the entire intersection if required, at no additional cost to the Owner.

1.11 COORDINATION OF WORK

A. Coordinate activity schedule and extend full cooperation to other Contractors who have responsibilities either concurrent with, proceeding, or following this project's duration along the work site. Ensure availability of access to selected portions of this project area to others and provide appropriate information for planning purposes to other Contractors. No compensation or time extension will be allowed as a result of conflicting construction activities.

B. Comply with coordination requirements outlined in Specification Section 01 14 19 – Use of Premises.

C. Dial 811 to contact either Texas 811 or Lone Star 811 One-Call all three (3) One-Call centers in the state of Texas a minimum of forty-eight (48) hours prior to construction within twenty-five (25) feet of a private pipeline.

Contact numbers for such centers are as follows:

1. TESS (Texas) One Call (800) 344-8377
2. Texas One-Call (800) 245-4545
3. Texas (Lone Star) One Call (800) 669-8344

D. Approvals from the following pipeline entities are needed for this project. Approvals are obtained during design and are the responsibility of the Principal Architect/Engineer:

E. Prevent overstress or damage of any structure and any part or member of it during construction. This applies to new and existing facilities, utilities, and structures affected by construction operations. Contractor shall monitor and record the effect of its construction operations on new and existing facilities, utilities and structures and provide engineered temporary supports and connections as required to assure the safety and stability of the same to prevent overstress of any part

F. Prior to commencing any Work involving state or local agencies, agency stipulated notifications shall be made by the Contractor

G. Contractor Work performed within all rights-of-way shall be performed in accordance with the respective entities' standards.

1.12 CONTRACTOR USE OF PREMISES

A. Comply with all requirements outlined in Specification Section 01 14 19 – Use of Premises.

1.13 CONTRACT CLARIFICATION

A. Should clarification of the Contract Documents be requested, request clarification before proceeding with Work by submitting a Request for Information (RFI). Such requests shall be preceded by a diligent investigation of the Contract Documents. Include evidence of such investigation(s) in all requests for clarification.

1.14 ALTERNATE CONSTRUCTION METHODS

A. Alternate construction means and methods will be permitted in accordance with applicable Contract Document details and specification at no additional cost to the Owner. Alternate construction means and methods shall provide a substantial benefit to the project and/or the Owner. Contractor accepts full responsibility for all additional costs of geotechnical investigations and other incidental items, including any re-design that may be necessary to permit the alternate construction means and methods.

1.15 WARRANTY

A. Comply with the warranty requirements stipulated in Contract Document General Conditions and the warranty requirements of the various specification sections of this project manual.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 14 19

USE OF PREMISES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Administrative and procedural requirements for:
    a. Contractor Responsibilities
    b. Temporary Utilities
    c. Limits of Construction
    d. Storage Sheds and Buildings
    e. Working Times
    f. Site Access Times
    g. Notification to Adjacent Occupants
    h. Safety Requirements
    i. First Aid Equipment
    j. Fire Protection
    k. Security Measures
    l. Protection of Utilities, Pipelines, and Property
    m. Surface Restoration
    n. Traffic Control and Use of Public Rights of Way
    o. Contractor’s Roads and Parking
    p. Coordination with Facility Owner’s Operations
    q. Contractor's Field Office
    r. Principal Architect/Engineer's Field Office
    s. Project Photographs
    t. Special Considerations Related to Adjacent Properties and Facilities
    u. Historical and Archaeological Sites

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Proposing Requirements, Contract Forms, and General Conditions of the Contract.

2. Division 01 – General Requirements.

1.2 MEASUREMENT AND PAYMENT

A. Unit Price. No separate payment will be made for this item. Include the cost in associated items for this project.

1.3 SUBMITTALS

A. See Specification Section 01 33 00 – Submittals for the requirements for the mechanics and administration of the submittal process.

B. Contractors Safety Program.

C. All proposed notifications to adjacent occupants.

D. Planning requests for temporary Owner's facility shutdowns.

1.4 CONTRACTOR RESPONSIBITIES

A. Comply with applicable requirements specified in other sections of Project Specifications.

B. Comply with procedures for access to the site and Contractor's use of rights-of-way.

C. Maintain and operate temporary construction facilities and temporary systems to assure continuous service of Owner's and other adjacent existing facilities.

D. Modify and extend temporary systems as Work progress requires.

E. Completely remove materials and equipment when no longer required.

F. Restore existing facilities used for temporary services to original or better condition, or as specified.

G. Prior to installation of material, equipment and/or other work, verify with subcontractors, material or equipment manufacturers, and installers that the substrate or surface to which those materials will attach is acceptable for installation of those materials or equipment. (Substrate is defined as any building or construction surfaces to which materials or equipment are attached to, or required prior to installation i.e., floors, walls, ceilings, soils, utilities, site grading, and backfill etc.).

H. Correct unacceptable substrate until acceptable for installation of equipment or materials.

1.5 TEMPORARY UTILITES

A. Obtaining Temporary Service:

1. Make arrangements with utility service companies for temporary services, unless provided by Owner.

2. Abide by rules and regulations of utility service companies and/or

authorities/agencies/entities having jurisdiction.

3. Be responsible for utility service costs and permits until Work is substantially complete. Included services are fuel, power, light, heat, and any other utility services necessary for execution, completion, testing, and initial operation of Work.
4. Be responsible for providing approved metering devices, as necessary, for any temporary utilities.

B. Water:

1. The Owner will provide water at the site via a 2-inch water tap.
2. Provide necessary approved metering devices and backflow preventers. The Woodlands Joint Powers Agency (WJPA) may have these devices for use if the Contractor does not have one on hand.

C. Electricity and Lighting:

1. Provide electrical service required for Work, including testing of Work. Provide power for lighting, operation of equipment, and other use as necessary.
2. For projects on existing sites, electric power service to be provided includes temporary power service or generator(s) to maintain Owner's operations during scheduled shutdown(s). Coordinate all temporary shutdowns with Owner and Owner's Representative(s).
3. Minimum lighting level shall be ten (10) foot-candles for open areas; twenty (20) foot-candles for stairs and shops. Provide minimum of one (1) 300 watt lamp for each 200 square feet of work area.

D. Heat and Ventilation:

1. Provide temporary heat as necessary for protection or completion of Work.
2. Provide temporary heat and ventilation to assure safe working conditions. Maintain enclosed areas at minimum of 50°F.

E. Telephone:

1. Provide emergency telephone service (including call waiting and call forwarding) at Project Site for use by Contractor personnel, Owner, Owner's Representative, and others performing work or furnishing services at the site.

F. Sanitary Facilities:

1. Provide and maintain sanitary facilities for persons on job site. Comply with regulations of State and local departments of health.
2. Enforce use of sanitary facilities by construction personnel at job site.

Enclose sanitary facilities. Pit-type toilets will not be permitted. No discharge will be allowed from these facilities. Collect and store sewage and waste so as not to cause nuisance or health problem. Haul sewage and waste off-site and properly dispose of in accordance with all applicable regulations.

3. Locate toilets near Work site, within 500 feet of working activities for line work projects and secluded from view as best as possible. Keep toilets clean and supplied throughout course of Work. Locate toilets a minimum of 100 feet from all water wells.

1.6 LIMITS OF CONSTRUCTION

A. Construction operations and storage areas are limited to Owner's property, permanent easements, temporary construction easements (TCE), and/or the Limits of Construction or Construction Limits as indicated on the Contract Drawings.

B. Unauthorized use of areas, or trespassing on land outside of defined limits, is not permitted.

C. Make arrangements, at no cost to the Owner, for Contractor's temporary use of any private properties which may be needed by Contractor for performance of Work. Contractor and Contractor's surety shall indemnify and hold harmless the Owner and Owner's Representatives against claims or demands arising from use of properties outside the Limits of Construction. Submit notarized copy of any separately negotiated agreement(s) between private property owner(s) and Contractor prior to use of area.

D. Where Limits of Construction are shown on Contract Drawings to extend to a property or Right-of-Way line, keep equipment, materials, and stockpiles a minimum of 5 feet from boundary, or existing fence lines.

E. Where utility alignment is within an esplanade and Limits of Construction are shown to extend to edge of the esplanade, keep equipment, materials, and stockpiles a minimum of 5 feet from back of curb.

F. There are unique terms and conditions associated with the various public and private easements, rights-of-entry, encroachment and crossing documents (collectively, the easement documents) which may be site specific. Contractor shall familiarize itself with all easement Documents. Easement documents are available from the Owner on a case by case basis upon request.

G. The Contractor, at its sole expense, shall be responsible for complying with all terms and conditions of all easement documents and the easement rights described therein for this project.

H. Contractor shall safely, properly, and adequately assume and perform all of the duties, indemnities, responsibilities, and liabilities of the Owner under the

easement documents.

I. Contractor, at its cost, shall provide all insurance required by the easement documents. All land included within the tracts covered by the easement documents and easements described herein shall be restored to its original condition prior to Substantial Completion of the construction (including, without limitation, repair or replacement of pavement, concrete, signs, fencing, trees, sidewalks, landscaping, shrubbery, and grass) unless otherwise specified in the Contract Documents.

1.7 STORAGE SHEDS AND BUILDINGS

A. Provide adequately ventilated, watertight storage facilities with floor above ground level for protection of materials and equipment susceptible to weather damage.

B. Store materials in neat and orderly manner. Store materials and equipment to permit easy access for identification, inspection, and inventory.

C. Storage of materials not susceptible to weather damage may be on blocks off ground.

D. Storage of all fuels and chemicals shall be in designated areas by Contractor.

E. Refer to Specification Section 01 65 50 – Product Delivery, Storage, and Handling for additional requirements.

F. Fill and grade site for temporary structures to provide positive drainage away from Work area, but not to impact adjacent property owners.

G. Avoid obstructing drainage ditches or inlets. When obstruction is unavoidable due to requirements of Work, provide grading and temporary drainage structures to maintain unimpeded drainage flow. Failure of the Contractor to maintain proper site drainage shall prohibit it from making a claim against the Owner for monetary or time damages due to drainage impacts.

1.8 WORKING TIMES

A. Construction shall be conducted during working hours as indicated in Specification Section 00 72 00 – General Conditions of the Contract, unless otherwise amended by a supplemental specification or agreement to the General Conditions of the Contract, and approved by Owner.

1.9 SITE ACCESS TIMES

A. Contractor to coordinate all site access, including deliveries, outside of working hours with Owner's Representative. Neither Owner nor Owner's Representatives shall sign for any Contractor deliveries. Refer to Specification Section 01 65 50 – Product Delivery, Storage, and Handling.

B. Contractor shall coordinate with Owner to not interfere with Owner's facility

operations.

1.10 NOTIFICATION OF ADJACENT OCCUPANTS

A. Notify individual occupants in areas to be affected by Work of proposed construction activities and schedule using a standardized notification form letter and/or door hanger. Notification shall be made not less than 72 hours or more than 2 weeks prior to performance of work within 200 feet of homes or businesses. Coordinate all notifications with Owner's Representative.

B. Include in notification the names and telephone numbers of two Contractor representatives for resident contact available on 24-hour call. Describe precautions that Contractor will take to protect private property and identify potential inconveniences and disruptions to resident's access and utilities.

C. For Contractor's convenience, Owner's Representative will provide an example notice at the pre-construction meeting. In addition to other requirements of this specification regarding notification to adjacent occupants, Contractor's notice is generally to follow the form and content of the example notice.

D. Submit proposed notification(s) to Owner for approval prior to distribution. Provide notice(s) in languages as appropriate (i.e., double sided notice. Notice on one side shall be written in English and flip side shall be written in Spanish).

1.11 SAFETY REQUIREMENTS

A. Beware of overhead power lines existing in area and in close proximity to project. When 10 feet of clearance between energized overhead power line and construction-related activity cannot be maintained, submit a request to the appropriate utility provider to de-energize or move conflicting overhead power line(s).

B. Submit Contractor's Safety Program in accordance with Specification Section 01 33 00 – Submittals. Include Site Safety and Site Security in accordance with Specification Section 00 72 00 – General Conditions of the Contract.

C. Conduct operations in strict accordance with the Contractor's Safety Program, in accordance with applicable Federal, State, and local safety codes and statutes, and with good construction practice. Establish and maintain procedures for safety of all work, personnel, and equipment involved in Project.

D. Observe and comply with Texas Occupational Safety Act (Art. 5182a, V.C.S.) and with all safety and health standards promulgated by Secretary of Labor under Section 107 of Contract Work Hours and Standards Act, published in 29 CFR Part 1926 and adopted by Secretary of Labor as occupational safety and health standards under Williams-Steiger Occupational Safety and Health Act of 1970, and to other legislation enacted for safety and health of Contractor employees. Safety and health standards apply to subcontractors and their employees as well as to Contractor and its employees.

E. Observance of and compliance with regulations is solely and without qualification responsibility of Contractor without reliance or superintendence of or direction by the Owner or Owner's Representative. Immediately advise Owner's Representative of investigation or inspection by Federal Safety and Health Inspectors of Contractor or subcontractor's work or place of work on job site under this Contract, and after investigation or inspection, advise Owner's Representative of results. Submit one copy of accident reports to Owner's Representative within 10 days of occurrence.

F. Protect areas occupied by workmen using best available devices for detection of lethal and combustible gases. Test devices frequently to assure functional capability. Constantly observe infiltration of liquids into Work area for visual or odor evidences of contamination, and immediately take appropriate steps to seal off entry of contaminated liquids into Work area.

G. Implement safety measures, including but not limited to safety personnel, first-aid equipment, ventilating equipment, and other safety equipment, as specified or detailed on the Contract Drawings.

H. Maintain required coordination with Police and Fire Departments during entire period covered by Contract.

I. In safety plan, include project safety analysis. Itemize major tasks and potential safety hazards. Plan to eliminate hazards or protect workers and public from each hazard.

1.12 FIRST AID EQUIPMENT

A. Provide first aid kit throughout construction period. List telephone numbers for hospitals, and ambulance services in each first aid kit.

B. Have at least one person thoroughly trained in first aid and cardiopulmonary resuscitation (CPR) procedures present on site whenever Work is in progress. Contractor to conform to protocols and requirements for training and protection against "blood borne pathogens."

1.13 FIRE PROTECTION

A. Conform to specified fire protection and prevention requirements established by Federal, State, or local governmental agencies and as provided in Contractor's Safety Program.

1.14 SECURITY MEASURES

A. Protect all Work materials, equipment, and property from loss, theft, damage, and vandalism. Perform duty to protect property of the Owner used in connection with performance of Work.

B. If existing fencing or barriers are breached or removed for purposes of construction, provide and maintain temporary security fencing equal to existing.

1.15 PROTECTION OF UTILITIES, PIPELINES, AND PROPERTY

A. Utilize Utility Coordinating Committee One Call System (telephone number, (713) 223-4567), which must be called 48 hours in advance to locate utilities. Toll free telephone number is 1-800-669-8344, Texas (Lone Star) One Call System.

B. Notify Woodlands Joint Powers Association (WJPA) a minimum of 72 hours in advance of any field activities. Telephone number 281-367-1271.

C. Contractor shall adhere to each privately owned and operated utility company's construction guidelines when working adjacent-to or across each such entities wet or dry utility.

D. Prior to abandonment of any utility indicated on the Drawings, make arrangements with Owner's Representative and utility owner to terminate service, remove meters, valves, appurtenances, transformers, and/or poles, as required.

E. Utility Outages and Shutdowns: Provide a notification to the Owner's Representative and private utility companies (when applicable) a minimum of 48 hours, excluding weekends and holidays, in advance of required utility shutdown. Shutdown planning and coordination activities shall commence a minimum of 2-weeks prior to scheduled shutdown. Coordinate all work as required.

F. Protect and prevent damage to existing crossing, parallel, and adjacent pipelines during construction in accordance with Specification Section 01 11 13 – Work Covered by Contract Documents.

G. Protection of the Work, and Public and Private Property

1. Take precautions, provide programs, and take actions necessary to protect the Work, and public and private property from damage.
2. Do not alter condition of properties adjacent to and along Limits of Construction.
3. Do not use ways, means, methods, techniques, sequences, or procedures that result in damage to adjacent properties or improvements.
4. Restore properties damaged by Contractor outside of designated Limits of Construction at no cost to Owner.
5. Take action to prevent damage, injury, or loss, including, but not limited to, the following:
    a. Store materials, supplies, and equipment in orderly, safe manner that will not interfere with progress of Work or work of others.
    b. Provide suitable storage for materials subject to damage by exposure to

weather, theft, breakage, or otherwise.

c. Place upon Work or any part thereof only safe loads.

d. Frequently clean up refuse, rubbish, scrap materials, and debris created by construction operations, keeping Project site safe and orderly.

e. Provide safe barricades and guard rails to protect pedestrian and vehicular traffic around openings, scaffolding, temporary stairs and ramps, excavations, elevated walkways, and other hazardous areas.

6. Assume full responsibility for preservation of public and private property on or adjacent to the Limits of Construction. When direct or indirect damage is done by or on account of any act, omission, neglect, or misconduct in execution of Work by Contractor, restore to condition equal to or better than that existing before damage was done.

7. Perform daily clean up in affected construction areas in order to restore site to existing or better conditions. Areas should be free of debris, scrap material, dirt, mud, and other items identified by Owner's Representative. Do not leave buildings, roads, streets, or other construction areas unclean. If deemed necessary by the Owner's Representative, Contractor shall employ street sweeping/cleaning equipment to maintain area streets.

H. Barricades and Warning Signals:

1. Where Work is performed on or adjacent to any roadway, right-of-way, or public place, furnish and erect barricades, fences, lights, warning signs, and danger signals, and take other precautionary measures, for protection of persons or property and of the Work.

2. Paint barricades to be visible at night. From sunset to sunrise, furnish and maintain at least one light at each barricade.

3. Erect sufficient barricades to keep vehicles and pedestrians from entering the area under construction.

4. Maintain barricades, signs, lights and provide watchmen until Project is accepted by the Owner or the site has been completely restored to its preconstruction condition.

5. Whenever Work creates encroachment on public roadways, station flagmen to manage traffic flow in accordance with approved traffic control plan. Refer to Specification Section 01 55 26 – Traffic Control.

I. Protection of Existing Structures:

1. Underground Structures:

a. Underground structures are defined to include, but not be limited to, sewer, water, gas, and other piping, manholes, boxes, chambers,

electrical signal and communication conduits, tunnels, and other existing subsurface installations located within or adjacent to limits of Work.

b. Known underground structures including water, sewer, electric, and telecommunication services are shown on Contract Drawings. This information is not guaranteed to be correct or complete.

c. Explore ahead of trenching and excavation work and sufficiently uncover obstructing underground structures to determine their location, to prevent damage to them, and to prevent interruption of utility services. Restore underground structures to original conditions at no additional cost if damaged during construction.

d. Locate and protect private lawn sprinkler systems which may exist within site. Repair or replace damaged systems to condition existing at start of Work, or better.

e. Necessary changes in location of Work may be made by the Owner to avoid unanticipated underground structures.

f. If permanent relocation of underground structures or other subsurface installations is required and not otherwise provided in Contract, the Owner will direct Contractor in writing to perform Work, which is paid for under provisions for changes as described in Specification Section 00 72 00 - General Conditions of the Contract.

2. Surface Structures: Surface structures are defined as existing buildings, structures and other constructed installations above ground surface. Included with structures are their foundations and any extensions below the surface. Surface structures include, but are not limited to buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks, guard cables, fencing, and other facilities visible above ground surface.

3. Existing Condition Survey: Contractor shall survey and adequately document the condition and elevation of existing structures adjacent to the proposed alignment.

4. Protection of Underground and Surface Structures:

a. Support in place and protect from direct or indirect damage underground and surface structures located within or adjacent to limits of Work.

b. Prevent overstress or damage to any structure and any part or member of structures during construction. This applies to new and existing facilities, utilities, and structures affected by construction operations. Contractor shall monitor and record the effect of its construction operations on new and existing facilities, utilities, and structures, and shall provide engineered temporary supports and connections as

required to assure the safety and stability of the structures and prevent overstress of any part. Employ a registered Professional Engineer licensed in the State of Texas to design temporary supports to assure safety and integrity of structures and facilities.

c. Install temporary supports carefully and as required by party owning or controlling structure. Before installing structure supports, satisfy Owner's Representative that methods and procedures have been approved by owner of structure.

d. Avoid moving or changing property of public utilities or private corporations without prior written consent of responsible official of that service or public utility. Representatives of these utilities reserve the right to enter within limits of this Project for purpose of maintaining their properties, or of making changes or repairs to their property that may be considered necessary by performance of this Contract.

e. Notify owners and/or operators of utilities and pipelines adjacent to the Work of the nature of construction operations and dates when operations will be performed. When construction operations are required in immediate vicinity of existing structures, pipelines, or utilities, give minimum of 5 working days advance notice. Probe and flag location of underground utilities prior to commencement of excavation. Keep flags in place until construction operation reaches and uncovers utility.

f. Assume risks attending presence or proximity of underground and surface structures within or adjacent to Work including but not limited to damage and expense for direct or indirect damage caused by Contractor's Work to structure. Immediately repair damage.

J. Protection of Installed Products:

1. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to final completion of Work.

2. Control traffic to prevent damage to equipment, materials, and surfaces.

3. Provide coverings to protect equipment and materials from damage. Cover projections, wall corners, jambs, sills, and exposed sides of openings in areas used for traffic and passage of materials in subsequent work.

1.16 SURFACE RESTORATION

A. Restore site to the condition which existed before construction in accordance with Specification Section 01 74 23 – Restoration of Site, unless otherwise noted in Contract Documents.

1.17 TRAFFIC CONTROL AND USE OF PUBLIC RIGHTS OF WAY

A. Comply with traffic regulation in accordance with Specification Section 01 55 26 - Traffic Control, and approved traffic control plan(s).

B. Provide barricades and signs in accordance with Section VI of the State of Texas Manual on Uniform Traffic Control Devices.

C. Obtain necessary permits and Owner's approval when the nature of Work requires closing an entire street. Obtaining permits required for street closure are the Contractor's responsibility. Avoid unnecessary inconvenience to abutting property owners. Avoid closing more than two (2) consecutive intersections at one time, except by permission of Owner.

D. Notify Owner's Representative at least 48 hours prior to closing a street or street crossing. It is the Contractor's responsibility to obtain all required permits for street closures in advance.

E. Maintain 10-foot-wide minimum access lane for emergency vehicles, including access to fire hydrants, at all times.

F. Remove surplus materials and debris and open each 500 lineal foot length of roadway for public use when work within that length is complete.

G. Contractor shall provide and install signs indicating entrances to businesses whose normal entry is impaired or detoured as a result of construction. Proposed signs shall be submitted to the Owner's Representative for approval prior to manufacture and installation.

H. Final acceptance of any portion of Work is not based on return of roadway to public use.

I. Avoid obstructing driveways or entrances to private property.

J. Provide temporary access or complete excavation and backfill in one continuous operation to minimize duration of obstruction when excavation is required across drives or entrances.

K. Contractor shall bear the sole responsibility for damage to existing traffic cables resulting from its construction activities. The Contractor shall be responsible for the repair of damaged traffic cables including the re-cabling of the entire intersection if required, at no additional cost to the Owner.

L. Construct and maintain temporary detours, ramps, and/or roads to provide for normal public traffic flow when use of public roads or streets is closed by necessities of Work. Contractor shall obtain all required roadway closure or detour permits in advance of commencing the proposed temporary detour, ramps, and/or roadway Work.

M. Provide mats or other means to prevent overloading or damage to existing roadways from tracked equipment, large tandem axle trucks or equipment that

will damage existing roadway surface. Contractor shall repair or replace damaged roadway not scheduled for removal and/or replacement at no additional cost to the Owner. Repairs or replacement shall be in conformance with the roadway owner's requirements.

N. Provide daily sweeping of hard-surface roadways to remove soils tracked onto public roadways.

1.18 CONTRACTORS ROADS AND PARKING

A. Prevent interference with traffic on existing roads.

B. Construct and maintain temporary access roads and parking areas.

C. Designate temporary parking areas to accommodate Contractor's and Owner's Representative personnel. When site space is not adequate, provide additional off-site parking. Locate as approved by Owner's Representative.

D. Minimize use by construction traffic of existing streets and driveways.

E. Do not allow heavy vehicles or construction equipment in existing parking areas.

F. Do not inhibit the ability of the Owner's personnel to access, operate, and maintain existing facilities during construction.

1.19 COORDINATION WITH FACILITY OWNER'S OPERATIONS

A. Definition: A "shutdown" is when a portion of the normal operation of Owner's facility, whether equipment, systems, piping, or conduit, has to be temporarily suspended or taken out of service to perform the Work.

B. Work that may interrupt normal operations shall be accomplished at times convenient to, and approved by Owner.

C. Except for necessary shutdowns, perform the Work such that Owner's facilities remain in continuous satisfactory operation during the Project. Schedule and conduct the Work such that the Work does not:

1. Impede Owner's production or processes,
2. Create potential hazards to public health or wellbeing,
3. Create potential hazards to operating equipment and personnel,
4. Reduce the quality of Owner's facilities' product(s) or effluent, or
5. Cause odors or other nuisances.

D. Coordinate shutdowns with Owner. When possible, combine activites into a single shutdown to minimize impacts on Owner's operations and processes.

1. For each shutdown, submit an inventory of labor and materials required to perform the shutdown and activities, an estimate of time required to accomplish the complete shutdown including time for Owner to take down

and start up existing equipment, systems, or conduits, and written description of steps required to complete the Work associated with the shutdown.

E. Furnish at the Site, in close proximity to the shutdown and tie-in work areas, tools, equipment, spare parts and materials, both temporary and permanent, necessary to successfully complete the shutdown. Complete to the extent possible, prefabrication of piping and other assemblies prior to the associated shutdown. Demonstrate to Owner's satisfaction that Contractor has complied with these requirements before commencing the shutdown.

F. If Contractor's operations cause an unscheduled interruption of Owner's operations, immediately re-establish satisfactory operation for Owner.

G. Unscheduled shutdowns or interruptions of continued safe and satisfactory operation of Owner's facilities that result in fines or penalties by authorities having jurisdiction shall be paid solely by Contractor.

H. Shutdowns of Electrical Systems: Comply with Laws and Regulations, including the National Electric Code. Contractor shall lock out and tag circuit breakers and switches operated by Owner and shall verify that affected cables and wires are de-energized to ground potential before shutdown Work is started. Upon completion of shutdown Work, remove the locks and tags and notify Owner that facilities are available for use.

1.20 PROJECT PHOTOGRAPHS

A. Refer to Specification Section 01 32 36.01 – Project Photographs

1.21 SPECIAL CONSIDERATIONS RELATED TO ADJACENT PROPERTIES AND FACILITIES

A. Contractor shall be responsible for negotiations of any waivers or alternate arrangements required to enable transportation of materials to the site.

B. Maintain conditions of access road to site such that access is not hindered as the result of construction related deterioration.

1. Provide daily sweeping of hard-surface roadways to remove soils tracked onto roadway.

1.22 HISTORICAL AND ARCHAEOLOGICAL SITES

A. If, during the course of construction, evidence of deposits of historical or archeological interest are found, the Contractor shall cease operations affecting the find and shall notify Owner.

1. No further disturbance of the deposits shall ensue until the Contractor has been notified by Owner that Contractor may proceed.

2. Owner will issue a notice to proceed after appropriate authorities have surveyed the find and made a determination to Owner.
3. Compensation to the Contractor, if any, for lost time or changes in construction resulting from the find shall be determined in accordance with changed or extra work provisions of the Contract Documents.

B. Refer to Specification Section 00 72 00 – General Conditions of the Contract including paragraph 4.2.4.

1.23 WARRANTY (NOT USED)

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 OWNER TRAINING (NOT USED)

END OF SECTION

SECTION 01 25 13

PRODUCT SUBSTITUTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. The procedure for requesting the approval of substitution of a product that is not equivalent to a product which is specified by descriptive or performance criteria or defined by reference to one or more of the following:

   a. Name of manufacturer.

   b. Name of vendor.

   c. Trade name.

   d. Catalog number.

2. Substitutions are not "or-equals".

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.

2. Division 01 – General Requirements.

C. Request for Substitution – General:

1. Base all bids on materials, equipment, and procedures specified.

2. Certain types of equipment and kinds of material are described in specifications by means of references to names of manufacturers and vendors, trade names, or catalog numbers.

   a. When this method of specifying is used, it is not intended to exclude from consideration other products bearing other manufacturer's or vendor's names, trade names, or catalog

numbers, provided said products are "or-equals," as determined by Owner's Representative.

3. Other types of equipment and kinds of material may be acceptable substitutions under the following conditions:
   a. Or-equals are unavailable due to strike, discontinued production of products meeting specified requirements, or other factors beyond control of Contractor; or,
   b. Contractor proposes a cost and/or time reduction incentive to the Owner.

1.2 MEASUREMENT AND PAYMENT

A. Unit Price. No separate payment will be made for this item. Include the cost in associated items for this project.

1.3 SUBMITTALS (NOT USED)

1.4 QUALITY ASSURANCE

A. In making request for substitution or in using an approved product, Contractor represents Contractor:
   1. Has investigated proposed product, and has determined that it is adequate or superior in all respects to that specified, and that it will perform function for which it is intended.
   2. Will provide same guarantee for substitute item as for product specified.
   3. Will coordinate installation of accepted substitution into Work, to include building modifications if necessary, making such changes as may be required for Work to be complete in all respects.
   4. Waives all claims for additional costs related to substitution which subsequently arise.

1.5 DEFINITIONS

A. Product: Manufactured material or equipment.

1.6 PROCEDURE FOR REQUESTING SUBSTITUTION

A. Substitution shall be considered only:
   1. After award of Contract.
   2. Under the conditions stated herein.

B. Written request through Contractor only.

C. Transmittal Mechanics:
   1. Follow the transmittal mechanics prescribed for Shop Drawings in Specification Section 01 33 00 – Submittals.

a. Product substitution will be treated in a manner similar to "deviations," as described in Specification Section 01 33 00 – Submittals.

b. List the letter describing the deviation and justifications on the transmittal form in the space provided under the column with the heading DESCRIPTION.

1) Include in the transmittal letter, either directly or as a clearly marked attachment, the items listed in the following paragraph below.

D. Transmittal Contents:

1. Product identification:

a. Manufacturer's name.

b. Telephone number and representative contact name.

c. Specification Section or Drawing reference of originally specified product, including discrete name or tag number assigned to original product in the Contract Documents.

2. Manufacturer's literature clearly marked to show compliance of proposed product with Contract Documents.

3. Itemized comparison of original and proposed product addressing product characteristics including but not necessarily limited to:

a. Size.

b. Composition or materials of construction.

c. Weight.

d. Electrical or mechanical requirements.

4. Product experience:

a. Location of past projects utilizing product.

b. Name and telephone number of persons associated with referenced projects knowledgeable concerning proposed product.

c. Available field data and reports associated with proposed product.

5. Data relating to changes in construction schedule.

6. Data relating to changes in cost.

7. Samples:

a. At request of Owner’s Representative.

b. Full size if requested by Owner’s Representative.

c. Held until substantial completion.

d. Owner's Representative not responsible for loss or damage to samples.

1.7 APPROVAL OR REJECTION

A. Written approval or rejection of substitution given by the Owner's Representative, Principal Architect/Engineer, and the Owner.

B. Owner's Representative reserves the right to require proposed product to comply with color and pattern of specified product if necessary to secure design intent.

C. In the event the substitution is approved, the resulting cost and/or time reduction will be documented by Change Order in accordance with the General Conditions.

D. Substitution will be rejected if:

1. Submittal is not through the Contractor with his stamp of approval.
2. Request is not made in accordance with this Specification Section.
3. In Owner's Representative opinion, acceptance will require substantial revision of the original design.
4. In the Owner's Representative opinion, substitution will not perform adequately the function consistent with the design intent.

E. Contractor shall reimburse Owner for the cost of the Owner's Representative evaluation whether or not substitution is approved.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 26 63

CHANGE ORDERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

Procedures for processing Change Orders, including:

1. Quality Assurance.
2. Responsible Individual.
3. Documentation of Change in Contract Price and Contract Time.
4. Change Procedures.
5. Proposals and Contract Modifications.
6. Work Change Directive.
7. Change Order.
8. Execution of Change Documentation.
9. Correlation of Contractor Submittals.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Introductory Information, Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

1.2 MEASUREMENT AND PAYMENT (NOT USED)

1.3 SUBMITTALS (NOT USED)

1.4 QUALITY ASSURANCE

A. Reference Standards:

1. Equipment Rental Rates: equipmentwatch.com. Rental Rate is defined as full unadjusted base rental rate for appropriate item of construction equipment.

1.5 RESPONSIBLE INDIVIDUAL

A. Provide letter to the Owner's Representative indicating name, title, address and contact information of individual authorized to execute change documents and who is responsible for informing others in Contractor's employ and Subcontractors of changes to the Work. Information should be provided at the

Preconstruction Conference but, no later than 10 calendar days following the Preconstruction Conference.

1.6 DOCUMENTATION OF CHANGE IN CONTRACT PRICE AND CONTRACT TIME

A. Maintain detailed records of changes in Work. Provide full information required for identification and evaluation of proposed changes, and substantiate costs of changes in Work.

B. Document each proposal for change in cost or time with sufficient data to allow evaluation of proposal. Provide additional information upon request of the Owner or the Owner's Representative.

C. Proposals shall include the following minimum information:

1. Quantities of items in original Proposal with additions, reductions, deletions, and substitutions.
2. Quantities and cost of items in original schedule of values with additions, reductions, deletions, and substitutions.
3. Provide unit prices for items not included in original Proposal with supporting information when absent from original Proposal Work.
4. Justification for changes in Contract Time.
5. Additional data upon request.

D. For changes in Work performed on a time-and-materials basis, provide the following additional information:

1. Quantities and description of products and equipment.
2. Taxes, insurance and bonds.
3. Overhead and profit as noted in Document 00 72 00 - General Conditions, Article 11.5.
4. Dates, times, and by whom work was performed.
5. Time records and certified copies of applicable payrolls.
6. Invoices, receipts for products, rented equipment, and subcontracts, similarly documented.

E. For changes in Work performed on a time-and-materials basis, payment for rental equipment will be as follows:

1. Actual invoice cost for duration required to complete extra work without markup for overhead and profit. When extra work comprises only a portion of rental invoice where equipment would otherwise be on site, compute

hourly equipment rate by dividing the actual monthly invoice by 176. (One day equals 8 hours and 1 week equals 40 hours.)

2. Do not exceed estimated operating costs given on equipmentwatch.com website for items of equipment. Overhead and profit will be allowed on operating cost.

F. For changes in Work performed on a time-and-materials basis using Contractor-owned equipment, use equipmentwatch.com rates as follows:

1. Contractor-owned equipment will be paid at Rental Rate for duration of time required to complete extra work without markup for overhead and profit. Utilize lowest cost combination of hourly, daily, weekly, or monthly rates. Use 150 percent of Rental Rate for double shifts (one extra shift per day) and 200 percent of Rental Rate for more than two shifts per day. Standby rates shall be 50 percent of appropriate Rental Rate shown on equipmentwatch.com website. No other rate adjustments apply.

2. Do not exceed estimated operating costs given on equipmentwatch.com. Overhead and profit will be allowed on operating cost. Operating costs will not be allowed for equipment on standby.

1.7 CHANGE PROCEDURES

A. Changes to Contract Price or Contract Time can only be made by issuance of Change Order. Issuance of Work Change Directive will be formalized into a Change Order. Changes will be in accordance with requirements of the General Conditions.

B. The Owner's Representative will advise of minor changes in Work not involving an adjustment to Contract Price or Contract Time as authorized by the General Conditions by issuing supplemental instructions.

C. Request clarification of Drawings, Specifications, Contract Documents, or other information by using Request for Information. Response by the Owner's Representative to Requests for Information does not authorize Contractor to perform tasks outside scope of Work. Changes must be authorized as described in this section.

1.8 PROPOSALS AND CONTRACT MODIFICATIONS

A. The Owner or the Owner's Representative may issue a Request for Proposal (RFP), which includes detailed description of proposed change with supplementary or revised Drawings and Specifications. The Owner or the Owner's Representative may also request a proposal in response to a Request for Information. Prepare and submit proposal within 7 days or as specified in the request.

B. Submit request for Contractor changes to Owner's Representative describing proposed change and its full effect on Work, with a statement describing reason

for change and effect on Contract Price and Contract Time including full documentation.

C. The Owner may use the Principal Architect/Engineer to review Change Orders.

1.9 WORK CHANGE DIRECTIVE

A. The Owner may issue a signed Work Change Directive instructing Contractor to proceed with a change in Work. Work Change Directive will subsequently be incorporated in Change Order.

B. Document will describe changes in Work and designate method of determining change in Contract Price or Contract Time.

C. Proceed promptly to execute changes in Work in accordance with Work Change Directive.

1.10 CHANGE ORDER

A. Stipulated Price Change Order

1. Stipulated Price Change Order will be based on accepted proposal.

B. Unit Price Change Order

1. Where Unit Prices for affected items of Work are included in Proposal, unit price Change Order will be based on unit prices, subject to the General Conditions.
2. Where unit prices of Work are not pre-determined in Proposal, Work Change Directive or accepted proposal will specify unit prices to be used.

C. Time-and-Material Change Order

1. Provide itemized account and supporting data after completion of change, within time limits indicated for claims in the General Conditions.
2. The Owner will determine change allowable in Contract Price and Contract Time as provided in the General Conditions.
3. Maintain detailed records of work done on time-and-material basis as specified in paragraph 1.4, Documentation of Change in Contract Price and Contract Time.
4. Provide full information required for evaluation of changes and substantiate costs for changes in Work.

1.11 EXECUTION OF CHANGE DOCUMENTATION

A. The Owner or the Owner's Representative will issue Change Orders, Work Change Directives, or accepted proposal for signatures of parties as described in the General Conditions.

1.12 CORRELATION OF CONTRACTOR SUBMITTALS

A. For Stipulated Price Contracts, promptly revise Schedule of Values and Application for Payment forms to record authorized Change Orders as separate line item.

B. For Unit Price Contracts, next monthly estimate of Work after acceptance of a Change Order will be revised to include new items not previously included and appropriate unit rates.

C. Promptly revise progress schedules to reflect change in Contract Time, and to adjust time for other items of work affected by change, and resubmit for review.

D. Promptly enter changes to on-site and record copies of Drawings, Specifications, or Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 29 73

SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Measurement and Payment
2. Definition
3. Preparation
4. Submittal

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Introductory Information, Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

1.2 MEASUREMENT AND PAYMENT

A. Unit Price. No separate payment will be made for this item. Include the cost in associated items for this project.

1.3 SUBMITTALS

A. Submit Schedule of Values in accordance with requirements of Section 01 33 00 – Submittals. Submit at least 10 days prior to submitting first application for progress payment. Submit via SharePoint.

B. Revise Schedule of Values and resubmit for items affected by contract modifications, Change Orders, and Work Change Directives. After changes are reviewed without exception by Authority's Principal Architect/Engineer, make submittal at least 10 days prior to submitting next application for progress payment.

1.4 DEFINITIONS

A. Schedule of Values: Is a schedule, prepared and maintained by the Contractor, allocating portions of the Contract Amount to various portions of the Work, including a tabulation of all of the costs of the various Subcontracts and materials which in the aggregate make up the Cost of the Work. The Schedule of Values shall be subject to Owner's approval and, after such approval, be used as the basis for reviewing the Contractor's Application For Payment.

B. Break down costs to list major products or operations for each line item which has an installed value of more than $5000.

1.5 PREPARATION

A. For stipulated price contracts, subdivide Schedule of Values into logical portions of Work, such as major work items or work in contiguous geographic areas.

B. Schedule and Schedule of Values shall be developed together. At a minimum, the Schedule of Values shall be broken out by trade and split between materials and labor as approved by the Owner. Such Prices will include overhead and profit applicable to each item of work.

C. For lump sum equipment items where submittal of operation/maintenance data and testing are required, include separate item for equipment operation and maintenance data submittal valued at 5 percent of lump sum amount for each equipment item and separate item for testing and adjusting valued at 5 percent of lump sum amount for each equipment item.

D. Round off figures for each listed item to nearest $100 except for value of one item, when necessary, to make total of items in Schedule of Values equal Contract Price for stipulated price contracts or lump sum amount in Schedule of Unit Price Work.

E. Submit Schedule of Values in approved electronic spreadsheet, formatted to print on 11” x 17” paper, to the Owner’s Document Management System.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Specific requirements for the preparation, submittal, updating, status reporting and management of the construction Progress Schedule.

B. Provide Construction Schedules for Work included in Contract in accordance with requirements in this Section. Create Construction Schedule using Critical Path Method (CPM) computer software capable of mathematical analysis of Precedence Diagramming Method (PDM) plans. Provide printed activity listings and bar charts in formats described in this Section.

C. Combine activity listings and bar charts with narrative report to form Construction Schedule submittal for Owner and the Owner's Representatives.

D. Related Specification Sections include, but are not necessarily limited to:

1. Division 00 - Bidding Requirements, Contract Forms and Conditions of the Contract.

2. Division 01 - General Requirements.

1.2 MEASUREMENT AND PAYMENT

A. No separate payment will be made for this item. Include the cost of construction scheduling in overhead cost for this project.

1.3 SCHEDULING STAFF

A. Employ or retain services of individual experienced in critical path scheduling for duration of Contract. Individual shall cooperate with Owner's Representative

and shall update schedule (Progress Schedule) monthly as required by the Contract's General Conditions, to indicate current status of Work.

1.4 QUALITY ASSURANCE

A. The person preparing and revising the construction Progress Schedule shall be experienced in the preparation of schedules of similar complexity.

B. Within five (5) days from award of the Contract, Contractor shall submit to Owner's Representative the name of the person responsible for the preparation, maintenance, updating and revision of all schedules.

1. Qualifications necessary:

a. At least five (5) years verifiable experience in the preparation and updating of complex construction schedules for projects of similar type, size and complexity.

b. Proficient in the use of Microsoft© Project® 2007.

1.5 DEFINITIONS

A. The following definitions shall apply to this Specification Section:

1. BASELINE SCHEDULE: The initial as-bid, detailed, cost and resource loaded Progress Schedule prepared by the Contractor to define its plan for constructing the Project as required by the Contract Documents, and accepted by the Owner or Owner's Representative as meeting the requirements of the Contract Documents for specified constraints, sequences, milestones and completion dates.

2. PROGRESS SCHEDULE: The initially accepted Baseline Schedule, or subsequently approved Revised Baseline Schedules, updated each month to reflect actual start and finish dates of schedule activities and all time impact events whether caused by Contractor or Owner or factors beyond the control of either party.

3. REVISED BASELINE SCHEDULE: The initially accepted Baseline Schedule revised to reflect only approved changes.

4. WORKING SCHEDULE: A schedule developed from the Progress Schedule, utilizing scheduling software features not allowed for Baseline and Progress Schedules at the Contractor's sole discretion, to indicate the Contractor's plan for executing the Work, and providing for schedule recovery when approved time extensions are not sufficient to provide for

timely completion due to Contractor inefficiencies beyond the control of the Owner or outside the risks accepted by the Owner.

1.6 SUBMITTALS

A. Shop Drawings:

1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
2. Baseline Schedule: Submitted within 20 days after Effective Date of Agreement.
3. Monthly Progress Schedules.
4. Revised Baseline Schedules.
5. Working Schedules.
6. Look-Ahead Schedules.

1.7 GENERAL REQUIREMENTS

A. Contractor shall prepare and submit Baseline and Progress Schedules and updates and revisions to them as specified herein.

1. All scheduling to be performed in Microsoft© Project® 2007.
2. The Baseline and Progress Schedules shall be a calendar day-based and cost-loaded Critical Path Method (CPM) network diagram with supporting data.

B. Disallowed Scheduling Software Features:

1. The following specific features are not allowed to be applied in the Baseline and Progress Schedules:
   a. Resource leveling.
   b. Activity or event constraints, other than those specified by the Contract Documents.
   c. Leads and lags:
      1) Create specific activities with specific durations in-lieu-of leads and lags.
      2) Durations shall have positive values.
   d. Default progress data:
      1) Start and finish dates shall not be automatically updated.
      2) Update with actual start and finish dates documented from field reports.
      3) Work activities shall be updated by actual Work progression, not cash flow driven.

4) Updating of activity percent complete and remaining duration shall be independent functions, not one parameter calculated from the other.

5) Out-of-sequence progress shall be accounted for through retained logic, not a default option of progress override.

e. Multiple calendars.

2. Any float suppression techniques or other software features that corrupts the pure mathematical model calculating the critical path.

a. The following CPM schedule outputs will be rejected without further review:

1) Schedules indicating the start of the critical path at a date point or activity beyond the date of Notice to Proceed, or schedules indicating a discontinuous critical path from Notice to Proceed to Contract completion.

2) Schedules defining critical activities as those on a path or paths having some minimum value of float.

3) Schedules with multiple critical paths.

4) Schedules indicating a completion date beyond the contractual completion date.

3. Contractor, at Contractor's sole discretion, may employ the disallowed scheduling software features for Contractor's exclusive use in preparing a Working Schedule.

C. Float Time:

1. Neither the Owner nor the Contractor owns the float; the project owns the float.

2. As such, liability for delay of the project completion date rests with the party actually causing delay to the project completion date.

D. By preparing and submitting the Baseline Schedule, the Contractor represents that it can and intends to execute the Work and portions thereof within the

specified times and constraints and that its bid covers the costs associated with the execution of the Work in accordance with the Construction Schedule.

E. Contractor shall provide an electronic copy on CD media for the Baseline Schedule and Progress Schedule and all monthly updates of both to accompany hard copies of the schedules and tabular reports.

1. Electronic submittal shall be in a format compatible with Microsoft© Project® 2007.
2. Contractor shall provide with the schedules, a procedural outline of the system shut-downs and proposed tie-ins, and the Owner's O&M staff, which shall be subject to approval of the Owner.

1.8 SUBMITTAL PACKAGES

A. Baseline Schedule:

1. CPM time-scaled network diagram:
   a. Via Sharepoint®

B. Monthly updates that include the following:

1. Revised Baseline Schedule as appropriate.
   a. Update to reflect approved Change Orders occurring since the prior update.
2. Updated Progress Schedule.
3. Explanation of changes in logic, duration of activities.
4. Upload electronic version (pdf) to SharePoint.

C. Look-Ahead Rolling Schedule:

1. A four-week rolling schedule shall be provided by the Contractor at each progress meeting.
   a. The schedule shall provide an accurate representation of the work performed the previous week and work planned for the current week and subsequent two (2) weeks.
2. The schedule shall be provided in a tabular format with bars representing work duration.
   a. The schedule shall refer to activity ID numbers on the Baseline and Progress Schedules.
   b. Activities that are on the critical path and activities that are behind schedule shall be noted by color, highlight, or underscore.
3. Derived from the Working Schedule, if applicable.

1.9 BASELINE SCHEDULE

A. Schedule shall include, but not be limited to, activities that show the following that are applicable to the project:

1. Project characteristics, salient features, or interfaces, including those with outside entities that could affect time of completion.
2. Project start date, scheduled completion date and other milestones.
3. Work performed by Contractor, subcontractors and suppliers.
4. Submittal development, delivery, review and approval, including those from Contractor, subcontractors and suppliers.
5. Procurement, delivery, installation and testing of materials, plants and equipment.
6. Testing and settlement periods.
7. Utility notification and relocation.
8. Erection and removal of falsework and shoring.
9. Finish work and final cleanup.
10. Project float as the predecessor activity to the scheduled completion date.

B. Schedule shall have not less than 15 activities, unless otherwise authorized by the Owner's Representative.

1. The number of activities shall be sufficient to assure adequate planning of the project, to permit monitoring and evaluation of progress, and to do an analysis of time impacts.
2. Schedule activities shall include the following:
   a. A clear and legible description.
   b. Start and finish dates.
   c. A duration of not less than one (1) working day, except for event activities, and not more than 10 working days, unless otherwise authorized by the Owner's Representative.
   d. At least one (1) predecessor and one (1) successor activity, except for project start and finish milestones.
   e. Required constraints: Only contractually required constraints may be inserted into the Baseline Schedule.
   f. Codes for responsibility, stage, work shifts, location and contract pay item

C. Working durations shall be planned to incorporate the effects of normal weather impacts. See General Conditions Article 12.2 for the "Baseline Rain Day Determination.

1.10 PROGRESS SCHEDULE

A. Develop Progress Schedule based on approved Baseline and Revised Baseline Schedules.

1. All restrictions on use of constraints, leads and lags, resource leveling, etc., shall also apply to Progress Schedules.

B. The Progress Schedule will be updated once per month for monitoring progress.
   1. Contractor may submit one (1) additional update per month for its own convenience.

C. Indicate progress by making entries on the most recently accepted version of the network diagram and supporting data to show:
   1. Activities completed.
   2. Activities started.
   3. Remaining duration for each activity started but not yet completed.
   4. Percent complete based on value of work in place and value of equipment or material delivered and properly stored.
   5. Status of activity due to be completed by the next scheduled progress meeting.

D. Computerized Progress Schedule and percent completion of Work shall be used to verify Contractor's payment requests.
   1. Progress payments will not be processed by the Owner’s Representative unless the updated Progress Schedule has been submitted concurrently with a pay request and found acceptable by the Owner’s Representative.

1.11 REVISIONS TO PROGRESS SCHEDULE

A. Contractor shall submit data for a revised Progress Schedule within five (5) days of the occurrence of any of the following:
   1. When contractor-caused delay in completion of any activity or group of activities indicates an overrun of the Contract Time or Control Dates by 30 working days or 10 percent of the remaining duration, whichever is less.
   2. When delays in submittals, deliveries, or work stoppages are encountered making necessary the replanning or rescheduling of the Work.
   3. When the schedule does not represent the actual progress of the Work.
   4. When a change order significantly affects the contract completion date.

B. The revised Progress Schedule shall be the basis of a Working Schedule showing:
   1. How Contractor intends to return to schedule.
   2. How Contractor intends to avoid falling behind schedule on future activities.

C. Show changes on the network diagram and supporting data including:
   1. New activities and their duration.
   2. Modifications to existing activities.

D. Provide written narrative report as needed to define:

1. Problem areas, anticipated delays, and impact on the current schedule.
2. Corrective action recommended, and its effect.
3. Major changes in scope.
4. Revised projections of progress and completion.

E. Except as provided in the following subparagraphs 1 and 2, the cost of revisions to the Progress Schedule resulting from changes in the Work shall be included in the cost for the change in the Work, and shall be based on the complexity of the revision or Change Order, man-hours expended in analyzing the change, and the total cost of the change.

1. The cost of revision to the Construction Schedule not resulting from authorized changes in the Work shall be the responsibility of the Contractor.
2. The cost of revision to the Construction Schedule for the Contractor's convenience shall be the responsibility of the Contractor.

F. The revised network diagram and supporting data for the Progress Schedule shall be submitted to the Owner’s Representative upon completion of the revisions, but not later than the next progress meeting.

G. Revisions to the Progress Schedule for the Contractor's convenience:

1. Must be approved by the Owner’s Representative before Contractor changes the sequence of Work.

1.12 TIME IMPACT ANALYSIS (TIA)

A. The accepted initial Baseline Schedule or subsequently accepted Revised Baseline Schedule shall be used for TIA.

B. Contractor shall submit a written TIA to the Owner’s Representative with each request for adjustment of Contract Time, or when Contractor or Owner’s Representative consider that an approved or anticipated change may impact the critical path or contract progress.

1. The TIA must be attached to any change order prior to approval of any change to time or cost.

C. The TIA shall illustrate the impacts of each change or delay on the current scheduled completion date or internal milestone, as appropriate.

1. The analysis shall use the Baseline or Revised Baseline Schedule (accepted Baseline Schedule) that has a data date closest to and prior to the event.
2. If the Owner’s Representative determines that the accepted Baseline Schedule used does not appropriately represent the conditions prior to the event, the accepted Baseline Schedule shall be updated to the day before the event being analyzed.
3. The TIA shall include an impact schedule developed from incorporating the event into the accepted Baseline Schedule by adding or deleting activities,

or by changing durations or logic of existing activities as appropriate to the nature of the change event.

4. If the impact schedule shows that incorporating the event modifies the critical path and scheduled completion date of the accepted Baseline Schedule, the difference between scheduled completion dates of the two (2) schedules shall be equal to the adjustment of Contract Time.

D. Contractor shall submit a TIA in duplicate within 15 working days of receiving a written request for a TIA from the Owner's Representative.

1. Contractor shall allow the Owner's Representative two (2) weeks after receipt to approve or reject the submitted TIA.
2. All approved TIA schedule changes shall be shown on the next update schedule.

E. In the event of a TIA rejection:

1. If a TIA submitted by the Contractor is rejected by the Owner's Representative, the Contractor shall meet with the Owner's Representative to discuss and resolve issues related to the TIA.
2. If agreement is not reached, the Contractor will be allowed 15 days from the meeting with the Owner's Representative to give notice.
3. Contractor shall only show actual as-built work, not unapproved changes related to the TIA, in subsequent update schedules.
4. If agreement is reached at a later date, approved TIA schedule changes shall be shown on the next update schedule.
5. Owner's Representative will withhold remaining payment on the schedule contract item if a TIA is requested by Owner's Representative and not submitted by Contractor within 15 working days.
6. The schedule item payment will resume on the next estimate after the requested TIA is submitted.

a. No other contract payment will be retained regarding TIA submittals.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 32 36.01

PROJECT PHOTOGRAPHS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Technical and submittal requirements for project photographs, including:

   a. Measurement and Payment

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 - General Requirements.

1.2 MEASUREMENT AND PAYMENT

A. Unit Price. No separate payment will be made for this item. Include the cost in associated items for this project.

1.3 DEFINITIONS:

1. Pre-construction Photographs: Photographs taken, in sufficient numbers and detail, prior to beginning field activities, to show original construction site conditions.

1.4 SUBMITTALS:

1. Refer to Section 01 33 00 – Submittals.
2. Format and Media. Digital photography shall be used for Preconstruction and Progress Photographs.

   1) Digital Photography. Use at least 6.0 megapixel density for photographs. Submit digital photographic files on compact disks (CD) in JPEG format. Submit disks in 3-hole punched plastic sheets with a maximum of two CD's per sheet. Mark disks with project name and dates of photos.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mechanics and administration of the submittal process for:
    a. Shop Drawings.
    b. Samples.
    c. Miscellaneous submittals.
    d. Operation and Maintenance Manuals.
2. General content requirements for Shop Drawings.
3. Content requirements for Operation and Maintenance Manuals.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 - General Requirements.
3. Sections in Divisions 02 through 48 identifying required submittals.

1.2 MEASUREMENT AND PAYMENT

A. Unit Price. No separate payment will be made for this item. Include the cost in associated items for this project.

1.3 SUBMITTALS (NOT USED)

1.4 DEFINITIONS

A. Shop Drawings:

1. See General Conditions.
2. Product data and samples are Shop Drawing information.

B. Operation and Maintenance (O&M) Manuals:

1. Contain the information required for proper installation and maintenance of building materials and finishes.
2. Contain the technical information required for proper installation, operation and maintenance of process, electrical and mechanical equipment and systems.

C. Miscellaneous Submittals:

1. Submittals other than Shop Drawings and O&M Manuals.

2. Representative types of miscellaneous submittal items include but are not limited to:
    a. Construction schedule.
    b. Facility Shutdown Plan(s)
    c. HVAC test and balance reports.
    d. Installed equipment and systems performance test reports.
    e. Manufacturer's installation certification letters.
    f. Instrumentation and control commissioning reports.
    g. Warranties.
    h. Service agreements.
    i. Construction photographs.
    j. Record Documents.
    k. Cost breakdown (Schedule of Values).
    l. Safety Plan(s).

1.5 SUBMITTAL SCHEDULE

A. Schedule of Shop Drawings:
    1. Submitted and approved within 20 days of receipt of Notice to Proceed.
    2. Account for multiple transmittals under any specification section where partial submittals will be transmitted.
B. Shop Drawings: Submittal and approval prior to 50 percent completion.
C. Operation and Maintenance Manuals and Completed Equipment Record Sheets: Initial submittal within 60 days after date Shop Drawings are approved.

1.6 PREPARATION OF SUBMITTALS

A. General:
    1. All submittals and all pages of all copies of a submittal shall be completely legible.
    2. Submittals which, in the Owner’s Representative’s or Principal Architect/Engineer’s sole opinion, are illegible will be returned without review.
B. Shop Drawings:
    1. Scope of any submittal and shop drawing transmittal:
        a. Submit shop drawings utilizing Owner’s standard Submittal Transmittal Form.
        b. Limited to one (1) Specification Section.

c. Do not submit under any Specification Section entitled (in part) "Basic Requirements" unless the product or material submitted is specified, in total, in a “Basic Requirements” Section.

2. Numbering letter of transmittal:
   a. Include a series number, "xx", beginning with "01" and increasing sequentially with each additional transmittal.
   b. Assign consecutive series numbers to subsequent transmittals.
3. Describing transmittal contents:
   a. Provide listing of each component or item in submittal capable of receiving an independent review action.
   b. Identify for each item:
      1) Manufacturer and Manufacturer's Drawing or data number.
      2) Contract Document tag number(s).
      3) Unique page numbers for each page of each separate item.
      4) Use divider sheets with labeled tabs to separate independent items within a single submittal.
   c. When submitting "or-equal" items that are not the products of named manufacturers, include the words "or-equal" in the item description.
4. Contractor stamping:
   a. General:
      1) Contractor's review and approval stamp shall be applied either to the letter of transmittal or a separate sheet preceding each independent item in the submittal.
         a) Contractor's signature and date shall be wet ink signature. Is an electronic signature acceptable as most submittals are uploaded to SharePoint as a .PDF electronic document?
         b) Shop Drawing submittal stamp shall read "(Contractor's Name) has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval as stipulated under General Conditions Paragraph 6.20.4."
      2) Submittals containing multiple independent items shall be prepared with an index sheet for each item listing the discrete page numbers for

each page of that item, which shall be stamped with the Contractor's review and approval stamp.

a) Individual pages or sheets of independent items shall be numbered in a manner that permits Contractor's review and approval stamp to be associated with the entire contents of a particular item.

b) Use divider sheets with labeled tabs to separate independent items within a single submittal.

b. Electronic stamps:

1) Contractor may electronically embed Contractor's review and approval stamp to either the Submittal Transmittal Form or a separate index sheet preceding each independent item in the submittal.

2) Contractor's signature and date on electronically applied stamps shall be wet ink signature. Is an electronic signature acceptable as most submittals are uploaded to SharePoint as a PDF electronic document?

5. Resubmittals:

a. Number with original root number and a suffix letter starting with "A" on a new Submittal Transmittal Form.

b. Do not increase the scope of any prior transmittal.

c. Account for all components of prior transmittal.

1) If items in prior transmittal received "A" or "B" Action code, list them and indicate "A" or "B" as appropriate (See also 1.6, this Section).

a) Do not include submittal information for items listed with prior "A" or "B" in resubmittal.

2) Indicate items to be resubmitted “at a later date” for any prior "C" or "D" Action item not included in resubmittal.

a) Obtain Principal Architect/Engineer’s approval to exclude items.

6. Electronic submittals utilizing web based document management system (SharePoint®):

a. Shop drawing submittals shall be produced (scanned) in Adobe Acrobat's Portable Document Format (PDF) Version 5.0 or higher.

b. Do not password protect and/or lock the PDF document.

c. Create one (1) PDF document (PDF file) for each submittal.

d. Drawings or other graphics must be converted to PDF format and made part of the singe (one [1]) PDF document.

1) Scanning to be used only where actual file conversion is not possible.

e. Limit PDF document size to 5MB.

f. Rotate pages that must be viewed in landscape to the appropriate position for easy reading.

g. Images only shall be scanned at a resolution of 300 dpi or greater.

   1) Perform Optical Character Recognition (OCR) capture on all images.

   2) Achieve OCR with the "original image with hidden text" option.

   3) Word searches of the PDF document must operate successfully to demonstrate OCR compliance.

h. Create bookmarks in the navigation frame, for each entry in the Table of Contents/Index.

   1) Normally three (3) levels deep (i.e., "Chapter," "Section," "Sub-section").

i. Thumbnails must be generated for each PDF file.

j. Set the opening view for PDF files as follows:

   1) Initial view: Bookmarks and Page.

   2) Magnification: Fit in Window.

   3) Page layout: Single page.

   4) Set the file to open to the cover page of the submittal with bookmarks to the left, and the first bookmark linked to the cover page.

k. All PDF documents shall be set with the option "Fast Web View" to open the first pages of the document for the viewer while the rest of the document continues to load.

l. File naming conventions:

   1) File names shall use a "nine dot three" convention (XXXXXX-YY-Z.PDF) where XXXXXX is the Specification Section number, YY is the

Shop Drawing Root series number and Z is an ID number used to designate the associated volume.

a) Example 1:

(1) Two (2) pumps submitted as separate Shop Drawings under the same Specification Section:

(a) Pump 1 = 43 21 21-01-1.pdf.

(b) Pump 2 = 43 21 21-02-1.pdf.

b) Example 2:

(1) Control system submitted as one (1) Shop Drawing but separated into two (2) shop drawing submittals:

(a) Volume 1 = 40 90 00-01-1.pdf.

(b) Volume 2 = 40 90 00-01-2.pdf.

7. Provide clear space (3 In Sq) for Principal Architect/Engineer stamping of each component defined in the PREPARATION OF SUBMITTALS Article – Contractor Stamping.
8. Contractor shall not use red color for marks on transmittals.
   a. Duplicate all marks on all copies transmitted, and ensure marks are photocopy reproducible.
   b. Outline Contractor marks on reproducible transparencies with a rectangular box.
9. Transmittal contents:
   a. Coordinate and identify Shop Drawing contents so that all items can be easily verified by the Owner's Representative and the Principal Architect/Engineer.
   b. Identify equipment or material use, tag number, Drawing detail reference, weight, and other Project specific information.
   c. Provide sufficient information together with technical cuts and technical data to allow an evaluation to be made to determine that the item submitted is in compliance with the Contract Documents.
   d. Submit items such as equipment brochures, cuts of fixtures, product data sheets or catalog sheets on 8-1/2 x 11 In pages.
      1) Clearly mark (indicate) exact item or model and all options proposed.
   e. When a Shop Drawing submittal is called for in any Specification Section, include as appropriate, scaled details, sizes, dimensions, performance characteristics, capacities, test data, anchoring details, installation instructions, storage and handling instructions, color charts, layout Drawings, rough-in diagrams, wiring diagrams, controls, weights and

other pertinent data in addition to information specifically stipulated in the Specification Section.

1) Arrange data and performance information in format similar to that provided in Contract Documents.

2) Provide, at minimum, the detail specified in the Contract Documents.

f. Provide warranty information.

g. If proposed equipment or materials deviate from the Contract Drawings or Specifications in any way, clearly note the deviation and justify the said deviation in detail in a separate letter immediately following transmittal sheet.

10. Samples:

a. Identification:

1) Identify sample as to transmittal number, manufacturer, item, use, type, project designation, tag number, standard Specification Section

or Drawing detail reference, color, range, texture, finish and other pertinent data.

2) If identifying information cannot be marked directly on sample without defacing or adversely altering samples, provide a durable tag with identifying information securely attached to the sample.

b. Include application specific brochures, and installation instructions.

c. Provide Contractor's stamp of approval on samples or transmittal form as indication of Contractor's checking and verification of dimensions and coordination with interrelated work.

d. Resubmit samples of rejected items.

C. Miscellaneous Submittals:

1. Prepare in the format and detail specified in Specification requiring the miscellaneous submittal.

D. Operation and Maintenance Manuals:

1. Owner's use of manufacturer's Operation and Maintenance materials:

a. Materials are provided for Owner's use, reproduction and distribution as training and reference materials within Owner's organization.

1) Applicable to hard copy or electronic media.

2) Applicable to materials containing copyright notice as well as those with no copyright notice.

b. Notify manufacturer of this intended use of materials provided under the Contract.

2. Number each Operation and Maintenance Manual transmittal with the original root number of the associated Shop Drawing.

a. Identify resubmittals with the original number plus a suffix letter starting with "A."

3. Submittal format:

a. Interim submittals: Submit two (2) paper copies until manual is approved.

b. Final submittals:

1) Within 30 days of receipt of approval, submit one (1) additional paper copy and two (2) electronic copies to the Owner’s Document

Management System (SharePoint) in Portable Document Format (PDF).

a) Compact discs to be secured in jewel cases.

2) Electronic copies will be reviewed for conformance with the approved paper copy and the electronic copy (PDF) requirements of this Specification.

3) Non-conforming CDs will be returned with comments.

a) Provide final CDs within 30 days of receipt of comments.

4. Paper copy submittals:

a. Submit Operation and Maintenance Manuals printed on 8-1/2 x 11 In size heavy first quality paper with standard three-hole punching and bound in

appropriately sized three-ring (or post) vinyl view binders with clear overlays front, spine and back.

1) Provide binders with titles inserted under clear overlay on front and on spine of each binder.
   a) As space allows, binder titles shall include, but not necessarily be limited to, Project Name, related Specification Number, Equipment Name(s) and Project Equipment Tag Numbers.
2) Provide a Cover Page for each manual with the following information:
   a) Manufacturer(s).
   b) Date.
   c) Project Owner and Project Name.
   d) Specification Section.
   e) Project Equipment Tag Numbers.
   f) Model Numbers.
   g) Principal Architect/Engineer.
   h) Contractor.
3) Provide a Table of Contents or Index for each manual.
4) Use plastic-coated dividers to tab each section of each manual per the manual's Table of Contents/Index for easy reference.
5) Provide plastic sheet lifters prior to first page and following last page.

b. Reduce Drawings or diagrams bound in manuals to an 8-1/2 x 11 In or 11 x 17 In size.
   1) Where reduction is not practical to ensure readability, fold larger Drawings separately and place in vinyl envelopes which are bound into the binder.
   2) Identify vinyl envelopes with Drawing numbers.

c. Mark each sheet to clearly identify specific products and component parts and data applicable to the installation for the Project.
   1) Delete or cross out information that does not specifically apply to the Project.

5. Electronic copy submittals:
   a. Electronic copies of the approved paper copy Operation and Maintenance Manuals are to be produced in Adobe Acrobat's Portable Document Format (PDF) Version 5.0 or higher.
   b. Do not password protect and/or lock the PDF document.

c. Create one (1) PDF document (PDF file) for each equipment O&M Manual.

d. Drawings or other graphics must be converted to PDF format and made part of the one (1) PDF document.

   1) Scanning to be used only where actual file conversion is not possible.

e. Rotate pages that must be viewed in landscape to the appropriate position for easy reading.

f. Images only shall be scanned at a resolution of 300 dpi or greater.

   1) Perform Optical Character Recognition (OCR) capture on all images.

   2) Achieve OCR with the "original image with hidden text" option.

   3) Word searches of the PDF document must operate successfully to demonstrate OCR compliance.

g. Create bookmarks in the navigation frame, for each entry in the Table of Contents/Index.

   1) Normally three (3) levels deep (i.e., "Chapter," "Section," "Sub-section").

h. Thumbnails must be generated for each PDF file.

i. Set the opening view for PDF files as follows:

   1) Initial view: Bookmarks and Page.

   2) Magnification: Fit in Window.

   3) Page layout: Single page.

   4) Set the file to open to the cover page of the manual with bookmarks to the left, and the first bookmark linked to the cover page.

j. All PDF documents shall be set with the option "Fast Web View" to open the first pages of the document for the viewer while the rest of the document continues to load.

k. File naming conventions:

   1) File names shall use a "ten dot three" convention (XXXXXX-YY-Z.PDF) where XXXXXX is the Specification Section number, YY is the

Shop Drawing Root number and Z is an ID number used to designate the associated volume.

a) Example 1:

(1) Two (2) pumps submitted as separate Shop Drawings under the same Specification Section:

(a) Pump 1 = 43 21 21-01-1.pdf.

(b) Pump 2 = 43 21 21-02-1.pdf.

b) Example 2:

(1) Control system submitted as one (1) Shop Drawing but separated into two (2) O&M volumes:

(a) Volume 1 = 40 90 00-01-1.pdf.

(b) Volume 2 = 40 90 00-01-2.pdf.

l. Labeling:

1) As a minimum, include the following labeling on all CD-ROM discs and jewel cases:

a) Project Name.

b) Equipment Name and Project Tag Number.

c) Project Specification Section.

d) Manufacturer Name.

e) Vendor Name.

m. Binding:

1) Include labeled CD(s) in labeled jewel case(s).

a) Bind jewel cases in standard three-ring binder Jewel Case Page(s), inserted at the front of the Final paper copy submittal.

b) Jewel Case Page(s) to have means for securing Jewel Case(s) to prevent loss (e.g., flap and strap).

6. Operation and Maintenance Manuals for Materials and Finishes:

a. Building Products, Applied Materials and Finishes:

1) Include product data, with catalog number, size, composition and color and texture designations.

2) Provide information for re-ordering custom manufactured products.

b. Instructions for Care and Maintenance:

1) Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods and recommended schedule for cleaning and maintenance.

c. Moisture Protection and Weather Exposed Products:

1) Include product data listing, applicable reference standards, chemical composition, and details of installation.

2) Provide recommendations for inspections, maintenance and repair.

d. Additional requirements as specified in individual product specifications.

7. Operation and Maintenance Manuals for Equipment and Systems:

a. Submission of Operation and Maintenance Manuals for equipment and systems is applicable but not necessarily limited to:

1) Major equipment.

2) Equipment powered by electrical, pneumatic or hydraulic systems.

3) Specialized equipment and systems including instrumentation and control systems and system components for HVAC process system control.

4) Valves and water control gates.

b. Equipment and Systems Operation and Maintenance Manuals shall include, but not necessarily be limited to, the following completed forms and detailed information, as applicable:

1) Fully completed type-written copies of the associated Equipment Record(s), Exhibits A1, A2 and A3, shall be included under the first

tab following the Table of Contents of each Operation and Maintenance Manual.

a) Each section of the Equipment Record must be completed in detail.

(1) Simply referencing the related manual for nameplate, maintenance, spare parts or lubricant information is not acceptable.

b) For equipment items involving components or subunits, a fully completed Equipment Record Form is required for each operating component or subunit.

c) Submittals that do not include the associated Equipment Record(s) will be rejected without further content review.

d) Electronic copies of the Exhibits may be obtained by contacting the Project Manager.

2) Equipment function, normal operating characteristics, limiting operations.

3) Assembly, disassembly, installation, alignment, adjustment, and checking instructions.

4) Operating instructions for start-up, normal operation, control, shutdown, and emergency conditions.

5) Lubrication and maintenance instructions.

6) Troubleshooting guide.

7) Parts lists:

a) Comprehensive parts and parts price lists.

b) A list of recommended spare parts.

c) List of spare parts provided as specified in the associated Specification Section.

8) Outline, cross-section, and assembly Drawings; engineering data; and electrical diagrams, including elementary diagrams, wiring diagrams,

connection diagrams, word description of wiring diagrams and interconnection diagrams.

9) Test data and performance curves.

10) As-constructed fabrication or layout Drawings and wiring diagrams.

11) Instrumentation or tag numbers assigned to the equipment by the Contract Documents are to be used to identify equipment and system components.

12) Additional information as specified in the associated equipment or system Specification Section.

1.7 TRANSMITTAL OF SUBMITTALS

A. Shop Drawings, Samples and Operation and Maintenance Manuals:

1. Transmit all submittals via Owner's Document Management System (SharePoint).
2. Transmit all paper submittals to the address provided below.

San Jacinto River Authority

2436 Sawdust Road

The Woodlands, Texas 77380

Attn: (Construction Manager – TBD)

3. Utilize SJRA Standard Submittal Transmittal Form (to be provided by Owner) to transmit all Shop Drawings, Samples and Operation and Maintenance Manuals.
4. All submittals must be from Contractor.
   a. Submittals will not be received from or returned to subcontractors.
   b. Operation and Maintenance Manual submittal stamp may be Contractor's standard approval stamp.
5. Provide submittal information defining specific equipment or materials utilized on the Project.
   a. Generalized product information, not clearly defining specific equipment or materials to be provided, will be rejected.

B. Miscellaneous Submittals:

1. Transmit under Contractor's standard Submittal Transmittal Form or letterhead.
2. Submit in triplicate or as specified in individual Specification Section.
3. Transmit to the address provided below.

San Jacinto River Authority

2436 Sawdust Road

The Woodlands, Texas

Attn: (Construction Manager – TBD)

4. Provide copy of Submittal Transmittal without attachments to Owner's Representative.

C. Expedited Return Delivery:

1. Include prepaid express envelope or airbill in submittal transmittal package for any submittals Contractor expects or requires express return mail.
2. Inclusion of prepaid express envelope or airbill does not obligate Owner’s Representative or Principal Architect/Engineer to conduct expedited review of submittal.

D. Fax Transmittals:

1. Permitted on a case-by-case basis to expedite review when approved by Principal Architect/Engineer.
2. Requires hard copy transmittal to immediately follow.
   a. Principal Architect/Engineer will proceed with review of fax transmittal.
   b. Principal Architect/Engineer 's approval or rejection comments will be recorded and returned on hard copy transmittal.
3. Provisions apply to both:
   a. Initial transmittal contents.
   b. Supplemental information required to make initial transmittal contents complete.

1.8 PRINCIPAL ARCHITECT/ENGINEER 'S REVIEW ACTION

A. Shop Drawings and Samples:

1. Items within transmittals will be reviewed for overall design intent and will receive one of the following actions:
   a. NO EXCEPTION.
   b. EXCEPTIONS AS NOTED.
   c. REVISE & RESUBMIT
   d. REJECTED - RESUBMIT.
   e. ACKNOWLEDGE RECEIPT.
   f. FOR INFORMATION PURPOSES ONLY.

g. SUPPLEMENTARY INFORMATION.

2. Submittals received will be initially reviewed to ascertain inclusion of Contractor's approval stamp.
   a. Submittals not stamped by the Contractor or stamped with a stamp containing language other than that specified herein will not be reviewed for technical content and will be returned without any action.
3. In relying on the representation on the Contractor's review and approval stamp, Owner and Principal Architect/Engineer reserve the right to review and process poorly organized and poorly described submittals as follows:
   a. Submittals transmitted with a description identifying a single item and found to contain multiple independent items:
      1) Review and approval will be limited to the single item described on the transmittal letter.
      2) Other items identified in the submittal will:
         a) Not be logged as received by the Principal Architect/Engineer.
         b) Be removed from the submittal package and returned without review and comment to the Contractor for coordination, description and stamping.
         c) Be submitted by the Contractor as a new series number, not as a re-submittal number.
   b. Principal Architect/Engineer, at Principal Architect/Engineer's discretion, may revise the transmittal letter item list and descriptions, and conduct review.
      1) Unless Contractor notifies Principal Architect/Engineer in writing that the Principal Architect/Engineer's revision of the Submittal Transmittal Form item list and descriptions was in error, Contractor's review and

approval stamp will be deemed to have applied to the entire contents of the submittal package.

4. Submittals returned with Action "A" or "B" are considered ready for fabrication and installation.
   a. If for any reason a submittal that has an "A" or "B" Action is resubmitted, it must be accompanied by a letter defining the changes that have been made and the reason for the resubmittal.
   b. Destroy or conspicuously mark "SUPERSEDED" all documents having previously received "A" or "B" Action that are superseded by a resubmittal.
5. Submittals with Action "A" or "B" combined with Action "C" (Revise and Resubmit) or "D" (Rejected) will be individually analyzed giving consideration as follows:
   a. The portion of the submittal given "C" or "D" will not be distributed (unless previously agreed to otherwise at the Preconstruction Conference).
      1) One (1) copy or the one (1) transparency of the "C" or "D" Drawings will be marked up and returned to the Contractor.
         a) Correct and resubmit items so marked.
   b. Items marked "A" or "B" will be fully distributed.
   c. If a portion of the items or system proposed are acceptable, however, the major part of the individual Drawings or documents are incomplete or require revision, the entire submittal may be given "C" or "D" Action.
      1) This is at the sole discretion of the Principal Architect/Engineer.
      2) In this case, some Drawings may contain relatively few or no comments or the statement, "Resubmit to maintain a complete package."
      3) Distribution to the Owner and field will not be made (unless previously agreed to otherwise).
6. Failure to include any specific information specified under the submittal paragraphs of the Specifications will result in the submittal being returned to the Contractor with "C" or "D" Action.
7. Calculations: Requirements for the submittal of calculations in the individual Specification Sections shall be satisfied through the submittal of a certification sealed by the Principal Architect/Engineer that the calculations have been performed. Certification will be received for information purposes only and will be returned stamped "D. ACKNOWLEDGE RECEIPT ".
8. Transmittals of submittals which the Principal Architect/Engineer considers as "Not Required" submittal information, which is supplemental to but not essential to prior submitted information, or items of information in a transmittal which have been reviewed and received "A" or "B" Action in a

prior submittal, will be returned with Action "E. Acknowledge Receipt" (Principal Architect/Engineer 's Review Not Required).

9. Samples may be retained for comparison purposes.
   a. Remove samples when directed.
   b. Include in bid all costs of furnishing and removing samples.
10. Approved samples submitted or constructed, constitute criteria for judging completed work.
    a. Finished work or items not equal to samples will be rejected.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

EXHIBIT A1

Equipment Record

Equipment Data and Spare Parts Summary

Project Name	Specification Section:
Equipment Name	Year Installed:
Project Equipment Tag No(s).	
Equipment Manufacturer	Project/ Order No.
Address	Phone
Fax / Web Site / E-mail	
Local Vendor/Service Center	
Address	Phone
Fax / Web Site / E-mail	

MECHANICAL NAMEPLATE DATA

Equip.		Serial No.		
Make		Model No.		
ID No.	Frame No.	HP	RPM	Cap.
Size	TDH	Imp. Sz.	CFM	PSI
Other:				

ELECTRICAL NAMEPLATE DATA

Equip.			Serial No.					
Make			Model No.					
ID No.	Frame No.	HP	V.	Amp.	HZ	PH	RPM	SF
Duty	Code	Ins. Cl.	Type	NEMA	C Amb.	Temp. Rise	Rating	
Other:								

SPARE PARTS PROVIDED PER CONTRACT

Part No.	Part Name	Quantity

RECOMMENDED SPARE PARTS		
Part No.	Part Name	Quantity

EXHIBIT A2
Equipment Record

Recommended Maintenance Summary

Equipment Description	Project Equip. Tag No(s).

RECOMMENDED BREAK-IN MAINTENANCE (FIRST OIL CHANGES, ETC.)	INITIAL COMPLETION * FOLLOWING START-UP						
	D	W	M	Q	S	A	Hours

RECOMMENDED PREVENTIVE MAINTENANCE	PM TASK INTERVAL *						
	D	W	M	Q	S	A	Hours

*** D = Daily W = Weekly M = Monthly Q = Quarterly S = Semiannual A = Annual Hours = Run Time Interval**

EXHIBIT A3

Equipment Record

Lubrication Summary

Equipment Description	Project Equip. Tag No(s).

Lubricant Point						
Lubricant Type		Manufacturer	Product	AGMA #	SAE #	ISO
	1					
	2					
	3					
	4					
	5					
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SECTION 01 35 05

ENVIRONMENTAL PROTECTION AND SPECIAL CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Addresses:

1. Minimizing the pollution of air, water, or land; control of noise, the disposal of solid waste materials, and protection of deposits of historical or archaeological interest.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

1.2 MEASUREMENT AND PAYMENT

A. Unit Prices. No separate payment will be made for this item. Include the cost of same in associated items for this project.

1.3 SUBMITTALS

A. Shop Drawings:

1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
2. Prior to the start of any construction activities submit:
   a. A detailed proposal of all methods of control and preventive measures to be utilized for environmental protection.
   b. A drawing of the work area, haul routes, storage areas, access routes and current land conditions including trees and vegetation.
   c. Submit manufacturer's catalog sheets and other product data on dispensing equipment, pump, and aboveground fuel storage tanks, indicating capacity and dimensions of tank.
   d. Submit drawings to show location of tank protection area and driveway. Indicate nearest inlet or channelized flow area. Clearly dimension distances and measurements.
   e. Submit list of spill containment equipment, and quantities thereof, located at fueling area.

1.4 ENVIRONMENTAL CONTROLS

A. Provide and maintain methods, equipment, and temporary construction as necessary for controls over environmental conditions at construction site and adjacent areas.

B. Work to minimize impact to surrounding environment. Adopt construction procedures that do not cause unnecessary excavation and filling of terrain, indiscriminate destruction of vegetation, air or stream pollution, nor harassment or destruction of wildlife.

C. Recognize and adhere to environmental requirements of Project. Limit disturbed areas to boundaries established by Contract. Avoid pollution of "on-site" streams, sewers, wells, or other water sources.

D. Burning of rubbish, debris, or waste materials is not permitted.

1.5 POLLUTION CONTROL

A. Provide methods, means, and facilities required to prevent contamination of soil, water, or atmosphere by discharge of noxious substances from construction operations.

B. Provide equipment and personnel to perform required emergency measures to contain spillage, and to remove contaminated soils or liquids. Excavate and dispose of contaminated earth off-site, and replace with suitable compacted fill and topsoil.

C. Provide systems for control of atmospheric pollutants.

1. Prevent toxic concentrations of chemicals.
2. Prevent harmful dispersal of pollutants into atmosphere.

D. Use equipment that conforms to current Federal, State, and local laws and regulations.

E. Install or otherwise implement positive controls to prevent hazardous materials migrating from Work area.

1.6 PEST AND RODENT CONTROL

A. Provide rodent and pest control as necessary to prevent infestation of construction or storage areas.

B. Employ methods and use materials which will not adversely affect conditions at site or on adjoining properties.

1.7 NOISE CONTROL

M. Provide vehicles, equipment, and construction activities that minimize noise to greatest degree practicable. Conform noise levels to latest OSHA standards.

Do not permit noise levels to interfere with Work or create nuisance in surrounding areas.

N. Conduct construction operations during daylight hours except as approved by Owner's Representative.

O. Select construction equipment to operate with minimum noise and vibration. When in opinion of Owner's Representative, objectionable noise or vibration is produced by equipment, rectify conditions without additional cost to Owner. Sound Power Level (PWL) of equipment shall not exceed 85 dbA (re: 10-12

watts) measured 5 feet from piece of equipment. Explicit equipment noise requirements are specified with equipment specifications.

1.8 DUST CONTROL

A. Control objectionable dust caused by operation of vehicles and equipment. Apply water or use other methods, subject to approval of Owner's Representative, to control amount of dust generated.

1.9 WATER RUNOFF AND EROSION CONTROL

A. Comply with Texas Pollutant Discharge Elimination System (TPDES) permit when required.

B. In addition to TPDES requirements:

1. Provide methods to control surface water, runoff, subsurface water, and water from excavations and structures to prevent damage to Work, site, or adjoining properties.
2. Control fill, grading and ditching to direct water away from excavations, pits, tunnels, and other construction areas; and to direct drainage to proper runoff courses so as to prevent erosion, sedimentation or damage.
3. Provide, operate, and maintain equipment and facilities of adequate size to control surface water.
4. Dispose of drainage water in manner to prevent flooding, erosion, or other damage to portion of site or to adjoining areas and in conformance with environmental requirements.
5. Retain existing drainage patterns external to construction site by constructing temporary earth berms, sedimentation basins, retaining areas, and temporary ground cover as needed to control conditions.
6. Plan and execute construction and earth work by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
   a. Minimize area of bare soil exposed at one time.
   b. Provide temporary control measures, as berms, dikes, and drains.
7. Construct fills and waste areas by selective placement to eliminate erosion of surface silts or clays.
8. Inspect earthwork periodically to detect evidence of start of erosion. Apply corrective measures as required to control erosion.

1.10 QUALITY ASSURANCE

A. Person conducting visual examination for pollutant shall be fully knowledgeable about the TPDES Construction General Permit, detecting sources of storm water contaminants, inspection of aboveground storage tank and appurtenances for

leakage, and the day-to-day operations that may cause unexpected pollutant releases.

PART 2 - PRODUCTS

2.1 ABOVEGROUND FUEL STORAGE TANK

A. Tank Assembly: Must be listed with UL 1709 and UL 2085.

B. Inner Steel Storage Tank: Follow UL 142, with minimum thickness of ⅛-inch welded construction.

C. Tank Encasement: Either concrete or steel to provide minimum of 110 percent containment of inner tank capacity. Provide 5-gallon overspill containment pan for tank refueling.

D. Dispenser Pump: For submersible pump, UL listed emergency shut-off valve to be installed at each dispenser. For suction pump, UL listed vacuum-activated shut-off valve, with shear section, is to be installed at each dispenser. Fuel may not be dispensed from tank by gravity flow or by pressurization of tank. Means must be provided to prevent release of fuel by siphon flow.

E. Representative Manufacturers: Convault, Fireguard, Ecovault, SuperVault, or equal.

2.2 CONCRETE

A. Provide concrete with minimum strength of 4,000 psi at 28 days.

2.3 AGGREGATES

A. Coarse aggregate shall consist of crushed stone, gravel, crushed blast furnace slag, or combination of these materials. Aggregate shall be composed of clean,

hard, durable materials, free from adherent coatings, salt, alkali, dirt, clay, loam, shale, soft or flaky materials, or organic and injurious matter.

B. Coarse aggregates shall conform to following gradation requirements.

Sieve Size	**Percent Retained**
(Square Mesh)	(By Weight)
2-1/2"	0
2"	0 - 20
1-1/2"	15 - 50
3/4"	60 - 80
No. 4	95 - 100

PART 3 - EXECUTION

3.1 INSTALLATION

A. Employ and utilize environmental protection methods, obtain all necessary permits, and fully observe all local, state, and federal regulations.

B. No clearing and grubbing or rough cutting permitted until erosion and sediment control systems are in place, other than site Work specifically directed by Owner's Representative to allow soil testing and surveying.

C. Prohibit equipment and vehicles from maneuvering on areas outside of dedicated rights-of-way and easements for construction. Immediately repair damage caused by construction traffic to erosion and sediment control systems.

D. Maintain existing erosion and sediment control systems located within project site until acceptance of Project or until directed by Owner's Representative to remove and discard existing system.

E. Regularly inspect and repair or replace damaged components of erosion and sediment control systems as specified in this Section. Unless otherwise directed, maintain erosion and sediment control systems until project area stabilization is accepted by the Owner. Remove erosion and sediment control systems promptly when directed by Owner's Representative. Discard removed materials off site.

F. Remove and dispose sediment deposits at designated spoil site for Project. If a project spoil site is not designated on Drawings, dispose of sediment off site at

location not in or adjacent to stream or flood plain. Assume responsibility for off-site disposal. Spread sediment evenly throughout site, compacted and stabilized. Prevent sediment from flushing into a stream or drainage way. If sediment has been contaminated, dispose of in accordance with existing federal, state, and local rules and regulations.

G. Assume responsibility for collecting, storing, hauling, and disposing of spoil, silt, and waste materials as specified in this or other Specifications and in compliance with applicable federal, state, and local rules and regulations.

H. Employ protective measures to avoid damage to existing trees to be retained on project site. Conduct construction operations under this Contract in conformance with erosion control practices described in Drawings and this or other Specifications.

I. Prepare spill response and containment procedures to be implemented in event of significant materials spill. Significant materials include but are not limited to: raw materials; fuels; materials such as solvent, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; chemical required to be reported pursuant to Section 313 of Title III of SARA; fertilizers; pesticides, and waste products such as slag, ashes and sludge that have potential to be released with storm water discharges. Spill containment procedures shall be kept on-site or in construction field office.

J. Spill containment equipment appropriate to size of operation is to be located in close proximity of fueling area. Such equipment includes, but not limited to,

suitable waste containers for significant materials, drip pans, booms, inlet covers, or absorbent.

K. Properly label significant materials or waste containers used for construction activities and stored on-site overnight.

L. Install, maintain, and inspect erosion, sediment control measures and practices as specified in Drawings and in this or other Specifications

M. Land Protection:

1. Except for any work or storage area and access routes specifically assigned for the use of the Contractor, the land areas outside the limits of construction shall be preserved in their present condition.
    a. Contractor shall confine his construction activities to areas defined for work within the Contract Documents.
2. Manage and control all borrow areas, work or storage areas, access routes and embankments to prevent sediment from entering nearby water or land adjacent to the work site.
3. Restore all disturbed areas including borrow and haul areas and establish permanent type of locally adaptable vegetative cover.
4. Unless earthwork is immediately paved or surfaced, protect all side slopes and backslopes immediately upon completion of final grading.
5. Plan and execute earthwork in a manner to minimize duration of exposure of unprotected soils.
6. Except for areas designated by the Contract Documents to be cleared and grubbed, the Contractor shall not deface, injure or destroy trees and

vegetation, nor remove, cut, or disturb them without approval of the Owner's Representative.

a. Any damage caused by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the Contractor's expense.

7. Utilize, as necessary, erosion control methods to protect side and backslopes, minimize and the discharge of sediment to the surface water leaving the construction site as soon as rough grading is complete.

   a. These controls shall be maintained until the site is ready for final grading and landscaping or until they are no longer warranted and concurrence is received from the Owner's Representative.

   b. Physically retard the rate and volume of run-on and runoff by:

      1) Implementing structural practices such as diversion swales, terraces, straw bales, silt fences, berms, storm drain inlet protection, rocked outlet protection, sediment traps and temporary basins.

      2) Implementing vegetative practices such as temporary seeding, permanent seeding, mulching, sod stabilization, vegetative buffers,

hydroseeding, anchored erosion control blankets, sodding, vegetated swales or a combination of these methods.

3) Providing Construction sites with graveled or rocked access entrance and exit drives and parking areas to reduce the tracking of sediment onto public or private roads.

8. Discharges from the construction site shall not contain pollutants at concentrations that produce objectionable films, colors, turbidity, deposits or noxious odors in the receiving stream or waterway.

N. Solid Waste Disposal:

1. Collect solid waste on a daily basis.
2. Provide disposal of degradable solid waste to an approved solid waste disposal site.
3. Provide disposal of nondegradable solid waste to an approved solid waste disposal site or in an alternate manner approved by Owner's Representative and regulatory agencies.
4. No building materials wastes or unused building materials shall be buried, dumped, or disposed of on the site.

O. Fuel and Chemical Handling:

1. Store and dispose of chemical wastes in a manner approved by regulatory agencies.
2. Take special measures to prevent chemicals, fuels, oils, greases, herbicides, and insecticides from entering drainage ways.
3. Do not allow water used in onsite material processing, concrete curing, cleanup, and other waste waters to enter a drainage way(s) or stream.
4. The Contractor shall provide containment around fueling and chemical storage areas to ensure that spills in these areas do not reach waters of the state.

P. Control of Dust:

1. The control of dust shall mean that no construction activity shall take place without applying all such reasonable measures as may be required to

prevent particulate matter from becoming airborne so that it remains visible beyond the limits of construction.

a. Reasonable measures may include paving, frequent road cleaning, planting vegetative groundcover, application of water or application of chemical dust suppressants.

b. The use of chemical agents such as calcium chloride must be approved by the State of Texas DOT.

2. Utilize methods and practices of construction to eliminate dust in full observance of agency regulations.

3. The Owner's Representative will determine the effectiveness of the dust control program and may request the Contractor to provide additional measures, at no additional cost to Owner.

Q. Burning:

1. Do not burn material on the site.

2. If the Contractor elects to dispose of waste materials by burning, make arrangements for an off-site burning area and conform to all agency regulations.

R. Control of Noise:

1. Control noise by fitting equipment with appropriate mufflers.

S. Completion of Work:

1. Upon completion of work, leave area in a clean, natural looking condition.

2. Ensure all signs of temporary construction and activities incidental to construction of required permanent work are removed.

T. Historical Protection:

1. If during the course of construction, evidence of deposits of historical or archaeological interests is found, cease work affecting find and notify Owner's Representative.

a. Do not disturb deposits until written notice from Owner's Representative is given to proceed.

2. The Contractor will be compensated for lost time or changes in construction to avoid the find based upon normal change order procedures.

3.2 TOPSOIL PLACEMENT FOR EROSION AND SEDIMENT CONTROL SYSTEMS

A. When topsoil is specified as a component of another Specification, conduct erosion control practices described in this Specification during topsoil placement operations.

B. When placing topsoil, maintain erosion and sediment control systems consisting of swales, grade stabilization structures, berms, dikes, waterways, and sediment basins.

C. Maintain grades which have been previously established on areas to receive topsoil.

D. After areas to receive topsoil have been brought to grade, and immediately prior to dumping and spreading topsoil, loosen subgrade by discing or by scarifying to a depth of at least 2 inches to permit bonding of topsoil to subsoil. Compact by passing bulldozer up and down slope, tracking over entire surface area of slope to create horizontal erosion control slots.

E. No sod or seed shall be placed on soil which has been treated with soil sterilants until sufficient time has elapsed to permit dissipation of toxic materials.

3.3 DUST CONTROL

A. Implement dust control methods to control dust creation and movement on construction sites and roads and to prevent airborne sediment from reaching receiving streams or storm water conveyance systems, to reduce on-site and off-site damage, to prevent health hazards, and to improve traffic safety.

B. Control blowing dust by using one or more of following methods:

1. Mulches bound with chemical binders such as Carasol, Terratack, or equal.
2. Temporary vegetative cover.
3. Spray-on adhesives on mineral soils when not used by traffic.
4. Tillage to roughen surface and bring clods to surface.
5. Irrigation by water sprinkling.
6. Barriers using solid board fences, snow fences, burlap fences, crate walls, bales of hay, or similar materials.

C. Implement dust control methods immediately whenever dust can be observed blowing on project site.

3.4 KEEPING STREETS CLEAN

A. Keep streets clean of construction debris and mud carried by construction vehicles and equipment. If necessary, install stabilized construction exits at construction, staging, storage, and disposal areas. Vehicle/equipment wash area (stabilized with coarse aggregate) may be installed adjacent to stabilized construction exit, as needed. Release wash water into a drainage swale or inlet

protected by erosion and sediment control measures. Construction exit specified in Section 01 57 13.02 - Stabilized Construction Access.

B. In addition to stabilized construction exits, shovel or sweep pavement to extent necessary to keep street clean. Water hosing or sweeping of debris and mud off of street into adjacent areas is not allowed.

3.5 EQUIPMENT MAINTENANCE AND REPAIR

A. Confine maintenance and repair of construction machinery and equipment to areas specifically designated for that purpose. Locate areas so that oils, gasoline, grease, solvents, and other potential pollutants cannot be washed directly into receiving streams or storm water conveyance systems. Provide these areas with adequate waste disposal receptacles for liquid as well as solid waste. Clean and inspect maintenance areas daily.

B. On construction site where designated equipment maintenance areas are not feasible, take precautions during each individual repair or maintenance operation to prevent potential pollutants from washing into streams or conveyance systems. Provide temporary waste disposal receptacles.

3.6 WASTE COLLECTION AND DISPOSAL

A. Formulate and implement a plan for collection and disposal of waste materials on construction site. In plan, designate locations for trash and waste receptacles and establish a collection schedule. Specify and carry out methods for ultimate disposal of waste in accordance with applicable local, state, and federal health and safety regulations. Make special provisions for collection and disposal of liquid wastes and toxic or hazardous materials.

B. Keep receptacles and waste collection areas neat and orderly to extent possible. Waste shall not be allowed to overflow its container or accumulate from day-to-day. Locate trash collection points where they shall least likely be affected by concentrated storm water runoff.

3.7 WASHING AREAS

A. Avoid washing concrete delivery trucks or dump trucks and other construction equipment at locations where runoff shall flow directly into a watercourse or storm water conveyance system. Designate special areas for washing vehicles. Locate these areas where wash water shall spread out and evaporate or infiltrate directly into ground, or where runoff can be collected in temporary holding or seepage basin. Beneath wash areas construct a gravel or rock base to minimize mud production.

3.8 STORAGE OF CONSTRUCTION MATERIALS AND CHEMICALS

A. Isolate sites where chemicals, cements, solvents, paints, or other potential water pollutants are stored in areas where they shall not cause runoff pollution.

B. Store toxic chemicals, materials, pesticides, paints, and acids in accordance with manufacturers' guidelines. Protect groundwater resources from leaching

by placing a plastic mat, packed clay, tar paper, or other impervious materials on areas where toxic liquids are to be opened and stored.

3.9 DEMOLITION AREAS

A. Demolition activities which create large amounts of dust with significant concentrations of heavy metals or other toxic pollutants shall use dust control techniques to limit transport of airborne pollutants. However, retain water or slurry used to control dust contaminated with heavy metals or toxic pollutants on site, and prevent runoff directly into watercourses or storm water conveyance systems. Carry out methods of ultimate disposal of these materials in accordance with applicable local, state, and federal health and safety regulations.

3.10 SANITARY FACILITIES

A. Provide construction sites with adequate portable toilets for workers in accordance with applicable health regulations.

3.11 PESTICIDES

A. Use and store pesticides during construction in accordance with manufacturers' guidelines and with local, state, and federal regulations. Avoid overuse of pesticides which could produce contaminated runoff. Take great care to prevent accidental spillage. Never wash pesticide containers in or near flowing streams or storm water conveyance systems.

3.12 CONSTRUCTION METHODS

A. Provide fuel tank protection area and driveway as shown on Drawings.

B. Do not locate fueling area in or near channelized flow area or close to storm sewer conveyance system. Provide sufficient space to allow installation of other erosion and sediment controls to protect those areas.

C. Clear and grub fueling area to remove unsuitable materials. Place geotextile fabric as permeable separator to prevent mixing of coarse aggregate with underlying soil. Overlap fabric minimum of 6 inches. Place coarse aggregate on top of geotextile fabric to minimum depth of 8 inches.

D. Grade protection area and driveway to provide sufficient drainage away from stabilized areas. Use sandbags, gravel, boards, or similar methods to prevent sediment from entering public right-of-way, receiving stream or storm water conveyance system. Provide driveway to fuel tank area with minimum width of 15 feet for one-way traffic and 30 feet for two-way traffic.

E. Place aboveground storage tank on top of cast-in-place or pre-cast foundation. Base size and thickness of foundation on size and weight of tank to be used, with minimum thickness of 6 inches. Enclose concrete foundation by 5-inch by

5-inch concrete curb and extend minimum of 1 foot beyond tank and dispenser assemblies, so that leak and drip can be contained within concrete foundation.

F. Slope concrete foundation minimum of 1 percent toward 6-inch wide by 12-inch long by 4-inch deep sump pit. Install minimum of 2-inch pipe inside sump pit with valve on outside of curb to allow draining of concrete foundation.

G. Install portable concrete Jersey Barrier around concrete foundation. Provide minimum clearance of 2 feet from edge of foundation. In lieu of Jersey barrier, install 4-inch diameter steel pipe bollards around foundation. Bury bollards minimum of 3 feet deep, 3 feet above ground, and 4 feet on center, encased in 12-inch wide concrete foundation.

3.13 MAINTENANCE

A. Inspections shall be conducted by designated health and safety officer qualified to conduct health and safety inspections.

B. Inspect stabilized areas after every storm event and at least once a week. Provide periodic top dressing with additional coarse aggregate to maintain required depth. Repair and clean out damaged control measures used to trap sediment.

C. Inspect fuel tank foundation's bermed area after every storm event and at least once a week. Visually examine storm water contained in tank's bermed foundation area for oil sheen or other obvious indicators of storm water pollution. Properly dispose of storm water when pollutant is present. Record visual examination of storm water discharge in Report noting date and time of examination, name of examiner, observations of water quality, and volume of storm water discharged from bermed area. Keep Report with other storm water pollution control inspection reports on site, in readily accessible location.

3.14 TEMPORARY FUELING AREA CLOSURE

A. Dispose of temporary vehicle and equipment fueling area by removal of sediment and erosion controls properly off site. Owner's Representative will inspect top soils in fueling area and immediate vicinity for evidence of fuel leaks. If Owner's Representative determines that sufficient pollutants have been released, remove soil and properly dispose off site. Other remediation methods may be required.

END OF SECTION

SECTION 01 45 16.32

CONTRACTOR'S QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Measurement and Payment
2. Quality Assurance/Control of Installation
3. References
4. Manufacturer's Field Services and Reports

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

1.2 MEASUREMENT AND PAYMENT

A. Unit Price. No separate payment will be made for this item. Include the cost in associated items for this project.

1.3 SUBMITTALS (NOT USED)

1.4 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality at no additional cost to the Owner.

B. Comply fully with manufacturers' installation instructions, including each step in sequence.

C. Request clarification Owner's Representative before proceeding when manufacturers' instructions conflict with Contract.

D. Comply with specified standards as minimum requirements for Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce specified level of workmanship.

1.5 REFERENCES

A. Obtain copies of standards and maintain at job site when required by individual Specification sections.

1.6 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. When specified in individual Specification sections or as required by Owner's Representative, provide material or product suppliers' or manufacturers' technical representative to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, operator training, test, adjust and balance of equipment as applicable and to initiate operation, as required. Conform to minimum time requirements for start-up operations and operator training when defined in Specification sections.

B. At Owner's Representative's request, submit qualifications of manufacturers' representative to Owner's Representative 15 days in advance of required representatives' services. Representative is subject to approval by Owner's Representative.

C. A manufacturers' representative is to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to a manufacturer's written instructions. Submit report within 14 days of observation to Owner's Representative for review.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 51 36.01

PROCEDURE FOR WATER VALVE ASSISTANCE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

Operation of valves. Owner employees will operate existing valves. Contractor's employees may operate new valves included in the Project prior to acceptance by the Owner.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements

1.2 MEASUREMENT AND PAYMENT

A. No separate payment will be made for this item. Include the cost of valve operation and valve assistance in Unit Price bid for valves and water mains.

1.3 PROCEDURE

A. Contractor to coordinate with Owner’s Representative for valve assistance.

1.4 SUBMITTALS

A. Submit request for work order planning meetings in accordance with Section 01 33 00 – Submittals.

1.5 CANCELLATION

A. The Owner may cancel a scheduled valve assistance appointment at no extra cost to either party. Cancellation may be caused by bad weather, preparation work taking longer than anticipated or unforeseen delays by one or more of the three parties.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 55 26

TRAFFIC CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes traffic control requirements for signs, signals, control devices, flares, lights, as well as construction parking control, English-speaking flagpersons, peace officers, designated haul routes and bridging of trenches and excavations.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.

2. Division 01 – General Requirements.

1.2 MEASUREMENT AND PAYMENT

A. No separate payment will be made for Traffic Control and Regulation. Include in related work items.

1. Flagmen. No separate payment.

1.3 SUBMITTALS

A. Conform to requirements of Section 01 33 00 – Submittals.

B. Traffic control plan responsive to the current Texas Manual on Uniform Traffic Control Devices (TMUTCD) sealed by Registered Professional Engineer is incorporated into Drawings. If Contractor proposes to implement traffic control without modification to plan provided, submit a letter confirming decision. If Contractor proposes to implement traffic control different than plan provided, submit a traffic control plan in conformance with TMUTCD sealed by Registered Professional Engineer.

C. Submit copies of approved lane closure permits.

D. Provide information and records regarding use of qualified flagmen to verify use of “peace officers” as flagmen in compliance with Contract and Texas law, including but not limited to, Article 4413 (29bb), commonly referred to as Private Investigators and Private Security Agencies Act, and Article 2.12, Texas Code of Criminal Procedure.

E. Provide information and records regarding use of qualified flagmen to verify Contractor’s use of “certified flagmen” as flagmen is in compliance with Contract.

1.4 FLAGMEN

A. Use flagmen, qualified as described under Paragraph 1.4.B, Uniformed Peace Officers, and Paragraph 1.4.C, Certified Flagmen, to control, regulate, and

direct even flow and movement of vehicular and pedestrian traffic when construction operations encroach on public traffic lanes.

B. Uniformed Peace Officer: Individual who has full-time employment as peace officer and receives compensation as flagman for private employment as individual employee or independent contractor. Private employment may be either employee-employer relationship or on an individual basis. Flagman may not be in employ of another peace officer and may not be a reserve peace officer.

1. Peace officer is defined as:

   a. Sheriffs and their deputies

   b. Constables and deputy constables

   c. Marshals or police officers of an incorporated city, town, or village

   d. As otherwise provided by Article 2.12, Texas Code of Criminal Procedure, as amended

2. Individual who has full-time employment as a peace officer is one who is actively employed in a full-time capacity as a peace officer working, on average, a minimum of 32 paid hours per week, being paid a rate of pay not less than prevailing minimum hourly wage rate set by federal Wage and Hour Act and entitled to full benefits of participation in retirement plan, vacation, holidays, and insurance benefits. A reserve peace officer does not qualify, under this definition, as a peace officer.

C. Certified Flagman: Individual who receives compensation as flagman and meets the following qualifications and requirements:

1. Formally trained and certified in traffic control procedures.

2. Required to wear distinctive uniform, bright-colored vest, and be equipped with appropriate flagging and communication devices

3. English speaking, with Spanish as advantageous, but not required, primary, or secondary language.

4. Paid as Certified Flagman, equivalent to hourly wage rate set for Rough Carpenter under Specification Section 00 73 43 – Wage Scale for Construction.

5. Required to carry proof of training/certification and photographic identification card issued by training institute to allow Owner's Representative to easily determine necessary full-time traffic control is

actually provided when and where construction work encroaches upon traffic lanes.

PART 2 - PRODUCTS

2.1 SIGNS, SIGNALS, AND DEVICES

A. Comply with Texas State Manual on Uniform Traffic Control Devices.

B. Traffic Barriers, Cones and Drums, Flares and Lights: As approved by local jurisdictions.

PART 3 - EXECUTION

3.1 PUBLIC ROADS

A. Abide by laws and regulations of governing authorities when using public roads. If Work requires public roads be temporarily impeded or closed, obtain approvals from governing authorities and pay permits before starting any Work. Coordinate activities with Owner's Representative.

B. Maintain 10-foot-wide, all-weather lane adjacent to Work areas for use of emergency vehicles. Keep all-weather lane free of construction equipment and debris.

C. Cover or remove the permanent signs and construction signs that are incorrect or that do not apply to the current situation for a particular phase. Do not mount signs on drums or barricades, except those listed in the latest Barricades and Construction standard sheets.

D. Place positive barriers to protect drop-off conditions greater than 1 FT within the clear zones that remain overnight.

E. Construction activities not to obstruct normal flow of traffic from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. on designated major arterials or as directed by the Owner.

F. Maintain local driveway access to residential and commercial properties adjacent to Work areas at all times. Use all-weather materials as approved by

Owner's Representative when maintaining temporary driveway access to commercial and residential driveways.

G. Cleanliness of Surrounding Streets: Keep streets used for entering and leaving job area free of excavated material, debris, and foreign material resulting from construction operations.

H. Provide Owner's Representative 1-week notice prior to implementing each approved traffic control phase.

I. Notify local schools, churches, bus lines, police department, commercial businesses, and fire department in writing of construction a minimum of 5 working days prior to beginning Work.

J. Remove existing signing and striping that are in conflict with construction activities or may cause driver confusion.

K. Provide safe access for pedestrians along major cross streets.

L. Alternate closures of cross streets so that two adjacent cross streets are not closed simultaneously.

M. Do not close more than two consecutive esplanade openings at a time without prior approval by Owner's Representative.

3.2 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to prevent interference with public traffic and parking, and access by emergency vehicles.

B. Monitor parking of construction personnel's vehicles in existing facilities. Maintain vehicular access to and through parking areas.

C. Prevent parking on or adjacent to access roads or in non-designated areas.

3.3 FLARES AND LIGHTS

A. Provide flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

3.4 HAUL ROUTES

A. Utilize haul routes designated by authorities or shown on Drawings for construction traffic.

B. Confine construction traffic to designated haul routes.

C. Provide traffic control at critical areas of haul routes to regulate traffic and minimize interference with public traffic.

3.5 TRAFFIC SIGNS AND SIGNALS

A. Construct necessary traffic control devices for temporary signals including but not limited to loop detectors, traffic signal conduits, traffic signal wiring, and crosswalk signals required to complete Work. Notify, a minimum of 60 days in advance, the agency concerning control boxes and switchgear. The agency will

perform service, programming, or adjustments, to signal boxes and switchgear should this work be required during construction.

B. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control and areas affected by Contractor's

operations. Establish notices, signs, and traffic controls before moving into next phase of traffic control.

C. Relocate traffic signs and signals as Work progresses to maintain effective traffic control.

D. Unless otherwise approved by Owner's Representative, provide driveway signs with name of business that can be accessed from particular cross-over. Use two signs for each cross-over.

E. Replace existing traffic control devices in project area.

F. Owner's Representative may direct Contractor to make minor traffic control sign adjustments to eliminate driver confusion and maintain traffic safety during construction at no additional payment.

3.6 BRIDGING TRENCHES AND EXCAVATIONS

A. Whenever necessary, bridge trenches and excavation to permit an unobstructed flow of traffic. Provide steel plates that can be laid across construction areas and major drives of commercial businesses.

B. Secure bridging against displacement by using adjustable cleats, angles, bolts, or other devices whenever bridge is installed:

1. On existing bus route.
2. When more than 5 percent of daily traffic is comprised of commercial or truck traffic.
3. When more than two separate plates are used for bridge.
4. When bridge is to be used for more than 5 consecutive days.

C. Install bridging to operate with minimum noise.

D. Adequately shore trench or excavation to support bridge and traffic.

E. Extend steel plates used for bridging a minimum of 1 foot beyond edges of trench or excavation. Use temporary paving materials (premix) to feather edges of plates to minimize wheel impact on secured bridging.

F. Use steel plates of sufficient thickness to support H-20 loading, truck or lane, that produces maximum stress.

3.7 REMOVAL

A. Remove equipment and devices when no longer required.

B. Repair damage caused by installation.

C. Remove post settings to a depth of 2 feet.

3.8 TRAFFIC CONTROL, REGULATION, AND DIRECTION

A. Use flagmen to control, regulate, and direct even flow and movement of vehicular and pedestrian traffic including but not limited to the following conditions:

1. Where multi-lane vehicular traffic must be diverted into single lane vehicular traffic
2. Where vehicular traffic must change lanes abruptly
3. Where construction equipment must enter or cross vehicular traffic lanes and walks
4. Where construction equipment may intermittently encroach on vehicular traffic lanes and unprotected walks and crosswalks
5. Where traffic regulation is needed due to rerouting of vehicular traffic around Work site.
6. Other areas of Work where construction activities might affect public safety and convenience.

B. Use and maintain flagmen at points for periods of time as may be required to provide for public safety and convenience of travel.

C. Use of flagmen is for purpose of assisting in regulation of traffic flow and movement and does not relieve Contractor of full responsibility for taking other steps and providing other flaggers or personnel as Contractor may deem necessary to protect Work and public.

3.9 INSTALLATION STANDARDS

A. Work in other phases shall be permitted, provided 1) phases are not continuous to one work is being done in presently, 2) installation of utility occurs in only one phase. Keep work and operation in second phase to an absolute minimum. Perform work in no more than two phases at a time. Authorization to perform work in second phase shall not relieve any responsibility of completing backfilling and paving operations in accordance with Contract.

B. Place temporary pavement with a single lane closure, in accordance with TMUTCD.

C. Reinstall temporary and permanent pavement markings as directed by Owner's Representative. Alternative markings shall be considered when marking manufacturer's weather conditions cannot be met. These alternatives are to be submitted and approved by Owner's Representative prior to installation. No extra payment will be made for use of alternative markings.

3.10 MAINTENANCE OF EQUIPMENT AND MATERIAL

A. Designate individual to be responsible for maintenance of traffic handling around construction area. Individual must be accessible at all times to immediately correct any deficiencies in equipment and materials used to handle traffic including missing, damaged, or obscured signs, drums, barricades, or

pavement markings. Give name, address, and telephone number of designated individual to Owner's Representative.

B. Make daily inspections of signs, barricades, drums, lamps, and temporary pavement markings to verify that these are visible, in good working order, and conform with traffic handling plans and directions of Owner's Representative. When not in compliance, immediately bring equipment and materials into compliance by replacement, repair, cleaning, relocation, and realignment.

C. Keep equipment and materials, especially signs and pavement markings, clean and free of dust, dirt, grime, oil, mud, or debris.

D. Owner's Representative shall decide if damaged or vandalized signs, drums, and barricades can be reused.

END OF SECTION

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SECTION 01 65 50

PRODUCT DELIVERY, STORAGE, AND HANDLING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for product delivery, storage and handling.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 - General Requirements.

1.2 MEASUREMENT AND PAYMENT

A. No payment will be made to Contractor for equipment or materials not properly stored and insured or without approved Shop Drawings.

1. Previous payments for items will be deducted from subsequent progress estimate(s) if proper storage procedures are not observed.

B. Unit Price. No separate payment will be made for this item. Include the cost in associated items for this payment.

1.3 SUBMITTALS

A. Provide Owner project Log Book.

1.4 TRANSPORTATION

A. Make arrangements for transportation, delivery, and handling of equipment and materials required for timely completion of Work.

B. Transport and handle products in accordance with instructions.

C. Consign and address shipping documents to proper party giving name of Project, street number, and city. Shipments shall be delivered to Contractor.

1.5 DELIVERY

A. Scheduling: Schedule delivery of products or equipment as required to allow timely inspection and installation, and to avoid prolonged storage, overburdening of limited storage space, conflicts with other contractors on site.

Confirm availability of equipment and personnel for handling products prior to delivery.

B. Packaging: Deliver products or equipment in manufacturer's original unopened and unbroken cartons or other containers designed and constructed to protect the contents from physical or environmental damage.

C. Identification: Clearly and fully mark and identify as to manufacturer, item, and installation location.

D. Protection and Handling: Provide manufacturer's instructions for storage and handling.

PART 2 - PRODUCTS

A. Products: Means material, equipment, or systems forming Work. Does not include machinery and equipment used for preparation, fabrication, conveying, and erection of Work. Products may also include existing materials or components designated for reuse.

B. For material and equipment specifically indicated or specified to be reused in the work:

1. Use special care in removal, handling, storage and reinstallation, to assure proper function in completed work.

2. Arrange for transportation, storage and handling of products which require offsite storage, restoration or renovation. Pay all costs for such work.

C. When contract documents require that installation of work comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in installation, including two copies to Owner’s Representative. Maintain one set of complete instructions at job site during installation until completion.

D. Provide equipment and components from fewest number of manufacturers as practical, in order to simplify spare parts inventory and allow for maximum

interchangeability of components. For multiple components of same size, type, or application, use same make and model of component throughout Project.

PART 3 - EXECUTION

3.1 PROTECTION, STORAGE AND HANDLING

A. Protection:

1. Protect materials in accordance with manufacturer's recommendations and requirements of these Specifications.
    a. Store products or equipment in location to avoid loss or physical damage to items while in storage.
2. Protect equipment from exposure to elements and keep thoroughly dry.
3. When space heaters are provided in equipment, connect and operate heaters during storage until equipment is placed in service.

B. Storage:

1. Store materials in accordance with manufacturer's recommendations and requirements of these Specifications.
2. Make necessary provisions for safe storage of materials and equipment. Place loose soil materials, and materials to be incorporated into Work to prevent damage to any part of Work or existing facilities and to maintain free access at all times to all parts of Work and to utility service company installations in vicinity of Work. Keep materials and equipment neatly and compactly stored in locations that will cause minimum inconvenience to other contractors, public travel, adjoining owners, tenants, and occupants. Arrange storage to provide easy access for inspection.
3. Restrict storage to areas available on construction site for storage of material and equipment as shown on Drawings or approved by Owner's Representative.
4. Provide off-site storage and protection when on-site storage is not adequate. Provide addresses of and access to off-site storage locations for inspection by Owner's Representative.
5. Do not use lawns, grass plots, or other private property for storage purposes without written permission of owner or other person in possession or control of premises.
6. Store in manufacturers' unopened containers.
7. Neatly, safely, and compactly stack materials delivered and stored along line of Work to avoid inconvenience and damage to property owners and general

public, and maintain at least 3 feet from fire hydrant. Keep public, private driveways, and street crossings open.

8. Repair or replace damaged lawns, sidewalks, streets, or other improvements to satisfaction of Owner's Representative. Total length which materials may be distributed along route of construction at one time is 1,000 linear feet, unless otherwise approved in writing by Owner's Representative.

C. Handling:

1. Handle materials in accordance with manufacturer's recommendations and requirements of these Specifications.
2. Coordinate off-loading of materials and equipment delivered to job site. If necessary to move stored materials and equipment during construction, relocate materials and equipment at no additional cost to Owner. Do not allow the off-loading of materials in those parking areas used for crew's personal vehicles.
3. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
4. Provide additional protection during handling as necessary to prevent breaking, scraping, marring, or otherwise damaging products or surrounding areas.
5. Handle products by methods to prevent over bending or over stressing.
6. Lift heavy components only at designated lifting points.
7. Do not drop, roll, or skid products off delivery vehicles. Hand carry or use suitable materials handling equipment.

3.2 STORAGE FACILITIES (NOT USED)

3.3 FIELD QUALITY CONTROL

A. Inspect Deliveries:

1. Inspect all products or equipment delivered to the site prior to unloading.
   a. Reject all products or equipment that are damaged, used, or in any other way unsatisfactory for use on Project.

B. Monitor Storage Area: Monitor storage area to ensure suitable temperature and moisture conditions are maintained as required by manufacturer or as appropriate for particular items.

END OF SECTION

SECTION 01 74 13

CLEANING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes intermediate and final cleaning of Work, not including special cleaning of closed systems specified elsewhere.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

1.2 MEASUREMENT AND PAYMENT

A. Unit Price. No separate payment will be made for this item. Include the cost in associated items for this project.

1.3 SUBMITTALS (NOT USED)

1.4 STORAGE AND HANDLING

A. Store cleaning products and cleaning wastes in containers specifically designed for those materials.

1.5 SCHEDULING

A. Schedule cleaning operations so that dust and other contaminants disturbed by cleaning process will not fall on newly painted surfaces.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents:

1. Compatible with surface being cleaned.
2. New and uncontaminated.
3. For Manufactured Surfaces: Material recommended by manufacturer.

PART 3 - EXECUTION

3.1 CLEANING - GENERAL

A. Prevent accumulation of wastes that create hazardous conditions.

B. Conduct cleaning and disposal operations to comply with laws and safety orders of governing authorities.

C. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains or sewers.

D. Dispose of degradable debris at an approved solid waste disposal site.

E. Dispose of nondegradable debris at an approved solid waste disposal site or in an alternate manner approved by regulatory agencies.

F. Handle materials in a controlled manner with as few handlings as possible.

G. Do not drop or throw materials from heights greater than 4 FT or less than 4 FT if conditions warrant greater care.

H. On completion of work, leave area in a clean, natural looking condition.

1. Remove all signs of temporary construction and activities incidental to construction of required permanent Work.

I. Do not burn on-site.

3.2 INTERIOR CLEANING

A. Cleaning During Construction:

1. Keep work areas clean so as not to hinder health, safety or convenience of personnel in existing facility operations.

2. At maximum weekly intervals, dispose of waste materials, debris, and rubbish.

3. Vacuum clean interior areas when ready to receive finish painting.

a. Continue vacuum cleaning on an as-needed basis, until Substantial Completion.

B. Final Cleaning:

1. Complete immediately prior to Demonstration Period.

2. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed surfaces.

3. Wipe all lighting fixture reflectors, lenses, lamps and trims clean.

4. Wash and shine glazing and mirrors.

5. Polish glossy surfaces to a clear shine.

6. Ventilating systems:

a. Clean permanent filters and replace disposable filters if units were operated during construction.

b. Clean ducts, blowers and coils if units were operated without filters during construction.

7. Replace all burned out lamps.
8. Broom clean process area floors.
9. Mop office and control room floors.

3.3 EXTERIOR (SITE) CLEANING

A. Cleaning During Construction:

1. Construction debris:
   a. Confine in strategically located container(s):
      1) Cover to prevent blowing by wind.
      2) Store debris away from construction or operational activities.
      3) Haul from site minimum once a week.
   b. Remove from work area to container daily.
   c. Site clean-up prior to storm events. Thoroughly clean site of all loose or unsecured items which may become airborne or transported by flowing water during storm events.
2. Vegetation: Keep weeds and other vegetation trimmed to 3 IN maximum height.
   a. The use of chemical weed control substances should be avoided unless prior Owner approval is received.
3. Soils, sand, and gravel deposited on paved areas and walks:
   a. Remove as required to prevent muddy or dusty conditions.
   b. Do not flush into storm sewer system.

B. Final Cleaning:

1. Remove trash and debris containers from site.
   a. Repair areas disturbed by location of trash and debris containers to Owner’s satisfaction including but not limited to re-seeding, sod

placement, pavement repair, asphalt repair, sidewalk repair, and rut removal and/or fill placement.

2. Clean paved roadways.

3.4 FIELD QUALITY CONTROL

A. Immediately prior to Demonstration Period, conduct an inspection with Owner's Representative to verify condition of all work areas.

END OF SECTION

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SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for construction waste management and disposal.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.

2. Division 01 – General Requirements.

1.2 MEASUREMENT AND PAYMENT

A. No separate payment will be made for waste material disposal under this Section. Include payment in unit price for related sections.

1.3 SUBMITTALS

A. Conform to requirements of Section 01 33 00 – Submittals.

B. Obtain and submit disposal permits for proposed disposal sites if required by local ordinances. Submit a copy of all disposal permits to the Owner's Representative.

C. Submit copy of written permission from property owner(s) outside limits of Project, with description of property, prior to disposal of excess material. Submit written and signed release from property owner upon completion of

disposal work. Copies of the permission and release documents are to be submitted to the Owner's Representative.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 SALVAGEABLE MATERIAL

A. Excavated Material: When indicated on Drawings, load, haul, and deposit excavated material at location or locations shown on Drawings outside limits of Project.

B. Other Salvageable Materials: Conform to requirements of individual Specification Sections.

C. Coordinate with the Owner's Representative the loading of salvageable material.

3.2 EXCESS MATERIAL

A. Remove and legally dispose of vegetation, rubble, broken concrete, debris, asphaltic concrete pavement, excess soil, and other materials not designated for salvage from job site.

B. Excess soil may be deposited on private property outside the Project limits when written permission is obtained from property owner. See Paragraph 1.3C above.

C. Verify flood plain status of any proposed disposal site. Do not dispose of excavated materials in area designated as within 100-year Flood Hazard Area unless the proper permit has been obtained. Remove excess material placed in "100-year Flood Hazard Area" at no additional cost to the Owner.

D. Remove waste materials from site daily, in order to maintain site in neat and orderly condition, unless otherwise authorized by the Owner.

END OF SECTION

SECTION 01 74 23

RESTORATION OF SITE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for the restoration of sites affected by Utility Work, Roadway Reconstruction or Widening, or Facilities Work. Section does not apply to roadway extension projects.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.
3. Section 02 41 13 13 – Removing Existing Pavements and Structures.
4. Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities.
5. Section 32 13 13 – Concrete Pavement, Curb, Sidewalks, and Steps.
6. Section 32 90 00 – Seeding, Sodding, and Landscaping.
7. Section 32 92 13 – Hydro-Mulching.

1.2 MEASUREMENT AND PAYMENT

A. No separate payment will be made for this item. Include in cost of associated items/work.

1.3 REFERENCES

A. ANSI Z60.1 – American Standard for Nursery Stock.

1.4 DEFINITIONS

A. Site Restoration is replacement or reconstruction of site improvements to rights-of-way, easements, public property, and private property that are affected or altered by construction operations, with improvements to restore to a condition

which is equal to, or better than, that which existed prior to construction operations.

B. Site Improvement includes but is not limited to pavement, curb and gutter, esplanades, sidewalks, driveways, culverts, headwalls, mail boxes, lighting, signage, fences, lawns, irrigation systems, and landscaping.

1.5 SUBMITTALS (NOT USED)

1.6 QUALITY ASSURANCE

A. Have trees, landscape shrubs, and plantings performed by qualified personnel.

1.7 SCHEDULING (NOT USED)

1.8 WARRANTY

A. Provide 2-week warranty on plants and sod grasses that die due to shock or damage only.

B. Replace plants that fail during warranty period according to specifications governing original plants.

C. Damage caused by natural hazards including hail, high winds or storm is not covered by warranty.

D. Existing plant material required to be moved on site are covered under warranty.

PART 2 - PRODUCTS

2.1 MATERIALS (NOT USED)

PART 3 - EXECUTION

3.1 CLEANING

A. Remove debris and trash to maintain clean and orderly site as described in General Conditions and Section 01 74 19 – Construction Waste Management and Disposal.

3.2 MAINTENANCE

A. Maintain shrubs, plantings, sodded areas and seeded areas through warranty period.

B. Replace shrubs, plantings, and seeded or sodded areas that fail to become established through warranty period.

C. Maintain newly planted trees, shrubs, and plantings as follows:

1. Water as often as necessary to keep ground and backfill moist until plantings have become established.

2. Repair or replace bracing as necessary.
3. Prune as necessary.
4. Treat plants in accordance with approved methods of horticultural practices where insects or disease affect plants after planting.

END OF SECTION

SECTION 02673

WATER WELL INSPECTION WORK

PART 1 – GENERAL

1.01 SUMMARY

This Section describes performing water well and pumping equipment inspection work that are currently estimated to include The Woodlands Wells 34.

Water Well and Pumping Equipment Removal and Inspection

Well 34 does not have an existing cat walk, sound wall, right-angle gear drive or auxiliary engine. For Well 34, remove the existing electric motor (if present on well) and turn over to the Owner. Remove the existing discharge head, column assembly, pump bowl and other pumping equipment. Prior to removal from site, allow Owner an opportunity to inspect. With written authorization from the Owner, remove this equipment from the site and inspect, and prepare a written inspection report. The report shall include a list of all wear components which will require replacement for re-assembly of well equipment. All for the Owner and/or Owner's Representative to also be able to inspect the equipment at the facility. Following all inspections, and upon written approval by the Owner, sort, separate and label all equipment and components so that all equipment and components from Well 34 can be readily identified and able to be transported off-site. The components will then be transported by the Contractor to a maximum of two (2) SJRA Woodlands Division facilities/sites for storage until a separate rehabilitation contractor is executed.

Perform well video survey(s), as required.

A DATA SHEET FOR THE WATER WELL, PUMP AND MOTOR MATERIALS AND EQUIPMENT (Data Sheet) for each well is located at the end of this Section and includes existing well, pump and motor data and current design estimates for the well and new pumping equipment.

The existing well construction and material settings sheet for The Woodlands Well 34 is provided in Appendix A that follows this Section.

The well site address and Montgomery County Key Map location are as follows:

Well 34: 550 Trade Center Parkway, Key Map 218 J.

Each prospective CONTRACTOR is encouraged to visit the specified well site locations prior to the bid opening to observe each well site, ensure that they

can perform the work outlined with their service rig(s) and equipment and have site-specific observations to prepare the related costs for the Bid Proposal.

Each prospective Contractor is required to submit a written Contractor Experience and Equipment Record to the Engineer prior to the bid opening.

Contacts: Engineer of Record:
San Jacinto River Authority
Aaron K. Schindewolf, P.E.
281-367-9511 phone
281-362-4385 fax

Construction Manager (primary contact):
San Jacinto River Authority
TBD
281-367-9511 phone
281-362-4385 fax

1.02 RELATED REQUIREMENTS

No Related Technical Specifications for this Contract other than this Section 02673.

1.03 REFERENCES

The publications listed below form a part of this Specification to the extent referenced, the publications are referred to in the text by basic designation only. If there is a more recent version or edition of the reference standard, then the most recent version or edition shall apply.

AMERICAN PETROLEUM INSTITUTE (API)

API 5L	2012 Specification for Line Pipe

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A36/A36M	2012 Standard Specification for Carbon Structural Steel
ASTM A48/A48M	2012 Standard Specification for Gray Iron Castings
ASTM A53/A53M	2012 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A108	2013 Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished

ASTM A275/A275M	2013 Standard Test Practice for Magnetic Particle Examination of Steel Forgings
ASTM A276	2013 Standard Specification for Stainless Steel Bars and Shapes
ASTM A510	2013 Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel
ASTM A519	2012 Standard Specification for Seamless Carbon and Alloy Steel Mechanical Tubing
ASTM A582/A582M	2012 Standard Specification for Free-Machining Stainless Steel Bars
ASTM B505/B505M	2014 Standard Specification for Copper Alloy Continuous Castings
ASTM B584	2014 Standard Specification for Copper Alloy Sand Castings for General Applications

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	2010 Structural Welding Code – Steel, includes Errata

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA A100	2006 Water Wells
AWWA E101	1988 Vertical Turbine Pumps - Line Shaft and Submersible Types
AWWA C206	2011 Field Welding of Steel Water Pipe

HYDRAULIC INSTITUTE (HI)

HI 1.1 - 1.5	1994 Centrifugal Pumps – Installation, Operation and Maintenance

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC. (IEEE)

IEEE Standard 841-2001	IEEE Standard for Petroleum and Chemical Industry – Severe Duty Totally Enclosed Fan-Cooled (TEFC) Squirrel Cage Induction Motors – Up to and Including 370 kW (500 Hp) (latest edition thereto)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA Premium Efficiency Standard for New Electric Motor (latest edition thereto)

NSF INTERNATIONAL

Standard 61	2012 Drinking Water System Components Health Effects

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ)

2013 Rules and Regulations for Public Water Systems (or latest edition thereto)

TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR)

2014 Water Well Drillers and Water Well Pump Installers Rules

1.04 SUBMITTALS

Contractor shall submit the following required information.

A. Well Video Surveys:

The Contractor shall furnish the Owner and Engineer with the original DVD and one (1) DVD copy and a written survey report for each well video survey inspection. Related specifications and requirements are listed in subsection 3.02 B. in the Section.

B. Report on Discharge Head, Pump and Column Pipe Assembly:

After written authorization to remove equipment from site by Owner, the Contractor shall inspect the existing discharge head, pump bowl, column pipe assembly and any other pumping equipment and provide a written report to the Owner and Engineer on the condition of the materials and equipment, a list of the materials and equipment that need to be replaced or reconditioned and the cause or causes of any failures or damage to the materials or equipment, if apparent. The equipment shall be made available for inspection by the Owner and/or Owner's Representative. Related specifications and requirements are listed in subsections 2.01 A.1 and 3.02 A. in this Section.

The Contractor is not required to inspect the existing electric motor at each well site. The Contractor shall provide the existing electric motor to the Owner and the existing electric motor shall remain the property of the Owner and <u>is not</u> included in the salvage materials for the existing

pumping equipment or the salvage materials bid item for the existing pumping equipment for each well.

1.05 QUALITY ASSURANCE

A. Well Contractor Experience and Licenses

The Contractor personnel, including the project manager, field superintendent, service rig operator and field personnel must have adequate experience, skill and equipment and be currently licensed to successfully perform the water well rehabilitation work and install the permanent pumping equipment outlined and meet all the requirements of this project.

The project and work must be supervised by a field superintendent currently licensed by the Texas Department of Licensing and Regulation (TDLR) in the State of Texas as a pump installer and having more than ten (10) years of related experience for the work specified.

The well pump and pumping equipment shall be installed by an experienced service rig operator that is currently licensed by the Texas Department of Licensing and Regulation (TDLR) in the State of Texas as a pump installer.

B. Well Contractor Location and Subcontracting

The Contractor's company office, well yard and shop shall be located in Montgomery County or Harris County, Texas.

C. Well Contractor Equipment and Shop

Service Rigs:
The Contractor shall have and make available the following service rigs with the following minimum requirements for the duration of this Contract:

If needed to return an Owner's production well to service to meet necessary water supply requirements, the Contractor must make available for this project a minimum of two (2) service rigs for simultaneously work at two well sites at the same time, each with a minimum fifty ton (50T) capacity; double drum, workover rig with tubing drum and bailing drum. Each service rig must be equipped with minimum total tubing braking surface area of 1,700 square inches and be capable of handling the Owner's largest capacity well pump assembly at the deepest possible pump setting. A service rig with a hydraulic-driven draw works is not allowed.

Machine and Pump Shop:
The Contractor must own and operate its own working machine shop and pump shop with the minimum equipment and capabilities to: disassemble, wash and clean the pump bowl assembly and column assembly; machine and repair all makes, models and sizes of vertical turbine pump bowls, submersible pump bowls, impellers, bowl assembly, discharge heads, right angle gear drives, column pipe, drive shaft, line shafts, oil tubing, bearings, motor stand, motor drive hub and other pumping equipment components that are comparable to those of the Owner.

D. Well Contractor Manpower

The Contractor shall staff each service rig with a capable and experienced crew with a minimum of three (3) people per crew during all field operations unless approved otherwise by the Owner or Engineer in writing. The service rig operator shall be currently licensed in the State of Texas as a pump installer.

E. Unit Coordination

The Contractor is responsible to ensure compatibility among all components of water well, including the well, well pump, motor, motor drive, right-angle gear drive and auxiliary engine assembly (if applicable) and accessories.

1.06 OUTLINE OF WORK

The following general outline of the water well and pump rehabilitation work is the current estimated work that could be required for each individual well. The actual work, materials and time required and sequence of work for the project could change based on the actual conditions of the well, pump and/or motor encountered, review of the well video survey(s) and reevaluation of the available information and work required once the project begins.

The existing well construction and material settings sheet for Well 34 is provided in Appendix A.

Water Well and Pumping Equipment Removal and Inspection

The Woodlands Well 34 - Estimated work; if approved, the Contractor shall:

A. Mobilize and demobilize a service rig and all equipment, materials and personnel to and from well site, as needed to complete the required work at well site.

B. Remove the existing electric motor (if present) and provide to the Owner.

C. Remove and set at site the existing discharge head, pump bowl, column pipe assembly and any other pumping equipment and materials for Owner to inspection. Upon written authorization by Owner, the materials can be taken by Contractor to their facility for inspection, and prepare a written inspection report and provide the report to the Owner and Engineer for review. The Contractor shall make the pumping equipment available for inspection by the Owner and Engineer.

D. The Owner and Engineer shall review the Contractor's written inspection report and notify the Contractor of the quantities of existing column pipe, line shafting, oil tubing and other column assembly components that are recommended for replacement and what components can be re-used as-is or through rehabilitation or repair. The report shall also provide information on the condition of the existing pump bowl and recommendations on any repair that are required or if complete replacement is necessary.

E. Following all inspections, and upon written approval by the Owner, sort, separate and label all equipment and components so that all equipment and components from Well 34 can be readily identified and able to be transported off-site. Contractor will ship components to a maximum of two (2) SJRA Woodlands Division facilities/sites for storage.

F. Bail and dispose of oil from well prior to first well video survey.

G. Perform initial well video survey and any subsequent well video survey of the entire well, as needed, to check the condition of the well materials, including the surface casing, blank liner and screen sections, the depth of the fill material in the well and the status or effectiveness of any prior well cleaning or work completed. Provide report detailing the video and any anomalies noted.

H. Provide cover for well head. This cover is to remain in place until well rehabilitation mobilization occurs under a separate contract.

I. Complete clean up work and coordinate with the Owner to ensure that site conditions following completion of Contractor work are "as found" or better than those existing prior to initiating the rehabilitation work. Any on-site appurtenances, facilities or equipment damaged by the Contractor shall be repaired and replaced by the Contractor, at no cost to the Owner.

PART 2 – PRODUCTS

2.01 MATERIALS AND/OR EQUIPMENT

A. Well Pump:

1. Inspection Report

   As specified in the Proposal and subsections 1.04 B., 1.06 and 3.02 A. in this Section, and upon written permission, the Contractor shall inspect the existing pump bowl, column pipe, shafting, oil tubing, other pump components and/or the discharge head and provide a written report to the Owner and Engineer that provides information on the condition of the pumping equipment and materials and lists the equipment and materials that need to be replaced. The pumping equipment shall be made available for inspection by the Owner and Engineer.

PART 3 - EXECUTION

3.01 PREPARATION

A. Well Site and Well Protection

1. Each prospective Contractor is encouraged to visit the well site location prior to the bid opening to observe the site conditions and ensure that they can perform the work outlined with their service rig and equipment.

2. Each prospective Contractor shall visit each site location prior to the bid opening to observe the well site and ensure that they can perform the work outlined with their service rig and equipment.

3. Contractor shall cover, secure and protect the open well during all phases of well, pump and motor inspection work to prevent possible introduction of foreign material into the well, prevent damage, vandalism or contamination of the well, well water or groundwater. If directed by the Owner, the Contractor shall adequately weld a steel cap on top of the surface casing. The Contractor is responsible for any damage, vandalism or contamination of the well, well water or groundwater.

4. Contractor shall take necessary measures to protect the existing discharge piping, valves, well collection lines, appurtenances, facilities, equipment and utilities at each well site and the adjoining property during the well rehabilitation operations. All

equipment that is required to be disassembled to remove the pumping equipment shall be neatly organized in a location acceptable to the Owner.

5. Contractor shall maintain the well site premises, materials, tools, well service rig and equipment to prevent or minimize contamination of the well site and property, water well, well water and groundwater.

6. Contractor shall furnish and use temporary, sanitary, sealed and leakproof toilet facilities for personnel at the well site during the work at the well site and follow all applicable TCEQ rules and regulations.

7. Contractor shall coordinate the well site restoration and clean up work with the Owner to ensure that site conditions following completion of Contractor work are “as found” or better than those existing prior to initiating the rehabilitation work. Additional requirements and specifications for the site restoration and clean-up are in subsection 3.02 in this Section.

8. Any appurtenances, facilities, equipment or utilities at the well site or the adjoining property that are damaged by the Contractor shall be repaired and replaced by the Contractor, at no cost to the Owner or adjoining property owner.

B. Storage, Discharge, Disposal and Treatment of Water, Wastes and Fluids

1. Contractor shall obtain any discharge or disposal permits required by local, state or federal agencies prior to the start of any discharge or disposal operations.

2. Contractor shall be responsible for disposing of all water, wastes, fluids, oil, acids and chemicals from the well or stored at the well site in accordance with all local, state and federal regulations.

3. Contractor shall provide portable steel tanks for temporary storage of water, mud, cuttings, solids and fluids. Use of earthen mud pits, dug pits or slush pits will not be permitted.

4. Contractor shall dispose of all wastes, solids and contaminants off the project site in a legal manner.

5. Contractor is responsible for providing all the hoses, pipes, valves and connections needed to convey the water from the well to a drain, sewer or other approved discharge point.

Include the complete cost of storage tanks, hoses, pipes, valves and off-site disposal of water, fluids and wastes in the corresponding prices in the Bid Form.

6. Water that is clear or low in suspended solids, neutralized to a pH of six (6) or higher and has a chlorine residual of three (3) milligrams per liter (mg/L) or less can be disposed of into a nearby storm drain, storm sewer or other discharge point that is identified and approved by the Owner or Engineer.

7. Contractor shall provide treatment to all well water produced in the cleaning and rehabilitation operations to meet the definition of potable drinking water prior to discharging the water to the storm drain, storm sewer or other approved drainage point located at or near the well site. Contractor is responsible for materials, equipment, methods and treatment required to remove suspended sediment and materials in the water including drilling mud, silt, sand or other particles in the water including furnishing and using settling tanks, filter fabric fence, hay or straw, and other effective methods. Settled materials shall not be discharged to, pumped or drained into the storm drain, sewer or other approved drainage point.

9. Contractor shall store all wastes, oil, chemicals, acids and fluids at the well site in leakproof containers or tanks and take precautions and provide adequate containment to prevent site contamination from spills and leaks.

10. If directed by the Owner or Engineer, the Contractor shall pressure wash the concrete driveway and/or pad at a well site to remove any staining or discoloration of the concrete that is due to the Contractor's work and operations at the well site.

C. Safety Equipment and Training

1. Contractor shall provide adequate safety equipment, including all hard hats, hard-toe shoes, gloves, safety glasses, ear protection and other appropriate safety equipment and training that are required for the work specified for all Contractor personnel, subcontractors and visitors. Contractor shall enforce use of the safety equipment by the Contractor personnel, subcontractors and visitors at all times on the job site. Contractor and subcontractors shall provide adequate safety training for work specified.
2. Contractor, subcontractors and visitors shall conform to all applicable rules and requirements, including but not limited to the Occupational Safety and Health Administration (OSHA), Texas

Department of Licensing and Regulation (TDLR) and Texas Commission on Environmental Quality (TCEQ).

D. Water Supply

1. Owner shall provide water to the Contractor from an outlet at or within 500 feet of the well site or water plant site as follows:

   Well 34 – 2-inch water supply available on-site.

2. Contractor shall coordinate with Owner regarding the necessary connections for the water outlet. Contractor is responsible for providing all the hoses, pipes, valves, fittings and connections needed to convey the water from the outlet source to the well. Contractor shall install a back-flow preventer on the water line or another type of back-flow device, if approved by the Owner.

3. Contractor shall install a flowmeter with a totalizer on the water line and record the volume of water used for the project. The Contractor will not have to pay for the water as long as the water is not wasted.

3.02 WELL AND PUMP INSPECTION WORK

A. Removal and Inspection of Permanent Pumping Equipment

1. Electric Motor

   a. As specified and if not already completed, the Contractor shall remove the existing electric motor and provide the motor to the Owner.

      The existing electric motor and motor shaft for each well shall remain the property of the Owner and <u>is not</u> included in the salvage materials for the existing pumping equipment.

2. Pump Components

   a. As specified and if not already completed, the Contractor shall remove and inspect the existing pump components (upon written permission by Owner to remove from site) including the discharge head, pump bowl, column pipe, oil tubing, line shaft, bearings, couplings and any other related components. The pumping equipment shall be made available for inspection by the Owner and Engineer.

b. Following all inspections, and upon written approval by the Owner, sort, separate and label all equipment and components so that all equipment and components from Well 34 can be readily identified when transported off-site as noted in Section 02673 1.06E.

3. Written Inspection Report

a. Contractor shall prepare a written inspection report to the Engineer on the condition of the existing discharge head, pump bowl, column pipe, oil tubing, line shaft, bearings, couplings and any other related pumping equipment components.

c. The written report shall include information on the condition of the existing components and materials that need to be replaced, refurbished or reconditioned. The report shall include the estimated costs for any additional materials and/or time that are not covered in the Base Bid or Alternate Bid items.

d. No written inspection report by Contractor is required for the existing electric motor, which shall remain the property of the Owner and is not included in the salvage materials.

B. Well Video Survey Inspection and Procedure

1. Contractor shall perform well video survey(s), performed after the pumping equipment has been removed from the well, and at other times as approved by the Engineer.

2. For each well video survey, Contractor shall perform a color video survey of the entire depth of the completed well, or other depth approved by Engineer, to check the physical condition and depths of the well materials and whether any fillup or foreign substances are present that require removal from the well.

3. Video equipment to consist of a self-contained video camera and a monitoring unit connected by a coaxial cable. Video camera to be waterproof and small enough to ensure passage through the liner and screen sections. Video camera unit to include two separate video cameras with two separate light sources in one camera assembly unit with one video camera having a downhole camera lens and the second separate video camera having a right-angle camera. Video camera unit must have capability for operator to select downhole or right-angle lens from the surface for on-demand use without pulling the video camera unit out of

the well, installing a camera attachment for right-angle view inside the well and rerunning the video camera unit back in the well. A downhole video camera with mirrors or a mirror attachment is not acceptable for use. Downhole video camera should show a self-continuous, clear picture of entire inside periphery of casing, liner, and screen and right-angle video camera should show clear close-up picture of casing, liner and screen.

4. Record and furnish the Owner and Engineer with a continuous written record of the well video survey inspection that includes the original DVD and one (1) DVD copy.

5. During each well video survey inspection, maintain a written record that lists the exact depth/s and/or depth intervals of the surface casing, top of the blank liner (lap), each blank liner and screen section, static water level, gravel level and fillup in the bottom of the well. The written record also shall include notations regarding observations on the physical condition of the well materials and any structural damage or irregularities that are observed. The Contractor shall provide a written record for each well video survey to the Owner and Engineer.

6. Reference datum for all depths on the written report shall be the height of the top of the pump foundation above ground level. Take measurement readings from the top of the pump foundation by means of a meter device. Make measurement from an object a fixed distance in front of video camera positioned at exact location of screen or liner.

7. During the well video survey operation, the Owner or Engineer reserves the right to request pictures at designated intervals from the video monitor. Such pictures to be taken with a Polaroid oscilloscope film camera, a Bezel assemble and latching device or other acceptable video equipment. Oscilloscope video camera to have been modified to take pictures from the video monitor screen.

3.03 MEASUREMENT AND PAYMENT

A. The following items to be included by the Contractor in the price bid for the base bid and alternate bid items listed in the Bid Form (Section 00 41 00.01), B. Base Unit Price Table for the estimated work, materials and time for this project, as described in these Specifications and documents.

2. Removal of the existing electric motor (if specified), removal and inspection of the existing well pump bowl, column pipe assembly, pumping equipment, and well video survey(s), as specified in this Section.

END OF SECTION

DATA SHEET FOR THE WATER WELL, PUMP AND MOTOR MATERIALS AND EQUIPMENT

A. **SJRA – The Woodlands Well 34**

1. Well Materials:

   a. A copy of the original well material settings sheet is in Appendix A.

      The well is constructed with:
      18-inch diameter surface casing and
      12-inch diameter screen and blank liner.
      8-inch diameter internal screen and blank liner installed (2001).

      Well screen depth interval: approximately 660 to 880 feet.
      Total screen length: approximately 150 feet.
      8-inch diameter screens (2001): approximately 661 to 880 feet.
      Total screen length: approximately 132 feet.

2. Existing Pumping Equipment:

   a. Pump Model: Christensen 12 CLC (9 Stages)
      Design Point: 800 gpm at TDH of 620 feet

   b. Motor Horsepower: 200 Hp

   c. Pump Setting Depth: 570 feet
      (from base of discharge head to top of upper bowl)

   d. Column Pipe Diameter and Wall Thickness: 8-inch I.D, 0.322 inch

   e. Column Shafting Diameter: 1-15/16 inches

   f. Oil Tubing Diameter: 3 inches

FORM NO. 1202 - 1M - 8-51 - B&L

THE LAYNE TEXAS COMPANY, LTD.

HOUSTON -:- DALLAS

MATERIAL SETTING

REPORT NO.
S. O. 1102-7181
PAGE 1 OF 1
FILE NO. 3859
DATE 5/18/77

CUSTOMER LOCATION

FOR Montgomery Co. M.U.D. #39 (WELL 34)

LOCATION WELL Woodlands Trade Center

SURVEY FIELD

COUNTY Montgomery STATE Texas

OTHER LAND MARKS

WELL DATA

NAME WELL WELL NO. 1

ELEVATION DATUM

TYPE WELL Gravel Wall

SURFACE CASING CEMENTED yes NO. SACKS 350 + 8% Gel

SIZE HOLE UNDERREAMED 30" DEPTH 650'-895'

GRAVEL TYPE 212-213-365-231 NO. CU. YDS. 108

TYPE SCREEN S.S.W.W. Barlug GAGE .045

DRILLER F.R. Wall RIG NO. 2

OTHER C.R. McFarland

DEPTH	LENGTH	SIZE, KIND, WEIGHT MATERIAL
+2'		18" O.D. Surface Casing 70.59#
0		Surface
550'		Top of 12-3/4" Liner
650'	652'	18" O.D. Surface Casing 70.59#
660'	110'	12-3/4" O.D. Blank Liner 43.77#
685'	25'	12-3/4" O.D. S.S.W.W.Barlug Scr. .045 GA.
700'	15'	12-3/4" O.D. Blank Liner 43.77#
745'	45'	12-3/4" O.D. S.S.W.W.Barlug Scr. .045 GA.
760'	15'	12-3/4" O.D. Blank Liner 43.77#
820'	60'	12-3/4" O.D. S.S.W.W.Barlug Scr. .045 GA.
838'	18'	12-3/4" O.D. Blank Liner 43.77#
848'	10'	12-3/4" O.D. S.S.W.W.Barlug Scr. .045 GA.
870'	22'	12-3/4" O.D. Blank Liner 43.77#
880'	10'	12-3/4" O.D. S.S.W.W.Barlug Scr. .045 GA.
893'	13'	12-3/4" O.D. Blank Liner 43.77#
895'	2'	12-3/4" O.D. SET NIPPLE & B.P.V.

MAY 2001

8" INSTALLATION
INTERNAL SCREEN & LINER

8" BLANK LINER: 606'-887' (149')

8" SCREEN: 661'-880' (132')

$\Sigma \approx 281'$

GRAVEL PACK: 16x30/16x30+20x40

SKETCH