

SECTION 01010  
SUMMARY OF WORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Work covered by contract documents
- B. Work by others
- C. Contractor use of site and premises
- D. Work sequence
- E. Easements and right-of-way
- F. Protection of public and private property
- G. Maintenance of traffic
- H. Barricades and lights
- I. Lines and grades
- J. Regulatory requirements
- K. Cutting and patching

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work will include all necessary labor, supervision, equipment, tools and materials for the construction of approximately 1980 linear feet of 20" C905 PVC water main with 3/4" copper service connections, valves, bends, couplings, tees and fire hydrant laterals. The work will also include cutting, capping, and grouting the existing 24" waterline that is to be abandoned, and the abandoning of the 8" waterline on the east side of Linden Ave as shown in the drawings. Work includes but is not limited to: reconnection of an existing 8" water line; coordinating water service outages; removal of existing road base, asphalt and concrete; removal and resetting of exist landscaping; connections to existing system; asphalt paving and patching; installation of aggregate base course, concrete sidewalk, and completion of all associated site work relating to the project.
- B. Contractor shall furnish and pay for all materials, equipment, supplies, appurtenances; provide all construction equipment and tools; and perform all necessary labor and supervision

- C. Contractor shall coordinate the progress of the Work including coordination between trades, subcontractors, suppliers, public utilities and contractor performing work on site and Owner to insure the progress of Work
- D. It is the intent of this contract that Work proceed in the most expeditious manner possible
- E. Construct the Work under contract indicated in the Bid Form
- F. The cross-referencing of specification sections under the heading "Related Sections" and elsewhere within each specification section is intended as an aid to the Contractor and shall not relieve the Contractor from his responsibility to coordinate the Work under the Contract Documents. Listings of cross-references are not intended to be comprehensive. The omission of a cross-reference to an additional or related requirement shall not relieve the Contractor of his obligation to provide a complete Project.

### 1.3 WORK BY OTHERS

- A. Construct work to allow for work by others. Coordinate construction schedule with the Owner.

### 1.4 CONTRACTOR USE OF SITE AND PREMISES

- A. Contractor to coordinate designated staging area with City of Grand Junction
- B. Contractor shall limit use of the premises for Work and will use the designated staging area for field offices, equipment, and material storage. Areas have been designated on the Drawings for contractor's use
- C. Coordinate use of premises under direction of Engineer and/or Owner
- D. Assume full responsibility for the protection and safekeeping of equipment and products stored on site under this Contract
- E. Contractor may use only those areas designated in coordination with the City of Grand Junction for storage and such additional areas as Engineer may designate
- F. Contractor should plan for normal workdays, Monday through Friday, within the hours of 7:00 am to 7:00 pm. Other work hours and days may be allowed by the City of Grand Junction and Engineer upon 48 hours written notice

### 1.5 OWNER USE OF SITE AND PREMISES

- A. Owner shall coordinate with Contractor to provide access to the site at all times

### 1.6 WORK SEQUENCE AND WORK RESTRICTIONS

- A. Construct work to allow for work by others. Coordinate construction schedule with the Owner.

- B. Maintain minimum width clearance for access of City and Contractor personnel and emergency vehicles at all times.
- C. Contractor shall maintain access to all driveways/access points at all times.
- D. Contractor shall submit a detailed CPM format schedule outlining all steps required to assure complete and satisfactory construction, testing, and startup of work. Address all work sequence and constraints described in this Section.
- E. All service interruptions shall be coordinated with service owner and the City of Grand Junction
  - 1. Schedule each outage with Engineer and Owner
- F. Sequences other than those specified will be considered by Engineer, provided they afford equivalent continuity of operations.

#### 1.7 EASEMENTS AND RIGHT-OF-WAY

- A. Construction access to the site is indicated on the Drawings by public roads. Access across private property is strictly prohibited.
- B. Work will be performed in the dedicated street Right-of-Way, utility easement, and on Owner's property.
- C. Construction Area Limits
  - 1. Confine construction operations to the immediate vicinity of the location in accordance with the Owner.
  - 2. Areas not designated for access roads, parking areas, storage areas, existing facilities areas, and construction areas, Contractor shall not trespass in or on these areas.
    - a. Contractor shall be responsible for keeping all their personnel out of areas not designated for Contractor use except in case of isolated Work located within these areas for which the Contractor shall coordinate with Owner and shall not proceed with such work without Owner approval.
  - 3. Contractor shall use due care in placing construction tools, equipment, excavated materials, and pipeline materials and supplies, so as to cause the least possible damage to property and existing vegetation and landscaping.
    - a. Responsibility for protection and safekeeping of materials and equipment on or near the work site shall be entirely that of the Contractor and no claim shall be made against the Owner for any reason.
    - b. If the Owner needs access to the sites occupied by stored materials or equipment, Contractor shall provide access.
- D. On Private Property
  - 1. Do not enter for material delivery or occupy for any purpose with personnel, tools, equipment, construction materials, or excavated materials, any private property

outside the designated construction easement without written permission of the owner and tenant.

E. Within Street Right-of-Way and Utility Easement

1. Perform all work and conduct all operations of Contractor, his employees, and his subcontractors in accordance with the requirements of the City and/or Mesa County.

1.8 PROTECTION OF PUBLIC AND PRIVATE PROPERTY

- A. Protect, shore, brace, support, and maintain underground conduits, drains, and other underground construction uncovered or otherwise affected by construction operations
- B. Contractor shall be responsible for all damage to streets, roads, highways, shoulders, street lighting and/or signage, embankments, culverts, location or character, which may be caused by transporting equipment, materials, or personnel to or from the Work or any part or site thereof, whether by him or his subcontractors
- C. Make satisfactory and acceptable arrangements with the Owner of, or the agency or authority having jurisdiction over, any damaged property concerning its repair or replacement or payment of costs incurred in connection with the damage

1.9 PROTECTION OF WORK AND FACILITIES

- A. Contractor shall be solely responsible for the protection of Work until final acceptance
- B. Contractor shall protect all and any previously performed Work, work in progress or completed by others, and existing facilities from damage during the performance of Work in the area

1.10 MAINTENANCE OF TRAFFIC

- A. Conduct Work to interfere as little as possible with public travel, whether vehicular or pedestrian
  1. Whenever it is necessary to cross, close, or obstruct private roads, driveways, multi use paths, and walks, provide and maintain suitable and safe detours, or other temporary expedients for accommodation of private travel
    - a. Submit traffic control plans for work within right-of-ways for approval by City of Grand Junction Engineering and Transportation Department prior to commencing any work.
  2. Maintenance of traffic is not required if Contractor obtains written permission from the owner and tenant of private property, or from the authority having jurisdiction over public property involved, to obstruct traffic at the designated point

1.11 BARRICADES AND LIGHTS

- A. Protect streets, roads, highways, and other public thoroughfares which are closed to traffic by effective barricades with acceptable warning and directional signs

- B. Locate barricades at the street intersecting public thoroughfare on each side of the blocked section
- C. Provide suitable barriers, signs, and lights to the extent required to adequately protect the public
- D. Provide similar warning signs and lights at obstructions such as material piles and equipment
- E. Illuminate barricades and obstructions with warning lights from sunset to sunrise
- F. Store materials and conduct work to cause the minimum obstruction to the other contracts
- G. Install and maintain barricades, signs, lights, and other protective devices in conformity with applicable statutory requirements including the Manual of Uniform Traffic Control Devices and as required by Mesa County and/or CDOT.

#### 1.12 LINES, GRADES AND SURVEY

- A. Construct all Work to the lines, grades, and elevations indicated on the Drawings
  - 1. The Owner may employ a separate surveyor to perform a verification survey to check final layout and grades.
  - 2. Contractor is responsible for correcting all incorrect grades or grades not meeting specified tolerances
- B. Engineer has established basic horizontal and vertical control points in the Drawings
  - 1. Use these points as datum for the Work
  - 2. Provide such competent personnel and tool, stakes, and other materials as Engineer may require in establishing or designating control points, in establishing construction easement boundaries, or in checking layout survey, and measurement work performed by Contractor
- C. Provide all survey, layout, and measurement work required
  - 1. Work performed by a qualified professional engineer or registered land surveyor acceptable to Engineer
  - 2. Locate and protect control points prior to starting site work, and preserve all permanent reference points during construction
    - a. Make no changes or relocations without prior written notice to Engineer
    - b. Report to Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations
    - c. Require surveyor to replace Project control points which may be lost or destroyed
    - d. Establish replacements based on original survey control
  - 3. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means
    - a. Temporary project benchmark
    - b. Stakes for grading, fill and topsoil placement
    - c. Utility slopes and invert elevations
  - 4. From time to time, verify layouts by the same methods

5. Maintain a complete, accurate log of all control and survey work as it progresses
6. On request of Engineer, submit documentation to verify accuracy or field engineering work

#### 1.13 REGULATORY REQUIREMENTS

- A. Comply with all federal, state, and local laws, regulations, codes, and ordinances applicable to the Work.
- B. References in the Contract Document to local codes shall mean the codes in effect in the City of Grand Junction and Mesa County according to the jurisdiction in which the Work is performed.
- C. Other standards and codes which apply to the Work are designated in the specific technical specifications.

#### 1.14 CUTTING AND PATCHING

- A. Contractor shall be responsible for all cutting, and patching, including attendant excavation and backfill, required to complete the Work or to
  1. Uncover portions of the Work to provide for installation of ill-timed work
  2. Remove and replace defective work
  3. Remove and replace work not conforming to requirements of Contract Documents
  4. Remove samples of installed work as specified for testing
- B. Provide products as specified or as required to complete cutting and patching operations
- C. Inspection
  1. Inspect existing conditions of the Project, including elements subject to damage or to movement during cutting and patching
  2. After uncovering work, inspect the conditions affecting the installation of products, or performance of the work
  3. Report unsatisfactory or questionable conditions to the Engineer in writing; do not proceed with the work until the Engineer has provided further instructions
- D. Preparation
  1. Provide devices and methods to protect other portions of the Project from damage
  2. Provide protection from the elements for that portion of the Project which may be exposed by cutting and patching work, and maintain excavations free from water
  3. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes
  4. Restore work which has been cut or removed; install new products to provide completed Work in accord with requirements of Contract Documents

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 01020

GEOTECHNICAL REPORT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Reports of explorations and tests of subsurface conditions at the project site.

1.2 RELATED SECTIONS

- A. Section 01010 – Summary of Work
- B. Section 02300 – Earthwork

1.3 INVESTIGATION

- A. Soil and subsurface investigations were not conducted at the site.
- B. Bidders are expected to make their own investigation of the site prior to the bid date.

1.4 INTERPRETATION

- A. Soil investigation data is not provided. Owner and Engineer disclaim any responsibility for the accuracy, true location, and extent of the soils. They further disclaim responsibility for interpretations of the soil conditions by bidders, as in projecting soil-bearing values, rock profiles, soil stability and the presence, and level and extent of underground water.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION



## SECTION 01039

### COORDINATION AND MEETINGS

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. General requirements
- B. Coordination
- C. Field engineering
- D. Alteration project procedures
- E. Preconstruction conference
- F. Progress meetings
- G. Requests for information

##### 1.2 RELATED SECTIONS

- A. Section 01010 – Summary of Work
- B. Section 01340 – Shop Drawings and Product Data
- C. Section 01700 – Contract Closeout

##### 1.3 GENERAL REQUIREMENTS

- A. Refer to General Conditions for Owner meetings and other requirements
- B. Engineer will schedule and administer pre-construction meeting according to agenda
  1. Prepare agenda for meetings including items required by Owner and Contractor
  2. Notify Contractor and Owner 4 days in advance of meeting date
  3. Preside at meeting
- C. Contractor will schedule and administer site mobilization and weekly progress meetings. Contractor will also be responsible for coordination, field engineering, alteration, project procedures, cutting and patching procedures outlined herein. If work progress does not warrant a meeting, all parties can mutually agree to postpone meeting.
  1. Arrange for the attendance of Contractor's agents, employees, subcontractors, and suppliers as appropriate to the agenda
  2. Record the minutes; include all significant proceedings and decisions
  3. Reproduce and distribute copies of minutes within one week after each meeting
    - a. To all participants in the meetings

- b. To Engineer
  - c. To Owner
  - 4. Owner and other inspecting parties such as the geotechnical engineer/technician as well as plant operators may attend meetings
  - 5. Engineer will attend weekly meetings either via phone or on site
- D. Representatives of contractors, subcontractors, and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents

#### 1.4 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various Sections of specifications to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later by others.
- B. Verify that utility requirement characteristics of operating equipment are compatible with available utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment, and coordinate preparation of grading and other requirements for installation utility work by others.
- C. Coordinate completion and clean-up of Work of separate Sections in preparation for final completion and for portions of Work designated for Owner's use
- D. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

#### 1.5 FIELD ENGINEERING

- A. Employ a Land Surveyor registered in the State of Colorado and acceptable to the Engineer and Owner.
- B. Contractor will locate and protect survey control and reference points.
- C. Control datum for survey is that established by Owner provided survey and shown on Drawings.
- D. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

#### 1.6 ALTERATION PROJECT PROCEDURES

- A. Materials: As specified in product Sections; match existing products and work for patching and extending work.
- B. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work to match existing adjacent work in texture and appearance.

- C. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Engineer.
- D. Where a change of plane of 1/4-inch or more occurs, submit recommendation for providing a smooth transition for Engineer review.
- E. Patch or replace portions of existing surfaces, which are damaged, lifted, or showing other imperfections.
- F. Finish surfaces as specified in individual product sections.

#### 1.7 PRECONSTRUCTION CONFERENCE

- A. Engineer will schedule a conference after Notice of Award
- B. Location: TBD by City of Grand Junction
- C. Attendance
  - 1. Owner's Representative
  - 2. Engineer and his professional consultants
  - 3. Geotechnical Engineer
  - 4. Contractor's Project Manager
  - 5. Contractor's Superintendent
  - 6. Major Subcontractors
  - 7. Others as Appropriate
- D. Agenda:
  - 1. Execution of Owner Contractor Agreement.
  - 2. Submission of executed bonds and insurance certificates.
  - 3. Distribution of Contract Documents.
  - 4. Submission of list of subcontractors and suppliers, list of products, Schedule of Values, and Construction Project Schedule in critical path format.
  - 5. Designation of personnel representing the parties in Contractor, Owner, and the Engineer.
  - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, cost proposal requests, Change Orders and Contract closeout procedures.
  - 7. Construction scheduling and updates.
  - 8. Scheduling activities of Geotechnical Engineer, equipment manufacturers representatives, and other field tests
  - 9. Critical work sequencing
  - 10. Major equipment deliveries and priorities
  - 11. Procedures for maintaining Record Documents
  - 12. Construction facilities, controls and construction aids
  - 13. Temporary utilities provided by Owner
  - 14. Safety and first-aid procedures
  - 15. Security and housekeeping procedures

## 16. Procedures for testing and disinfection

### 1.8 PROGRESS MEETINGS

- A. Contractor will schedule and administer meetings throughout progress of the Work at weekly intervals. If work progress does not warrant meeting, all parties can mutually agree to postpone the weekly meeting.
- B. Location of the Meetings: The project field office of the Contractor, or other locations arranged for by Contractor, convenient to all parties
- C. Contractor will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within one week to Contractor, Owner, participants, and those affected by decisions made.
- D. Attendance
  - 1. Owner's Representative
  - 2. Engineer, and his professional consultants as needed
  - 3. Contractor's Superintendent
  - 4. Subcontractors as appropriate to the agenda
  - 5. Suppliers as appropriate to the agenda
  - 6. Others, as appropriate
- E. Suggested Agenda
  - 1. Review Minutes of Previous meetings
  - 2. Review Unresolved issues from Last Meeting
  - 3. Review of Work Progress
  - 4. Field Observations, Problems, Conflicts and Decisions
  - 5. RFI Review
  - 6. Review of Submittals Schedule and Status of Submittals
  - 7. Schedule
    - a. General Schedule Issues
    - b. Review of off-site fabrication and delivery schedules
    - c. Planned progress during succeeding work period (3-week "Look ahead")
    - d. Maintenance of construction project schedule
    - e. Corrective measures to regain project schedules
  - 8. Maintenance of Quality and Work Standards
  - 9. Change Orders
  - 10. New PR's
  - 11. Accepted Change Orders
  - 12. Pay Requests
  - 13. Other Business

### 1.9 REQUESTS FOR INFORMATION (RFI)

- A. The Contractor shall prepare and submit an RFI upon the discovery of the need for interpretation of the Contract Documents or additional information.
  - 1. Only the Contractor shall submit RFIs to the Engineer.

2. RFIs shall be submitted on Engineer's RFI form. Engineer will provide a template for the Contractor upon request.
- B. RFI shall include:
1. Project Name
  2. Engineer Job Number
  3. Date
  4. Name of Contractor
  5. Name of Engineer
  6. RFI number, numbered sequentially
  7. Related specification section number, title, and related paragraphs, as needed
  8. Drawing number and detail references, as needed
  9. Field conditions
  10. Contractor's proposed solution. If the Contractor's solution(s) affect contract times or contract price, Contractor shall state the effects on the RFI.
  11. Contractor's signature
  12. Relevant attachments including but not limited to drawings, descriptions, measurements, photos, product data, and shop drawings
- C. Electronically Submitted RFIs
1. Contractor shall submit one (1) complete RFI file in Adobe Acrobat PDF format
- D. Engineer's Response
1. Engineer will review each RFI, determine action required, and respond.
  2. Engineer will review and respond to each RFI within seven (7) working days
  3. If Engineer receives an RFI after 1:00 P.M. local time, the RFI will be considered as received the following working day.
  4. Engineer will not respond to RFIs requesting approval of submittals, approval of substitutions, coordination and information already indicated in Contract Documents, adjustment in contract time or contract amount, or erroneous RFIs.
  5. Engineer may respond to RFIs on related issues with a single response.
  6. If Engineer requests additional information as a result of the RFI, any further action or RFIs submitted by the Contractor will restart a new seven (7) day review period.
  7. Contractor shall submit any request for change of contract time or contract price utilizing proper Change Order forms.
- E. Contractor shall log and track all RFIs submitted organized by RFI number.
1. RFI log shall be submitted at each progress meeting
  2. RFI log shall include:
    - a. Project name
    - b. Name, address, and phone number of Contractor
    - c. Contractor representative name
    - d. RFI number
    - e. RFI description
    - f. RFI submittal date
    - g. RFI response date
    - h. Related Change Order number, as needed

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

## SECTION 01200

### PAYMENT PROCEDURES

#### PART 1 GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.
- B. This information is supplemental to the requirements as stated in the General Conditions.

##### 1.2 SUMMARY

- A. This Section includes additional administrative and procedural requirements necessary to prepare and process Applications for Payment. Refer to General Conditions for most requirements of the Owner.
  - 1. Unit Prices for administrative requirements governing use of unit prices
  - 2. Construction Progress Schedules

##### 1.3 DEFINITIONS

- A. Unit Price: An amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services.

##### 1.4 PROCEDURES FOR UNIT PRICES

- A. Unit bid prices, as quoted in the Bid Form, shall be in full compensation for labor, materials, equipment, rentals, freight, applicable taxes, overhead, profit and incidentals to complete all work for each pay item; and for all risk, loss, damage, or expense of whatever nature arising from the nature of the work or the prosecution thereof.
- B. Work or materials that are essential to the work, but for which there are no pay items, will not be measured and paid for separately, but shall be included in other items of work.
- C. Prices include all necessary material, for a complete installation, insurance, applicable taxes, overhead, and profit
  - 1. Bid Item No. 1: Export Trench Spoils
    - a. Description: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The unit price will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: locating and protecting all existing above and below ground utilities and connections along and around the item; topsoil removal, stockpiling, and replacement; required excavation and transportation of excess material from the water main trench; disposing of materials off-site in

accordance with the Drawings and Specifications and any applicable local, state or federal requirements; clean up; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.

- b. Unit of Measurement: Per actual number of cubic yards (volume) of onsite material hauled off site. Payment will be based on units completed and accepted of the Work required by this bid item.
2. Bid Items No. 2-5: Water Pipe – 4-inch, 6-inch, and 8-inch PVC C900 DR-18 and 20-inch PVC C905 DR-25
  - a. No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The measurement for payment for this item will be the number of linear feet of pipe installed. The unit price will include all of Contractor's costs which are not specifically measured and paid for under other bid items. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: locating and protecting all existing above and below ground utilities and connections along and around the item; topsoil removal, stockpiling, and replacement; excavating, dewatering, rock and muck removal and backfill with suitable material(s), and compaction of excavations; furnishing, transporting, and installing all pipe, detectable marking tape, tracer wire, flowfill groundwater barriers, and materials as indicated; adjusting location of existing small utilities and valves; tapping and/or connecting to pipes or structures and repairing all structures as necessary; furnishing, transporting, and installing special fittings or items not otherwise provided for elsewhere in the Drawings and Specifications; furnishing, transporting, and installing joining materials including O-rings, gaskets, bolts, joint restraints, connecting bands, and other miscellaneous items; excavating, including exploratory excavation; constructing the specific bedding including the furnishing, placing, and compacting of sand, gravel, and rock; supporting trenches as required; disposing of debris, pipe, and damaged materials; testing; inspecting; disinfection; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: Per actual number of linear feet of pipe installed. Payment will be based on the units completed and accepted of the Work required by this bid item.
3. Bid Item No. 6-8: Bend – 20-inch (45, 22.5, and 11.25 degrees) with Thrust Restraint
  - a. Description: The measurement for payment for this item will be on a per-each basis, complete in place, in accordance with the Drawings or Specifications or as otherwise directed by Engineer. The unit price will include all of Contractor's costs. This bid item includes but is not limited to the following items: locating and protecting all existing utilities along and around the item; adjusting location of any existing small utilities and valves; furnishing, transporting, and installing all materials including any sheeting and/or bracing required for support trenches; constructing required connections to existing and new pipes; excavating, backfilling, and compacting, including imported backfill material and flowfill; subbase material, sod, and other surfacing material outside of the prescribed



trench width which is not paid for under another section of this Specification; protecting aboveground and underground utilities and service connections; disposing of debris, pipe, excess excavated material, and damaged materials; testing; inspecting; disinfecting; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.

- b. Unit of Measurement: Per actual number of bends installed. Payment will be based on units completed and accepted of the Work required by this bid item.
4. Bid Item No. 9-11: Tee – 20-inch by 4, 6, & 8-inch
- a. Description: The measurement for payment for this item will be on a per-each basis, complete in place, in accordance with the Drawings or Specifications or as otherwise directed by Engineer. The unit price will include all of Contractor's costs. This bid item includes but is not limited to the following items: locating and protecting all existing utilities along and around the item; adjusting location of any existing small utilities and valves; furnishing, transporting, and installing all materials including any sheeting and/or bracing required for support trenches; constructing required connections to existing and new pipes; excavating, backfilling, and compacting, including imported backfill material and flowfill; subbase material, sod, and other surfacing material outside of the prescribed trench width which is not paid for under another section of this Specification; protecting aboveground and underground utilities and service connections; disposing of debris, pipe, excess excavated material, and damaged materials; testing; inspecting; disinfection; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: Per actual number of tees installed. Payment will be based on units completed and accepted of the Work required by this bid item.
5. Bid Item No. 12: Fire Hydrant Assembly
- a. Description: The measurement for payment for this item will be on a per-each basis, complete in place, in accordance with the Drawings or Specifications or as otherwise directed by Engineer. The unit price will include all of Contractor's costs. This bid item includes but is not limited to the following items: locating and protecting all existing utilities along and around the item; adjusting location of any existing small utilities and valves; furnishing, transporting, and installing all materials including any sheeting and/or bracing required for support trenches; installing fire hydrant assembly including gate valve, hydrant lateral pipe line, and mechanical joint restraint in accordance with the Drawings and Specifications and any applicable local, state or federal requirements; constructing required connections to existing and new pipes; excavating, backfilling, and compacting, including imported backfill material and flowfill; subbase material, sod, and other surfacing material outside of the prescribed trench width which is not paid for under another section of this Specification; protecting aboveground and underground utilities and service connections; disposing of debris, pipe, excess excavated material, and damaged materials; testing; inspecting; disinfection; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.

- b. Unit of Measurement: Per actual number of Fire Hydrant Assemblies installed. Payment will be based on units completed and accepted of the Work required by this bid item.
6. Bid Item No. 13: Water Service Line  $\frac{3}{4}$ -inch Type K copper
- a. Description: The measurement for payment for this item will be the number of linear feet of pipe installed, complete in place, in accordance with the Drawings or Specifications or as otherwise directed by Engineer. The unit price will include all of Contractor's costs. This bid item includes but is not limited to the following items: locating and protecting all existing utilities along and around the item; adjusting location of any existing small utilities and valves; furnishing, transporting, and installing all materials including any sheeting and/or bracing required for support trenches; tapping connection to watermain with brass tapping saddle; new corporation stop; replacement of entire water service to the curb stop as well as the curb stop if exist service line is not Type K copper; excavating, including exploratory excavation; backfilling, and compacting, including imported backfill material and flowfill; subbase material, sod, and other surfacing material outside of the prescribed trench width which is not paid for under another section of this Specification; protecting aboveground and underground utilities and service connections; disposing of debris, pipe, excess excavated material, and damaged materials; testing; inspecting; disinfection; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: Per actual number of water service connections installed. Payment will be based on units completed and accepted of the Work required by this bid item.
7. Bid Item No. 14-16: Gate Valve 4-, 6-, and 8-inch With Box
- a. Description: The measurement for payment for this item will be on a per-each basis, complete in place, in accordance with the Drawings or Specifications or as otherwise directed by Engineer. The unit price will include all of Contractor's costs. This bid item includes but is not limited to the following items: locating and protecting all existing utilities along and around the item; adjusting location of any existing small utilities and valves; furnishing, transporting, and installing all materials including any sheeting and/or bracing required for support trenches; constructing required connections to existing and new pipes; excavating, backfilling, and compacting, including imported backfill material and flowfill, subbase material, sod, and other surfacing material outside of the prescribed trench width which is not paid for under another section of this Specification; protecting aboveground and underground utilities and service connections; disposing of debris, pipe, excess excavated material, and damaged materials; testing; inspecting; disinfecting; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: Per actual number of gate valves installed. Payment will be based on units completed and accepted of the Work required by this bid item.
8. Bid Item No. 17: Butterfly Valve 20-inch With Box

- a. Description: The measurement for payment for this item will be on a per-each basis, complete in place, in accordance with the Drawings or Specifications or as otherwise directed by Engineer. The unit price will include all of Contractor's costs. This bid item includes but is not limited to the following items: locating and protecting all existing utilities along and around the item; adjusting location of any existing small utilities and valves; furnishing, transporting, and installing all materials including any sheeting and/or bracing required for support trenches; constructing required connections to existing and new pipes; excavating, backfilling, and compacting, including imported backfill material and flowfill, subbase material, sod, and other surfacing material outside of the prescribed trench width which is not paid for under another section of this Specification; protecting aboveground and underground utilities and service connections; disposing of debris, pipe, excess excavated material, and damaged materials; testing; inspecting; disinfecting; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: Per actual number of gate valves installed. Payment will be based on units completed and accepted of the Work required by this bid item.
9. Bid Item No. 18: Air Release Valve w/Manhole
- a. Description: The measurement for payment for this item will be on a per-each basis, complete in place, in accordance with the Drawings or Specifications or as otherwise directed by Engineer. The unit price will include all of Contractor's costs associated with protecting all existing aboveground and underground utilities, items, materials, and surfaces along and around the item; adjusting location of any existing small utilities and valves; furnishing, transporting, and installing all materials including any sheeting and/or bracing required for support trenches; 20-inch MJ by 6-inch FL tee; 6" FL butterfly valve; air release valve; vent pipe; marker post; bedding; new concrete manhole and lid; excavating, including exploratory excavation; backfilling, and compacting, including imported backfill material and flowfill; dewatering, dewatering permit and associated water discharge requirements; removing and replacing pavement, base course, subbase material, sod, and other surfacing material outside of the prescribed trench width which is not paid for under another section of this Specification; protecting aboveground and underground utilities and service connections; disposing of debris, pipe, excess excavated material, and damaged materials; testing; inspecting; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: Per actual number of new air release valve assemblies and vaults. Payment will be based on units completed and accepted of the Work required by this bid item.
10. Bid Item No. 19: Clear and Grub
- a. Description: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The measurement for payment for this item will be the total number of acres cleared and grubbed and will include all of Contractor's costs. This bid item includes but is not limited to: completing the

another bid item; disposing of materials off-site in accordance with the Drawings and Specifications and any applicable local, state or federal requirements; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.

- b. Unit of Measurement: Per the actual number of acres cleared and grubbed. Payment will be made upon completion and acceptance of the Work required by this bid item.

11. Bid Item No. 20: Demolish Existing Concrete

- a. Description: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The measurement for payment for this item will be the total square footage of actual concrete removed and will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: protecting all existing items, materials, and surfaces not to be demolished; sawcutting; demolishing, hauling, and disposing of existing concrete materials to be demolished as required; clean up; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
- b. Unit of Measurement: Per square feet (surface area) of actual concrete removed. Payment will be based on units completed and accepted of the Work required by this bid item.

12. Bid Item No. 21: Demolish Existing Asphalt

- a. Description: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The measurement for payment for this item will be the total number of square yards of actual asphalt removed and will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: protecting all existing items, materials, and surfaces not to be demolished; sawcutting; demolishing, hauling, and disposing of existing asphalt materials to be demolished as required; clean up; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
- b. Unit of Measurement: Per square yard (surface area) of actual asphalt removed. Payment will be based on units completed and accepted of the Work required by this bid item.

13. Bid Item No. 22: Demolish Existing 24-Inch Water Line

- a. Description: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The measurement for payment for this item will be the total linear footage of pipe removed and will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: protecting all existing items, materials, and surfaces not to be demolished; excavating, tapping the existing steel water main, cut & capping of line, welding, injecting the line with sand aggregate flow fill, ensuring pipe is free of voids, backfilling and compaction around pipe, hauling, and disposing of existing materials as shown on the Drawings; clean up; and

providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.

- b. Unit of Measurement: Per actual number of linear feet of pipe removed. Payment will be based on the units completed and accepted of the Work required by this bid item.
14. Bid No. 23: Fire Hydrant Removal (Return to City)
  - a. Description: The measurement for payment for this item will be on a per-each basis, complete in place, in accordance with the Drawings or Specifications or as otherwise directed by Engineer. The unit price will include all of Contractor's costs. This bid item includes but is not limited to the following items: locating and protecting all existing utilities along and around the item; adjusting location of any existing small utilities and valves; furnishing, transporting, and installing all materials including any sheeting and/or bracing required for support trenches; removal of the existing fire hydrant assembly and existing gate valve box in accordance with the Drawings and Specifications and any applicable local, state or federal requirements and return fire hydrant assembly and gate valve box to City shop; excavating, backfilling, and compacting, including imported backfill material and flowfill; subbase material, sod, and other surfacing material outside of the prescribed trench width which is not paid for under another section of this Specification; protecting aboveground and underground utilities and service connections; disposing of debris, pipe, excess excavated material, and damaged materials; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: Per actual number of Fire Hydrant removed. Payment will be based on units completed and accepted of the Work required by this bid item.
15. Bid Item No. 24: Sand Aggregate Flow Fill Existing 24" Steel Water Main
  - a. No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The measurement for payment for this item will be the total cubic yards of sand aggregate flow fill injected and will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: protecting all existing items, materials, and surfaces adjacent to the work being performed; grout injection plan, excavating, tapping the existing steel water main, cut & capping of line, welding, injecting the line with sand aggregate flow fill, ensuring pipe is free of voids, backfilling and compaction around pipe; replacing surfacing materials, as required disposing of debris, pipe, and damaged materials; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: Per actual number of cubic yards (volume) of sand aggregate flow fill injected. Payment will be based on units completed and accepted of the Work required by this bid item.
16. Bid Item No. 25: Erosion and Sediment Control
  - a. Description: No separate measurements for payment will be made for any labor, equipment, and materials required for this item. The lump sum price will include all of the Contractor's costs. This bid item includes but is not limited to the

following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: furnishing and installing all materials including concrete washout areas, inlet protection, outlet protection, silt fence, curb socks, sediment control logs, vehicle tracking control, and any other materials required to complete the Work; providing all materials, fabricating, and installing erosion and sediment control measures; excavation and backfill, as required for installation; providing and installing all ancillary erosion control items specified in the Drawings, and all other means and methods specified in the erosion control drawings; obtaining required permits; inspecting; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.

- b. Unit of Measurement: No measurement for payment will be made for this work. It shall be paid for at the Contract Lump Sum Price based upon the percentage completed and accepted of the work required by this bid item. One-third of the lump sum price for this item will be paid after twenty-five percent (25%) of the original Contract amount has been earned; the second third will be paid after fifty percent (50%) of the original Contract amount has been earned; and the final third upon final acceptance of the Project.
17. Bid Item No. 26: Seeding
- Description: The measurement for payment for this item will be on an acreage basis, complete in place, in accordance with the Drawings or Specifications or as otherwise directed by Engineer. The measurement for payment for this item will be the total number listed in the bid schedule and will include all of Contractor's costs associated with seeding/sod/landscaping/ topsoil/re-vegetation, watering, planting, edging, plastic weed barrier, cleanup, haul, and any replacement of existing conditions, to existing condition or better, to Owner's/Engineer's satisfaction. Reseeding all areas disturbed by the Work per the seed mix requirements as specified on the Construction Documents including seed bed preparation, fertilization, seeding, and all other costs not included under other bid items. Inspecting and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
- a. Unit of Measurement: Per actual number of acres of ground surface seeded. Payment will be based on units completed and accepted of the Work required by this bid item.
18. Bid Item No. 27: Aggregate Base Course (Class 6) – 6-inch
- a. Description: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The measurement for payment for this item will be the total square yards of road base installed and will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: furnishing and installing Class II aggregate base with CDOT Class VI gradation; site grading to establish grade prior to placement of Road Base; subgrade preparation; removing debris and excess materials; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.

- b. Unit of Measurement: Per actual number of square yards of road base installed. Payment will be based on units completed and accepted of the Work required by this bid item.
19. Bid Item No. 28: Hot Bituminous Pavement (Patching) (4-inch Thick)
- a. Description: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The measurement for payment for this item will be the total tons of 4-inch thick asphalt paved and will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: saw cutting and patching or repairing existing asphalt and concrete as required to install improvements; furnishing all new materials and labor required to install improvements; installation of all materials as indicated, including all required surface and subgrade preparation; tack coat; clean up; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: Per actual number of tons (weight) of 4-inch thick asphalt road surface paved. Payment will be based on units completed and accepted of the Work required by this bid item.
20. Bid Item No. 29: Concrete – 6-foot Pan (8-inch thick, reinforced)
- a. Description: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The measurement for payment for this item will be the actual number of linear feet of concrete pan installed and will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: saw cutting existing asphalt and concrete as required to install improvements; furnishing all new materials, including rebar, and labor required to install improvements; installation of all materials as indicated, including all required surface and subgrade preparation; clean up; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: Per actual number of linear feet of concrete pan installed. Payment will be based on units completed and accepted of the Work required by this bid item.
21. Bid Item No. 30: Concrete Driveway Section (8-inch) (Commercial)
- a. Description: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The measurement for payment for this item will be the actual number of square feet of concrete walk installed and will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: saw cutting and patching or repairing existing asphalt and concrete as required to install improvements; furnishing all new materials and labor required to install improvements; installation of all materials as indicated, including all required surface and subgrade preparation; clean up; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.

- b. Unit of Measurement: Per actual number of square feet (surface area) of concrete walk installed. Payment will be based on units completed and accepted of the Work required by this bid item.
22. Bid Item No. 31: Construction Surveying
- a. Description: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The lump sum price will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: all construction surveying, locating, referencing, calculating, and staking necessary for the construction of the Work record drawings in accordance with the Drawings and Specifications and in conformance with the CDOT Survey Manual.
  - b. Unit of Measurement: No measurement for payment will be made for this work. It shall be paid for at the Contract Lump Sum Price based upon the percentage completed and accepted of the work required by this bid item. One-third of the lump sum price for this item will be paid after twenty-five percent (25%) of the original contract amount has been earned; the second third will be paid after fifty percent (50%) of the original contract amount has been earned; and the final third upon final acceptance of the project.
23. Bid Item No. 32: Mobilization/Demobilization
- a. Description: No separate measurement for payment will be made for any labor, equipment, materials, and incidental work required for this item. The lump sum price will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: preparing and installing temporary fencing around project work and staging areas, and any other fencing/security items as deemed necessary by Contractor and not covered by another bid item; establishing Contractor's staging area, construction trailers, offices, buildings, other necessary facilities, and temporary power and communications; obtaining permits; providing required bonds and insurance; preparing the project schedule. Item also includes demobilization at the completion of the project including the removal of the Contractor's equipment, supplies, temporary facilities, excess materials, and cleaning up the site; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: The total bid amount for mobilization and demobilization shall not exceed eight percent (8%) of the total bid price. Bids received that exceed this amount may be grounds for rejection of the total bid. No measurement for payment will be made for this work. It shall be paid for at the Contract Lump Sum Price based upon the percentage completed and accepted of the work required by this bid item. Fifty percent (50%) of the lump sum price will be paid at the time of the first monthly progress payment; an additional thirty percent (30%) will be paid when one-half of the original Contract amount is earned. The remaining twenty percent (20%) will be paid upon final acceptance of the Project.
24. Bid Item No. 12: Traffic Control



- a. Description: No separate measurement for payment will be made for any labor, equipment, and materials required for this item. The lump sum price will include all of Contractor's costs. This bid item includes but is not limited to the following items installed or conducted in accordance with the Drawings and Specifications or as otherwise directed by Engineer: preparing, implementing, adjusting as necessary, and maintaining the approved Traffic Control Plan in accordance with the Drawings and Specifications and accepted Traffic Control Plan; temporary traffic lights; and providing all other related and necessary labor, equipment, and materials to complete the Work not covered by other items in this section.
  - b. Unit of Measurement: No measurement for payment will be made for this work. It shall be paid for at the Contract Lump Sum Price based upon the percentage completed and accepted of the work required by this bid item. One-third of the lump sum price for this item will be paid after twenty-five percent (25%) of the original Contract amount has been earned; the second third will be paid after fifty percent (50%) of the original Contract amount has been earned; and the final third upon final acceptance of the Project.
- D. Measurement and Payment: Refer to bid form and 1.5 (A) of this Section for establishment of unit prices
- E. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor.

## 1.5 APPLICATION FOR PAYMENTS

- A. General
- 1. Submit itemized payment request as required in General Conditions together with Schedule of Values and other submittals as specified herein
  - 2. Contractor shall not "project" work completed beyond the date of Application for Payment submittal for the purpose of payment request
- B. Each Application for Payment shall be consistent with previous applications and payments as certified by the Engineer and paid for by the Owner.
- 1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements
- C. Payment Application Times: Each progress payment date is as indicated in the Agreement. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement
- D. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.
  2. Include amounts of Change Orders issued prior to the last day of the construction period covered by the application
- E. Transmittal
1. Submit copy of each Application for Payment to the Engineer by means ensuring receipt within 24 hours
  2. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the Engineer
- F. Initial Application for Payment
1. Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
    - a. List of subcontractors
    - b. List of principal suppliers and fabricators
    - c. Schedule of Values
    - d. Contractor's Construction Schedule (preliminary if not final)
    - e. Schedule of principal products
    - f. List of Contractor's staff assignments
    - g. Copies of building permits
    - h. Copies of authorizations and licenses from governing authorities for performance of the Work
    - i. Certificates of insurance and insurance policies
    - j. Performance and payment bonds, if required
- G. Application for Payment at Substantial Completion
1. Following issuance of the Certificate of Substantial Completion, submit an Application for Payment. This application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of Work
    - a. Administrative actions and submittals that shall precede or coincide with this application include:
      - i) Occupancy permits and similar approvals
      - ii) Warranties (guarantees) and maintenance agreements
      - iii) Test/adjust/balance records
      - iv) Maintenance instructions
      - v) Meter readings
      - vi) Start-up performance reports
      - vii) Change-over information related to Owner's occupancy, use, operation and maintenance
      - viii) Final cleaning
      - ix) Application for reduction of retainage, and consent of surety
      - x) Advice on shifting insurance coverages
    - b. List of incomplete Work, recognized as exceptions to Engineer's Certificate of Substantial Completion

#### H. Application for Final Payment

1. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Price, previous payments, and sum remaining due.
2. Application for Final Payment will not be considered until the following have been accomplished:
  - a. Completion of Project closeout requirements
  - b. Completion of items specified for completion after Substantial Completion
  - c. Assurance that unsettled claims will be settled
  - d. Assurance that Work not complete and accepted will be completed without undue delay
  - e. Transmittal of required Project construction records to Owner
  - f. Proof that taxes, fees and similar obligations have been paid
  - g. Removal of temporary facilities and services
  - h. Removal of surplus materials, rubbish and similar elements

#### 1.6 PROGRESS SCHEDULE

- A. Coordination: coordinate preparation and updates of Contractor's Construction Schedule with the preparation of Schedule of Values.
  1. Correlate line items in the Construction Schedule with required project tasks, including the following:
    - a. Mobilization/demobilization
    - b. Permits and regulatory requirements
    - c. Submittals
    - d. Equipment
    - e. O&M Manuals
    - f. Work breakdown of major project work
    - g. Major subcontractors work
    - h. Startup and commissioning
    - i. Training
    - j. Substantial completion
    - k. Final completion
    - l. Milestones and operational shutdown requirements
- B. Utilize the Critical Path Method (CPM) type construction schedule to establish preliminary progress schedule and track Work progress
  1. After acceptance by Engineer of preliminary Progress Schedule submitted per requirements of General Conditions, set preliminary Progress Schedule as the Construction Baseline Schedule
  2. Update and submit the construction progress schedule on a monthly basis with the pay application
    - a. Monthly submittal should indicate progress of tasks, changes to baseline schedule logic, work additions such as change orders, milestone and contract date changes
    - b. Submit two (2) color print copies, 11" x 17" size, and one Adobe pdf copy
    - c. Upon request provide copy of project schedule CPM data file

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

A. Provide a list of unit prices as indicated in Section 00310 – Bid Form

END OF SECTION

## SECTION 01340

### SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Submission of all shop drawings and product data as required by the Contract Documents for all equipment and materials to be furnished under this contract unless specifically indicated otherwise

##### 1.2 RELATED SECTIONS

- A. Section 01600 – Materials and Equipment
- B. Section 01730 – Operations and Maintenance Data
- C. Specification Divisions 2 thru 16

##### 1.3 SUBMITTALS

###### A. Definitions

- 1. Technical submittals: Shop drawings, product data and samples prepared by Contractor, subcontractors, suppliers, or manufacturers
  - a. Shall be submitted by the Contractor to Engineer for approval for the use of Equipment and Materials to complete the Work or as needed to describe the following:
    - i) Operation and maintenance
    - ii) Technical properties
    - iii) Installation
  - b. Shop drawings: Custom prepared data for the Project and Work including diagrams, bills of material, instructions, and other information
  - c. Product data: Non-custom prepared printed information for the Project and Work on materials and products
  - d. Samples: Fabricated and non-fabricated tangible samples of products and material
    - i) Used for visual inspection and testing and analysis
- 2. Informational submittals: Reports, administrative informational submittals, certification and guarantees not including and defined as shop drawings, samples and product data
  - a. Reports: Include laboratory reports and tests, technical procedures and records and design analysis
  - b. Administrative informational submittals: Submittals necessary for administrative records such as construction photographs, work records, schedules, standards, record project data, safety data, and similar information submittals
  - c. Certification: Includes manufacturer or supplier certificates and guarantees

###### B. General Requirements

1. Quality
  - a. Shall be of suitable quality for legibility and reproduction purposes
  - b. Shall be useable for reproduction yielding legible hard copy
  - c. Submittals not conforming to specified requirements herein and as specified in Divisions 2 through 16 shall be subject to rejection by Engineer and upon Engineer request, Contractor shall resubmit documents that are in conformance
2. Dimensions
  - a. English units shall be provided on submittals
  - b. Metric units are acceptable in addition to English units
  - c. English units shall govern
3. Form of submittals
  - a. Submittals shall be transmitted in electronic format as specified herein
  - b. Scanned submittals are acceptable
  - c. Electronic project documents and submittals shall be transmitted in the following format:
    - i) Native electronic format, nonproprietary
    - ii) Adobe PDF produced from native electronic format
  - d. Filename:
    - i) Shall be consistent for the initial and any subsequent submission revisions for a single submittal
    - ii) Contractor shall use a consistent naming convention for all submittals
      - a) Use number of original submittal followed directly by a capital letter corresponding to the number of times a submittal is resubmitted (i.e., #001, #001A, #001B, etc.)
4. Non-conforming submittals shall be subject to rejection by Owner and/or Engineer
5. Submittal completion requirements
  - a. Submittals shall include design criteria, dimensions, construction materials and all other information specified for a complete submittal to facilitate Engineer review of the submittal information adequately
  - b. In the event various drawings are included a submittal for a class of Equipment, Contractor shall annotate clearly which parts apply to furnished Equipment
    - i) Information not pertaining to the submittal shall be clearly annotated. Highlighting of such information will cause rejection of the submittal by the Engineer
  - c. Contract Drawings
    - i) Copies or portions thereof will not be allowed as acceptable fabrication or erection drawings
    - ii) In the event Contract Drawings are used by the Engineer for erection drawings to annotate information on erection or identify reference details, Engineer title block and professional seal shall be removed and replaced with the Contractor's title block on the Contract Drawing(s). Contractor shall revise such erection drawings for subsequent revisions by the Engineer to Contract Drawings

## C. Preparation

1. Shop Drawings
  - a. Drawings shall be presented in a clear and thorough manner:

- b. Identify details by reference to sheet and detail, schedule or room numbers shown on Contract Drawings
  - c. Identify equipment by reference to equipment name and tag number shown on Contract Drawings
  - d. Scale and Measurements: Make drawings accurate to a scale with sufficient detail to show the kind, size, arrangement and function of component materials and devices
  - e. Minimum sheet size: 8.5" by 11"
  - f. Fabrication drawing size: 11" by 17" or 24" by 36"
2. Product Data
- a. Clearly mark each copy to identify pertinent products or models submitted for review
  - b. Identify equipment by reference to equipment name and P&ID number
  - c. Catalog cut sheets: Cross-out or hatch irrelevant data
- D. Technical Submittals: Shop Drawings and Product Data Submittal Requirements
1. Shop Drawings and Product Data shall include the following, at a minimum:
- a. Specifications of manufacturer(s)
  - b. Equipment parts and catalogs
  - c. Bills of materials, material lists, and schedules
  - d. Shop erection and fabrication drawings
  - e. Drawings shall include equipment dimensions, weights, installation location requirements, plates required, main components, support details, anchor bolt details/sizes/locations, support base sizes, baseplate sizes, spacing and clearance requirements for installation, erection, operation and maintenance disassembly
  - f. Electrical requirements:
    - i) Shall include schematic diagrams including one-line diagrams, terminal block numbers, internal wiring diagrams, external connections, controls, and any other information as requested in individual specification sections
  - g. List of spare parts
  - h. Instruction and Operation and Maintenance (O&M) manuals
    - i) As specified herein and in Specification Section 01730
  - i. Manufacturer's performance testing of equipment
  - j. Concrete mix design data and information
  - k. Performance characteristics and capacities
  - l. External connections, anchorages, and supports required
  - m. Other drawings, parts, catalogs, specifications, samples, or data necessary for the Engineer to determine conformance with Contract Documents
2. Samples – Office samples shall be of sufficient size and quantity to clearly illustrate:
- a. Functional characteristics of the product, with integrally related parts and attachment devices
  - b. Full range of color, texture and pattern
  - c. Comply with requirements identified in individual specification sections
- E. Construction Schedule: Designate in the construction schedule, or in a separate coordinated shop drawing schedule, the dates for submission and the dates that reviewed Shop Drawings and Product Data will be needed, if accelerated review is requested

- F. Field samples and Mock-ups:
  - 1. Contractor shall erect, at the Project Site, at a location acceptable to the Engineer and Owner
  - 2. Size or area: as specified in the respective specification section
  - 3. Fabricate each sample and mock-up complete and finished
  - 4. Remove mock-ups at conclusion of Work or when acceptable to Engineer

#### 1.4 CONTRACTOR RESPONSIBILITIES

- A. Review shop drawings and product data prior to submission for accuracy and completeness of each submission
- B. Approve and stamp each submission before submitting to Engineer
- C. Determine and verify:
  - 1. Field measurements
  - 2. Field construction criteria
  - 3. Catalog numbers and similar data
  - 4. Conformance with specifications and identification of all deviations
  - 5. Confirm assignment of unit responsibility
- D. Prior to each submission, carefully review and coordinate all aspects of each item being submitted
- E. Verify that each item and the corresponding submittal conform in all respects with specified requirements of the Work and of the Contract Documents with respect to means, methods, techniques, sequences, and operations of construction, and safety precautions and programs incidental thereto
- F. Make submissions promptly in accordance with Construction Schedule, and in such sequence as to cause no delay in the Work or in the work of any other Contractor
- G. Limit requirement for accelerated submittal review by Engineer to no more than 10% percent of total number of submittals
  - 1. Accelerated submittal review period: less than 14 calendar days
- H. Notify Engineer in writing, at time of submission, of any deviations in the submittals from Contract Document requirements:
  - 1. Identify and tabulate all deviations in transmittal letter
  - 2. Indicate essential details of all changes proposed, including modifications to other facilities that may be a result of the deviation
  - 3. Include required piping and wiring diagrams

#### 1.5 SUBMISSION REQUIREMENTS

- A. Make submissions far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmissions, and for placing orders and securing delivery



- B. In scheduling, allow fourteen (14) calendar days for review by Engineer following receipt of submission in Engineer's office:
  - 1. Time required to mail submissions or resubmissions is not considered a part of review period
  
- C. Submittal Naming and Numbering
  - 1. Assign a unique number to include all shop drawings, product data and other information required for individual specification sections, beginning with #001.
  - 2. Resubmissions shall have the original number with a letter, starting with "A". If the first submittal required resubmission, it would be labeled #001A.
  - 3. Each specification section may still have more than one submittal number for later submissions (i.e., Preliminary O&M Manuals, Final O&M Manuals, etc.)
  - 4. Contractor shall use a consistent naming convention for all submittals
  
- D. Quantity of Submittals Required
  - 1. Shop Drawings and Product Data:
    - a. Initial submittal:
      - i) Electronic – One (1) copy to Engineer
    - b. Resubmittal:
      - i) Electronic – One (1) copy to Engineer
    - c. Final Submittal for Distribution
      - i) One (1) electronic copy to Engineer
    - d. As –constructed document submittals
      - i) Electronic – One (1) copy to Engineer and one (1) copy to Owner
  - 2. Samples
    - a. Initial submittal:
      - i) Submit three (3) of each sample unless specified otherwise in individual specification section
    - b. Resubmittal:
      - i) Submit three (3) to Engineer
    - c. One (1) sample of approved sample submittal will be returned to Contractor
  - 3. Informational submittals
    - a. Technical reports and administrative submittals
      - i) Electronic – One (1) copy to Engineer
      - ii) Paper: Three (3) copies to Engineer
    - b. Certificates and guarantees:
      - i) Electronic – One (1) copy to Engineer
      - ii) Paper: Three (3) copies to Engineer
    - c. Test reports
      - i) Paper
        - a) Owner: Two (2) copies
        - b) Engineer: One (1) copy
        - c) Contractor: Two (2) copies
        - d) Manufacturer/supplier: One (1) copy
  - 4. Instruction and O&M manuals
    - a. In accordance to Specification Section 01730

5. At no additional cost to the Owner and whether or not submittals are copyrighted, the Owner may copy and use for staff training and/or internal operations any submittals approved for final distribution as well as required by this Contract

E. Submittal Transmittal Requirements

1. Accompany each submittal with a letter of transmittal showing all information required for identification and checking
2. Shall include:
  - a. Drawing numbers and titles
  - b. Revision number
  - c. Electronic filename
  - d. Deviations from Contract Documents: As specified herein
  - e. Submittals unidentifiable will be returned for proper identification
  - f. Date

F. Submittals Requirements

1. Submittal number
2. Date of submission and dates of any previous submissions
3. Project title and number
4. Owner Contract identification number if applicable
5. Names of:
  - a. Contractor
  - b. Supplier
  - c. Manufacturer
6. Identification of the product, with the specification section number
7. Field dimensions, clearly identified as such
8. Relation to adjacent or critical features of the Work or materials
9. Applicable standards, such as ASTM or Federal Specification numbers
10. Identification of deviations from Contract Documents:
  - a. If Contractor proposes to provide material or equipment of Work which deviates from the Project Manual, Contractor shall indicate so under “deviations” on the transmittal form accompanying the submittal copies
  - b. Identify all requested deviations as specified and on the copies of Specifications and Drawings required by paragraph below.
11. Confirmation of compliance with Contract Documents and, if applicable, identification of deviations from Contract Documents:
  - a. Provide the following documents to demonstrate compliance with the contract specifications:
    - i) A copy of the relevant Drawing(s) with all addendum updates that apply to the equipment in various Divisions marked to show specific changes necessary for the equipment proposed in the Contractor’s submittal
      - a) If no changes are required, the Drawing(s) shall be clearly marked “No Changes Required”
      - b) Failure to include copies of relevant Drawing(s) with the submittal, whether changes are required or not, shall be cause for rejection of the entire submittal with no further review by Engineer

- c) Relevant Drawing(s) include as a minimum the control diagrams, process and instrumentation diagrams (P&IDs), and Process (P) drawings.
- ii) A copy of each pertinent specification section with all addendum updates included, all referenced and applicable specifications sections, with their respective addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate the requested deviations from the specification requirements:
  - a) If deviations from the specifications are indicated and, therefore requested, by the Contractor, the submittal shall be accompanied by a detailed, written justification for each deviation
  - b) Failure to include a copy of the marked up specification sections, along with justification for any requested deviations to the specification requirements, with the submittal shall be cause for rejection of the entire submittal with no further review by Engineer

- 12. Identification of revisions on resubmissions
- 13. An 8" by 4" blank space for Contractor's and Engineer's stamps
- 14. Stamp cover sheet of each submittal as identified in letter of transmittal
- 15. Contractor's stamp: Initialed or signed, certifying review and approval of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the Work and of Contract Documents. Use stamp to include wording similar to the following:

This submittal has been reviewed by *[Name of Contractor]* and approved with respect to the means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incidental thereto. *[Name of Contractor]* also warrants that this submittal complies with contract documents and comprises no deviations thereto:  
 Section No: \_\_\_\_\_ Submittal No: \_\_\_\_\_  
 Date: \_\_\_\_\_ By: \_\_\_\_\_

- G. For equipment that is provided directly by manufacturer without specification provide:
  - 1. Shop drawings: Illustrate complete assembly of products; foundation, installation and anchor requirements; dimensions and total weights of each, electrical wiring diagrams
  - 2. Product data: Provide manufacturer's literature including general assembly, materials of construction, model and type, detailed data describing parts and accessories, sufficient data to verify compliance with specifications
  - 3. Manufacturer's installation instructions: Provide detailed connection requirements and startup instructions
  - 4. Manufacturer's field report: Indicate personnel present and actual start-up procedures that were performed by manufacturer's representative
  - 5. Field report and test results shall be submitted to the Engineer by the Contractor

H. Submittal Log:

1. Maintain an accurate submittal log for duration of the Work showing current status of all submissions
  2. Show submittal number, section number, section title, submittal description, dates and disposition of submittal
  3. Make submittal log available to Engineer for Engineer's review upon request
- I. Unless specified otherwise, make submissions in groups to facilitate efficient review and approval:
1. Include all associated items from individual specification sections to assure that all information is available for checking each item when it is received
  2. Submit a complete initial submittal including all components when an item consists of components from several sources
  3. Partial submittals may be rejected as not complying with provisions of the Contract
  4. Engineer will not be held liable for delays due to poorly organized or incomplete submissions
  5. Do not include items from more than one specification section for any one submittal number
- J. Contractor may require subcontractors to provide drawings, setting diagrams and similar information to help coordinate the Work, but such data shall remain between Contractor and his subcontractors and will not be reviewed by Engineer unless specifically called for within the Contract Documents
- K. All submittals for each component of multi-component systems shall be compiled and submitted through the Contractor to the Engineer by the manufacturer having System Responsibility
- 1.6 DISPOSITION OF SHOP DRAWINGS, PRODUCT DATA, AND INFORMATION SUBMITTALS
- A. "No Exceptions Taken": Approved with No Corrections Noted
1. One copy sent to Owner
  2. One copy sent to Resident Project Representative
  3. One copy retained in Engineer's file
  4. Remaining copies returned to Contractor for his use
    - a. One copy to be kept on file at Contractor's office at job site
    - b. Remaining copies for Contractor's office file, suppliers, or subcontractors
  5. No corrections or comments noted on the submittal or on a Submittal Response Summary Sheet
  6. Issues or miscellaneous comments pertaining to other related items of the Work may be included in transmittal letter
  7. Resubmission not required
- B. "Exceptions Noted": Approved with Corrections Noted
1. One copy sent to Owner
  2. One copy sent to Resident Project Representative
  3. One copy retained in Engineer's file
  4. Remaining copies returned to Contractor for his use

- a. One copy to be kept on file at Contractor's office at job site
  - b. Remaining copies for Contractor's office file, suppliers or subcontractors
  - c. Copies of submittal data in operation and maintenance manuals to be revised according to corrections
  - 5. Comply with corrections or comments as noted on the submittal or on a Submittal Response Summary Sheet
  - 6. Resubmission not required
- C. "Revise And Resubmit": Incorrect information provided or Significant Information Still Required
- 1. One copy sent to Resident Project Representative
  - 2. One copy retained in Engineer's file
  - 3. All remaining copies returned to Contractor for revision and re-submittal
  - 4. Copy of transmittal letter and/or Submittal Response Summary Sheet sent to Owner. A "No Exceptions Taken" or "Exceptions Noted" submittal it will be forwarded to Owner after review per above disposition requirements
  - 5. Submittal is either: incorrectly annotated; specific comments need to be addressed and incorporated in re-submittal; and/or additional information may be required as noted on the submittal or on a Submittal Response Summary Sheet
  - 6. Submitted information may not include or address specific item required per the specification as identified on the submittal or on a Submittal Response Summary Sheet
  - 7. Specific information related to identified item may be required for final approval of submittal
  - 8. Resubmission of entire submittal may be required or resubmission of specific item may be required as identified on the submittal or on a Submittal Response Summary Sheet
- D. "Rejected": Returned for Correction
- 1. One copy sent to Resident Project Representative
  - 2. One copy retained in Engineer's file
  - 3. All remaining copies returned to Contractor
  - 4. Copy of transmittal letter and/or Submittal Response sent to Owner
  - 5. Contractor required to resubmit complete submittal package in accordance with Contract Documents
  - 6. Submittal does not comply with provisions of Contract Documents as noted on the submittal or on a Submittal Response Summary Sheet
  - 7. Resubmission required
- E. "Receipt Acknowledged": For Reference Purposes Only, or for Record Copy:
- 1. Applicable to manufacturer or Contractor provided calculations and other miscellaneous documentation no subject to Engineer review and approval
  - 2. One copy sent to Resident Project Representative
  - 3. One copy retained in Engineer's file
  - 4. One copy returned to Contractor
  - 5. Copy of transmittal letter sent to Owner
  - 6. Remaining submittal copies destroyed
  - 7. Detailed review and comment by Engineer not required

8. Resubmission not required

## 1.7 DISPOSITION OF SAMPLES

- A. "No Exceptions Taken": Approved with No Corrections Noted
  - 1. One sample sent to Owner
  - 2. One sample sent to Resident Project Representative
  - 3. One sample retained in Engineer's file
  - 4. Acknowledgement: Copy of transmittal letter sent to Contractor
  - 5. Resubmission not required
- B. "Exceptions Noted": Approved with Corrections Noted
  - 1. One sample sent to Owner
  - 2. One sample sent to Resident Project Representative
  - 3. One sample retained in Engineer's file
  - 4. Acknowledgement: Copy of transmittal letter sent to Contractor
  - 5. Work performed or products furnished to comply with exceptions noted in acknowledgement
  - 6. Resubmission not required
- C. "Rejected": Returned for Correction
  - 1. One sample retained in Engineer's file
  - 2. Remaining samples sent to Contractor for resubmittal and compliance with the Contract Documents as noted in transmittal letter
  - 3. Copy of transmittal letter sent to Owner
  - 4. Resubmission required

## 1.8 RESUBMISSION REQUIREMENTS

- A. Make any corrections or changes in submittals required by Engineer and resubmit until approved
- B. Transmit each resubmission under new letter of transmittal. Use number of original submittal followed directly by a capital letter corresponding to the number of times a submittal is resubmitted (i.e., #001, #001A, #001B, etc.)
- C. Shop Drawings and Product Data
  - 1. Revise initial drawings or data and resubmit as specified for the initial submittal
  - 2. Indicate any changes which have been made other than those requested by Engineer
- D. Samples: Submit new samples as required for initial submittal
- E. Reimbursement of Resubmission Review Costs:
  - 1. Review of first submittal and one resubmittal will be performed by Engineer at no cost to Contractor
  - 2. Cost for review of subsequent resubmissions will be directly paid by Contractor
  - 3. Engineer will document work-hours required for review and costs for Engineer review will be deducted from payments due Contractor as Change Order deducts

4. Charges for review of resubmissions will include Engineer at maximum rate of \$150 per hour and administrative staff at maximum rate of \$75 per hour

## 1.9 PROJECT RECORD SUBMITTALS

- A. After completion of the Work and prior to final payment, Contractor shall furnish record documents and final approved shop drawings and samples (as-constructed shop drawings and samples) in the number of copies specified herein.
  1. Contractor shall provide additional copies of final approved shop drawings and samples for insertion in Equipment instruction and O&M manuals as required
  2. All copies shall be clearly marked "Project Record"

## 1.10 ENGINEER'S DUTIES

- A. Review submittals with reasonable promptness and in accordance with approved submission schedule provided that each submittal has been called for by the Contract Documents and is stamped by Contractor as indicated above
  1. No extensions of time are allowed due to Engineer's delay in reviewing submittals unless all the following criteria are met:
    - a. Contractor has notified Engineer in writing that timely review of particular submittal in question is critical to the progress of the Work and Contractor has identified the requested submittal return date.
    - b. Engineer has failed to return submittal within 21 days of receipt of the submittal or receipt of said notice, whichever is later
    - c. Contractor demonstrates that delay in progress of the Work was directly attributable to Engineer's failure to return submittal within 21 days
  2. No extensions of time are allowed due to delays in progress of the Work caused by rejection and subsequent resubmission of data, including multiple resubmissions
  3. Engineer's review shall not extend to means, methods, techniques, sequences, construction operations, and safety precautions and programs incidental thereto. No information regarding these items will be reviewed whether or not included in submittals
  4. In the event that Engineer will require more than 21 calendar days to perform review, Engineer shall so notify Contractor
- B. Review drawings and data submitted only for general conformity with Contract Documents
  1. Engineer's review of drawings and data returned marked No Exceptions Taken or Exceptions Noted does not indicate a thorough review of all dimensions, quantities, and details of material, equipment device or items shown
  2. Engineer's review does not relieve Contractor of responsibility for errors, omissions or deviations nor responsibility for compliance with the Contract Documents
- C. Assume that no shop drawing or related submittal comprises a deviation to the Contract Documents unless Contractor advises Engineer otherwise in writing which is acknowledged by Engineer in writing:
  1. Consider and review only those deviations from the Contract Documents clearly identified as such on the submittal and tabulated on the Contractor's transmittal sheet.

- D. Review informational submittals for indications of Work or Material deficiencies and will respond to Contractor regarding such deficiencies
- E. Return submittals to Contractor for distribution or for resubmission
- F. Transmit, unreviewed, to Contractor all copies of submittals received directly from suppliers, manufacturers and subcontractors
- G. Transmit, unreviewed, to Contractor all copies of submittals not called for by the Contract Documents or which have not been approved by Contractor
- H. Engineer will not review uncalled-for shop drawings or product data except by special arrangement
- I. Engineer to affix stamp and indicate approval for submittal or resubmission requirements.

#### 1.11 SUBMITTAL SCHEDULE

- A. Unless indicated otherwise, provide all submittals required by individual sections of the Contract Documents to establish compliance with the specified requirements.
- B. Contractor to produce schedule of submittals for Engineer review

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION



## SECTION 01380

### CONSTRUCTION PHOTOGRAPHS

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Construction record photographs prior to commencing and during the course of the Work

##### 1.2 RELATED SECTIONS

- A. Section 01010 – Summary of Work
- B. Section 01700 – Contract Closeout: Project Record Documents

##### 1.3 PHOTOGRAPHY REQUIRED

- A. Take photographs of the existing conditions prior to commencing work to document existing conditions
- B. Take photographs on the date on which each scheduled Application for Payment is due. Intent is for digital photos to be kept as project record
- C. CD of Digital photos become the property of Owner

##### 1.4 COSTS OF PHOTOGRAPHY

- A. Pay all costs for specified photography and printing
  - 1. Parties requiring additional photography or prints will pay for them directly

##### 1.5 DELIVERY OF PHOTOS

- A. Submit digital photos to the Engineer with monthly pay requests or within 20 days of photo date

#### PART 2 PRODUCTS (NOT APPLICABLE)

#### PART 3 EXECUTION

##### 3.1 TECHNIQUE

- A. Factual Presentation
- B. Correct Exposure and Focus
  - 1. High resolution and sharpness

2. Maximum depth-of-field
3. Minimum distortion

### 3.2 VIEWS REQUIRED

- A. Photograph from locations to adequately illustrate the condition of construction and the state of the Project
  1. Photographic survey of the existing site
    - a. Show all areas to be modified
    - b. Show all areas in which Contractor will conduct operations or store equipment
  2. Weekly photographs
    - a. Minimum of eight (8) views weekly until final acceptance
    - b. Views as designated by the Engineer or Owner

### 3.3 PHOTOGRAPH REQUIREMENTS FOR PROGRESS SITE PHOTOGRAPHS

- A. Responsibility
  1. Site photographs for Owner record of construction progress shall be the responsibility of the Contractor
  2. Contractor shall be responsible for site photographs including the existing and progress of Work
- B. Photographs shall include, but not limited to, the following:
  1. Existing site: Photographs of existing site conditions before site work commences
    - a. Number of views shall be sufficient to cover the existing site conditions
  2. Progress of work: Shall include photographs from clearing throughout construction
    - a. Number of views shall be sufficient to cover progress in Work and shall include a minimum of eight (8) different views
  3. After completion of Work: Shall be sufficient to show completed and finished Work
- C. Digital images
  1. Provide images in uncompressed JPEG format
  2. Minimum resolution: 1500 x 2200
  3. Submitted digital images shall not be cropped
- D. Identify each digital image file
  1. Name of project
  2. Orientation and description of view
  3. Date and time of exposure

### 3.4 ADDITIONAL PHOTOGRAPHS

- A. Contractor shall provide additional photographs upon the request of the Engineer
- B. Additional photographs may include, but not limited to, the following:
  1. Publicity photographs
  2. Special events at Project site
  3. Major phase of Work

4. Substantial Completion
5. Follow-up investigations for on-site events such as construction damage or losses
6. Additional record photographs during final acceptance

### 3.5 PROJECT RECORD

- A. Submit CD of all photos, grouped by date
- B. Engineer will distribute, after review
  1. One copy of each view to Owner
  2. One copy of each view to Engineer's file
  3. One copy of each view returned to Contractor for inclusion in Project Record Document

END OF SECTION

SECTION 01400  
QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance / Control of installation
- B. Inspection and testing laboratory services
- C. Qualification of laboratory
- D. Laboratory duties
- E. Limitations of authority of testing laboratory
- F. Contractor's responsibilities
- G. Field testing
- H. Testing and services schedule

1.2 RELATED SECTIONS

- A. Section 01010 - Summary of Work
- B. Section 01340 - Shop Drawings, Product Data, and Samples
- C. Section 01600 - Material and Equipment

1.3 REFERENCES

- A. Conform to reference standard by date of issue current on date of Contract Documents
- B. Obtain copies of standards when required by Contract Documents
- C. Where specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document

1.4 SUBMITTALS

- A. Submit under provisions of Section 01340

- B. Provide copies of written reports for materials, equipment or systems as scheduled at the end of this section. Reference each report by respective section number.
- C. Laboratory Test Reports: Provide written reports of each test and inspection to Engineer. Each report shall include:
  - 1. Date issued
  - 2. Project title and number
  - 3. Testing laboratory name, address and telephone number
  - 4. Name and signature of laboratory inspector
  - 5. Date and time of sampling or inspection
  - 6. Record of temperature and weather conditions
  - 7. Date of test
  - 8. Identification of product and specification section
  - 9. Location of sample or test in the Project
  - 10. Type of inspection or test
  - 11. Results of tests and compliance with Contract Documents
  - 12. Interpretation of test results when requested by Engineer
- D. Shop Test Reports: Provide reports detailing results of tests and certification from manufacturer to verify compliance with specifications
- E. Field Test Reports: Provide reports detailing results of the tests. Indicate compliance or non-compliance with Contract Documents. Identify corrective action for materials and equipment which fails to pass field tests.

#### 1.5 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality
- B. Comply fully with manufacturer's instructions, including each step in sequence
- C. Should manufacturer's instructions conflict with Contract Documents, request clarification from Engineer before proceeding
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship
- E. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement
- F. Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities: Conditions of the Contract
- G. Certification of products: Respective sections of specifications
- H. Laboratory tests required and standards for testing: Respective sections of specifications

## 1.6 INSPECTION AND TESTING LABORATORY SERVICES

- A. Owner will employ and pay for the services of a testing agency to perform specified laboratory testing of materials where the technical specifications specifically obligate the Owner to provide the services
  - 1. It is the Contractor's responsibility to initiate and coordinate all required tests and inspections including conformance with requirements of all applicable public agencies and authorities. Contractor will be responsible for coordinating the testing requirement with testing agency and provide the testing agency no less than two (2) working days advance notification to schedule tests.
  - 2. Employment of the testing agency shall in no way relieve Contractor's obligations to perform the Work of the Contract
  - 3. Contractor shall employ and pay for the services of a testing agency to perform all specified services and testing not specifically identified in the technical specifications to be provided by Owner related to the design of mixes, products and equipment, to Engineer's review of proposed materials and equipment before, during and after incorporation in the Work and to retest materials and equipment which fail original tests
- B. Retesting required because of non-conformance to specified requirements shall be performed by the same testing agency on instructions by the Engineer. Payment for retesting will be charged to the Contractor by deducting inspection or testing charges from the Contract Sum/Price

## 1.7 QUALIFICATION OF TESTING AGENCY

- A. Meet "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories
- B. Meet basic requirements of ASTM E 329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction" as applicable
- C. Authorized to operate in the State in which the Project is located

## 1.8 TESTING AGENCY DUTIES

- A. Cooperate with Engineer and Contractor; provide qualified personnel after due notice
- B. Perform specified inspections, sampling, and testing of materials and methods of construction
  - 1. Comply with specified standards
  - 2. Ascertain compliance of materials with requirements of Contract Documents
- C. Promptly notify Engineer and Contractor of observed irregularities or deficiencies of work or products

## 1.9 LIMITATIONS OF AUTHORITY OF TESTING AGENCY

- A. Testing Agency Is Not Authorized To
  - 1. Release, revoke, alter or enlarge on requirements of Contract Documents
  - 2. Approve or accept any portion of the Work
  - 3. Owner employed testing agency shall not perform any duties of the Contractor

## 1.10 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory and testing agency personnel and provide access to Work
- B. Secure and deliver to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete and other material mixes which require control by the testing laboratory
- D. Furnish copies of product test reports as required
- E. Furnish Incidental Labor and Facilities
  - 1. To provide access to Work to be tested
  - 2. To obtain and handle samples at the project site or at the source of the product to be tested
  - 3. To facilitate inspections and tests
  - 4. For storage and curing of test samples
- F. Cooperate with testing agency; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested
  - 1. Notify Engineer and testing agency 24 hours prior to expected time for operations requiring services to allow for scheduling of tests and laboratory assignment of personnel
  - 2. Make arrangements with testing agency and pay for additional samples and tests required for Contractor's use

## 1.11 FIELD TESTING

- A. Owner shall pay all costs associated with standard field testing of materials as detailed in these specifications. Contractor shall pay all costs for testing of piping and equipment as detailed in these specifications. Owner's testing agency will take concrete samples, cure and break samples and report results. Owner's testing agency will also provide compaction testing and proctors for backfill operations. Contractor shall pay for all retesting due to tests indicating failed conditions.
- B. Provide all required materials, labor, equipment, water, and power required for testing
- C. Perform all tests in presence of Engineer and provide one copy of field test results to Engineer same day of tests

- D. Repair with no additional compensation all materials and equipment which fail during testing

1.12 LABORATORY TESTING AND SERVICES SCHEDULE

- A. Testing laboratory services shall be provided for, but shall not be limited to, the following:

<b>Specification Section</b>	<b>Type of Material, Equipment, or System</b>	<b>Owner (O) or Contractor (C) Provided</b>
02300	Earthwork	O
02740	Asphalt Mixes	O
02750	Concrete Mixes	O

1.13 FIELD TESTING AND SERVICES SCHEDULE

- A. Field testing shall be provided for, but shall not be limited to, the following:

<b>Specification Section</b>	<b>Type of Material, Equipment, or System</b>	<b>Owner (O) or Contractor (C) Provided</b>
02300	Earthwork	O
02510	Water Distribution System	C
02676	Disinfection of Water Systems	C
02740	Flexible Paving	O
02750	Rigid Paving	O

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION



SECTION 01700  
CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Substantial completion
- B. Final acceptance
- C. Project record documents
- D. Closeout procedures
- E. Final cleaning
- F. Final adjustment of accounts
- G. Final application for payment

1.2 RELATED SECTIONS

- A. Section 00700 – General Conditions
- B. Section 01500 – Construction Facilities and Temporary Controls
- C. Section 01340 – Shop Drawings and Product Data

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Prior to requesting inspection for certification of Substantial Completion, complete the following and list exceptions in the request:
  - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100% completion for the portion of the Work claimed as Substantially Complete
    - a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Price
    - b. If 100% completion cannot be shown, include a list of incomplete items, the value of incomplete Work, and reasons the Work is not complete. All items remaining outstanding on the Contractor's punch list shall include a projected date of completion and/or correction with an explanation of why such item is not presently completed
  - 2. Advise Owner of pending insurance changeover requirements
  - 3. Submit specific warranties, workmanship Bonds, maintenance agreements, final certifications, and similar documents

4. Obtain and submit releases enabling Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases
  5. Submit record drawings, instruction books and operating manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information
  6. Deliver tools, spare parts, extra stock, and similar items
  7. Make final changeover of permanent locks and transmit keys to Owner. Advise Owner's personnel of changeover in security provisions
  8. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes
- B. Inspection Procedures: On receipt of a request for inspection, Engineer will either proceed with inspection or advise Contractor of unfilled requirements. Engineer will prepare the Certificate of Substantial Completion following inspection or advise Contractor of construction that must be completed or corrected before the certificate will be issued
1. Engineering will repeat inspection when requested and assured by Contractor that the Work is Substantially Complete.
  2. Results of the completed inspection will form the basis of requirements for final acceptance

#### 1.4 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required
  2. Submit an updated final statement, accounting for final additional changes to the Contract Price
  3. Submit a certified copy of Engineer's final inspection list of items to be completed or corrected, endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by Engineer.
  4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the Date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work
  5. Submit consent of surety to final payment
  6. Submit evidence of final, continuing insurance coverage complying with insurance requirements
- B. Reinspection Procedure: Engineer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to Engineer.

1. Upon completion of reinspection, Engineer will prepare a certificate of final acceptance. If the Work is incomplete, Engineer will advise Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance
2. If necessary, reinspection will be repeated, but at the expense of the Contractor who will reimburse the Owner for these services by the Engineer

## 1.5 PROJECT RECORD DOCUMENTS

### A. General

1. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Engineer's reference during normal working hours
2. Maintain on site, one set of the following record documents; record actual revisions to the Work:
  - a. Contract Drawings
  - b. Specifications
  - c. Addenda
  - d. Change Orders and other Modifications to the Contract
  - e. Reviewed shop drawings, product data, and samples
  - f. Field test reports
  - g. Construction photographs
3. Store Record Documents and samples separate from documents used for construction
  - a. Provide files and racks for storage of documents
  - b. Provide locked cabinet or secure storage space for samples

### B. Record Drawings

1. Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings
2. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown
3. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings
4. Give particular attention to concealed elements that would be difficult to measure and record at a later date
  - a. Record information concurrently with construction progress
  - b. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work. Mark each document "Project Record" in neat, large, printed letters
  - c. Mark new information that is important to Owner but was not shown on Contract Drawings or Shop Drawings
  - d. Note related Change Order numbers where applicable
  - e. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set

- f. Upon completion of the Work, submit record drawings to Engineer for Owner's records
  - 5. Contract Drawings and approved Shop Drawings: Legibly mark each item to record actual construction, including:
    - a. Measured depths of elements of foundation in relation to finish grade or first floor datum
    - b. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvement
    - c. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
    - d. Field changes of dimensions and details
    - e. Changes made by Addenda or Change Order(s), if any
    - f. Details not on original Contract Drawings
    - g. References to related Shop Drawings and Modifications
- C. Record Specifications: Maintain one complete copy of the Project Manual including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and Modifications issued in printed form during construction
  - 1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
  - 2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
  - 3. Note related record drawing information and product data.
  - 4. Upon completion of the Work, submit record Specifications to Engineer for Owner's records
- D. Record Product Data: Maintain one copy of each product data Submittal. Note related Change Orders and markup of record drawings and specifications.
  - 1. Mark record documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the Site and from the manufacturer's installation instructions and recommendations.
  - 2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
  - 3. Upon completion of markup, submit complete set of record product data to Engineer for Owner's records
  - 4. Legibly mark and record at each Product section description of actual Products installed, including the following:
    - a. Manufacturer's name, product model, number, trade name and supplies
    - b. Product substitutions or alternates utilized
    - c. Changes made by Addenda, field order or change order
- E. Record Samples Submitted: Immediately prior to Substantial Completion, Contractor shall meet with Engineer and Owner's personnel at the Project Site to determine which Samples are to be transmitted to Owner for record purposes. Comply with Owner's instructions regarding packaging, identification, and delivery to Owner.

- F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and Submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records, and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to Engineer for Owner's records
- G. Maintenance Manuals: Contractor shall organize operation and maintenance data as specified in Section 01730
- H. Submit documents to Engineer with claim for final Application for Payment
- I. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes
- J. Make documents and samples available at all times for inspection by Engineer
- K. Label each document "Project Record" in neat, large printed letters

## PART 2 PRODUCTS (NOT APPLICABLE)

## PART 3 EXECUTION

### 3.1 CLOSEOUT PROCEDURES

- A. General
  1. Comply with requirements stated in the Owner's General Conditions of the Contract and in these specifications for administrative procedures in closing out the Work
  2. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection
  3. Provide submittals to Engineer/Owner that are required by governing or other authorities
  4. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due
- B. Operation and Maintenance Instructions: Arrange for each installer of Equipment that requires regular maintenance to meet with Owner's personnel at Project Site to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:
  1. Maintenance manuals
  2. Record documents
  3. Spare parts, materials and tools
  4. Lubricants and fuels
  5. Identification systems

6. Control sequences
7. Hazards, hazardous chemicals data sheets
8. Cleaning
9. Warranties and bonds
10. Maintenance agreements and similar continuing commitments

### 3.2 CONTRACTOR'S CLOSEOUT SUBMITTALS

- A. Evidence of Payment and Release of Liens: As specified in the General Conditions
- B. Final inspection reports by all regulatory agencies demonstrating the agencies' final approval
- C. At Contract close-out, deliver Record Documents to Engineer for the Owner
- D. Accompany Submittal with Transmittal Letter in Duplicate, Containing
  1. Date
  2. Project title and number
  3. Contractor's name and address
  4. Title and number of each Record Document
  5. Signature of Contractor or his authorized representative

### 3.3 FINAL ADJUSTMENTS OF ACCOUNTS

- A. Submit a Final Statement of Accounting to Engineer
- B. Statement Shall Reflect All Adjustments to the Contract Sum
  1. The original Contract Sum
  2. Additions and deductions resulting from
    - a. Previous Change Orders
    - b. Deductions for uncorrected Work
    - c. Deductions for liquidated damages
    - d. Deductions for reinspection payments
    - e. Other adjustments
  3. Total Contract Sum, as adjusted
  4. Previous payments
  5. Sum remaining due

### 3.4 FINAL APPLICATION FOR PAYMENT

- A. Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the General Conditions of the Contract

END OF SECTION

## SECTION 01730

### OPERATION AND MAINTENANCE DATA

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Submittals
- B. Format
- C. Content of each volume
- D. Manual for equipment and systems
- E. Instruction of Owner's personnel

##### 1.2 QUALITY ASSURANCE

- A. Preparation of data shall be done by personnel
  1. Trained and experienced in maintenance and operation of the described products
  2. Completely familiar with requirements of this section
  3. Skilled as a technical writer to the extent required to communicate essential data
  4. Skilled as a draftsman competent to prepare required drawings
- B. Manuals for equipment systems shall be prepared by the equipment manufacturer or system supplier
- C. Compile product data and related information appropriate for Owner's maintenance and operation of products furnished under the Contract
- D. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent sections of Specifications

##### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01340
- B. Manuals for equipment and systems
  1. Submit three (3) preliminary copies prior to the date of shipment of the equipment or system
    - a. Engineer will review
    - b. If acceptable, one (1) copy will be returned to Contractor, one (1) copy sent Owner, and one (1) copy retained in Engineer's file

- c. If unacceptable, two (2) copies will be returned to Contractor with Engineer's comments for revision and one (1) copy retained in Engineer's file. Resubmit three (3) revised preliminary copies for Engineer's review
  - d. No partial payments will be made for equipment and systems on hand or installed until preliminary manuals are submitted and acceptable
  - e. See Section 01340 for electronic submittal requirements, for the preliminary copy of the O&M manual an electronic submittal is allowable
- C. Submit three (3) final copies no less than 30 days prior to putting the equipment or system in service. If final manuals differ from accepted preliminary manuals, submit two (2) copies of any necessary supplemental material with instructions for insertion for conforming Engineer's and Owner's copies of preliminary manuals to final manuals
- 1. Engineer will compare with accepted preliminary manual
  - 2. If identical or otherwise acceptable, Contractor will be so notified. Two (2) copies will be transmitted to Contractor, three (3) copies will be held for later transmittal to Owner
  - 3. If not acceptable, four (4) copies will be returned to Contractor for revision or retained by Engineer and the necessary revision data requested from Contractor at Engineer's option
  - 4. No portion of the Work is substantially complete until final equipment and system manuals relating to that portion of the Work are accepted by Engineer
  - 5. Submit three (3) copies of any revisions found desirable during instruction of Owner's personnel with instructions for insertion for revising Owner's and Engineer's copies of manual
- D. Manual for materials and finishes
- 1. Submit two (2) preliminary copies 15 days prior to request for final inspection
    - a. Engineer will review
    - b. One copy will be returned to Contractor with comments, one (1) retained in Engineer's file
    - c. No final inspection shall be conducted until preliminary manuals are submitted
  - 2. Submit three (3) final copies, revised in accordance with Engineer's comments, within 10 days after final inspection
    - a. One copy will be transmitted to Contractor and two (2) copies retained by Engineer for later transmittal to Owner
    - b. No final payment shall be made until final manuals are submitted
  - 3. Additional requirements for specialized instruction of Owner's personnel are given in the detailed equipment specifications

#### 1.4 FORMAT

- A. Prepare data in the form of an instructional manual for use by Owner's personnel
- B. Presentation of Information
  - 1. Size: 8 ½" by 11"
  - 2. Paper: 20 lb weight minimum, white, for typed pages



3. Text: Manufacturer's printed data or neatly typewritten
4. Drawings
  - a. Provide reinforced punched binder tab, bind in with text
  - b. Reduced to 11" by 17" and folded to 8 ½" by 11"
  - c. Where reduction is impractical, folded and placed in 8 ½" by 11" envelopes bound in text
  - d. Suitably identified on drawings and envelopes
5. Provide flysheets for each separate product or each piece of operating equipment
  - a. Provide typed description of product and major component parts of equipment
  - b. Provide indexed tabs, may be in color
6. Spine and cover: identify each volume with typed or printed title "OPERATION AND MAINTENANCE INSTRUCTIONS" preceded by the word. "PRELIMINARY" or "FINAL" as applicable. Final manuals to list information on the cover and the spine. List the following:
  - a. Title of project, reference Owner and project location as applicable
  - b. Identity of separate structure as applicable
  - c. Identity of general subject matter covered in manual and specification section number
7. As much as possible, assemble and bind material in the same order as specified

C. Binders

1. Preliminary manuals: Commercial quality permanent 3-ring or 3-post binders with durable, cleanable, hard plastic covers. GBC bound manual may be accepted upon review by Engineer
2. Final manuals: Commercial quality permanent 3-ring or 3-post binders with durable, cleanable, hard plastic covers with clear plastic cover and spine pockets suitable for title and cover inserts. Manufacturer's pre-printed binder may be accepted upon review by Engineer. "Deluxe Round Ring View Binder" as manufactured by Wilson Jones or accepted substitution
3. Final electronic manual: Provide one copy in digital format, all documents to be in native file format (Word, Excel, AutoCAD, pdf) or converted from native file format into Adobe pdf. Provide one copy on an electronic disk, CD or DVD

D. Arrange content by systems under section numbers and sequence of table of contents of this Project Manual

E. Provide tabbed flyleaf for each separate product and system, with typed description of product and major component parts of equipment

F. Electronic Manual: Compile in an electronic book format with Chapter bookmarks (equal to tabbed fly leaves) and OCR (optical character recognition) to allow for document searches.

## 1.5 CONTENTS OF EACH VOLUME

A. Neatly typewritten table of contents for each volume, arranged in a systematic order

1. Contractor, name of responsible principal, address and telephone number
2. A list of each product required to be included, indexed to the content of the volume
3. List, with each product, the name, address and telephone number of
  - a. Subcontractor or installer
  - b. Maintenance contractor, as appropriate
  - c. Identify the area of responsibility of each
  - d. Local source of supply for parts and replacement
4. Identify each product by product name and other identifying symbols as set forth in Contract Documents

B. Product Data

1. Include only those sheets which are pertinent to the specific product
2. Annotate each sheet to
  - a. Clearly identify the specific product of part installed
  - b. Clearly identify the data applicable to the installation
  - c. Delete references to inapplicable information

C. Drawings

1. Supplement product data with drawings as necessary to clearly illustrate
  - a. Relations of component parts of equipment and systems
  - b. Control and flow diagrams
2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation
3. Do not use Project Record Documents as maintenance drawings

D. Written text, as required to supplement product data for the particular installation

1. Organize in a consistent format under separate headings for different procedures
2. Provide a logical sequence of instructions for each procedure

E. Copy of each warranty, bond and service contract issued

1. Provide information sheet for Owner's personnel, give
  - a. Proper procedures in the event of fracture
  - b. Instances which might affect the validity of warranties or bonds

## 1.6 MANUALS FOR EQUIPMENT AND SYSTEMS

A. Provide an operation and maintenance manual for each item of equipment or system listed in the schedule of manuals in the quantity listed in the submittal schedule

B. Content for each of equipment and system as appropriate

1. Description of unit and component parts
  - a. Function, normal operating characteristics and limiting conditions
  - b. Performance curves, engineering data and tests
  - c. Complete nomenclature and commercial number of all replaceable parts
2. Operating procedures
  - a. Startup, break-in, routine and normal operating instructions

- b. Regulation, control, stopping, shutdown and emergency instructions
    - c. Summer and winter operating instructions, as applicable
    - d. Special operating instructions
  - 3. Maintenance procedures
    - a. Routine operations
    - b. Guide to "trouble-shooting"
    - c. Disassembly, repair and reassembly
    - d. Alignment, adjusting and checking
  - 4. Servicing and lubrication schedule
    - a. List of lubricants required
  - 5. Manufacturer's printed operating and maintenance instructions
  - 6. Description of sequence of operation by control manufacturer
  - 7. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance
    - a. Predicted life of parts subject to wear
    - b. Items recommended to be stocked as spare parts
  - 8. As-installed control diagrams by controls manufacturer
  - 9. Each contractor's coordination drawings
    - a. As-installed color-coded piping diagrams
  - 10. Charts of valve tag numbers with the location and function of each valve
  - 11. List of original manufacturer's spare parts, manufacturer's current prices and recommended quantities to be maintained in storage
  - 12. Other data as required under pertinent sections of specifications
- C. Content for each electric and electronic item or system, as appropriate
- 1. Description of system and component parts
    - a. Function, normal operating characteristics and limiting conditions
    - b. Performance curves, engineering data and tests
    - c. Complete nomenclature and commercial number of replaceable parts
  - 2. Circuit directories of panelboards
    - a. Electrical service
    - b. Controls
    - c. Communications
  - 3. As-installed color-coded wiring diagrams
  - 4. Operating procedures
    - a. Routine and normal operating instructions
    - b. Sequences required
    - c. Special operating instructions
  - 5. Maintenance procedures
    - a. Routine operations
    - b. Guide to "trouble-shooting"
    - c. Adjustment and checking
  - 6. Manufacturer's printed operating and maintenance instructions
  - 7. List of original manufacturer's spare parts, manufacturer's current prices and recommended quantities to be maintained in storage
  - 8. Other data as required under pertinent sections of specifications

- D. Prepare and include additional data when the need for such data becomes apparent during instruction of Owner's personnel
- E. Additional requirements for Operation and Maintenance Data: The respective sections of specifications

1.7 INSTRUCTIONS OF OWNER'S PERSONNEL

- A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in the operation, adjustment and maintenance of all products, equipment and system
- B. Operation and maintenance manual constitutes the basis of instruction
  - 1. Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance

1.8 Additional requirements for specialized instruction of Owner's personnel are given in the detailed equipment specifications

- A. Equipment and systems Operation and Maintenance manuals shall be prepared for each of the following

Specification Section	Type of Equipment or System
00315	Prepackaged Treatment Unit
11245	Chemical Feed Pumps
11313	Vertical Turbine Pump
11355	Chlorination Equipment
15835	Exhaust Fans
15850	Combination Louver Damper
16150	Variable Frequency Drive and Control Equipment
16900	Control System

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION