

## SECTION 01010 - SUMMARY OF WORK

### PART 1 - GENERAL

#### 1.01 GENERAL:

The project consists of razing and removing the two existing trickling filters; converting two existing secondary clarifiers to primary clarifiers; replacing equipment on two existing primary clarifiers; construction of a new bioreactor with an anoxic basin and three anaerobic basins; construction of new blower and generator building; construction of a new 120' Ø clarifier; construction of a new raw water pump station; construction of a new thermophilic digester and pump station; removal of existing chlorine contact basin; construction of a new ultra-violet disinfection station; addition to the Biosolids building to add additional lab and office space; modifications to the existing trickling filter pump station; and new reuse water disc filter and ultra-violet disinfection station. The project also includes various yard piping modifications and additions, along with some grading and paving projects. A significant portion of the project will involve performing electrical work to supply power and controls to existing and new facility equipment. The work includes all civil, mechanical, electrical, and structural components, as indicated in Volume II, Design Drawings.

#### 1.02 EQUIPMENT PRE-PURCHASED BY THE OWNER

- A. The following equipment for this project has been pre-purchased or provided by Orem City:
1. Three primary clarifier mechanisms
  2. One secondary clarifier mechanism
  3. Anaerobic basin mixers
  4. Anoxic basin mixer
  5. Ladox™ bioreactor mixing system
  6. Three fine-bubble diffuser systems
  7. Six turbo blowers
  8. One disc filtration system
  9. One UV disinfection system for main plant effluent disinfection
  10. One UV disinfection system for reuse application
  11. Three mixed-flow transfer pumps
  12. One used generator

#### 1.03 BRIEF DESCRIPTION AND PHASING OF THE WORK COVERED BY THE CONTRACT DOCUMENTS:

- A. The following list has been furnished for the convenience of the Contractor and shall not be considered as representing all Work required in the Contract Documents. Contractor shall not take advantage of any errors or omissions in this listing and shall report any discrepancies or questionable items to the Engineer for clarification. The Orem Water Reclamation Facility must be able to continue to meet discharge requirements throughout the entire 2010 Upgrade Project. Careful coordination must be performed in concert with

the operational staff at the treatment plant to achieve this goal. The construction manager from AQUA Engineering will coordinate with the operational staff and the Contractor on a daily basis to insure that all staging of construction is performed to keep the facility in compliance with discharge requirements.

To assist the Contractor in preparing his work plan, a proposed staging plan is described below. Obviously, it is not the intent of this plan to tell the contractor exactly how to complete this project, but rather to inform in what order certain parts of the construction can take place. Any variation of what is described below will be entertained as long as the plant can be operated and kept in compliance.

1. **Trickling Filters.** Raze and remove existing trickling filters including media and mechanisms, which cannot take place until all four primary clarifiers have been brought on line and are operational. Media may be used as fill in other areas of the project and may also be disposed of at the southwest corner of the site. Mechanisms to be salvaged to the owner on site.
2. **Primary Clarifiers #3 and #4.** Remove and salvage the equipment in existing secondary clarifiers (clarifiers #3 & #4) to the owner on site. Modify clarifiers for scum disposal and install new primary clarifier equipment supplied by the owner. The remodel of Primary Clarifier No. 3 and No. 4 can be started and completed at any time, but they cannot be brought on line until the Thermophilic Digester Building is completed and on line since the sludge pumps for these clarifiers are in this building.
3. **Primary Clarifiers #1 & #2.** Install new primary clarifier equipment in clarifier #1 and install new FRP weirs and baffles in clarifiers #1 & #2. Salvage old equipment to the owner on site. This work cannot be started until Primary Clarifiers #3 and #4 are operational.
4. **Bioreactor No.3 and Misc. Tanks.** Construct new Bioreactor #3 with three anaerobic basins and one anoxic basin, and install Ladox™ mixers in Bioreactor #3, fine-bubble diffuser system in Bioreactor #3, and mixers in the anaerobic and anoxic basins. This work can start at any time.
5. **Work in Bioreactors No. 1 and No. 2.** Run new piping to and install fine-bubble diffusers in Bioreactors #1 and #2. The work in No. 2 cannot start until Bioreactor No. 3 and the exterior tanks are operational. Work in No. 1 cannot start until both Bioreactors 2 and 3 are operational.
6. **Blower Building.** Construct new blower and generator building and install new turbo blowers and used generator. This work may commence at any time and is necessary for the start-up of all aeration systems.
7. **Secondary Clarifier No. 8.** Construct one new 120' Ø concrete secondary clarifier basin, and install clarifier mechanisms and equipment. This work can start at any time. Before the minor work in Secondary Clarifier no. 7 can be done, this clarifier must be operational.
8. **Pump Station No. 2.** Construct a new primary effluent/RAS pump station and install three mix-flow pumps. This work can start at any time, but must be operational before Bioreactor No. 3 can be operational.
9. **New UV Disinfection Building.** Remove existing chlorine contact basin and install U.V. disinfection system. Salvage any valves, gates, walkway and handrail to the

Owner. The construction of the new UV building can be started at any time along with the required demolition of only the north half of the chlorine contact basin. The UV system must be operational before the south half of the basin can be removed and the utility water storage tank can be completed.

10. **New Thermophilic Digester.** Construct new thermophilic digester with boilers, heat exchangers, waste gas equipment and burner, and modifications to piping and walls of existing primary and secondary digesters. The construction of the Thermophilic Digester and Building can start at any time and must be completed before primary clarifier No. 3 and No. 4 are brought on line.
11. **Reuse System.** Modify existing trickling filter pump station, install new pumps, and construct reuse water filter and UV disinfection system with all equipment. The construction of the Reuse system, and the remodel of the trickling filter pump station cannot take place until all four primary clarifiers have been brought on line and are operational.
12. **Biosolids Building Addition.** Construct building addition to Biosolids Building and install lab and office equipment including plumbing and fixtures. This work can start at any time.
13. **Yard Piping.** Construct new piping to interconnect all facilities as shown on the drawings. Obviously, piping must be phased to accommodate bringing new processes on line and taking existing processes off line.
14. **Site Improvements.** All site improvements shall be completed as shown on the drawings, including site grading, building foundations and floor preparation, utilities, plant drains, asphalt, and drainage. While there are ground drains throughout the site, the Contractor is still likely to encounter groundwater during excavations. Prior to commencing deep excavations, the Contractor should consult the geotechnical report and review the boring logs in the drawings.
15. **Electrical and Control.** All electrical and control including all site electrical, HVAC electrical, lighting, low voltage power, process equipment electrical and control, and all wiring of instrumentation. This work is essential to the phasing of the project in bringing new processes on line and remodeling existing processes and structures.
16. **Utilities.** All plumbing and underground piping in the building, including all water lines, drainage lines, non potable water lines, including all fittings, valves, and hydrants.

END OF SECTION 01010



## SECTION 01070 - ABBREVIATIONS

### PART 1 - GENERAL

#### 1.01 GENERAL:

- A. Wherever in these Contract Documents the following abbreviations or acronyms are used, they shall have the meanings indicated as follows:

#### 1.02 ABBREVIATIONS AND ACRONYMS:

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturer's Association
AASHTO	American Association of the State Highway and Transportation Officials
ACI	American Concrete Institute
AGC	Associated General Contractors
AGMA	American Gear Manufacturer's Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute, Inc.
APA	American Plywood Association
API	American Petroleum Institute
APWA	American Public Works Association
ASA	Acoustical Society of America
ASAE	American Society of Agriculture Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASLE	American Society of Lubricating Engineers
ASME	American Society of Mechanical Engineers
ASQC	American Society for Quality Control
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWPA	American Society for Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturer's Association
CGA	Compressed Gas Association
CLFMI	Chain Link Fence Manufacturer's Institute
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
ETL	Electrical Test Laboratories
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IPC	Institute of Printed Circuits
IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Society of America
MBMA	Metal Building Manufacturer's Association
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association

NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NGLI	National Lubricating Grease Institute
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
SMA	Screen Manufacturer's Association
SMACCNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction
UBC	Uniform Building Code
UL	Underwriters Laboratories, Inc.
WCRSI	Western Concrete Reinforcing Steel Institute
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

END OF SECTION 01070

## SECTION 01090 - REFERENCE STANDARDS

### PART 1 - GENERAL

#### 1.01 GENERAL:

- A. Whenever in these specifications references are made to published specifications, codes, standards or other requirements, it shall be understood that when no date is specified, only the latest published specifications, standards or requirements of the respective issuing agencies, as of the date that the Work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the drawings shall be waived because of any provision of, or omission from, said standards or requirements.

#### 1.02 REFERENCE SPECIFICATIONS, CODES AND STANDARDS:

- A. All work specified herein shall conform to or exceed the requirements of the referenced specifications, codes and standards to the extent that the provisions of such documents are not in conflict with the requirements of these Specifications.
- B. References herein to "Building Code" or IBC shall mean the International Building Code of the International Conference of Building Officials (ICBO). The latest edition of the code, as of the date of award, as approved and adopted by the agency having jurisdiction, including all addenda, modifications, amendments or other lawful changes thereto, shall apply to the Work.
- C. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the Engineer for clarification and directions prior to ordering or providing any materials or labor. The Contractor shall bid the most stringent requirements.
- D. Applicable Standard Specifications: The Contractor shall construct the Work specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards and specifications listed herein; except, that wherever references to "Standard Specifications" are made, the provisions therein for measurement and payment shall not apply.
- E. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- F. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- G. References in the Contract Documents to "Standard Specifications" shall mean the "Manual of Standard Specifications as Published by the American Public Works Association, Utah Chapter" including all current supplements, addenda and revisions thereof.

END OF SECTION 01090



## SECTION 01300 - CONTRACTOR SUBMITTALS

### PART 1 - GENERAL

#### 1.01 GENERAL:

- A. All submittals by the Contractor shall be submitted to the Engineer at the construction site.
- B. Within fourteen (14) days after the date of Notice to Proceed, the Contractor shall submit the following items to the Engineer:
  - 1. A Construction Schedule providing the starting and completion dates of the various stages of the Work. The Contractor shall be prepared to discuss its construction schedule at the pre-construction conference.
  - 2. Schedule of Values or lump sum price breakdown for progress payment purposes.

#### 1.02 SUBMITTAL REQUIREMENTS AND PROCESS:

- A. Wherever called for in the Contract Documents or when requested by the Engineer the Contractor shall furnish to the Resident Engineer for review, six (6) copies of each submittal.
- B. All submittals shall be accompanied by the Owner's standard submittal transmittal form. This form may be obtained from the Engineer. A separate transmittal form shall be used for each specific item for which a submittal is required. Each submittal should be referenced to the specification section requiring the submittal and/or drawing. All Contractor submittals shall be carefully reviewed by an authorized representative of the Contractor, prior to submission to the Engineer. Each submittal shall be dated, signed and certified by the Contractor as being correct and in strict conformance with the Contract Documents. In the case of shop drawings, each sheet shall be so dated, signed and certified. No consideration for review by the Engineer of any Contractor submittals will be made for any items which have not been so certified by the Contractor. All non-certified submittals will be returned to the Contractor without action taken by the Engineer and any delays caused thereby shall be the sole responsibility of the Contractor.
- C. Multiple-page submittals shall be collated into sets with each set stapled or bound.
- D. The Engineer will return copies of each submittal to the Contractor with review comments within fifteen (15) calendar days following their receipt by the Resident Engineer. There will be three (3) copies of a submittal returned to the Contractor when marked either "NO EXCEPTIONS TAKEN" or "EXCEPTIONS AS NOTED", and no formal revision and re-submission of said submittal will be required. However, if one or more copies of the submittal are returned to the Contractor marked "REVISE AND RESUBMIT" or "REJECTED", the Contractor shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the Engineer.
- E. Fabrication of an item shall commence only after the Engineer has reviewed the submittal and returned copies to the Contractor marked either "NO EXCEPTIONS TAKEN" or "EXCEPTIONS AS NOTED". Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis of claims for extra work.

- F. The Engineer's review of Contractor's submittals shall not relieve the Contractor of the entire responsibility for the correctness of details and dimensions. The Contractor shall assume all responsibility and risk for any misfits due to any errors in Contractor submittals. The Contractor shall be responsible for the dimensions and the design of adequate connections and details.

1.03 CONTRACTOR'S SCHEDULE SUBMITTAL:

- A. Within fourteen (14) days after the date of Notice to Proceed, the Contractor shall submit to the Resident Engineer a construction schedule for the Work showing a general plan for orderly progression of the Work including mobilization of plant and equipment and timing of procurement of major materials and equipment. The Engineer may request that the Contractor provide a revised or updated Construction Schedule if, at any time, the Engineer considers the completion date to be in jeopardy because of any portion of the Work falling behind schedule or the sequence of operations becomes different from the previous schedule.

1.04 PROPOSED SUBSTITUTES OR "OR EQUAL" ITEM SUBMITTAL:

- A. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function and quality required. The name followed by the words "or-equal" indicating that a substitution may be permitted. Materials or equipment of other Suppliers may be accepted by the Engineer if sufficient information is submitted by the Contractor to allow the Engineer to determine that the material or equipment proposed is equal to that named, subject to the following requirements:

1. The Engineer may require the Contractor to furnish at the Contractor's expense additional data about the proposed substitute. The burden of proof as to the type, function and quality of any such substitute material or equipment shall be upon the Contractor.
2. The Engineer will be the sole judge as to the type, function and quality of any such substitute material or equipment and the Engineer's decision shall be final. Acceptance by the Engineer of a substitute item shall not relieve the Contractor of the responsibility for full compliance with the Contract Documents.
3. The Owner may require the Contractor to furnish at the Contractor's expense a special performance guarantee or other surety with respect to any substitute.
4. The Contractor shall be responsible for resultant changes and all additional costs which the accepted substitution requires in the Contractor's work, the work of its subcontractors and of other contractors and shall effect such changes without cost to the Owner.

- B. The procedure for review by the Engineer will include the following:

1. If the Contractor wishes to furnish or use a substitute item of material or equipment the Contractor shall make written application to the Engineer on an Owner furnished "Substitution Request Form". The Contractor shall certify that the proposed substitute will perform adequately the functions and achieve the results called for by the Contract Documents.
2. The Engineer will be allowed a reasonable time within which to evaluate each proposed substitute. If proposed substitute material or equipment has been judged to be unacceptable by the Engineer, the Contractor shall provide the

material or equipment named in the Contract Documents.

3. No submittals will be made for a substitute item nor will any substitute item be ordered, installed or utilized without the Engineer's prior written acceptance.
  4. The Engineer will record the time required to evaluate substitutions proposed by the Contractor and in making any resulting changes in the Contract Documents. Whether or not the Engineer accepts a proposed substitute the Contractor shall reimburse the Owner for the charges of the Engineer for evaluating each proposed substitute.
- C. The Contractor's application using the "Substitution Request Forms" shall contain the following statements and/or information.
1. Acceptance of the proposed substitute will not affect the Contractor's Construction Schedule.
  2. Itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including cost of redesign and claims of other contractors affected by the resulting change.

1.05 **SAMPLES SUBMITTAL:**

- A. The Contractor shall submit not less than two (2) samples to the Engineer for acceptance at no additional cost to the Owner. Samples shall be submitted for acceptance a minimum of fourteen (14) days prior to ordering such material for delivery to the job site. All samples shall be clearly labeled and include technical data, physical characteristics and Supplier's name. If accepted by the Engineer, one (1) set of samples will be returned to the Contractor and one (1) set of samples shall remain at the job site until completion of the Work.

1.06 **OPERATION, MAINTENANCE AND TECHNICAL MANUAL SUBMITTAL:**

- A. The Contractor shall furnish to the Engineer four (4) identical sets of operation, maintenance and technical manuals and one electronic copy provided on compact disc or other approved form of electronic media. The Contractor shall include in the manuals for each item of mechanical, electrical and instrumentation equipment the following:
1. Complete operating instructions, including recommended troubleshooting and start-up procedures; tabulation of proper settings for all pressure relief valves, pressure switches and other related equipment protection devices; detailed test procedures to determine performance efficiency of equipment; list of all electrical relay settings including alarm and contact settings.
  2. Preventive maintenance procedures and schedules, including required lubricants, filters, adjustments and special tools.
  3. Parts lists, by generic title and identification number, complete with exploded views of each assembly. Spare parts information for all mechanical, electrical and instrumentation equipment. The spare parts list shall include the current list price of each spare part. The spare parts list shall be limited to those spare parts which each manufacturer recommends be maintained by the Owner in inventory at the plant site. Each manufacturer or supplier shall indicate the name, address, and telephone number of its nearest outlet for spare parts to facilitate the Owner in ordering.
  4. Disassembly and reassembly instructions, including required special tools.

5. Record drawings including diagrams and schematics as required under the electrical and instrumentation portions of these specifications.
- B. All technical manuals shall be submitted to the Engineer not later than the seventy-five percent (75%) of construction completion date or fourteen (14) days prior to startup of equipment if started before seventy-five percent (75%) completion of project. All discrepancies found in the technical manuals shall be corrected by the Contractor within thirty (30) days from the date of written notification by the Engineer.

1.07 RECORD DRAWINGS SUBMITTAL:

- A. The Contractor shall maintain, during the progress of the Work, one (1) set of Record Drawings and shall neatly mark on them all project changes from the details shown on the original Contract Drawings. Special attention shall be given to recording on the drawings the horizontal and vertical location of all buried utilities that differ from the locations indicated or which were revealed during the construction.
- B. Record drawings shall be accessible to the Engineer at all times during the construction period and shall be delivered to the Engineer upon completion of the Work.
- C. Requests for partial payments will not be accepted if the record drawings are not kept current. Upon substantial completion of the Work and prior to final acceptance the Contractor shall deliver a complete set of record drawings to the Engineer.

END OF SECTION 01300

## SECTION 01505 - MOBILIZATION

### PART 1 - GENERAL

#### 1.01 GENERAL:

- A. Mobilization shall include the obtaining of all permits; moving onto the site of all equipment; furnishing and erecting plants, temporary buildings and other construction facilities; all as required for the proper performance and completion of the Work. Mobilization shall include, but not be limited to, the following principal items:
1. Moving on to the site of all Contractor's plant and equipment required for first month operations.
  2. Installing temporary construction power, wiring and lighting facilities.
  3. Establishing fire protection equipment and instructing designated personnel in the operation of such apparatus.
  4. Providing field office trailer for the Contractor complete with furnishings and utility services. Owner will furnish the temporary power and water for the Contractor's field offices. Contractor to furnish and install necessary piping, wiring and disconnects.
  5. Providing all on-site Contractor communication facilities.
  6. Providing on-site Contractor's sanitary facilities.
  7. Arranging and setting up the Contractor's work and storage yard.
  8. Obtaining all required permits.
  9. Posting all OSHA required notices and establishment of safety programs.
  10. Have Contractor's superintendent at the jobsite full time.
  11. Submittal of Construction Schedule.

#### 1.02 PAYMENT FOR MOBILIZATION:

- A. Payment will be made based upon mobilization completion.

END OF SECTION 01505



## SECTION 01510 - TEMPORARY UTILITIES

### PART 1 - GENERAL

#### 1.01 GENERAL:

- A. It shall be the Contractor's responsibility to provide equipment that is adequate for the performance of the Work under this Contract within the time specified. All equipment shall be kept in satisfactory operating condition, shall be capable of safely and efficiently performing the required Work and shall be subject to inspection and approval by the Owner's representative at any time within the duration of the Contract. All work hereunder shall conform to the applicable requirements of the OSHA Standards for Construction.

#### 1.02 POWER AND LIGHTING:

- A. The Owner will provide (not install) all necessary electrical power for construction, unless the Contractor's power requirements exceed the plant's electrical system capacity, either as a whole or at a certain location, in which case the Contractor shall provide its own power. The Contractor shall provide all necessary temporary power connection, disconnects and distribution lines required for its operations under the Contract and shall provide and maintain all temporary power systems required to perform the Work in a safe and satisfactory manner. All temporary connections for electricity shall be subject to approval of the Engineer and shall be completely removed at the Contractor's expense prior to final acceptance of the Work. All wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. All electrical facilities shall conform to the requirements of the OSHA Safety and Health Standards for Construction.

#### 1.03 WATER SUPPLY:

- A. General: The Contractor shall provide an adequate supply of water of a quality suitable for all domestic and construction purposes. Utility or plant effluent water may be used for hydraulic structures and pipeline testing as approved by the Engineer. Potable water up to 5,000 gallons per month will be furnished by the Owner without charge. Quantities of potable water over 5,000 gallons per month shall be paid for by the Contractor.
- B. Potable Water: All drinking water on the site during construction shall be furnished by the Contractor and shall be bottled water or water furnished in approved dispensers. Notices shall be posted conspicuously throughout the site warning the Contractor's personnel that piped water may be contaminated.
- C. Water Connections: The Contractor shall not make connection to, or draw water from, any fire hydrant or pipeline without first obtaining permission of the authority having jurisdiction over the use of said fire hydrant or pipeline and from the agency owning the water system. For each such connection made, the Contractor shall first attach to the fire hydrant or pipeline a valve, backflow preventer, and a meter, if required by the said authority, of a size and type acceptable to said authority and agency.
- D. Removal of Water Connections: Before final acceptance of the Work all temporary water connections and piping installed by the Contractor shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of the Engineer and to the agency owning the affected utility.
- E. Fire Protection: The Contractor shall provide fire extinguishers and other fire protection equipment to adequately protect new and existing facilities and temporary facilities against damage by fire. Hose connections and hose, water casks, chemical equipment or other sufficient means shall be provided for fighting fires in the new, existing and temporary

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

1.04 SANITATION:

- A. Toilet Facilities: Fixed or portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Subpart D, Section 1926.51 of the OSHA Standards for Construction. The Owner's toilet facilities shall not be used by the Contractor's work force.
- B. Sanitary and Other Organic Wastes: The Contractor shall establish adequate and regular collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of in a manner satisfactory to the Engineer and in accordance with all laws and regulations pertaining thereto. Contractor may install temporary piping for toilet facilities to discharge into the incoming sewer.

1.05 COMMUNICATIONS:

- A. Telephone Services: The Contractor shall provide and maintain at all times during the progress of the Work not less than one telephone (land line or cell) in good working order, at its own field construction office. Each such telephone shall be connected to an established exchange for toll service and with all other telephones utilized by the Contractor. The Owner's telephone system shall not be used by the Contractor's work force.

END OF SECTION 01510

## SECTION 01530 - PROTECTION OF EXISTING FACILITIES

### PART 1 - GENERAL

#### 1.01 GENERAL:

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

#### 1.02 RIGHTS-OF-WAY:

- A. The Contractor shall not do any work or enter upon the rights-of-way of any oil, gas, sewer or water pipeline; any telephone or electric transmission line; any fence; or any other structure, until notified by the Engineer that the Owner has secured authority to do so. After authority has been obtained, the Contractor shall give the governing utility proper advanced notice of its intention to begin work.

#### 1.03 RESTORATION OF PAVEMENT AND SIDEWALKS:

- A. All paved areas and sidewalks not designated for replacement, cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas unless otherwise noted. All sidewalks and pavements which are subject to partial removal shall be neatly saw cut in straight lines.

#### 1.04 UNDERGROUND UTILITIES NOT SHOWN OR INDICATED:

- A. If the Contractor damages existing utilities, piping or improvements that are not shown or the location of which was not made known to the Contractor prior to excavation and the damage was not due to failure of the Contractor to exercise reasonable care the Contractor shall immediately notify the Engineer. If directed by the Engineer repairs shall be made by the Contractor under the provisions for changes and extra work contained in Articles 13, 14, and 15 of the General Conditions.

1.05 NOTIFICATION BY THE CONTRACTOR:

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

END OF SECTION 01530

## SECTION 01550 - SITE ACCESS AND STORAGE

### PART 1 - GENERAL

#### 1.01 HIGHWAY AND STREET LIMITATIONS:

- A. The Contractor shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits and other limitations affecting transportation and ingress and egress to the site of the Work. It shall be the Contractor's responsibility to construct and maintain any haul roads required for its construction operations.
- B. Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street, utility right-of-way or the site of the Work during the performance of the Work hereunder. The Contractor shall conduct its operations so as not to interfere unnecessarily with the authorized work of utility companies, other agencies, or the Owner's plant personnel. No street or access shall be closed without first obtaining permission of the Engineer or proper governmental authority. Where excavation is being performed in primary streets or highways one (1) lane in each direction shall be kept open to traffic at all times unless otherwise provided or shown. Fire hydrants on or adjacent to the Work shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the Contractor to assure the use of sidewalks, access routes and the proper functioning of all gutters, sewer inlets and other drainage facilities.
- C. Traffic Control: For the protection of traffic in public streets and plant operating personnel at the site of the Work, the Contractor shall provide, place and maintain all necessary barricades, traffic cones, warning signs, lights and other approved safety devices. The Contractor shall take all necessary precautions for the protection of the Work and the safety of the Owner's personnel and the public. All barricades and obstructions shall be illuminated at night.

#### 1.02 CONTRACTOR'S WORK AND STORAGE AREA:

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

END OF SECTION 01550



## SECTION 01560 - PROJECT ENVIRONMENTAL CONTROLS

### PART 1 - GENERAL

#### 1.01 EXPLOSIVES AND BLASTING:

- A. The use or storage of explosives on the Work or site will not be permitted.

#### 1.02 DUST ABATEMENT AND RUBBISH CONTROL:

- A. The Contractor shall provide under the Contract all necessary measures to prevent its operation from producing dust in amounts damaging to property or causing a nuisance to Owner's plant personnel and operations or to persons living in or occupying buildings in the vicinity. The Contractor shall be responsible for damage resulting from any dust originating from its operations. The dust abatement measures shall be continued throughout the length of the contract.
- B. During the progress of the Work the Contractor shall keep the site of the Work and other areas used by it in a neat and clean condition and free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the Work site, and shall establish regular intervals of collection and disposal of such materials and waste. The Contractor shall also keep its haul roads free from dirt, rubbish and unnecessary obstructions resulting from its operations. Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal and in conformance with all applicable Safety Laws and Health Standards for Construction. The Owner's dumpster shall not be used by the Contractor.

#### 1.04 SANITATION:

- A. The Contractor shall provide approved fixed or portable chemical toilets wherever needed for its employees. The Contractor shall establish regular intervals of collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of in a manner satisfactory to the Engineer and in accordance with all laws and regulations pertaining thereto. The Owner's toilet facilities shall not be used by the Contractor.

#### 1.05 CHEMICALS:

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

#### 1.06 CULTURAL RESOURCES:

- A. The Contractor's attention is directed to the National Historic Preservation Act of 1966 (16 U.S.C. 470) and 36 CFR 800 which provides for the preservation of potential historical architectural, archeological or cultural resources (hereinafter called "cultural resources"). If potential cultural resources are discovered during subsurface excavations at the site of construction, the following procedures shall be instituted:
  - 1. The Contractor shall immediately notify the Engineer.

2. The Engineer will issue a Field Order directing the Contractor to cease all construction operations at the location of such potential cultural resources find.
  3. Such Field Order shall be effective until such time as a qualified archeologist can be called to assess the value of these potential cultural resources and make recommendations to the Utah State Historical Society Archeologist.
- B. If the archeologist determines that the potential find is a bona fide cultural resource, at the direction of the Utah State Historical Society Archeologist, the Contractor shall suspend work at the location of the find under the provisions for changes contained in Articles 13, 14 and 15 of the General Conditions.

END OF SECTION 01560

## SECTION 01600 - MATERIALS AND EQUIPMENT

### PART 1 - GENERAL

#### 1.01 QUALITY ASSURANCE:

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

#### 1.02 PRODUCT DELIVERY, STORAGE AND HANDLING:

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

END OF SECTION 01600



## SECTION 01660 - EQUIPMENT TESTING AND PLANT STARTUP

### PART 1 - GENERAL

#### 1.01 GENERAL:

- A. Equipment testing and plant startup are required for satisfactory completion of the contract and shall be scheduled and completed within the contract time.

#### 1.02 EQUIPMENT TESTING:

##### A. Contractor Furnished Equipment (including Owner Selected Equipment):

1. The Contractor shall provide the services of an experienced and authorized representative of the manufacturer of each item of equipment indicated in the equipment schedules who shall visit the site of the Work and inspect, check, adjust if necessary, and approve the equipment installation. The Contractor shall have the manufacturer's representative revisit the Work site as often as necessary until any and all problems are corrected. The Contractor shall require that each manufacturer's representative furnish to the Engineer a written report addressed to the Owner certifying that the equipment has been properly installed and lubricated, is in accurate alignment, is free from any undue stress imposed by connecting piping or anchor bolts and has been operated satisfactorily under full-load conditions.
2. The Contractor shall be responsible for scheduling all operations testing. The Contractor shall furnish all personnel, power, water, chemicals, fuel, oil, grease and all other necessary equipment, facilities and services required for conducting the tests. The Contractor is advised that the Engineer and the Owner's operating personnel will witness operations testing and that the manufacturer's representative shall be required to instruct the Owner's operating personnel in correct operation and maintenance procedures. This instruction shall be scheduled with the Engineer and the Owner at least ten (10) days in advance and shall be provided while the equipment is fully operational. The Contractor shall have previously furnished the technical manuals required under Section 01300 entitled, "Contractor Submittals".

#### 1.03 PLANT STARTUP:

- A. The startup of the treatment plant facilities and equipment is a coordinating operation requiring the combined technical expertise of the Contractor, suppliers, Engineer and the Owner. The Contractor shall provide the effective coordination of all parties necessary for successful plant, facilities and equipment startup.
- B. The Contractor shall be required to startup and operate the various pieces of equipment for a continuous seven (7) day period under coordination direction of the Engineer and Owner. The startup shall not be commenced until all required leakage tests, disinfection and equipment tests have been completed to the satisfaction of the Engineer.
- C. All defects in materials or workmanship that appear during this test period shall be immediately corrected by the Contractor. The Contractor shall provide the services of authorized representatives of the manufacturer, in addition to those services required under equipment testing, as may be necessary, to correct faulty equipment operation. Time lost for equipment repairs, wiring corrections, control point settings or other reasons which actually interrupt the startup may, at the discretion of the Engineer, be justifiable cause for extending the startup test duration.

END OF SECTION 01660

## SECTION 01700 - PROJECT CLOSEOUT

### PART 1 - GENERAL

#### 1.01 FINAL CLEANUP:

- A. The Contractor shall promptly remove, from the vicinity of the completed work, all rubbish, unused materials, concrete forms, construction equipment and temporary structures and facilities used during construction. Final acceptance of the Work by the Owner will be withheld until the Contractor has satisfactorily complied with the requirements for final cleanup of the project site.

#### 1.02 FINAL SUBMITTALS:

- A. The Contractor, prior to requesting final payment shall obtain and submit the following items to the Engineer for transmittal to the Owner:
1. Written guarantees, where required.
  2. Operating manuals, technical manuals and instructions. The Contractor's attention is directed to the condition that one percent (1%) of the contract price will be deducted from any monies due the Contractor as progress payments if at the seventy-five percent (75%) construction completion point the approved technical manuals have not been submitted in accordance with Section 01300 entitled, "Contractor Submittals". The aforementioned amount will be retained by the Owner as the agreed estimated value of the approved technical manuals. Any such retention of money for failure to submit the approved technical manuals on or before the seventy-five percent (75%) construction completion point shall be in addition to the retention of any payments due to the Contractor as specified in Article 19 of the General Conditions.
  3. Manufacturers' representatives' installation, testing and startup reports.
  4. Keying.
  5. Maintenance stock items, spare parts and special tools.
  6. Completed record drawings.
  7. Certificates of inspection and acceptance by local governing agencies having jurisdiction.
  8. Releases from all parties who are entitled to claims against the subject project, property or improvement pursuant to the provisions of law.
  9. Extension of Performance Bond in accordance with Article SGC-22 of the Supplementary General Conditions.

1.05 MAINTENANCE AND GUARANTEE:

- A. The Contractor shall provide a bond to comply with the guarantee requirements contained in Article 22 of the General Conditions and Article SGC-22 of the Supplementary General Conditions.
- B. The Contractor shall make all repairs and replacements promptly upon receipt of written order from the Owner. If the Contractor fails to make such repairs or replacements promptly the Owner reserves the right to do the Work and the Contractor and his surety shall be liable to the Owner for the cost thereof. Replacement of earth fill, backfill or resurfacing where it has settled below the required finish elevations shall be considered as part of such required repair work.

END OF SECTION 01700



## SECTION 01730 - OPERATION AND MAINTENANCE MANUALS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specifications sections, apply to work of this section.

#### 1.02 SUMMARY:

- A. Furnish four sets of bound operation and maintenance manuals and one electronic copy on compact disc or other approved form of media. Manuals shall contain descriptive drawings and data which identify equipment installed at the project and detail the procedures and parts required to maintain and repair the equipment. Copies of approved submittals shall be included for all equipment.

#### 1.03 OPERATION AND MAINTENANCE MANUAL FOR MECHANICAL SYSTEMS:

##### A. General:

1. The "Operating and Maintenance Manual" is a bound compilation of drawings and data that the owner requires for each building or project. These manuals, complete with drawings and data, shall be furnished to the Owner.
2. The contractor has overall responsibility to obtain the necessary data from and compile the data as set forth in this specification, including items or equipment purchased by the Owner and delivered to the contractor for installation.
3. The number of binders (or "volumes") required for each individual building or project will depend on the amount of information to be catalogued.
4. All information included shall be legible and sufficiently marked to indicate the exact size, model, type, etc., of equipment furnished and installed.

- B. Purpose: The Operating and Maintenance Manual is prepared to provide a ready reference to all important pieces of mechanical and electrical equipment installed on the project. It is also to provide the necessary operating and maintenance data for use by service personnel. It is also to provide information required for checking equipment performance or for planning of plant expansion or redesign.

##### C. Quantity and Preparation (Submit through Engineer):

1. Four sets of the Operation and Maintenance Manuals shall be prepared for the project.
  - a. One set to the Engineer.
  - b. Three sets to Owner.
2. The quantities of drawings, manufacturer's literature, or other data required for these manuals are in addition to those otherwise required for normal distribution for approval during the construction period.

## PART 2 - MATERIALS AND METHODS

- 2.01 PAGE SIZE: All pages shall be standard 8-1/2 x 11 inches size or approximate multiples (preferably 16 x 11 inches) folded to 8-1/2 x 11 inch manila pockets, which shall have standard three-ring side punching for insertion in the binders. The equipment name, drawing description and number shall be written on the face of each manila pocket.
- 2.02 DRAWINGS: All drawings larger than 8-1/2" x 11" shall be folded and inserted in individual 8-1/2" x 11" manila pockets, which shall have standard three-ring side punching for insertion in the binders. The equipment name, drawing description and number shall be written on the face of each manila pocket.
- 2.03 BINDERS: Binders shall be Buckram binders with block lettering for sheet size 8-1/2 x 11 inches with 2" to 3-1/2" expandable metal capacity as required for the project. The number of binders, however, shall be based on not filling them beyond 4".

2.04 The following information shall appear on the front cover and backbone:

- A. "Operation and Maintenance Manual".
- B. Project Name (and volume number if more than one volume).
- C. "Orem City".
- D. Engineer's name.
- E. General Contractor's name.

Item E need not be printed on the backbone.

2.05 CONTENTS AND INDEXING:

- A. Manuals shall contain descriptions of the building systems in sufficient detail to adequately indicate the type of systems installed and the basic details of their operation.
- B. All purchased equipment data shall be used to designate the sections. Within each section additional indexing of component parts may be required.
- C. Operation and Maintenance Manuals shall contain to the fullest extent all possible information pertinent to the equipment. The arrangement and type of information to be filed shall be as follows:
  - 1. Copy of purchase order change (if any).
  - 2. Outline drawings, special construction details, "as built" electrical wiring and control diagrams for all major and supplementary systems.
  - 3. Manufacturer's test or calculated performance data and certified test curves.
  - 4. Installation, operating, and maintenance instructions, including a complete parts list and sectional drawing with parts identification numbers. Mark with model, size and plan number.
  - 5. Manufacturer's brochure marked to indicate exact equipment purchased. Brochures on component parts supplied by a manufacturer with his equipment, but not manufactured directly by him, shall also be included.

6. The serial numbers of each item of equipment installed are to be listed with the model numbers and plan symbols.
7. Written warranties.
8. Include a Table of Contents. The contents shall be divided with tabbed index dividers into the following suggested parts:
  - Part I Building and System Descriptions
  - Part II Purchased Equipment Data
  - Part III Test Reports and Valve Charts
  - Part IV Start-Up and Operation
  - Part V Preventative Maintenance Recommendations
9. A copy of the approved submittals for each piece of equipment.
10. A copy of all testing, adjusting and balancing reports.
11. Wiring diagrams marked with model and size and plan symbol.
12. Operating and Maintenance Manuals data for Part I shall be obtained directly from the mechanical and electrical consultants. (Allow consultant preparation cost.)
13. The index shall contain the name and address of the manufacturer and, if different, where replacement and repair parts may be obtained.

END OF SECTION 01730

