Technical Specifications Table of Contents

Division 1 – General Requirements

SECTION 01001
SUMMARY OF WORK

PART 1 – GENERAL

1.01 SCOPE

A. The Work to be performed under this Contract shall consist of furnishing plants, tools, equipment, materials, supplies, and manufactured articles and furnishing labor, transportation, and services, including fuel, power, water, and essential communications, and performing work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The Work shall be complete, and any work, materials, and services not expressly indicated or called for in the Contract Documents that may be necessary for the complete and proper construction of the Work in good faith, shall be provided by the **Contractor** as though originally so indicated, at no increase in cost to the **County**.

B. The quantities shown on the bid form are estimates for the Work, including the intended construction method based upon the available information. The assigned means, methods, and quantities described herein are subject to revision by the **County** for various reasons including but not limited to, unforeseen utility conflicts/ground water, discovery of subsurface rock strata, unforeseen pipeline encasement, etc. As such, a unit price contract type has been selected to procure the Work and is not intended to be a guarantee for a minimum amount of work.

1.02 PROJECT LOCATION

The Work is required at the locations shown on the Approved Drawings.

1.03 WORK COVERED BY THE CONTRACT DOCUMENTS

Work shall be performed according to the requirements of the Contract Documents.

1.04 WORK COORDINATION

A. The **Contractor** shall coordinate the Work with third parties (such as public utilities and the telephone company) in areas where such parties may have rights to underground property or facilities; and request maps or other descriptive information as to the nature and location of such underground facilities or property.

B. The **Contractor** shall coordinate the Work with owners of private and public property where access is required for the performance of the Work.

C. The **County** will work with the **Contractor** to assign and schedule the Work in a logical and efficient format. However, the items in this contract shall be priced such that each item may be assigned independently or combined with other items at the **County**'s sole discretion in regard to both quantity and scope. The **Contractor** shall perform only those work items directed by the **County** at the prices specified herein. (For example, if the **County** determines that a line segment shall be cleaned but not televised, the same unit price for cleaning shall apply.)

1.05 CONDITIONS AT THE SITES

A. The **Contractor** shall make necessary investigations to determine the existence and location of underground utilities.

B. The **Contractor** shall be responsible for damage to and for maintenance and protection of existing utilities, structures, and personal property.

C. These Contract Documents do not guarantee such utilities are in the location indicated or that they actually exist, or that other utilities are not within the area of the operations.

D. The **Contractor** is responsible for safety at no additional cost to the **County**.

E. The **Contractor** shall report hazardous conditions to the **County**.

+++ END OF SECTION 01001 +++

SECTION 01010 - PROJECT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

Section includes:

A. Access to and **Contractor's** use of the site
B. Coordination requirements
C. Construction procedures

1.02 ACCESS TO AND CONTRACTOR'S USE OF THE SITE

A. The space available to the **Contractor** for the performance of the Work, either exclusively or in conjunction with others performing other construction as part of the project, is shown on the drawings.

B. The **County** shall continue to utilize the existing wastewater collection system and water system during assessment and construction.

1. The **County** will endeavor to cooperate with the **Contractor's** operations when the **Contractor** has notified the **County** in advance of need for changes in operations in order to accommodate construction operations.
2. The **Contractor** shall conduct the Work to cause the least interference with the **County's** operations.

C. Equipment and vehicles used by the **Contractor** on the project shall be marked with the **Contractor's** name and telephone number.

1.03 COORDINATION REQUIREMENTS

A. Coordination with **County**:

1. Limit access through occupied areas to those days and times the **County** approves. Occupied areas include areas in which the **County's** regular operations will be going on or to which the **County** requires access during the construction period.
2. When the following must be modified, provide alternate facilities acceptable to the **County**:

    a. Emergency means of egress
    b. Utilities that must remain in operation
    c. Informational signage

3. The **Contractor** shall notify the **County** immediately of any circumstances that may jeopardize or that have interrupted utility service.

B. Security Procedures:

1. Limit access to the site to persons involved in the work.
2. Provide secure storage for materials.

3. Secure completed work as required to prevent loss.

C. Coordination of Construction:

1. Inform each party involved, in writing, of procedures required for coordination of the Work; include requirements for giving notice, submitting reports, and attending meetings.
2. Inform the **County** in advance, with ample time, when coordination of Work is required.

D. Utilities Notification Prior to Construction:

1. Georgia law mandates that, before beginning mechanical digging or excavation work, **Contractor** shall contact Georgia 811 by using eRequest on www.Georgia811.com or by calling 811 or 1-800-282-7411.

2. **Contractor** may utilize EDEN (Excavation Digging Event Notification) web application that enables Members and Professional Excavators to create, manage, respond to, and edit Georgia 811 Locate Request Tickets.

3. **Contractor** shall retain records of notification and responses during the course of the project until final Payment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CONSTRUCTION

A. General Examination Requirements:

1. Prior to performing work, examine the applicable substrates and the conditions under which the work is to be performed.
2. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding.
3. Notify the **County** promptly of type modifications required.
4. Before starting work that might affect existing construction, verify the existence and location of underground utilities and other underground construction.
5. Prepare preconstruction photographic documentation in conformance with the requirements of Section 01380 of these specifications.

B. General Preparation Requirements:

1. The **Contractor** shall obtain, maintain, and pay for required permits.
2. The **Contractor** shall take field measurements as required to properly conduct the work.

C. Cleaning and Protection: Keep installed work clean, and clean again when soiled by other operations.

D. Final Cleaning:

1. Remove materials and equipment that are not part of the work and any debris from the site prior to substantial completion.

2. Dispose of debris in a lawful manner.
3. Perform final cleaning after substantial completion has been certified, but before final payment.
4. Clean entire project site and grounds.

E. Substantial Completion:
   1. Requirements for the **Contractor** achieving Substantial Completion are defined in the Contract Documents in GR-1 of the General Requirements.
   2. Substantial Completion is typically defined to include:

      a. Completion of Work required by the Contract Documents
      b. Operation of components and systems of the Work, including acceptance of testing and startup requirements
      c. Closeout of quality deficiencies and non-conformances
      d. Delivery and acceptance of spare parts, operations manuals, and vendor documentation
      e. Completion of vendor training
      f. Completion and delivery of "red-line" as built drawings

   2. When the **Contractor** believes substantial completion has been achieved, **Contractor** shall notify the **County** in writing, requesting Substantial Completion. The **County** will verify that the contractual documentation requirements for Substantial Completion have been completed, including closeout of open NCRs. If verified, the **County** will schedule a Substantial Completion inspection and walk-through with the **Contractor**, DWM Operations, and the Designer, or will notify the **Contractor** in writing of acceptance or the reason(s) for denying Substantial Completion.

F. Final Completion:

   1. Requirements for the **Contractor** achieving Final Completion are defined in the Contract Documents in GR-9 of the General Requirements.
   2. After Substantial Completion, **Contractor** shall meet additional requirements for Final Completion and release of final payment. These requirements will be defined in the Contract and typically include:
      a. Completion of punch list items by the **Contractor**
      b. Demobilization from the project site
      c. Submittal of warranties
      d. Release of subcontractor or vendor liens
      e. Turnover of remaining project documents required by the Contract, including final as-built drawings by the Design Consultant

3.02 CHANGE MANAGEMENT

A. Contract Change Process

Any firm under contract with the **County** may submit a Change Request (CR) to the **County** following the requirements of the contract. A CR may address requested changes in cost and/or schedule, as well as contract terms or scope that do not result in cost or schedule impacts.

Changes may also be initiated by the **County** in the form of a Field Order (FO). The **Contractor** shall proceed with the change unless they believe the FO entitles them to a change in contract price, time, and/or term. If so, the **Contractor** shall submit a CR within 15 days of receiving the FO.

The CR from the **Contractor** is to be accompanied by a detailed proposal describing the **Contractor**'s opinion of the CR's cost, schedule, and/or contract term impacts.

If the CR is acceptable to the **County**, the **Contractor** will be directed to submit a CO to the **County** to process. If the CR is not acceptable to the **County** then the **Contractor** may negotiate the CR. If the cost and/or schedule impacts cannot be agreed, then the **County** will either instruct the **Contractor** to proceed with the change using a Unilateral Change Directive (UCD), if the change is deemed by the **County** to be needed, or the change can be terminated if the change is deemed to be not needed. If the **County** issues a UCD after failing to agree on the price of a CO, then the pricing of the change is per the contract terms.

A UCD can be initiated by the **County** only when there is an imminent threat to public safety or health, or a potential shutdown of a vital **County** function.

B. Amendment to the Contract

If the approval of a CO requires a written, formal amendment to the contract, the **County** will process the formal amendment.

C. Project Scope Change Impacts

A change to a Design /Build contract may materially change the scope of the project, including greater impact on the construction scope than the design scope. A design scope change may also materially impact the project configuration even if it is a no-cost change. Additionally, a change to one project's scope may have impacts to another project's scope.

So that a CO is not approved without understanding its full impacts beyond the affected contract scope, project scope change impacts shall be approved by the **County**. These must consider changes through every phase of the project, and/or impacts to other projects.

D. Baseline

If a CO is approved, the **Contractor** will prepare a Project Baseline Change Instruction Form to formally change the project scope, baseline schedule, and baseline budget.

E. Change Monitoring

The **Contractor** is responsible for monitoring changes to the contract. The **Contractor** will maintain a Design Change Log for each project, and will maintain a Construction Change Log that includes the change description, change status, category of change, contract, estimate of cost, estimate of schedule impact, and

current process step. Change logs are updated each month and included with the Project Progress Report.

Responding to and processing changes in a timely manner is a priority. Change backlogs will be vigorously monitored and managed. Change status reports will be developed by the **Contractor** from the Change Logs to provide current status of each open change, which process step is active, and how many days remain in the process step. "Overdue" reports will be elevated to the **County** for follow-up and closure.

F. Change Status

Changes will be identified by one of the four following status descriptions: Proposed Change is a change that has been submitted as a CR or FO, but has not yet been negotiated. Proposed changes require closure if they are deemed to be not required, or must be resolved in a timely manner if they are deemed required. The cost estimate and/or schedule impact of a proposed change will usually change as it goes through the contract change process. These changes must be reflected in the Change Log as they occur and included in monthly cost and schedule forecasts.

Pending Change is a change that has been negotiated, but has not yet received final **County** approval. These changes must be included in monthly cost and schedule forecasts.

Approved Change is a change that has received final **County** approval. The contract scope, budget, and/or schedule will be amended to include approved changes. Approved changes will be included in monthly cost and schedule forecasts until a formal re-baselining of the project schedule and/or budget is approved.

Closed Change is a change that has been formally rejected and closed by the **County**, or withdrawn by the originator.

G. Category of Change

Changes will be categorized as follows to track the types of changes that occur over the life of the project:

- **County** Requests: any change initiated by the **County**.
- Differing Site Conditions: new information not reasonably available during design, or considered "unforeseeable" through due diligence on the part of the **Contractor**.
- Design Errors: changes due to errors or deficiencies in the design.
- Design Omissions: items omitted from the design that would have been included in the original bid, had they been known.
- Regulatory Requirements: changes mandated by regulatory agencies that are different from approved permit conditions at the time the contract was approved.
- Other: changes required for all other reasons, including emergency work, adjustment of bid quantities, force majeure events, incentive payments, accepted substitutions, and changes identified during value engineering.

3.03 HEALTH AND SAFETY CONSIDERATIONS

A. Take precautions to prevent fires and to facilitate firefighting operations.

B. Take precautions to prevent accidents due to physical hazards.

C. Maintain working conditions in order to keep the site and adjacent public ways free of hazardous and unsanitary conditions and public nuisances.

D. Maintain working conditions to control rodents and other pests; prevent infestation of adjacent sites and buildings due to pests on this site.

E. Keep public streets free of debris from this Work.

F. Provide adequate traffic control in accordance with current MUTCD standards and the approved traffic permit.

G. When using trenches/excavations, follow OSHA standards 29 CFR 1926.650, 29CFR 1926.651, and 29 CFR 1926.652.

3.04 ENVIRONMENTAL PROTECTION

A. General

Contractor shall conduct its operation in a manner to prevent pollution of the environment surrounding the area of work and shall be responsible for furnishing necessary items for fulfilling the work described herein.

B. Material Transport

Contractor shall comply with the Official Code **County** of DeKalb Georgia pertaining to the duties of the **Contractor** in hauling material over **County**-owned rights-of-way. This includes, but is not limited to, approval of proposed haul routes, prevention of dropping of materials or debris on the streets from trucks arriving and leaving the site, providing a suitable vehicle inspection and cleaning installation with permanent crew, and the removal of material spilled in public areas at no additional cost to the local government agency.

C. Waste Materials

No waste or erosion materials shall enter natural or manmade water, wastewater collection systems, or stormwater drains. Erosion materials from excavations, borrow areas, or stockpiled fill shall be contained within the work area. **Contractor** shall develop methods for control of waste and erosion, which shall include filtration, settlement, and manual removal to satisfy the above requirements.

D. Burning

No burning of waste shall be allowed.

E. Dust Control

The **Contractor** shall control the generation of dust by its operations. Control of dust shall be accomplished by water sprinkling or by other methods approved by the **County.**

F. Noise Control

The **Contractor** shall minimize the noise caused by its operations.

When required by agencies having jurisdiction, noise-producing work shall be performed in less sensitive hours of the day or week as directed by the **County**.

The **Contractor** shall provide equipment that operates with the least possible noise. The use of noisy equipment is prohibited. Hoists and compressor plants shall be electrically operated unless otherwise permitted. The air intake of compressors shall be equipped with silencers, and machinery operated by gearing shall be provided with a type of gearing designed to reduce noise. Internal combustion engines shall be equipped with mufflers in good order.

Noise generated by mobile construction equipment, stationary construction equipment, and other equipment involved in the construction of the Work shall not exceed the decibel levels indicated below. Noise generated by mobile and stationary construction equipment will be measured 3 to 6 feet from building lines, and on the A-weighting network of Type 2 general purpose sound level meter set at fast response.

	Combined Residential and Commercial
Allowable sound levels of mobile construction equipment: - From 7 a.m. to 10 p.m., Monday thru Saturday, except legal holidays - At times other than those listed above	85 dBA 70 dBA
Allowable sound levels of stationary construction equipment: - From 7 a.m. to 10 p.m., Monday thru Saturday, except legal holidays - At times other than those noted above Night work from 10 p.m. until 7 a.m. shall require an approved special permit from the **County**.	70 dBA 60 dBA The dBA level will be included in the approved permit.

G. Use of Chemicals

Chemicals used during construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, shall show approval of either EPA or FDA. Use of such chemicals and disposal of residues shall be in conformance with instructions.

H. Bypassing During Construction

No wastewater shall be bypassed at sewage collection or treatment facilities during project construction unless a bypassing schedule has been approved by the **County.** It shall be the responsibility of the **Contractor** to prepare and secure the approval of bypassing not specifically identified in the Contract Documents.

I. Responsibility for Spills and Accidental Discharges

In the event the **Contractor** causes or has a spill or accidental discharge for which the **County** is fined by the State of Georgia Department of Natural Resources Environmental Protection Division (EPD), the **Contractor** agrees to remediate the spill or discharge immediately in accordance with current EPD regulations and to pay fines assessed against the **County** and/or **Contractor**, and pay for the **County**'**s** cost associated with efforts to remediate the situation. The **County** shall be notified immediately of such an event.

J. Odor Control

Contractor shall provide approved temporary odor control measures as required to control objectionable odors resulting from its cleaning and/or bypass pumping operations. Approved temporary odor control measures, when required, shall include odor control filters, additional ventilation, and/or covering of manholes.

3.05 PROTECTION OF THE WORK

A. Conduct construction operations so no part of the Work is subjected to damaging operations or influences that are in excess of those to be expected during normal occupancy conditions.

B. Execute work and stockpile spoils and materials to prevent flooding of excavations, below grade construction, and adjacent properties due to rainwater runoff.

C. Protect existing property not indicated to be removed.

D. Provide temporary supports as required to prevent movement and structural failure as designed by a Registered Professional Engineer in the state of Georgia at the **Contractor's** cost.

E. Equipment and vehicles used on DWM projects shall be clearly marked with the **Contractor's** name and telephone number. The identifying markings may be in the form of magnetic signs, decals, or painted lettering and shall be located on both

sides of the equipment/vehicle. The lettering shall be legible, of a contrasting color to the background surface, and at least two inches in height. Markings shall be in place upon initiation of the work on the project site.

F. A copy of the Project Notice to Proceed letter issued by the **County** shall be available on the job site as proof of the contractual relationship of the **Contractor** with the **County**. The letter shall be presented for review upon request by regulatory agencies or other **County** departments that visit the job site.

G. If removal and replacement of a paved private driveway is required, the replacement shall be performed within 2 weeks of removal. The required permanent pavement replacement for public roadways shall be performed within 30 days or within 7 days if the roadway is a state highway or major **County** arterial roadway. Temporary surface maintenance is the **Contractor's** responsibility and shall be adequate for the volume and type of traffic loads imposed. Temporary asphalt cold mix application, steel traffic plates, etc. shall be utilized as necessary.

H. The **Contractor** shall always maintain copies of permits and approved plans on the project site.

3.06 NOTIFICATION OF SERVICE INTERRUPTION

During progress of work under this Contract, it may be necessary to temporarily interrupt water, sewer, or other utility service to a limited number of customers in the vicinity of the work. It shall be the **Contractor's** responsibility to coordinate the service outage with the utility and to provide proper advance notification (a minimum of 48 hours) to the affected customers.

Due to the nature of businesses and traffic in certain projects' areas, water outages for connections, service changeovers, and other Work may not be allowed during normal work hours. The **Contractor** shall factor these considerations into bid price submitted. Coordination, special lighting, traffic control, employee overtime, special customer notification, etc. shall be included in these considerations by the **Contractor**.

++++END OF SECTION 01010++++

SECTION 01011
UNIQUE REQUIREMENTS

PART 1 - GENERAL

1.01 SCOPE

A. This Section conveys to the **Contractor** unique and unusual stipulations and requirements established for this Project. Some of the stipulations and requirements are a result of negotiations with various entities and organizations, which have an interest in this Project. Some requirements are based on technical aspects of the Project, which are not otherwise conveyed to the **Contractor**. The provisions of this Section shall supersede the provisions of the Division 1 through 17 Specifications, but shall not supersede the Bidding Requirements, Contract Forms, or Conditions of the Contract.

B. If Owner Controlled Insurance Program (OCIP) is implemented in the contract, then OCIP shall govern as follows: In connection with the Work, and for the **Contractor** and those subcontractors deemed eligible by the **County** for participation, the **County** shall implement an OCIP, providing certain insurance coverages as detailed herein. The insurance coverages provided by the OCIP apply only to the Work performed on the Project site. The **Contractor** and its subcontractors shall provide their own insurance for off-site activities. The Builder's Risk/All Risk Property Insurance component of the OCIP shall expressly exclude coverage on **Contractor's** and subcontractors' machinery, tools, and equipment not destined to become a part of the Project Work.

1.02 EXISTING FACILITY OPERATIONS

A. The existing facilities shall remain in operation while the new construction is in progress.

B. The **Contractor** shall coordinate the Work with the **County** so that the construction shall not restrain or hinder the operation of the existing facilities.

C. After having coordinated the Work with the **County**, the **Contractor** shall prepare a submittal in accordance with Specification Section 01014 and 01300 to include the time, time limits, and methods of each connection or alteration and have the approval of the **County** before Work is undertaken on the connections or alterations.

1.03 SEQUENCING

A. General: The **Contractor** shall be solely responsible for all construction sequencing.

B. Notify the **County** at least 48 hours prior to relocating piping or diverting flows.

C. Sequence Submittal:

1. The **Contractor** shall submit to the **County** for review a proposed sequence with appropriate times of starting and completion of tasks.

2. The **Contractor** may propose alternatives to the sequencing constraints shown in this Section in an attempt to reduce the disruption of the operation of the existing facility or streamline the tasks of this Contract. The **County** is not obligated to accept these alternatives.

A. Parking for **Contractor** personnel shall be fully contained within the site boundaries. No parking is permitted on public roads or on streets within the neighborhood. If necessary, the **Contractor** shall make arrangements for remote parking for its personnel, at no additional cost to the **County**.

B. **Contractor** is advised there are numerous pressurized pipes, energized conduits and duct banks, overhead utilities, and gravity flow systems on the site. The **Contractor** shall be responsible for protecting the existing utility lines and shall be responsible for the repair, damages and all cost resulting from construction activities to these systems. In addition to these requirements, the **Contractor** is required to verify the actual locations of various buried lines shown in the Drawings by carefully excavated test pits and other direct means before starting Work in given areas at no additional cost to the **County**. Special care shall be taken during excavation to mitigate damage potential from previously unknown and active systems. Overhead utilities may require raising or relocation to access site.

C. Unless shown otherwise on the Drawings, the **Contractor** shall restore the site to its original grade. Fill placed at the site to return it to its original grade shall be controlled fill, approved by the **County**. The site shall be grassed, strawed, and mowable. Final landscaping, including trees and shrubs, but not including grassing, shall be paid separately.

D. The **Contractor** shall be responsible for maintaining and cleaning the Site Access Road from the date it occupies the Construction Site through the final completion of the construction period.

E. **Contractor** shall grade site, relocate, set up, and connect utilities, including telephone and internet services for office facilities.

END OF SECTION 01011

SECTION 01014
WORK SEQUENCE

PART 1 - GENERAL

1.01 SCOPE

A. Work under this Section includes construction sequencing and providing temporary facilities as necessary to operate the water distribution facilities and prevent (potable water bypasses during the Work. Work shall be scheduled and conducted by the **Contractor** so as to neither impede nor adversely affect any **County** or utility operations.

B. The existing water distribution system is currently and continuously receiving potable water. Those functions shall not be interrupted except as specified herein. The **Contractor** shall coordinate the Work to avoid any interference with normal operation of the distribution system. The **Contractor** shall comply with the following general requirements as applicable:

1. Provide temporary pumps and other facilities necessary to meet the requirements of this Section.

2. Notify the **County** at least 48 hours before starting to relocate piping or taking existing components out of service.

3. Never bypass untreated or partially treated sewage to surface waters or drainage courses. This is strictly prohibited during construction. If the **Contractor's** operations cause accidental bypassing, the **County** shall immediately be entitled to employ others to stop the bypassing, and shall be entitled to do so without written notice to the **Contractor**.

C. Penalties imposed on the **County** because of any bypass caused by the actions of the **Contractor**, its employees, or subcontractors, shall be borne in full by the **Contractor**. This includes legal fees, cleanup, remediation, and other **County** expenses resulting directly or indirectly from the bypass.

1.02 SUBMITTALS

A. Outage Plan: In accordance with the General Conditions, the **Contractor** shall submit a detailed outage plan and schedule for any operations that necessitate removing a pipeline or structure from service. The schedule shall be coordinated with the construction schedule specified in this Section and shall meet the restrictions and conditions specified herein. The detailed plan shall describe the **Contractor's** method for preventing bypassing, the length of time required to complete said operation, the affected facilities, and the equipment the **Contractor** shall provide in order to prevent bypassing.

B. Sequence Submittal: The sequence provided in Part 3 of this Section is offered as a suggestion to the **Contractor**. The **Contractor** shall submit to the **County** for review

and approval a proposed detailed sequence with appropriate times of starting and completion of tasks.

C. Alternate Sequences: The **Contractor** may propose alternate sequences to those shown in Part 3 of this Section if they would reduce disruption of the existing facility's operation or streamline the tasks of this Contract.

1.03 QUALITY ASSURANCE

At least two weeks prior to any proposed activity that will require any portion of the water distribution system to be removed from operation, require bypassing, or interrupt flow, the **Contractor** shall schedule a meeting with DWM operating personnel to discuss the **Contractor's** detailed plan for the proposed operation. The plan shall meet the following minimum requirements:

A. Plan shall be written in outline form and presented in a format that shows the progression of events in sequential and/or concurrent order of activity, along with the duration of each activity.

B. The written plan shall be supplemented by understandable drawings, sketches, and details as required to show the logic of the plan.

C. The plan shall delineate the responsibilities of the DWM operating personnel and the **Contractor**, to eliminate delays from conflicting viewpoints about responsibilities when the plan is plan implemented.

D. After discussion of the plan at the meeting, any agreed changes shall be incorporated into the plan and a copy of the plan and details shall be distributed to DWM operating personnel, the **County**, and **Contractor** at least one week prior to commencement of activities. On the day prior to the commencement of activity, a brief meeting of involved parties shall convene to establish the starting time and initial activity of DWM operating personnel and **Contractor's** personnel.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

The sequence of construction is outlined for the major items of Work required. The **Contractor** shall coordinate its Work with the DWM operating personnel to minimize disruptions of system operation. The **Contractor** shall ascertain that existing facilities are protected and shall not be damaged as a result of this construction. No settlement of existing facilities shall be acceptable. All work shall be performed in a safe manner.

Unless otherwise permitted, no existing valves or equipment shall be operated by the **Contractor**.

3.02 PROPOSED CONSTRUCTION SEQUENCE

The project shall be constructed in five stages to allow continuous operation of the facilities and provide treatment of wastewater to a quality equivalent to the existing secondary treatment plant

or better. The five stages of construction shall generally be performed in sequence, with overlap as required to maintain the treatment facilities in service. The five stages are:

Stage 1 - Preparatory
Stage 2 - Bypass Facilities
Stage 3 - New Pipe, Structures, Valves, and Connections
Stage 4 - Modification to Existing Facilities
Stage 5 - Cleanup and Final Restoration

3.03 REQUIRED SEQUENCES

The following items define the sequence of certain construction steps that shall occur in order to properly and safely operate and maintain the treatment facilities.

3.04 COORDINATION WITH OTHER CONTRACTORS

The performance of the project shall be coordinated with other work going on at the same time on the project site. Certain portions of the project are required to be completed so others can perform their work in a timely manner. The construction schedule prepared by the **Contractor** shall take into account the intermediate requirements depicted on the sequence diagram. The **Contractor** shall bear the responsibility for Work delays that cause delay and damages to other contractors requiring connection to Work under this contract.

3.05 LIMITS OF CONSTRUCTION

Due to the need for other contractors to be performing work on the site, the **Contractor's** access to the site may be limited. The **Contractor** shall have access to some areas of the site only during certain steps during construction. The **Contractor** shall have access to the property defined within the construction limits throughout the project. Additionally, the **Contractor** shall have access to areas within the construction limit of others for only the periods of time required to perform the work.

A. Except where indicated otherwise on the drawings, pipeline and underground construction shall terminate at the construction limit lines indicated on the drawings. The **Contractor** reaching the construction limit first shall be responsible for adequately capping the line to allow both for testing and for easy continuation of or connection to the line by the **Contractor** continuing the line.

B. The **Contractor** may be responsible for performing work within the construction limits of other contractors.

3.06 MISCELLANEOUS CONSTRUCTION

Miscellaneous Work necessary to complete any flow diversion required may include piping, electrical work, diversion plugs, bulkheads, equipment installation, easements, permits, and other activities. The cost for these items shall be included in the **Contractor's** base bid.

END OF SECTION 01014

SECTION 01040
COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

A. The **Contractor** shall coordinate execution of the Work with subcontractors, other contractors working on related **County** projects, and the **County,** as required, to maintain operation of the existing facilities and satisfactory progress of the Work.

B. Requirements of this Section shall be in addition to those stated in the General Requirements.

C. The **County** requires a written explanation of the **Contractor's** plan for coordinating and accomplishing separate phases of the Work, supplemental to the details provided under Section 01310 - Construction Schedule.

1.02 EXISTING UTILITIES

A. Consult with the **County** on a daily basis while the **Contractor** performs demolition, excavation, or any other alteration activity. No water or sewer function, utility, or structure is to be altered, shut off, or removed unless approved in advance, and in writing, by the **County**. The **Contractor** shall give the **County** at least 48 hours advanced notice, in writing, of the need to alter, shut off, or remove such function.

B. Coordinate the Work with the **County** and revise daily activities to avoid adversely affecting system operations. Such revisions in the proposed work schedule shall be accomplished with no additional compensation to the **Contractor**.

END OF SECTION 01040

SECTION 01060
REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 SCOPE

A. The **Contractor** shall, without additional expense to the **County**, be responsible for obtaining National Pollutant Discharge Elimination System (NPDES) permits for discharges from this project to stormwater systems or watercourses, and for complying with any applicable federal, state, county, and municipal laws, codes, and regulations, in connection with the prosecution of the Work.

B. The **Contractor** shall take proper safety and health precautions to protect the Work, the workers, the public, and the property of others.

C. The **Contractor** shall be responsible for materials delivered and Work performed until completion and acceptance of the Work, except for any completed unit of construction thereof that may heretofore have been accepted.

1.02 NPDES PERMITS FOR STORMWATER DISCHARGES

A. The Federal Water Pollution Control Act (also known as the Clean Water Act, or CWA), as amended in 1987, requires NPDES permits for stormwater discharges associated with industrial activity.

B. On November 16, 1990, (55 FR 47990), the U.S. Environmental Protection Agency (EPA) issued regulations establishing permit application requirements for stormwater discharges associated with industrial activity. These are in Section 122.26 of Section 40 of the Code of Federal Regulations (40 CFR Part 122.26).

C. The November 16, 1990 regulation established the following definition of "stormwater discharge associated with industrial activity" at 40 CFR 122.26(b) (14):

"Stormwater discharge associated with industrial activity" means the discharge from any conveyance that is used for collecting and conveying stormwater and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. For the categories of industries identified in subparagraphs (i) through (x) of this subsection, the term includes, but is not limited to, stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. The following categories of facilities are considered engaging in "industrial activity" for purposes

of this subsection:

(x) Construction activity including clearing, grading, and excavation activities except: operations that result in the disturbance of less than five acres of total land area, which are not part of a larger common plan of development or sale

D. These regulations are effective for activities covered by the regulation on or after October 1, 1992.

E. The **Contractor** shall complete EPA Form 3510-2F. A "Guidance Manual for the Preparation of NPDES Permit Applications for Stormwater Discharges Associated with Industrial Activity," as published by EPA, is available to assist the **Contractor** in the application process.

END OF SECTION 01060

SECTION 01100
SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.01 CONNECTIONS TO EXISTING SYSTEMS

The **Contractor** shall perform the Work necessary to locate, excavate, and prepare for connections to the terminus of the existing systems as shown on the Drawings. The cost for this Work and for the actual connection to the existing systems shall be included in the bid price for the project and shall not result in any additional cost to the **County**. Connections shall be made only after approval by the **County**.

1.02 RELOCATIONS

The **Contractor** shall be responsible for the relocation of structures, including but not limited to light poles, signs, sign poles, fences, piping, conduits, and drains that interfere with the positioning of the Work as set out on the Drawings. The cost of such relocations shall be included in the bid price.

1.03 EXISTING UNDERGROUND PIPING, STRUCTURES, AND UTILITIES

A. The **Contractor** shall exercise extreme care before and during excavation to locate and flag various sewer, water, gas, telephone, electrical, or other utility lines not shown on the Drawings to avoid damage. Should damage occur to an existing line, the **Contractor** shall bear the costs associated with the damage and repair the line at no cost to the **County.**

B. The **Contractor** shall note that the locations of existing underground piping structures and utilities are shown without express or implied representation, assurance, or guarantee that they are complete or correct or that they represent a true picture of underground piping to be encountered.

C. The **Contractor** shall notify the **County** of existing piping and utilities that interfere with new construction and shall reroute or relocate the pipeline or utility as directed before any piping and utilities not shown on the Drawings are disturbed. .

D. The **Contractor** shall exercise care in any excavation to locate existing piping and utilities. Utilities that do not interfere with complete Work shall be carefully protected against damage. Any existing utilities damaged in any way by the **Contractor** shall be restored or replaced at the **Contractor's** expense as directed by the **County**.

1.04 HAZARDOUS LOCATIONS

The **Contractor** shall check existing wet wells, manholes, and related areas that are hazardous locations, to determine whether adequate oxygen is available whenever personnel are working in these areas. The **Contractor** shall exercise caution because explosive concentrations of sewage gas may be present and the wet well may be deficient in oxygen.

1.05 CONNECTIONS TO WORK BY OTHERS (Revise or delete as needed for this project)

A. Under this Contract, and as shown on the Drawings, the **Contractor** shall construct pipelines that are to be connected to pipelines constructed by others.

B. The **Contractor** shall connect pipelines built under this Contract to pipelines constructed by others by removing the plugs and making the connection.

C. The **Contractor** shall lay any pipelines (under this Contract) not constructed by others to the required line and grade, terminated with a plugged connection precisely at the location indicated on the Drawings, and then backfilled and marked with a yellow stake exposed a minimum of 3 feet above grade.

1.06 WATER FOR CONSTRUCTION PURPOSES

The Contractor shall be responsible for any cost of water used on the Project. A water meter and backflow device shall be obtained from the DeKalb County DWM main office for recording water used for cleaning and other Work items requiring water.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01100

SECTION 01200
PROJECT MEETINGS

PART 1 - GENERAL

1.01 SUMMARY

A. The **County** shall schedule and administer a preconstruction meeting, and may schedule periodic progress meetings, and specially called meetings throughout progress of the Work. The **County** shall set the agenda for the meetings and preside at the meetings. The **Contractor** shall make physical arrangements for the meetings pursuant to the **County's** requirements. Meetings are not a pay item.

B. Representatives of the **Contractor**, subcontractors, and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.02 PRECONSTRUCTION MEETING

A. The **County** shall schedule a Preconstruction Meeting prior to the start of construction.

B. The Preconstruction Meeting shall be attended by the following:

1. **County's** representative(s)
2. **Contractor's** Project Manager and Superintendent
3. Others as appropriate or required by the **County**

C. The Preconstruction Meeting will generally have the following agenda:

1. Designation of responsible personnel
2. Distribution and discussion of list of major subcontractors and suppliers
3. Projected construction schedule with critical Work sequencing
4. Major equipment deliveries and priorities
5. Procedures and processing of:
    a. Submittals
    b. Requests for Information (RFIs)
    c. Change Documents
        1. Requests for Proposals (RFPs)
        2. Work Authorizations
        3. Proposed Change Order Requests (CORs)
    d. Field Decisions and Clarification Memos
    e. Applications for Payment
    f. Change Orders
6. Procedures for maintaining Record Documents (Section 01350 - Project Document Tracking and Control Systems)

7. Periodic Meeting Schedule

8 Mobilization Form Submittal – **Contractor** shall complete and submit a Mobilizations Request form after the following have been completed:

a. NTP Received
b. Preconstruction Meeting completed and minutes reviewed and accepted
c. Safety Plan, Construction Quality Plan, and Permit/ Easement Plan submitted to and approved by **County**

1.03 PERIODIC PROGRESS MEETINGS

A. Project Progress Meetings shall be held monthly throughout the project duration. The **County** may alter the timing of, or add supplemental, scheduled periodic progress meetings, at its discretion.

B. The Project Progress Meetings shall be attended by the following:

1. **County's** representative(s)
2. **Contractor's** Project Manager, Superintendent, and other appropriate representative(s)
3. Others as appropriate or required by the **County**

C. The Progress Meetings will generally have the following agenda:

1. Review Work progress since last meeting
2. Discussion of Construction Schedule for next period
3. Status of major equipment and material deliveries
4. Construction problems affecting progress
5. Field observations, including Safety Report(s)
6. Status of pending RFIs and changes
7. Stakeholder complaints/public outreach
8. Status of permits and easements
9. Status of invoicing
10. Other business

1.04 OTHER MEETINGS

A. Schedule Progress Meetings

As per Section 01310 - Construction Schedule, during weekly progress meetings, the **Contractor** shall submit a Look-Ahead Schedule. This schedule shall cover four weeks: the immediate past week, the current week, and the forthcoming two weeks. This schedule shall include activities that are complete, started, incomplete or underway, or scheduled to be performed during this four-week timeframe. Results of the Progress meetings shall be reported in the Project Progress Meetings.

B. Specially-called meetings may be requested by either party or by other affected entities. Requests shall be made through the **County**, which shall coordinate the meeting schedule. Specially-called meetings shall be held as warranted by:

1. Unforeseen developments during construction or as needed to coordinate special events, such as tie-ins or system shutdowns

2. Concerns regarding individual project performance and adherence to the schedule of construction

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01200

SECTION 01210
MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.01 BASE BID

Payment for Work under this item shall be based on the lump sum bid and shall include the labor, materials, equipment, and incidentals, including the temporary facilities, required to construct the Project as shown on the Drawings and as specified.

1.02 UNIT PRICE ITEMS

Measurement for payment for Work performed under these items shall be for permanent facilities. Payment shall be based on the actual quantity installed, and shall be based on the unit price bid for the particular item. Payments made shall include labor, materials, equipment, and incidentals required to construct the Work in accordance with the Drawings and Specifications. Any unexpended portion of these Bid Items shall be credited to the **County** on the Final Pay Estimate.

1.03 ALLOWANCES

Measurement and payment for Work performed under this item, when authorized by the **County,** the **County** shall determine the method of payment for any Work so authorized. Any unexpended portion of the Allowance amount shall be credited to the **County** on the Final Pay Estimate.

END OF SECTION 01210

SECTION 01300
SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Preparing and processing of submittals for review and action.
2. Preparing and processing of informational submittals.

B. Submit the following for the **County's** review and action:

1. Shop drawings
2. Product data
3. Samples
4. Submittals indicated as "for approval"

C. Submit the following as informational submittals:

1. Structural design information required by the contract documents
2. Certificates
3. Coordination drawings
4. Reports
5. Qualification statements for manufacturers/installers
6. Submittals indicated as "for information only"

D. Specific submittals are described in individual sections.

E. Do not commence Work that requires review of any submittals until receipt of returned submittals with an acceptable action.

F. Do not allow submittals without an acceptable action marking to be used for the project.

G One copy of each submittal shall be uploaded by the **Contractor** into the software program named by the **County**. The **County** may determine that certain submittals also shall be submitted in hard copy form. A submittal consists of a Submittal Transmittal form from the Contractor and the data submitted for review.

1.02 DEFINITIONS

A. "Shop drawings" are drawings and other data prepared by the entity that is to do the Work, specifically to show a portion of the Work.

B. "Product data submittals" are standard printed data that show or otherwise describe a product or system, or some other portion of the Work.

C. "Samples" are actual examples of the products or Work to be installed.

D. “Informational submittals” are those identified in the Contract Documents as for information only.

1.03 FORM OF SUBMITTALS

A. Sheets larger than 8-1/2 by 14 Inches:

1. Maximum sheet size: 24 by 36 inches (except for full-size pattern or template drawings).
2. Number of copies:
   a. Submittals for review: Three blue or blackline prints
   b. Informational submittals: Three blue or blackline prints

B. Small sheets or pages:

1. Minimum sheet size: 8-1/2 by 11 inches
2. Maximum sheet size for opaque copies: 11 by 17 inches
3. Number of copies shall be the same as for larger sheets

C. Samples:

1. Two sets of each shall be submitted with the original submittal.
2. One set shall be returned.
3. If additional sets are needed by other entities involved in Work represented by the samples, these shall be submitted with original submittal.

1.04 COORDINATION OF SUBMITTALS

Coordinate submittals and activities that shall be performed in sequence or of different types for the same product or system so that the **County** has enough information to properly review each submittal.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 TIMING OF SUBMITTALS

A. Transmit each submittal at the time indicated on the approved construction schedule.

B. Deliver each submittal requiring approval in time to allow for adequate review and processing time, including resubmittals if necessary; failure of the **Contractor** in this respect shall not be considered as grounds for an extension of the contract time.

C. Deliver each informational submittal prior to start of the Work involved, unless the submittal is of a type that cannot be prepared until after completion of the Work; submit promptly.

D. If a submittal must be processed within a certain time in order to maintain the progress of the Work, state so clearly on the submittal.

E. If a submittal must be delayed for coordination with other submittals not yet submitted, the **County** may, at its option, either return the submittal with no action or notify the **Contractor** of the other submittals that shall be received before the submittal can be reviewed.

3.02 SUBMITTAL PROCEDURES - GENERAL

A. **Contractor** review: Sign each copy of each submittal certifying compliance with the requirements of the contract documents.

B. Notify the **County**, in writing and at time of submittal, of points upon which the submittal does not conform to the requirements of the contract documents, if any.

C. Preparation of submittals:

1. Label each copy of each submittal with the following information:
    a. Project name
    b. Date of submittal
    c. **Contractor**'s name and address
    d. Supplier's name and address
    e. Manufacturer's name
    f. Specification section where the submittal is specified
    g. Numbers of applicable drawings and details
    h. Other necessary identifying information

2. Submittals to receive **County's** action marking: Provide blank space on the label or on the submittal itself for action marking: minimum 4 inches wide by 5 inches high.

D. Transmittal of submittals:

1. Submittals shall be accepted from the **Contractor** only.
2. Submittals received without a transmittal form shall be returned without review or action.
3. Transmittal form: The **Contractor** shall use a form acceptable to the **County**, with space provided on the form for:
    a. Project name
    b. Submittal date
    c. Transmittal number
    d. Specification section number
    e. To:
    f. From:
    g. **Contractor**'s name
    h. Subcontractor's and supplier's names
    i. Manufacturer's name

j. Submittal type (shop drawing, product data, sample, informational submittal).
k. Description of submittal
l. Action marking
m. Comments

4. The **Contractor** shall complete a separate transmittal form for each submittal, also including the following:

a. Other relevant information
b. Requests for additional information

3.03 SHOP DRAWINGS

A. Content: Include the following information:

1. Dimensions, at accurate scale
2. All field measurements that have been taken, at accurate scale
3. Names of specific products and materials used
4. Details, identified by contract document sheet and detail numbers
5. Compliance with the specific standards referenced
6. Coordination requirements, including the relationship to adjacent or critical Work
7. Name of preparing firm
8. Design calculations

B. Preparation:

1. Reproductions of contract documents are not acceptable as shop drawings.
2. Copies of standard printed documents are not acceptable as shop drawings.
3. Documents shall be identified as indicated for submittals.
4. Space for **County's** action marking shall be adjacent to the title block.

3.04 PRODUCT DATA

A. Submit product data submittals for each system or unit of Work as one submittal.

B. When product data submittals are prepared specifically for this Project (in the absence of standard printed information), submit such information as shop drawings, and not as product data submittals.

C. Content:

1. Submit manufacturer's standard printed data sheets.
2. Identify the particular product being submitted; submit only pertinent pages.
3. Show compliance with properties specified.
4. Identify which options and accessories are applicable.

5. Include recommendations for application and use.
6. Show compliance with the specific standards referenced.
7. Show compliance with specified testing agency listings; show the limitations of their labels or seals, if any.
8. Identify dimensions, which have been verified by field measurement.
9. Show special coordination requirements for the product.

3.05 SAMPLES

A. Samples:

1. Provide samples that are the same as the proposed product.
2. Where selection is required, provide the full set of options.

B. Preparation:

1. Attach a description to each sample.
2. Attach name of manufacturer or source to each sample.
3. Where compliance with specified properties is required, attach documentation showing compliance.
4. Where there are limitations in availability, deliveries, or other similar characteristics, attach descriptions of such limitations.
5. Where selection is required, the first submittal may be a single set of options; after return of submittal with selection indicated, submit standard number of sets of selected item.

C. Keep final sample set(s) at the Project Site, available for use during progress of the Work.

3.06 REVIEW OF SUBMITTALS

A. Submittals for approval shall be reviewed, marked with appropriate action, and returned. Submittals are reviewed for conformance with project design concept and for compliance with standard of quality established in the Contract Documents. This review shall not relieve the **Contractor** from responsibilities for correctness of detail and dimension, nor from deviation from Contract Document requirements, except as noted and accepted in writing by the **County** at the time of submittal.

B. Informational submittals shall be reviewed.

C. Action markings for submittals for approval shall be as follows:

1. NO EXCEPTIONS TAKEN (NET): Indicate that the submitted item is released for manufacture
2. MAKE CORRECTIONS NOTED (MCN): Indicate that the submitted item is released for manufacture with the submittal complying with the comments
3. AMEND AND RESUBMIT (AAR): Indicates that the submittal shall be revised or a new submittal complying with the comments made shall be prepared.

4. REJECTED (REJ): Indicates that the submitted item does not comply with contract requirements and that another selection shall be made and the submittal process repeated.

5. SUBMIT SPECIFIED ITEM(s) (SSI): Indicates that the submittal shall submit specified item(s) based on the specifications or as stated by the County

Submittals returned with NET or MCN will be considered acceptable submittals provided the Contractor complies with the corrections noted. Any other coding requires action by the Contractor to provide an acceptable submittal before any work is fabricated, manufactured, or constructed and any progress by the Contractor prior to NET or MCN response from DWM will be at the Contractor's risk.

3.07 RETURN, RESUBMITTAL, AND DISTRIBUTION

A. Submittals shall be returned to the **Contractor** through SharePoint.

B. The **Contractor** shall address resubmittals in the same manner as original submittals, with changes other than those requested by the **County,** clearly indicated.

1. Exception: Transmittal number for resubmittal shall be the number of the original submittal plus a letter suffix.
2. Resubmittals shall be submitted within 14 days of **Contractor's** receipt of rejected submittal.

C. Distribution: The **Contractor** shall make one copy for project record documents.

END OF SECTION 01300

SECTION 01310
CONSTRUCTION SCHEDULE

PART 1 – GENERAL

1.01 SCOPE

A. Timely performance is of the essence on this Project. The **Contractor** may schedule its Work to complete the Project or any part of the Project earlier than is stipulated in the Contract and the milestone requirements. However, under no circumstances shall the **Contractor** be entitled to added compensation for delays that occur during the originally stipulated contract period.

B. The **County** has purchased the **Contractor's** entire scheduled time period by virtue of this Contract and further stipulates that only those delays that meet the tests set forth in GR-6 of the General Requirements shall be considered for adjustment and only to the extent that they delay the Work past the originally contractually stipulated milestones.

1.02 PROCEDURES

A. The Work under this Contract shall be planned, scheduled, executed, reported, and accomplished using the Precedence Diagramming Critical Path Method (CPM). The Work required by this section includes the requirement to prepare, maintain, and update the detailed schedules as described in this section. The CPM schedules shall be prepared in such a manner as to permit the orderly planning, organization, and execution of the Work and be sufficiently detailed to accurately depict all the Work required by the Contract. **Contractor** shall resource (labor, material, and equipment) and cost load its schedule as specified herein.

B. **Contractor** hereby agrees that in the process of preparing its baseline schedule and monthly updates, it shall consult with all key subcontractors and suppliers to obtain concurrence with the feasibility and achievability of **Contractor's** planned start dates, sequencing, durations, and completion dates. A copy of the computer input files, in XER format, shall be submitted on USB flash drive(s) containing fully detailed logs with each submittal. The procedures, technical details, and **Contractor**'s participation and responsibilities shall be as hereinafter described.

C. **Contractor** is responsible for determining the sequence of activities; the time estimates for the detailed construction activities; and the means, methods, techniques and procedures to be employed. The schedules identified herein shall represent the **Contractor**'s best judgment of how it shall prosecute the Work in compliance with the Contract requirements. **Contractor** shall maintain a current and accurate schedule that is properly and timely monitored, updated, and revised as Project conditions may require and as required by the Contract Documents.

D. **Contractor**'s Construction Schedule shall be prepared using the latest version of Oracle Primavera P6 Enterprise Project Portfolio Management (P6). Any and all costs incurred by the **Contractor** in researching, training, and/or educating its personnel in CPM and/or P6 (or the utilization of outside consultants) shall be part of the **Contractor**'s bid price and not reimbursed separately by the **County**

1. The Project Network Schedule Diagram, mathematical analyses, written narrative, and monthly updates will be reviewed by the **County**. Items will be reviewed for compliance with these Specifications and accurate reporting by the **Contractor** of Work in place, resource loading, and Work activity durations.

2. The **Contractor** shall submit to the **County** an accepted final CPM construction schedule and final schedule of values, including allowance Items, allocated to the CPM schedule activities within 45 days of Notice to Proceed. Requirements for the final CPM construction and final schedule of values are further described hereinafter. **Contractor**'s Application for Payment shall not be approved until the final CPM Schedule and Schedule of Values have been accepted. The Contract Baseline Schedule submittal shall not show any progress until it is accepted by the **County**

1.03 STANDARDS

A. Definition: CPM, as required by this Section, shall comply with the standards outlined in the Associated General **Contractor**s' publication, "Construction Planning and Scheduling," unless specifically changed by this Section.

B. PM Construction Schedule: The **Contractor**'s CPM Construction Schedule shall include a graphic time scaled logic network, computerized tabular reports, and resource loading as described below. To be acceptable, the schedule shall demonstrate the following:

1. A logical succession of Work from start to finish. This logical succession, when accepted, is the **Contractor**'s Work plan and, contrary to normal CPM standards, is designated as early start/early finish solely to accommodate the P6 software.

2. Clear definition of each activity including cost, manpower, equipment, and material quantities as resources. The assigned dollar value (cost loading) of each activity shall cumulatively equal the contract price.

3. Proper interfacing of related activities including submittals, major material and equipment deliveries, procurement, required permits, and other constraints, such as equipment or manpower/crew availability. Submittal dates shall include review periods and permit schedules shall include agency review and issue dates. The narrative shall explain the rationale for all constraints, lags, and unusual relationships.

4. Agreement with the interim milestones, schedule coordination requirements, and completion dates shall be as indicated in the Contract Documents.

C. CPM Graphic Logic Network

1. The CPM graphic logic network or diagram shall be in the form of a time-scaled diagram of the customary precedence diagram and may be divided into a number of separate pages with suitable notation relating the interface points among the pages. Individual pages shall not exceed 34 inches by 44 inches. At a minimum, notation on each activity line shall include activity descriptions, total float, and durations.

2. All construction activities and procurement shall be indicated in a time-scaled format, and a calendar shall be shown on all sheets along the entire sheet length. Each activity shall be plotted so the beginning and completion dates of said activity can be determined graphically by comparison with the calendar scale. A legend shall be included to clearly distinguish between critical and non-critical path activities and progress to date.

D. Duration: The duration indicated for each activity shall be in units of whole working days and shall represent the single best time considering the scope of the Work and resources planned for the activity including time for holidays and inclement weather. The calendar for the network shall be in calendar days. Except for certain non-labor activities, such as submittal preparation and review, curing concrete, delivering and fabrication of materials, or other activities described specifically in the Contract, activity durations shall not exceed 14 days, be less than one day, nor exceed $50,000 in value, unless otherwise accepted by the **County**.

E. The Interim Schedule and Contract Baseline Schedule shall show dependencies (or relationships) between each activity. Each activity shall have a successor and predecessor, except for the project start and finish milestone. The use of date constraints shall be limited to Contract milestones and Contract completion dates only, unless approved by the **County**. The finish milestone should have a “Finish on or Before” constraint.

F. Contract Baseline Schedule shall contain or be able to demonstrate that the following items have been addressed: 1) the Project’s name; 2) the **Contractor**’s name; 3) revision or edition number; 4) activities of completed Work; e) activities relating to different areas of responsibility, such as subcontracted Work that is distinctly separated from that being done by the **Contractor** directly; 5) labor resources distinguished by craft or crew requirements; 6) equipment and material resources distinguished by equipment and material requirements; 7) distinct and identifiable subdivisions of Work, such as cleaning, pre-liner installation inspection, CIPP installation; 8) locations of Work within the contract limit lines that necessitate different times or crews to perform; 9) outage schedules for existing utility services that will be interrupted during the performance of the Work; 10) phases; and 11) interim milestones and the Contract completion dates.

G. Computerized Tabular Reports: Reports shall include the following for each activity depicted in the schedule.

1. Activity ID
2. Activity description
3. Duration (original and remaining)
4. Early start date
5. Early finish date
6. Total float
7. Percent complete
8. Budgeted Total Cost

9. Actual Total Cost
10. Actual Start Date
11. Actual Finish Date

H. Project Information: Each report shall be prefaced with the following summary data:

1. Project name
2. **Contractor**
3. Type of tabulation (initial or updated)
4. Project duration
5. Project scheduled completion date
6. Projected completion date

1.04 ACCEPTANCE

A. The finalized CPM Construction Schedule shall be acceptable to the **County** when it provides an orderly progression of the Work from Notice to Proceed to Final Completion in accordance with the Contract requirements, adequately defines the **Contractor**'s Work plan, provides a workable arrangement for processing submittals in accordance with the requirements, and properly allocates resource values for manpower, major materials, equipment and costs to each activity (free of unbalances in resources) as determined by the **County**. Manpower may be represented as composite crews in the CPM construction schedule. The network diagram and tabular reports, when accepted by the **County,** shall constitute the CPM construction schedule until revised and re-accepted.

B. When the CPM Construction Schedule has been accepted, the **Contractor** shall submit to the **County**:

1. Three copies of the CPM graphic logic network
2. Three copies of a computerized, tabular report in which activities have been sequenced by early starting date
3. Two copies of the schedule on a USB Flash Drive
4. Three copies of the narrative

C. The **County**'s review and acceptance of the **Contractor**'s CPM Construction Schedule is for conformance to the requirements of the Contract Documents only. Review and acceptance by the **County** of the **Contractor**'s CPM Construction Schedule does not relieve the **Contractor** of any of its responsibility whatsoever for the accuracy or feasibility of the CPM Construction Schedule, or of the **Contractor**'s ability to meet interim milestone dates and the Contract completion date, nor does such review and acceptance expressly or impliedly warrant, acknowledge, or admit the reasonableness of the logic, durations, and resource value loading of the **Contractor**'s CPM Construction Schedule.

D. The **Contractor** shall participate in a conference with the **County** to review the **County**'s comments on the schedule and evaluation of the proposed network diagram, mathematical analyses, and monetary value of activities. The intent is to reach a clearer understanding of the CPM and achieve consensus on any revisions to be made. Any revisions necessary as a result of this review shall be resubmitted to the **County** within 10 calendar days after the conference. The accepted schedule shall then be used by the **Contractor** for planning, organizing, and directing the Work, and for reporting progress. If the **Contractor** desires to make changes in its method of performing the Work, it shall notify the **County** in writing, stating the reason for the changes. The **Contractor** shall receive written acceptance of the change prior to putting the change into the accepted schedule.

1.05 QUALIFICATIONS

A. The **Contractor** shall demonstrate competence in the use of CPM scheduling through the submission of a fully compliant CPM construction schedule with the initial CPM submission. In the event the **Contractor** fails to so demonstrate competence in the CPM scheduling, the **County** may direct the **Contractor** to employ the services of a scheduling firm that can demonstrate competence. The **Contractor** shall comply with such directive.

B. The **Contractor** shall use the services of a scheduler who has verifiable training and credentials in preparing and maintaining computerized CPM Construction Schedules using P6 software as specified herein. The scheduler shall qualify within the planning period.

1. Required Experience: Performed CPM scheduling on at least two completed construction projects of value at least 75 percent as large as this one and having at least 75 percent as many schedule items as this one. Scheduling of both projects shall have been done using the latest version of P6.
2. Submit to the **County** the following:

    a. Descriptions of at least two projects of the value and complexity above.
    b. Copy of a CPM schedule from one of the previous projects.
    c. Names and telephone numbers of facility **County** representative, design engineer, and construction manager for each project.
    d. Evidence supporting the above qualifications.

1.06 SUBMITTAL REQUIREMENTS

A. Initial submittal, revisions, and monthly updates of the network diagram, mathematical analyses, and written narrative shall be submitted in three hard copies and two data copies on a USB flash drive. Submittals shall not be accepted unless they are complete as described herein.

B. The **Contractor** shall submit the following:

1. A CPM time scaled logic network, computer generated using the latest version of P6.
2. Computerized tabular reports:

a. Activity sort by early start, organized by facility or area
b. Predecessor/successor listing
c. Activity code dictionary
d. Resource code dictionary

3. Basis of schedule narrative describing the logic and reasoning of the schedule. The narrative shall summarize the overall approach to construction sequencing, including but not limited to: 1) anticipated lost days due to weather; 2) the rationale for all constraints, lags, and unusual relationships; 3) the definition of labor and crews; 4) a list and durations for all major pieces of equipment and resources; and 5) Work proposed to be performed on any other than single-shift 5-day workweek basis
4. Resource value allocation by activity.
5. Breakdown of specific cost amount for each component of multi-component activities in the CPM schedule in spreadsheet format (using Microsoft Excel) showing component unit quantities as well as costs. Such breakdown, when accepted by the **County,** shall constitute the schedule of values for the Project.
6. USB flash drive copy of entire schedule, narrative, and spreadsheet.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SCHEDULE ORIENTATION SESSION

A. **Contractor** shall, upon notification from the **County**, attend a Schedule Orientation Session relating to the schedules and reports requirements for this Contract. The Schedule Orientation Session is designed to review in detail, the objectives of the schedules and reports requirements and the requirements. **Contractor** shall arrange for its Project Manager, Superintendent, and Scheduler to attend the Schedule Orientation Session.

B. The following items shall be discussed during the Schedule Orientation Session: 1) the procedures and requirements for the preparation of the Contract Baseline Schedule, and monthly updates by **Contractor**; b) how the requirements of the Contract Documents will be monitored and enforced by the **County**; c) how long-lead items and time requirements for the Work by subcontractors shall be identified and included in the Contract Baseline Schedule; d) testing and startup; e) coding and logic for the Contract Baseline Schedule; and f) identification and scheduling of shop drawings and other submittals.

3.02 SCHEDULE OF VALUES

A. Submittals

1. **Contractor** shall allocate a dollar value for each activity on the Contract Baseline Schedule. The dollar value for the activity shall be the cost of the Work, including labor, materials, and equipment. Allowances shall be loaded

on activities specifically included for this purpose. No activity on the Contract Baseline Schedule shall exceed a value of $50,000, unless approved by the **County**. The sum of all activity costs shall equal the Contract Price. **Contractor** shall revise the resource and value loading as necessary to gain the acceptance of the **County**

2. The final schedule of values shall incorporate all comments associated with the **Contractor**'s schedule/schedule of values submittals.
3. Submit documentation to support the values with data that shall substantiate their correctness, as requested by the **County**.
4. The schedule of values, when accepted by the **County**, shall be used as the only basis for the **Contractor**'s applications for payment. The total price paid for mobilization shall be as approved by the **County**, but in no case shall it exceed 4 percent of the total Part I and Part 2 bid amount.
5. The schedule of values shall be derived from the assigned progress schedule activity values and identified by activity ID.

B. Form and content of Schedule of Values

1. Identify the schedule of values submittal with:
   a. Title of Contract and location
   b. Contract Number
   c. Name and address of **Contractor**
   d. Date of submission
2. The **Contractor**'s Schedule of Values shall list the installed value of the component parts of the Work in sufficient detail to serve as the basis for computing values for progress payments during construction.
3. Identify accounts with the location code and area code as defined in the P6 format and list the number and title of the respective major Section of the Specifications.
4. All accounts in the Schedule of Values shall be derived from the activities in the progress schedule. Account data pertaining to the Schedule of Values shall, at a minimum, include the following for each account:
   a. CPM Activity number
   b. **County**'s Standard Code listed on the Bid Schedule
   c. Account representative quantities (linear feet of CIPP, linear feet of cleaning, tons of debris, etc.), unit costs, person-hours, item and account dollar value
   d. WBS code (as used by Primavera Project Planner scheduling software), including location, responsibility and area codes.
   e. Specification Section Number
   f. Account Type: Lump Sum (LS), Unit Price (UP), Allowance (AL), or Change Order (CO)

C. Unit Price Accounts (UP): Payment for Unit Price Accounts shall be based upon actual quantities of Work performed in compliance with the Contract Documents, as verified and accepted by the **County**. Whenever the actual quantity differs from the estimated quantity on the Unit Price Accounts, the **Contractor** shall notify the **County** in writing. Quantity over- and under-runs shall be tracked on the Schedule of Values.

D. Allowance Accounts (AL): Payment for Allowance Accounts shall be based upon invoices submitted by the **Contractor** subject to conditions and limitations of the Contract Documents. Refer to Section 01210 - Measurement, and Payment, for requirements. The Allowance shall be adjusted to the actual amount paid for such services, and adjusted by CO, either at the end of that phase of the Work or at the completion of the Work. The **County** shall have sole discretion on determining when to make adjustments to the Allowance.

E. A new account shall be added to the Schedule of Values for approved CO work. Payment for Time and Expense CO work shall be based upon the General and Supplementary Conditions of these Specifications.

F. The sum of all Account Values listed in the Schedule of Values shall equal the total Contract Price, excluding allowance Items.

3.03 MONTHLY APPLICATION FOR PAYMENT

A. Monthly Application for Payment: **Contractor** shall provide monthly Schedule Update, monthly Payment Report, and monthly Narrative Report as its monthly Application for Payment package.

B. Monthly Schedule Update: The **Contractor** shall submit, at intervals of 30 calendar days, an update of all activities in the as-planned CPM schedule. Update shall be created by updating the mathematical analyses and the corresponding computerized network diagram of the Schedule.

1. The schedule shall be updated by entering the following: Actual start and completion dates of completed activities and the actual start date and remaining duration of activities in progress.
2. The updated network diagram shall be submitted in the same format as noted in Section 1.02 - Procedures, with the calendar starting from the date of the update.
3. The updated mathematical analysis shall be submitted in the same format noted in Section 1.02 - Procedures.
4. The schedule update shall include an update of the cash flow projections in the same format as the original approved submittal.
5. The schedule update shall state the percentage of the Work actually completed and scheduled as of the report date.

C. The Monthly Payment Report shall show the activities or portions of activities completed during the reporting period, their total monetary values and the monetary values earned as a basis for the **Contractor**'s Application for Payment. A mutually agreed upon percent complete shall be assigned to each completed and

partially completed activity to be used for calculating the monetary value earned to date. For activities underway, the percent complete shall not be related to the remaining duration.

D. A monthly narrative report shall be submitted, including, but not limited to, the following:

1. Description of Work accomplished.
2. Summary of safety and quality issues occurring during the month and corrective actions taken.
3. **Contractor** evaluation of actual progress versus progress planned.
4. If the project is behind schedule, progress along all paths with negative float, along with the reasons for the delay.
5. A description of all revisions made to the schedule, including: all accepted added, deleted, and revised activities; all logic revisions; and all duration revisions.
6. A description of the problem areas, current and anticipated delaying factors and their impact, and an explanation of corrective actions taken or proposed.

E. If the **Contractor** fails to submit any of the required components of the Application for Payment, the **County** shall withhold approval of the Application for Payment until such time as the **Contractor** submits the required components.

3.04 PROGRESS MEETINGS AND LOOK-AHEAD SCHEDULES

A. For the weekly progress meetings, the **Contractor** shall submit a Look-Ahead Schedule. This schedule shall cover 4 weeks: the immediate past week, the current week, and the forthcoming 2 weeks. This schedule shall include all activities that are complete, started, are incomplete or underway, or scheduled to be worked during this 4-week timeframe. This schedule shall list all activities from the accepted CPM construction schedule that are complete, are scheduled for Work during the period, are currently planned to be worked, even if out of sequence, and Work that is unfinished but scheduled to be finished. Actual start and completion dates shall be provided for the Work that has been completed the prior week; forecast start and finish dates shall be provided for the Work that is in process or upcoming.

B. The **Contractor** shall review the Project Schedule and progress of Work and comparison with the latest approved baseline schedule. This shall include an analysis of Work accomplished since previous meeting, offsite fabrication status and issues, material delivery status and issues, actual and potential schedule slippage, problems arising from proposed changes, and other factors that might affect the Work

C. Each activity noted above shall be identified by activity number corresponding to the accepted CPM Construction Schedule and detailed description of the activity.

D. The Look-Ahead Schedule shall be delivered to the **County** 24 hours prior to the weekly progress meeting.

E. The Look-Ahead Schedule shall be in an XER and a PDF file

F. Tabular reports for manpower and equipment resources shall be provided for and with each Look-Ahead Schedule.

3.05 CPM CONSTRUCTION SCHEDULE REVISIONS

A. Contract Baseline Schedule shall not change, except as noted below:

1. Significant changes in scope requiring redesign of major project elements and additional time to incorporate the changes

2. Budget constraints deferring construction funding, resulting in placing the project on hold

3. A significant variance in the actual construction contract NTP date and the construction NTP date at the time of award

4. Any approved change orders that result in significant Project Scope Changes, as determined by the **County**

5. Any baseline change shall be accompanied with a Baseline Change Directive.

B. The **County** may direct and, if so directed, the **Contractor** shall propose, revisions to the CPM construction schedule upon occurrence of any of the following instances:

1. The actual physical progress of the Work falls more than 5 percent behind the accepted CPM Construction Schedule, as demonstrated by comparison to the accepted monthly CPM Construction Schedule updates or as determined by the **County** if a current accepted CPM Construction Schedule does not exist.

2. The **County** considers milestone or completion dates to be in jeopardy because of “activities behind schedule.” “Activities behind schedule” are those that have not or cannot be started or completed by the dates shown in the CPM Construction Schedule, regardless of the existence of positive float on the activity.

3. A CO has been issued that changes, adds, or deletes scheduled activities, or that affects the time for completion of scheduled activities.

C. When instances requiring revision to the CPM construction schedule occur, the **Contractor** shall submit the proposed revised CPM Construction Schedule within 10 working days after receiving direction from the **County** to provide such schedule. No additional payment shall be made to the **Contractor** for preparation and submittal of proposed revised CPM Construction Schedules. However, if the **County** accepts the proposed revised CPM Construction Schedule, it shall replace and supersede all previous CPM Construction Schedules and substitute for the next monthly CPM Construction Schedule update that would otherwise be required.

D. Revisions to the CPM Construction Schedule shall comply with all of the same requirements applicable to the original schedule.

3.06 SCHEDULE RECOVERY

A. If a revised CPM Construction Schedule accepted by the **County** requires the **Contractor** to employ additional manpower, equipment, hours of Work or Work shifts, or to accelerate procurement of materials or equipment, or any combination thereof, as schedule recovery measures to meet Contract milestones, the **Contractor** shall implement such schedule recovery measures without additional charge to the **County**.

B. Furthermore, if efforts to recover are not deemed effective as determined by the **County**, or if prior to submittal of the recovery schedule, the **County** determines that critical milestones are in jeopardy, the **County** may direct the **Contractor** to implement the above or any other recovery efforts at no additional costs to the **County**.

3.07 TIME IMPACT ANALYSIS REQUIREMENT

A. When the **Contractor** experiences delays and a time extension is requested, the **Contractor** shall submit to the **County** a written Time Impact Analysis illustrating the influence of all changes or all delays on the current Project completion date. The time impact analysis shall be constructed on an As-Built Schedule Analysis approach. The As-Built Schedule that is created shall incorporate all actual start and finish dates, actual durations of activities, and actual sequences of construction (referred to as the As-Built Logic) current as of the time the Time Impact Analysis is performed. This Time Impact Analysis shall incorporate all delays (including **County**, **Contractor**, and third party delays without exception) in the timeframe that they actually occurred with actual logic ties.

The As-Built Schedule data shall be obtained from the most recent approved monthly schedule update. The As-Built Schedule shall be created as an early start schedule with the actual start and finish dates coinciding with the early start and finish dates from the most recent approved monthly schedule update. The As-Built Schedule shall show the original activity durations equal to the actual duration and the actual logic driving all activities. The **County** shall validate this As-Built Schedule. All requests for time extension shall be based upon an analysis of this As-Built Schedule. The critical path shall be established and all **County** -caused delays on the critical path shall be identified. The time extension shall be based solely upon the cumulative duration of all **County** and third-party-caused delays that are on the critical path. Any time extensions to the project's Interim Milestone Dates, if any, shall be non-compensable time extensions only.

B. Each Time Impact Analysis shall demonstrate the estimated time impact based on the events of delay, the status of construction at that point in time, and the event time computation of all activities affected by the change or delay. The event times used in the analysis shall be those included in the latest approved update of the project schedule, in effect at the time the change or delay was encountered.

END OF SECTION 01310

SECTION 01350
PROJECT DOCUMENT TRACKING AND CONTROL SYSTEM

1.01 SCOPE

A. The **Contractor** shall utilize the **County**'s Project Document Tracking and Control System (DTCS)**.** The primary function of the system is to facilitate timely processing and approval of contract documentation in coordination with the overall Project Schedule established by these Specifications and the **Contractor**. The **Contractor** shall utilize this system for document tracking and control. The software will:

1. Facilitate communication between the **County** and **Contractor**.

2. Support turnaround time with regard to responses and approvals.

3. Provide a central location for Project information to support Project participants in performing their tasks based on the latest Project data.

4. Provide a standard system of project administration with accountability.

B. The **Contractor** shall utilize the web-based system that resides on the DWM server to generate documents in the proper format for submission to the **County**. The **Contractor** shall access the system using a compatible web browser from the **Contractor's** administrative field office location, and/or other locations where Work associated with the Project is being performed.

C. The **Contractor** shall be required to generate Project documents and records utilizing the aforementioned system. The **Contractor** shall be required to transmit and submit the Project documents within the system to the **County**.

D. The **Contractor** shall utilize a high-capacity scanner capable of scanning 11 x 17 documents, double-sided, onsite for the entire duration of the Project. Documents shall be scanned in and attached to the appropriate DTCS document, including submittals, shop drawings, operations & maintenance manuals, and other documents requested by the **County**.

E. The **Contractor** shall utilize the document control system to create and maintain Project documents, including, but not limited to the following:

1. Drawings
2. Submittals
3. Transmittals
4. Risk Register
5. Requests for Information (RFIs)
6. Requests for Proposal (RFPs)
7. Change Requests (CRs)
8. Change Orders (COs)
9. Inspector Daily Reports

10. Field Decisions/Field Changes, and Clarification Memos
11. Notice of Non-Compliance
12. Construction issue memos
13. Final Inspections/Punch lists
14. Meeting Minutes and agendas
15. Correspondence
16. Work Plans
17. Startup Plans
18. Equipment Operations & Maintenance training
19. Spare parts lists

F. The **Contractor** shall utilize the complete capabilities of the DTCS to meet the requirements of this Section. The **Contractor** shall provide a highly trained and experienced construction project controls person knowledgeable in construction work sequencing, productivity, scheduling, and application of the Primavera P6 software system. This person shall have a minimum of 3 years of experience in project controls. This person shall also work closely with the Contractor's management team and the **County** to deliver the documents outlined in this Section.

G. Software Support

The **Contractor** shall be required to establish an internet connection using DSL or better to connect to the DTCS to permit the forwarding and receipt of documents.

H. The **Contractor** shall be responsible for the cost of training for members of its firm or future retraining, as may be deemed necessary by the **Contractor**.

I. The **Contractor** shall meet with the **County** within 15 calendar days after the Contract is awarded to discuss access requirements and the **Contractor's** plan to utilize DTCS and execute the document control functions herein.

J. Access through the internet to the DTCS shall be operational within 30 calendar days following the pre-construction meeting date. This shall be operational from the **Contractor's** administrative field office location.

1.03 DRAWING LOG

The **County** will maintain a log of initial "issued for construction" drawings in the DTCS. Information shall include drawing number, title and revision number. In addition to logging the initial project drawing list, the **County** will maintain a log on the DTCS of subsequent revisions to these drawings and any sketches resulting from clarification memos, RFPs, RFD's, RFS's, , RFIs, Field Orders, Change Requests, Change Directives, and Change Orders (COs). It shall be the **Contractor's** responsibility to utilize the latest drawings and sketches in the performance of the Work.

1.04 SUBMITTALS/SHOP DRAWINGS

Submittal management shall be in accordance with specification 01300. The **Contractor**

shall utilize the DTCS to log and track submittals, as well as generate associated transmittal letters.

A. Guarantees/Warranties: A list of required Guarantee/Warranty submittals shall be entered into the DTCS by the **Contractor**.
B. Work Plans, Startup Plans, O&M Submittals, and Spare Parts: Testing, Startup, and O&M submittals shall be entered into the DTCS by the **Contractor** as individual submittals. These submittals shall be identified as individual submittals within the submittal packages identified.

1.05 CORRESPONDENCE

The **County** shall monitor and manage the correspondence, Non-Compliance Notices, Field Decisions and Clarification Memos, and Construction Issue Memo logs. The **Contractor** shall generate Project correspondence within the DTCS, and forward the correspondence to the **County**.

1.07 RISK MANAGEMENT PLAN AND RISK REGISTER

Contractor shall provide a detailed and specific description of their approach to the management of risks associated with the Project, including permitting, design, construction, and testing and the **County's** operation and maintenance of the Project. Such risks shall include those allocated under the Contract to the County as well as those allocated to the **Contractor**.

Contractor is to develop and maintain a Risk Management Plan that can be used by the **County** to understand and evaluate the **Contractor's** understanding of the biggest risks and challenges to the Project, and how it intends to mitigate such risks. The **Contractor** shall provide sufficient information to enable the **County** to understand this evaluation. The Risk Management Plan shall include:

A. A detailed risk register that identifies Project risk, the likelihood of such risk manifesting itself on the Project, the severity of such risk and a mitigation plan for such risk.

B. An identification of and elaboration upon features of the **Contractor's** Design (if Design-Build type delivery) and Construction Plan that the **Contractor** considers unique and/or innovative relative to reducing or eliminating Project risk.

The **Contractor**, **County and Construction Manager** will review the Risk Register during the Project's progress meetings. The **Contractor** shall update the project Risk Register and provide these updates to the project team through the DTCS system on a monthly basis.

1.08 REQUEST FOR INFORMATION & ANSWERS

The **Contractor** shall be responsible for generating RFIs on the DTCS system. The **Contractor** shall notify the **County** when an RFI is submitted. The **County** will monitor and manage the RFI log. The **County** will generate an Answer document in response to each RFI and forward them to the **Contractor**. The

DTCS shall track “Ball in Court” for RFIs and Answers, as well as date of original generation and response date. In addition, the RFIs shall reference the relative Specification Section and Drawings. The DTCS shall identify the date of the request and the originator, responsible party for a response and the date of the response.

1.09 CHANGE DOCUMENTS

Change documents include Request for Proposals (RFPs), Change Requests (CRs), and Change Orders (COs). Change documents will be monitored and managed by the **County** utilizing the DTCS.

1.10 DAILY INSPECTION REPORTS (DIR)

Each Construction Management (CM) inspector shall prepare a DIR for each day of work the inspector is at a fabrication facility or the construction site. The CM shall review reports and compile them, along with any QC records provided by the Construction Contractor (CC) for the work and any independent materials testing or survey results, in an overall “daily record” for entry into the CIP Program SharePoint site. The CM is responsible for approving DIRs and archiving them. DIRs shall be used to record the weather for the day, CC equipment and labor resources observed to be working, and inspections performed, observations, significant daily events, problems, and communications pertaining to the quality of the work. Entries shall be clear, concise, and factual. Personal opinions are not to be recorded. Inspections will be documented in detail recording how the work is being done, comparing the work to the Contract documents, and making a statement as to whether the work is in compliance with the Contract documents, including environmental compliance requirements.

DIRs include the following information:

• Project name, contract number, date, and QA inspector’s name
• Weather conditions
• CC’s name and resources (labor and equipment on each item of work inspected)
• Sub-contractors on site and work being performed
• Schedule activity for each item of work inspected
• Hold or witness points inspected
• Observations of inspections and time of inspection, including out of sequence schedule
activities observed
• Description of deficiencies issued and/or corrected and status of open deficiencies
• Re-inspections of work resulting in close-out of non-conformances
• Site visitors
• Photos and videos documenting the work—at least one per day for each work day; aerial
photographs (via drone or other means) are welcome

1.11 PUNCH LISTS

The **Contractor** will monitor and manage punch lists, and will create punch lists to be forwarded to the **County**. The **Contractor** shall address the punch list items that have been assigned to the **Contractor** and forward updates to the **County**. Once accepted as complete, the **County** will access the punch list in the DTCS and close it out.

1.12 MEETING MINUTES AND AGENDA

The **Contractor** will monitor and manage the meeting minute process. The **Contractor** will forward meeting minutes to the **County** electronically. The **Contractor** will log the meeting minute items into the DTCS within 3 days of the meeting date.

1.13 PROGRESS PAYMENTS /REQUISITIONS FOR PAYMENT

The Contractor is responsible for submitting monthly progress payment applications along with an update of the approved project schedule and a schedule summary. Progress payment applications shall be submitted by the last Friday of each month and as specified in Section 01310. Maintenance of the "As-Built" record documents by the **Contractor** shall be verified before processing shall be approved. Failure of a **Contractor** to maintain project record documents, maintain current and properly prepared daily reports, or submit the project schedule update per Section 01310 shall be just cause for withholding the monthly or final payment.

+++END OF SECTION 01350+++

SECTION 01380 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

The **Contractor** shall clearly document site conditions along the entire project site prior to the start and upon the completion of the project/contract by use of digital video recording. The cost of the photographic documentation shall be included in the Contract Price.

The **Contractor** shall submit monthly color progress photos along the entire line of the active Work site. Monthly record progress photographs shall be submitted with monthly payment requisition. Photographs shall document construction within roadways, rights-of-way, and easements,

The **Contractor** shall engage the services of an experienced professional photographer, approved by the **County**, to take videos, color photographs of the site as directed by the **County**.

1.02 PROCEDURES

A. The digital video recording and periodic still photographs shall be taken from identifiable reference points along the Work corridor. The same reference points shall be used through the life of the project/contract to achieve an accurate record of construction.

B. The **Contractor** shall adequately document areas of sensitivity such as landscaped areas, lake or stream banks, or areas surrounding existing structures.

C. Each photograph, video, or digital file of such submitted shall be dated, identified, and captioned, referencing the location, project name, project number, and pertinent information to clearly describe the scene.

D. Recording shall be done with adequate lighting. Written authorization by the **County** to proceed with video documentation at any areas shall be done with consideration of existing environmental conditions. The designee of the **County** will accompany the photographer during the video and photo sessions.

E. **Contractor** shall notify **County** of the time and place for video recording and digital photography. **Contractor** shall provide access and accommodation to the **County** representative during the photographic documentation process. The **County** reserves the right to reject any photograph that is not clear or definitive. Any photograph so rejected shall be subtracted from the total exposures required under this Contract.

F. The DTCS (Document Tracking Control System) shall be utilized by the **County** and the **Contractor** for the duration of the Project. The daily construction photographs shall be the permanent visual record of the pre-construction conditions, daily construction site activities, and the completion of construction Work. The **Contractor** shall submit to the **County** no fewer than four record

photos for each activity ID listed in the project schedule per the last schedule update. Applicable photos shall accompany each Pay Application.

1.03 VIDEOS

A. The project corridor shall be documented by digital video recordings.

B. All digital video recordings shall be in color and shot with a 1080 HD (1920 x 1080) using MPEG-4 program stream encoding (ISO-IEC 14496-14) camera and shall be a clear, stable image with no interference. Black and white recordings shall not be accepted. The video shall be provided on Digital Video Discs (DVDs) or USB Flash Drives and shall conform to currently recognized standards for video recordings. Specifically, the recordings shall be in focus and properly illuminated with good contrast. The picture shall be clear and possess accurate color levels and balance (tint) without outside interference. All recordings shall also include a clear and distortion free audio narration that clearly identifies all, important features of the project, including stationing along pipeline construction, and is in synchronization with the video. The recording shall bear a continuous "date and time stamp" that is electronically recorded by the camera.

C. A record of the contents of each recording shall be provided on a run sheet, identifying each chapter segment of the recording. The run sheet shall be provided in paper copy as well as on the flash dive or hard drive.

1.04 PHOTOGRAPHS

A. The file format for digital photographs shall be Tagged Image File Format (TIFF).

B. Digital cameras shall produce records with true optical resolution. Images shall not be resized or interpolated to a higher resolution from a lower resolution.

C. Photographic images shall be provided as 8 bit per channel RGB color images.

D. Digital camera files shall be captured as 12 megapixel files or greater in size with a minimum pixel array of 5,000 pixels by 3,500 pixels.

E. Three color 8” x 10” (or 8-1/2” x 11”) glossy prints of each photograph shall be produced. One set of digital images shall be furnished on a DVD along with the glossy prints. All disks shall have a label that includes project information as well as the date, and whether these are pre-construction, construction, or post-construction photographs.

F. The prints shall have indelibly printed on their reverse side the information listed below. The same information shall be printed on a sheet of paper in a clear sleeve to be included in the binder holding the prints and DVD+R. The information shall also be provided in a Microsoft Excel spreadsheet that shall be included on the DVD. Additionally, this information shall be embedded in each digital photo file using the IPTC/XMP (International Press Telecommunications Council's/Adobe Extensible Metadata Platform) Standard.

1. Project number

2. Project name
3. Contract number and description
4. Photo number
5. View and description, indicating:
    a. Location of camera
    b. General description of what the photograph represents
6. Whether this is a pre-construction, construction or post-construction photograph
7. Date picture was taken
8. Name of photographer
9. **County** witness

G. The **Contractor** shall transmit one electronic copy of each photo to the Engineer for use in preparing descriptions. The photos with descriptions will be returned to the **Contractor** for printing and mounting.

H. The prints shall be suitably mounted and labeled in loose-leaf type binders with protective covers for the prints. The binders shall be equipped with a pocket suitable for storing the DVDs. The materials shall meet the requirements of ISO 18902:2013 "Imaging materials - Processed Imaging Materials – Albums, Framing and Storage Materials."

1.05 SUBMITTALS

A. The **Contractor** shall furnish to the **County** for approval one copy of the video digital file taken of existing conditions prior to start of the Project and before the submittal of the first request for payment. The video digital file shall be assembled upon completion of the Project and shall be furnished to the **County** for approval prior to submittal of the final request for payment. No pay requests shall be processed before the submittal of the respective video records.

B. **Contractor** shall utilize the **County** DCTS Software to submit videos and progress photographs in electronic format for the duration of the project in accordance with Section 01350.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 USE OF PHOTOGRAPHS AND VIDEOS

A. Upon their creation, the photographs, prints, DVDs, and videos resulting from the Work under this Contract shall become the exclusive property of the **County**.

B. Neither the **Contractor** nor the photographer nor the video recording firm shall retain any rights pertaining to the photographs, prints, CDs/DVDs, or videos, nor shall they reproduce or otherwise publish or disseminate any of the photographs, aerials, prints, CDs/DVDs, or videos taken under this Contract without the prior written approval of the **County**.

C. The photographs, prints, CDs/DVDs, and videos shall be considered "Work made for hire" under applicable provisions of the Copyright Act, and the **County** shall be the copyright owner thereof and of the aspects, elements, and components thereof in which copyright protection might subsist. To the extent that such materials do not qualify as "Work made for hire," the **Contractor** hereby irrevocably transfers, assigns, and conveys exclusive copyright ownership in and to such materials to the **County**, free and clear of any liens, claims, or other encumbrances. The agreements between the **Contractor** and the photographer and videotaping firm shall include a provision containing these requirements.

+++END OF SECTION 01380+++

SECTION 01400
Contractor's Work Quality

PART 1 GENERAL

1.01 SECTION INCLUDES

A. **Contractor**'s Quality Assurance / Quality Control Requirements

B. Experience and Qualifications of Supply and Service Companies

C. Quality of Materials, Equipment, and Work

D. Defective Work, Equipment, or Materials

E. Welding Certification and Welding Inspection

F. **Contractor**'s Surveyor

G. Field Measurements

1.02 PAYMENT

No separate payment shall be made for performing any Work of this Section and costs thereof shall be deemed incidental to the Work and included in the prices bid for the Contract, unless otherwise specified in the Detailed Specifications.

1.03 RELATED SECTIONS

Detailed Specification 01410.

1.04 DESCRIPTION

A. Experience and Qualifications of Supply and Service Companies: The **Contractor** shall require subcontractors, materialmen, and equipment service providers to comply with the accepted Health, Safety & Security Plan, and Quality Assurance requirements under the Contract.

B. Quality of Materials, Equipment and Work

1. All materials, fixtures, fittings, supplies, and equipment furnished under this Contract shall be new, of standard first grade quality, of the best workmanship, correctly designed, and be intended for the use for which they are offered. Materials or equipment that, in the opinion of the **County**, are inferior or of a lower grade than indicated, specified or required, or are obsolete, shall not be accepted.

2. All Work of assembly, installation, and construction shall be done in a neat, first-class, and skillful manner. If the quality of the material, fixtures, fittings, supplies, equipment or Work required by the Drawings does not agree with that required by the Specifications, the better quality shall be supplied. In asking for prices on, or placing orders for, materials, fixtures, fittings, supplies, and equipment intended for use or installation under this

Contract, the **Contractor** shall provide the manufacturer or dealer with such complete information from these Specifications as may in any case be necessary. In every case, it shall quote in full to each such manufacturer or dealer the text of this subparagraph, as well as the text of such other portions of the Specifications, as are appropriate.

3. At all times while Work under this Contract is being performed, the **County** shall have access to all parts of the **Contractor**'s or manufacturers' plants or other locations where the forgings, plates, materials, fixtures, fittings, supplies, or any other articles required under this Contract are manufactured, assembled, tested, or inspected. The **County** shall be permitted to witness any or all of these operations, as the **County** may deem necessary to determine that the Work is being performed in accordance with the Specifications and the approved shop drawings. The cost, if any, of providing such access shall be considered part of the normal expense of conducting business and therefore non-reimbursable.

4. The **County** shall be furnished with full facilities for inspecting the Work and ascertaining that it is being done strictly in accordance with the requirements of the Specifications, Drawings, and the intent of this Contract.

5. The **Contractor** shall provide a suitable space for the **County** and the **County**'s authorized representatives conveniently located near that part of each plant where materials or equipment to be furnished under this Contract are being manufactured, assembled, or shop tested. Each space shall be furnished with facilities for the making and the keeping of records and correspondence. The reasonable use of a photocopier, telephone, and fax shall be provided, as required by the **County**. Long distance communications shall be made using **County** mobile telephones at no cost to the **Contractor**.

6. The **Contractor** shall give notice in writing to the **County** sufficiently in advance of its intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction in the event that the **County** intends to perform Witness Shop Testing and Quality Assurance Inspection. Such notice shall contain the date of commencement and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the **County** will: decide upon its intent to inspect the Work or notify the **Contractor** that inspection will be waived. In those instances where the **County** inspector(s) arrive at the agreed-upon location, at the agreed-upon date and time, and find that the article(s) to be inspected are not ready for inspection, the inspector(s) shall return to their home office and the expenses incurred shall be borne by the **Contractor** and shall be deducted from the **Contractor**'s next payment, unless otherwise determined by **County**.

7. Inspection of the Work by the **County** is made solely for the benefit of the **County**. The inspection of the Work shall not relieve the **Contractor** of any of its obligations to fulfill the Contract as herein prescribed, and defective Work shall be repaired or replaced at the **Contractor**'s sole expense.

C. Defective Work, Equipment, or Materials

1. All defective or imperfect Work, equipment, or materials furnished by the **Contractor** that is discovered before the Final Acceptance of the Work, or during a warranty period, shall be removed immediately even though it may have been overlooked by the **County** and approved for payment. The **Contractor** shall repair such defect, without compensation, in a manner satisfactory to the **County**.

2. Unsuitable materials and equipment shall be rejected, notwithstanding that such defective Work, materials, and equipment may have been previously overlooked by the **County** and accepted or approved for payment.

3. If any workmanship, materials, or equipment are rejected by the **County** as unsuitable or not in conformity with the Specifications or Drawings, the **Contractor** shall promptly replace such materials and equipment with acceptable materials and equipment at no additional cost to the **County**. Equipment or materials rejected by the **County** shall be tagged as such and shall be immediately removed from the site.

4. The **County** may order tests of imperfect or damaged Work equipment, or materials to determine the required functional capability for possible acceptance, if there is no other reason for rejection. The cost of such tests shall be borne by the **Contractor**, and the nature, tester, extent, and supervision of the tests shall be as determined by the **County**. If the results of the tests indicate

that the required functional capability of the Work, equipment, or material was not impaired, the Work, equipment, or materials may be deemed acceptable, in the discretion of the **County**. If the results of such tests reveal that the required functional capability of the questionable Work, equipment, or materials has been impaired, then such Work, equipment, or materials shall be deemed imperfect and shall be replaced. The **Contractor** may elect to replace the imperfect Work, equipment, or material instead of performing the tests.

5. If, in the making of any test, it is ascertained by the **County** that the material or equipment does not comply with the Contract, the **Contractor** will be notified thereof, and it will be directed to refrain from delivering said material or equipment, or to promptly remove it from the site or from the Work and replace it with acceptable material without cost to the **County**. Upon rejection of any material or equipment submitted as the equivalent of that specifically named in the Contract, the **Contractor** shall immediately proceed to furnish the named material or equipment.

D. Welding Certification and Welding Inspection

1. For Work performed within the limits of the **County**, field welding required under this Contract shall be performed by certified welders:

   a. Certification for Welding – For field and shop welding, the following welding qualification provisions shall apply:

      i. For field welding, required permits and safety plans shall be in place and adhered to.

      ii. For shop welding: welding shall be performed in accordance with the relevant Work-specific requirements in the Specifications and Drawings.

      iii. If existing certification is not approved or not submitted, then the welders/welding shop/tack welders shall be qualified in accordance with the above procedures and tests, as administered by an inspection agency approved by the **County**. The costs associated with the required tests for certification and/or retests, if any, shall be borne by the **Contractor**. The **County** shall be given a notice of not less than 5 business days prior to such tests and may elect to witness any or all of these tests. The costs associated with witnessing these tests shall be borne by the **Contractor**.

   b. Any deviation from the above shall not be permitted without a written waiver from the **County** or its designee.

2. All welding, including welder certification, shall be performed in accordance with the requirements of AWS D1, ASME IX (and the applicable construction code), and as approved by the **County**.

3. Welding inspection shall be in accordance with the latest rules of the American Welding Society, and the following shall apply:

   a. All welds shall be inspected visually in accordance with Section V of the ASME Code.

   b. All stainless steel partial penetration groove welds shall be inspected and approved by means of Liquid Penetrant Examination (PT) in accordance with Appendix 8 of Section VIII, Division 1 of the ASME Code. Welds failing the inspection shall be made good and re-inspected by PT.

   c. All carbon steel partial penetration groove welds shall be inspected and approved by means of Magnetic Particle Examination (MT) in accordance with Appendix 6 of Section VIII, Division 1, of the ASME Code. Welds failing the inspection shall be made good and re-inspected by MT.

   d. On full penetration welds, both the root pass and the final weldment shall be inspected by means of MT or PT as applicable.

   e. Unless otherwise approved, inspection of welds shall be conducted by an inspection agency approved by the **County**.

   f. Unless waived by the **County**, full-penetration welds shall be inspected by Radiographic Examination (RT) in accordance with ASME Code, Section VIII, Division I, Paragraph UW-51.

   g. The **County** may elect to witness any or all of the welding inspection. Notice shall be given to the **County** not less than 5 business days prior to welding and inspection of those items specifically designated by the **County**. The costs associated with the welding inspection by the **County** inspectors and any additional testing required by the **County** shall be borne by the **Contractor**.

E. **Contractor**'s Surveyor

1. The **Contractor** shall retain the services of a licensed land surveyor to perform survey Work, including, but not limited to, establishing line and grade, in advance of the construction; and to perform other surveying services for the Work included under the Contract. The surveyor shall be subject to the approval of the **County**. Survey drawings shall be submitted to the **County** for approval.

2. The **Contractor** shall erect, install, and maintain survey platforms, targets, benchmarks, and similar facilities to be used by the **County** in the performance of its inspection services; and shall perform survey Work required before, during, and after construction.

F. Field Measurements

1. The **Contractor** shall take the necessary measurements in the field to determine the exact dimensions for Work and verify pertinent data and dimensions shown on the Contract Drawings.

1.05 QUALITY ASSURANCE / QUALITY CONTROL PLAN

A. The **Contractor** shall establish and execute a Quality Assurance/Quality Control (QA/QC) Plan for the services and equipment that will be supplied under this Contract. The plan shall provide the **Contractor** with adequate measures for verification and conformance to defined requirements by its personnel and subcontractors, fabricators, suppliers, and vendors. The **County**'s review and acceptance of the **Contractor's** QA/QC plan shall not relieve the **Contractor** from any of its obligations for the performance of the Work. The **Contractor**'s assigned QA/QC personnel are subject to the **County**'s review and continued acceptance. No Work covered by the QA/QC plan shall start until the **County**'s written acceptance of the **Contractor**'s QA/QC plan has been obtained.

B. The **Contractor**'s quality control organization with lines of authority and reporting structure. The Construction Quality staffing shall include a Construction Quality Manager and a supporting staff as applicable to the project. The reporting structure shall clearly provide for direct reporting access by the Construction Quality Manager to the **Contractor**'s principal officers.

C. The names, qualifications (in resume format), duties, responsibilities, and authorities of the Construction Quality Manager and staff. Construction Quality personnel qualifications (in resume form), including copies of each member's applicable certificates of training and/or qualification.

D. A copy of a letter to the Construction Quality Manager signed by a principal officer of the **Contractor**'s firm that describes the responsibilities of the Construction Quality Manager and establishes his/her authority, including authority to stop Work that does not conform with the Contract Documents. The Construction Quality Manager shall issue letters of direction to other Construction Quality staff outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the CIP PMT and CM.

E. A copy of a letter to the Construction Quality Manager signed by a principal officer of the **Contractor's** firm that describes the responsibilities of the Construction Quality Manager and establishes his/her authority, including authority to stop Work that does not conform with the Contract Documents. The Construction Quality Manager shall issue letters of direction to other Construction Quality staff outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the CIP PMT and CM.

1.06 SUBMITTALS

A. Within 15 days after the commence Work date given in the Notice to Proceed (NTP), the **Contractor** shall provide its QA/QC plan to the **County** for approval. At a minimum, the plan shall consist of the following quality elements:

1. Responsibilities
2. Management and Production Instructions
3. Material Control
4. Marking and Material Identification
5. Setup and Operational Procedures
6. Non-Conformances
7. Painting

B. Additionally, when required by the **County**, the **Contractor** shall submit the following information prior to his entering into a supply or service subcontracts:

1. Contract number, supplies or services to be provided and a general description of the proposed item(s), such as trade name, type, etc.
2. The name and address of the manufacturer or service company and the location of the plant where supplies will be manufactured and tested as required, or at which the services will be performed.
3. Experimental and test data required to support the claimed performance of the supplies.
4. A description of the testing plant, including the hydraulic, electrical and other facilities, in sufficient detail to show that the plant is adequately equipped for performing the tests, if such testing is required.
5. All additional information that the **County** may deem necessary in order to determine the ability of the supply or service company to produce the item as called for by the Specifications.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

1.01 Quality Deficiency and Non-Conformance Documentation

Quality Deficiencies and Non-Conformances are defined as documentation, drawings, material, and equipment or Work not conforming to the specified requirements or procedures. The **County** will implement and maintain a three-tier non-conformance process, as follows:

A. Deficiency Notice (DN) – The lowest level of non-conformance reporting. It documents the deficient condition and provides the **Contractor** 72 hours, or before the Work is covered, to correct the issue before it is elevated to the next

level of reporting. It is issued for deficiencies that can be easily corrected without an engineering resolution. An example would be incorrect formwork dimensions observed prior to placement of concrete.

B. Non-Conformance Report (NCR) - The second level is an NCR that documents deficient Work that has not been corrected, or that would require an engineering solution to remedy. NCRs shall be answered in writing by the **Contractor** within 24 hours. The **Contractor** shall not be allowed to progress items for payment if it has open NCRs.

C. Corrective Action Request (CAR) – The highest level of non-compliant reporting. CARs are issued for programmatic and repetitive non-compliant conditions. Examples of CARs would be using the wrong drawing revision in the field (programmatic) and a condition where the same type of Work has multiple NCR issues over a short period of time (repetitive). CARs cannot be answered by the **Contractor** field staff. They shall be transmitted to the **Contractor**'s senior level management for response.

+++END OF SECTION 01400+++

SECTION 01410
TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 SCOPE

A. Testing shall be performed to determine that materials provided for the Work meet the specified requirements, in accordance with the requirements of the Specifications. Such testing includes, but is not necessarily limited to:

1. Cement
2. Aggregate
3. Concrete
4. Concrete block
5. Pipe
6. Steel and metals
7. Welding
8. Soil compaction
9. Bituminous pavement

B. Requirements for testing may be described in various sections of these Specifications; where no testing requirements are described, however if the **County** decides that testing is required to demonstrate compliance with specified material or performance standards, the **County** shall require testing to be performed under current pertinent standards for testing.

C. Employment of a testing laboratory shall in no way relieve the **Contractor** of its obligation to perform Work meeting the requirements of the Contract.

D. The independent testing laboratory shall be selected and paid by the **Contractor** and approved in writing by the **County** before any testing services are performed.

E. The **Contractor** shall pay directly for the services of the independent testing laboratory, approved by the **County**, for all testing required under this Contract.

1.02 LABORATORY DUTIES

A. Cooperate with **County** and **Contractor**.

B. Provide qualified personnel promptly on notice.

C. Perform specified inspections, sampling, and testing of materials and methods of construction.

1. Comply with specified standards, ASTM, other recognized authorities and as specified.

2. Ascertain compliance with requirements of Contract Documents.

D. Promptly notify the **County** and **Contractor** of irregularity or deficiency of Work that is

observed during performance of services.

E. Promptly submit three copies (two copies to **County** and one copy to **Contractor**) of report of inspections and tests in addition to those additional copies required by the **Contractor,** including:

1. Date issued
2. Project title and number
3. Testing laboratory name and address
4. Name and signature of inspector
5. Date of inspection or sampling
6. Record of temperature and weather
7. Date of test
8. Identification of product and Specification section
9. Location of Project and test
10. Type of inspection or test
11. Results of test
12. Observations regarding compliance with Contract Documents

F. Perform additional services as required.

G. Laboratory shall not be authorized to:

1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of Work.

1.03 CONTRACTOR RESPONSIBILITIES

A. Cooperate with laboratory personnel; provide access to Work and/or manufacturer's requirements. **Contractor** shall not charge for downtime due to required testing.

B. Provide to laboratory, preliminary representative samples, in required quantities, of materials to be tested.

C. Furnish copies of mill test reports.

D. Furnish required labor and facilities:

1. To provide access to Work to be tested

2. To obtain and handle samples at the site

3. To facilitate inspections and tests

4. Build or furnish a holding box for concrete cylinders or other samples as required by the laboratory

E. Notify laboratory sufficiently in advance of operation to allow for the assignment of personnel and schedules of tests.

F. Laboratory Tests: Where such inspection and testing are to be conducted by an independent laboratory agency, the sample or samples shall be selected by such

laboratory or agency or the **County** and shipped to the laboratory by the **Contractor** at **Contractor**'s expense.

G. Copies of the correspondence between the **Contractor** and testing agencies shall be provided to the **County**.

1.04 QUALITY ASSURANCE

Testing, when required, shall be in accordance with all pertinent codes and regulations and with procedures and requirements of the American Society for Testing and Materials (ASTM).

1.05 PRODUCT HANDLING

Promptly process and distribute all required copies of test reports and related instructions to insure all necessary retesting or replacement of materials with the least possible delay in progress of the Work.

1.06 FURNISHING MATERIALS

The **Contractor** shall be responsible for furnishing all materials necessary for testing.

1.07 CODE COMPLIANCE TESTING

Inspections and tests required by codes or ordinances or by a plan approval authority, and made by a legally constituted authority, shall be the responsibility of and shall be paid for by the **Contractor**, unless otherwise provided in the Contract Documents.

1.08 CONTRACTOR'S CONVENIENCE TESTING

Inspection or testing performed exclusively for the **Contractor's** convenience shall be the sole responsibility of the **Contractor**.

1.09 SCHEDULES FOR TESTING

A. Establishing Schedule

1. The **Contractor** shall, by advance discussion with the testing laboratory, determine the time required for the laboratory to perform its tests and to issue each of its findings, and make all arrangements for the testing laboratory to be onsite to provide the required testing.

2. Provide all required time within the construction schedule.

B. When changes of construction schedule are necessary during construction, coordinate all such changes of schedule with the testing laboratory as required.

1.10 TEST AND CERTIFICATIONS

A. General: As a minimum, the following tests shall be performed and the following certifications provided:

1. Cement: Certified test results by cement manufacturer or by independent laboratory shall be furnished as required by the **County**.

2. Aggregate and Mortar Sand: Certified test results by aggregate producer or by independent laboratory shall be furnished as required by the **County**.

3. Concrete

   a. At least five standard 6-inch cylinders shall be taken each day for each 100 cubic yards or fraction thereof for each class of concrete used.
   b. The number of cylinders, the point of sampling, and the method of securing the samples shall be determined by the **County**.
   c. All samples shall be taken to the testing laboratory for laboratory curing.
   d. Two of the laboratory cured samples shall be tested at 7 days, two samples tested at 28 days; one sample held in reserve.
   e. Test all concrete in accordance with ASTM C31-69, C39-71, and C-172.
   f. Slump Tests
      (1) Perform slump tests on the job in accordance with ASTM standards.
      (2) One slump test shall be performed for each 25 cubic yards of concrete.
      (3) More slump tests shall be performed if deemed necessary by the **County**.
   g. Perform air entrainment tests in accordance with the following standards:
      (1) Field tests - ASTM C 173
      (2) Laboratory tests - ASTM C 231

B. Precast and Concrete Block for Buildings

1. Block and precast may be visually inspected on the site by the **County**.

2. The **County** reserves the right to have the concrete block tested by an independent laboratory.

C. Steel and Miscellaneous Metal: Reinforcing steel, structural steel, and miscellaneous metal may be inspected visually on the site by the **County**.

D. Welding: 1 percent minimum of all structural welds during construction shall be inspected either visually or by an independent laboratory as required by the **County**.

E. Compaction of Earthwork

1. The compaction shall be tested by an independent laboratory.

2. The testing shall be performed in a manner in accordance with these Specifications.

F. Bituminous Concrete: The material testing for the bituminous concrete shall be performed by an independent laboratory as deemed necessary by the **County**.

1.11 TAKING SPECIMENS

Unless otherwise provided in the Contract Documents, all specimens and samples for tests shall be taken by the testing laboratory or the **County**.

1.12 TRANSPORTING SAMPLES

The **Contractor** shall be responsible for transporting all samples, except those taken by testing laboratory personnel, to the testing laboratory.

+++END OF SECTION 01410+++

SECTION 01500
TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 SCOPE

A. The **Contractor** shall provide the temporary facilities necessary for the proper completion of the Work, as necessary and as specified.

B. Maintain temporary facilities in proper and safe condition through the progress of the Work. In the event of loss or damage, immediately make repairs and replacements necessary subject to approval of the **County** and at no additional cost to **County**. At completion of the Work remove such temporary facilities or as directed by the **County**.

C. The ownership of the trailers for **County**'s facilities shall remain with the **Contractor**. However, the office furnishings and equipment provided by **Contractor** under this section of specifications shall remain as **County** properties. At completion of the Work, move the office furnishings and equipment to a location designated by the **County**.

1.02 REQUIREMENTS

A. General

1. The materials, equipment, and furnishings provided under this Section shall be new, and shall meet applicable codes and regulations.

2. Make provisions, and pay the costs of furnishing, installation, maintenance, professional services, permit fees, and site Work for the temporary facilities.

B. Construction

1. Temporary buildings shall be structurally sound, weather tight, with floors raised above ground. The mobile/modular buildings shall comply with GA-DCA/SBCC/ADA requirements, and shall be Williams-Scottsman or approved equal.

2. Temporary buildings shall have temperature transmission resistance compatible with occupancy and storage requirements.

1.03 CONTRACTOR'S FACILITIES

A. Submit a plan of the facilities layout to **County** for approval within 15 days of the Notice to Proceed. **Contractor's** plant, for purposes of this Section, is defined to include but not limited to its field offices, first aid station, sanitary facilities, storage facilities, and major equipment. Sufficient facilities shall be provided and maintained at the points where Work is in progress to adequately meet the demands of the Work and with ample margin for emergencies or overload.

The location of stationary and mobile equipment shall be subject to the **County**'s approval.

B. First Aid Stations: **Contractor** shall provide a suitable first aid station equipped with the facilities and medical supplies necessary to administer emergency first aid treatment. **Contractor** shall have standing arrangements for the removal and hospital treatment of any injured person. The information reflecting this arrangement shall be clearly posted for easy visibility. The first aid facilities and emergency ambulance service shall be made available by **Contractor** to **County** and **County's** personnel.

1.04 COUNTY'S FACILITIES

A. **County's** Project Office

1. Within 60 days after receipt of Notice to Proceed, provide the materials and equipment and construct, paint, furnish, and maintain the **County's** project office that shall meet the contract minimum square feet of finished floor space and 8 feet high with a full height partition dividing the office into rooms, as approved by the **County**. The partition walls shall be lined with vinyl covered sheetrock and sound deadening materials. The floor space shall be partitioned to provide for offices, a plan room, a copy room, a conference room, break area with kitchen facilities, including hot and cold running water in a double stainless steel sink, men's and women's rest rooms with exhaust fans, each with a wash basin with hot and cold running water, and a change room with two shower stalls, a wash basin, and a separate 40-gallon hot water heater. Contract Drawings shall show the office and site location and layout.

2. The actual layout and dimensions for the rooms shall be shown on the contract drawings. Additional entities, such as closets, built-in cabinets, and shelving, shall be determined by the **County** through the shop drawing approval process. The offices shall be provided with approximately 150 lineal feet of two-tier hung shelving and 150 lineal feet of lower cabinets, 30 inches in width and surfaced with wood grained laminate counter top. Each office shall include two letter-sized file cabinets of two drawers each, used as a vertical support to the laminated counter top. The two-tier shelving shall be constructed of 1”x12” white pine, faced with 1”x2” and 1”x3” facing stained to match the paneling, and finished with two coats of polyurethane satin varnish. The shelving shall be designed to support a full load of manuals, books, etc. without sagging. Interior floors shall be covered with indoor/outdoor carpeting, except rest rooms, main entry, and the kitchen area, which shall be composition vinyl.

3. The **County's** project office shall be a pre-fabricated building or a double-wide mobile office having ceiling, floor, and walls adequately insulated. This facility shall be erected on top of a minimum 6-inch 4,000-PSI reinforced concrete slab, over a 6-inch layer of crushed stone minimum 95 percent compaction with subgrade minimum of 95 percent compaction. The facility shall be tied down to meet code requirements. The complex shall have a minimum of five exterior steel doors, each equipped with a double deadbolt with a pull handle exterior and closer. The partition and closet doors shall be furnished with integral locks. The main entry shall have a covered porch at least 12 feet by 34 feet and approach steps and railing built with pressure treated wood and shall have an ADA-compliant access. The other entrance(s) shall have a covered porch at least 4 feet square with appropriate steps and railing. The office facility shall be properly skirted using perforated fiberglass skirting material designed to match the exterior of the structure. Also, construct additional supports below the floor space

occupied by the fireproof filing cabinets to meet the max dead and live loads. The office shall be secured with tie-downs 100-mile-per-hour minimum gusts and winds.

4. The office shall have a minimum of 18 vertical sliding windows, each, 46 inches x 27 inches, to allow adequate sunlight and ventilation, properly weatherproofed, equipped with insulated glass, screening, exterior steel reinforced bugler bars and Levelor blinds. Lighting fixtures with diffuser covers, in adequate numbers, shall be installed to give minimum illumination of 150 foot-candles and minimum glare. Exterior flood lights shall be provided at each exterior entry. The **Contractor** shall provide 110-volt duplex outlets, two above, and one below the lower cabinet counter top on each wall in each office shall be provided. The office building shall be adequately wired for electricity in accordance with applicable codes to handle the total lighting, air conditioning, and other loads. Provide air conditioning and heating combination unit(s) to maintain 78 degrees F inside in winter with outside air temperature of 20 degrees F and 72 degrees F inside in summer with outside temperature of 100 degrees F. The HVAC units shall be located at the kitchen/break room end of the facility equipped with an overhead plenum wall return air wall system.

5. Furnish the services of a professional computer system installer to install, connect, and test the various computers, printers, communication equipment, and other peripherals specified by contract. The project office and equipment layout is to be a complete installation with wall outlets and be a satisfactorily functioning system.

6. The **Contractor** shall provide furnishings, fixtures, and equipment, as stated in the Contract and approved by the **County**

1.05 TELEPHONE SERVICES

A. General

1. Make the necessary arrangements for outside telephone service to **Contractor's** office, **County's** Project Office(s), and the First Aid Station. The connection to **County's** Facilities shall be consistent with the specified hardware requirements for such facilities. Schematic drawings, showing the complete telephone system to be installed, shall be provided for review by the **County** before installation of the service. The communication system shall be maintained in good working condition.

2. All expenditures for installation costs of hardware, lines, line extensions, service changes, and recurring service charges for telephone service shall be paid by the **Contractor**. The **County** will reimburse the **Contractor** for long distance charges made by the **County**.

3. The telephone system to be installed and maintained for the **County's** Facilities shall meet minimum requirements within the contract. The **Contractor** shall provide the **County's** Project Office with five separate, auto rollover numbers, with intercom, paging, voice mail, conference calling, speaker phone, redial and speed dialing, call and message waiting signals, volume control, outgoing call restriction, night service, and flexible function keys. The **County's** Project Office shall be provided with phones for each office, including the conference and kitchen. The intercom and paging shall extend to the **County's** Site Office (if

existing or in the contract) located adjacent to the **County**'s Project Office.

4. Furnish two additional dedicated telephone lines to the **County's** Project Office. One shall be used for a dedicated facsimile machine. The second line shall be used for dedicated computer communications with the **County's** networked mainframe computer that shall meet the contract minimum requirement.

1.06 PARKING FACILITIES

A. Provide ample parking, paved, adjacent to **County**'s Project Office(s), without necessitating jockeying of cars, for minimum parking spaces of one per office plus two at the **County's** Project Office. Minimum handicapped parking places at the County office shall be marked. The parking surfaces shall be promptly and adequately maintained by the **Contractor** for the duration of the Contract.

B. The parking facilities shall be limited to the contract limits shown on the plans. The storage and Work facilities provided by the **County** shall not be used for parking by the **Contractor** or its personnel. Additional parking facilities required by the **Contractor** shall be the **Contractor's** responsibility.

1.07 SECURITY AND MAINTENANCE

A. Provide periodic indoor and outdoor maintenance and cleaning for temporary structures, furnishings, equipment, and services as specified herein above.

B. During other than normal daytime office working hours provide a totally separate electronic security system monitored by a security agency for the **County's** facilities. The offices shall be equipped with exterior security flood lights automatically activated by darkness and in sufficient number and placement to provide adequate lighting of the office and the parking areas.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PREPARATION

Fill and grade sites for temporary structures to provide surface drainage.

3.02 INSTALLATION

A. Construct temporary field offices, first aid stations, and storage facilities on proper foundations and provide connections for utility services.

B. Locate construction office facilities at locations within the Project approved by the **County**.

C. Determine the need for temporary utility services, including utility services for **County's** facilities and first aid stations, and make the arrangements with utility companies and governmental agencies to secure such services. Such services shall be provided at no additional cost to the **County**. Temporary utility services shall be furnished, installed, connected, and maintained by **Contractor** in a workmanlike manner, satisfactory to the **County**, and shall be removed in like manner prior to final acceptance.

D. Provide an outside standpipe equipped with a non-freeze hose bib at **County's** Project Office. The hose bib shall be sized for a standard half-inch garden hose connection.

3.03 MAINTENANCE AND CLEANING

Repair and clean the offices, parking areas and access routes and provide complete professional janitorial services, including ample hand soap, toilet paper, and paper towels, in the **Count**y's facilities for the duration of the project. Cleaning shall be done on a daily basis, to the satisfaction of the **County**, during other than normal daytime office working hours. These services shall include daily sweeping, vacuuming, dusting, emptying of trash, cleaning of wash basins, bathroom and shower facilities, kitchen, daily mopping and monthly waxing of the vinyl floors and monthly shampooing of carpet. **Contractor** shall also provide for monthly exterminating services of the offices.

3.04 REMOVAL

A. Remove temporary field offices, contents, and services at a time when no longer needed. The office contents shall be packed, moved, and unpacked by the **Contractor** to a location designated by the **County**.

B. Remove foundations and debris to an approved dump site; grade site to required elevations; clean and restore areas to **County's** satisfaction.

+++END OF SECTION01500+++

SECTION 01540
SECURITY AND SAFETY

Part 1 - GENERAL

1.01 SECURITY PROGRAM

A. The **Contractor** shall protect the Work, including field office trailers and contents, from theft, vandalism, and unauthorized entry.

B. The **Contractor** shall initiate a site security program at the time of mobilization onto the Work site that provides adequate security for material stored and installed onsite.

C. The **Contractor** shall maintain the security program throughout the Contract duration.

D. The **Contractor** and subcontractors shall be wholly responsible for the security of its storage compound and laydown areas, and for plant, material, equipment, and tools at times.

E. The **Contractor** shall provide the **County** with a list of 24-hour emergency phone numbers, including chain of command.

F. The **Contractor** must cooperate with Owner on all security matters and must promptly comply with any project security arrangements established by the Owner or Program Manager.

G. It is the **Contractor's** obligations to comply with all applicable governmental requirements and regulations and to undertake reasonable actions to establish and maintain secure conditions at any job site.

H. The **Contractor** shall be solely responsible for the safety and security of materials, equipment, their employees, their subcontractors and or any person who enters County's premises for any reason(s) related to this contract.

I. The **Contractor** shall comply with the site safety and security program at all times on the Owner's facilities.

J. The **Contractor** shall only allow entry to authorized persons with proper Owner-approved identification. All Contractor and Subcontractor employees will be required to have personnel working at these facilities photographed for an Owner-provided identification (ID) badge before they start work.

K. The **Contractor** shall not allow cameras on-site or photographs to be taken, except those required to perform the Work in accordance with the Contract Documents or otherwise approved by Owner. Photos taken on the County property for any reason (mishaps, near misses, accidents etc.) are prohibited from being used for Social Media and Training references unless authorized by the County.

L. It is the responsibility of the **Contractor** to ensure all articles of possible personal or monetary value found by the Contractor's employees are turned into the Owner or Program Manager.

M. The **Contractor** shall be responsible for maintaining satisfactory standards of employees' competency, conduct, courtesy, appearance, honesty and integrity, and shall be responsible for taking such disciplinary action with respect to any employee, as may be necessary.

N. The **Contractor** shall provide the County with a list of 24-hour emergency phone numbers, including a chain of command.

O. **Contractors** with non-English speaking employees shall provide an English speaking person, who has the ability to translate or communicate vital project specific or safety information.

PROJECT SAFETY

A. DRUG AND ALCOHOL POLICY

Any person under the influence of /or in possession of, distributing and/or selling control substances and/or alcohol will be removed from the site immediately. Prescription medication is allowable if it is contained in its original package and does not affect an employee's performance. DWM has a zero tolerance Drug and Alcohol policy.

B. COMPETENT PERSON REQUIREMENTS

Contractor and their Subcontractor shall have a Competent Person on the project for all operations as required by OSHA Standards.

(a) A competent person identified and on-site before any scaffold erection may begin and/or modified.

(b) A competent person identified and on-site before any excavation may begin and/or modified.

(c) A competent person identified and on-site before any Confined Space may begin.

(d) A competent person identified and on-site before any rigging operation may begin.

(e) A competent person identified to erect and inspect concrete formwork.

OSHA defines a competent person as one who is capable of identifying existing and predictable hazards in surroundings or working conditions that are unsanitary, hazardous or dangerous to employees, and who has the authority to take prompt corrective measures to eliminate them.

C. COMMUNICATIONS

1. Contractor shall Plan and execute all work in a manner, which complies with the stated objectives of their Project Safety Program.
2. Contractor employees and their subcontractors shall complete a Project Site-

Specific Health and Safety Orientation identifying projects hazards, detailing these specified project rules and DeKalb County Watershed Management Project Rules **(See Section C).** Employees shall complete this orientation before starting work.

3. Contractor shall create and maintain for project(s) an emergency action plan (EAP) which addresses the notification of the closet police, fire or ambulance and rescue services.

4. In case of a utility line break please contact 911 in addition to DWM Dispatch at 770-270-6243, the utility owner (Sewer, Water, Gas, Cable, and Electrical) and your project contract public relation representative. Please note: Gas Sewer and Electrical lines are considered Hazardous. Prompt emergency actions must follow immediately.

5. Contractors are required to have on file in the job trailer, a copy of their company's Safety Program and Hazard Communication Program.

6. All accidents must be reported to DWM Management immediately after occurrence. Accident reports and investigation forms must be completed and a copy to DWM Safety within 24 hours of an accident. All incidents or near misses must be reported to DWM Safety immediately for proper investigation and corrective actions to ensure prevention.

7. Contractor's accident/incident report shall contain (but not be limited too) the following:

    i. Name of person injured
    ii. Date and time of injury
    iii. Name(s) of all witnesses
    iv. Details of the accident
    v. Root Cause analysis of accident
    vi. Action taken to prevent re-occurrence of incident/accident
    vii. Nature/Extent of injury
    viii. Name of doctor/ emergency provider

8. All contractor personnel requiring medical attention shall be drug screened in accordance with the County's policy.

9. Tool Box Talks must be completed at least weekly. The toolbox talk must be documented with the signatures of all employees attending. Topics should include information relative to ongoing or upcoming operations and previous week's accidents.

10. Subcontractors must maintain and have available first aid and bloodborne pathogens kit.

11. Contractors and their subcontractors are responsible for transportation and

payment for treatment of their employees. It is the responsibility of each contractor to arrange for medical treatment of his or her injured employees.

12. Contractors and Subcontractors are responsible for the conduct of their employees and housekeeping of the construction/project site.

13. Any damage to existing or stored property or materials will financially be the sole responsibility of the offending subcontractor(s).

D. DISCIPLINARY POLICY

1. Contractor employees must work safely as a condition of employment on this project. DeKalb County reserves the right to remove any contractor employees from this project for unsafe behavior or failure to follow safe work practices. Insubordination or any act that causes an Immediately Dangerous to Life and Health (IDLH) situations will not be tolerated and will result in automatic removal.

E. PROJECT SITE

1. Vehicle parking is in designated areas only- Forward First Policy.
2. Report all unsafe site conditions to DWM Management for which the contractor does not have the resources or is not responsible to implement corrective action.
3. Only trained, certified and authorized employees shall operate forklifts, aerial lifts, cranes, machinery, heavy equipment, tools, and vehicles. All equipment shall be operated in accordance with manufacturer's specifications and all other applicable laws/standards. The operator must have certification cards on their person.
4. Cell phones are not allowed to be used onsite except for supervisors and management.
5. All subcontractors shall have warning devices on moving equipment and trucks in the proper working order while on site.

F. ELECTRICAL

Subcontractors must use either an assured grounding program and/or Ground Fault Circuit Interrupters (GFCI) for protection from shock/electrocution.

G. HAZARDOUS COMMUNICATION PROGRAM

Contractors are required to have on file with DWM and project job trailer, a copy of their company's Hazard Communication Program. Hazard Communication programs must include an inventory list of hazardous materials, explanation of their labeling system, and all corresponding safety data sheets (SDS) and name of the program coordinator. Contractor shall make the inventory list of hazardous materials available upon request by the County.

1.02 ENTRY CONTROL

A. The **Contractor** shall restrict entry of unauthorized personnel and vehicles onto the Project site.

B. The **Contractor** shall allow entry only to authorized persons with proper identification.

C. The **Contractor** shall maintain an Employee Log and Visitor Log and make the log available to the **County** upon request. This log shall be submitted to the **County** bi-weekly, or as necessary.

D. The **Contractor** shall require visitors to sign the Visitor Acknowledgment of the Program Site Rules/Visitor Log, which includes a release form. Copies of these forms shall be submitted to the **County** bi-weekly and maintained in the **Contractor's** security files on-site. See Section A.

E. The **Contractor** shall require each employee to sign the Employee Acknowledgment of Project Site Rules Log included in Section C. Employees, subcontractor employees, and lower-tier **Contractor** employees will receive a new employee orientation. Signing the Employee Log by the employee is certifying that the orientation training has been received.

F. The **County** has the right to refuse access to the site or request that a person or vehicle be removed from the site if found violating any of the Project safety, security, or conduct rules.

1.03 BARRICADES, LIGHTS, AND SIGNALS

A. The **Contractor** shall furnish and erect such barricades, fences, lights, and danger signals and shall provide such other precautionary measures for the protection of persons or property, and of the Work as necessary. Barricades shall be painted in a color that is visible at night. From sunset to sunrise, the **Contractor** shall furnish and maintain at least one light at each barricade and sufficient numbers of barricades shall be erected to keep vehicles from being driven on or into any Work under construction.

B. The **Contractor** shall be held responsible for damage to the Work and any resulting injuries due to failure of barricades, signs, and lights. Whenever evidence is found of such damage, the **Contractor** shall immediately remove the damaged portion and replace it at the **Contractor's** cost and expense. The **Contractor's** responsibility for the maintenance of barricades, signs, and lights shall not cease until the Project has been accepted by the **County**.

1.04 RESTRICTIONS

The **Contractor** shall not allow cameras on site or photographs taken without approval of the **County,** except as required under Section 01380.

1.05 CONTRACTOR SAFETY/HEALTH AND SECURITY PLAN

A. Within 30 days of Notice To Proceed, and prior to the performance of any Work, the **Contractor** shall prepare and submit a Contract-specific Health, Safety, and Security Plan signed by an officer of the **Contractor's** organization. Adequacy is the responsibility of the **Contractor**.

B. The **County** will review the **Contractor's** Health, Safety, and Security Plan for the adequacy of the plan. The plan shall:

1. Identify the person(s) responsible for implementation and enforcement of Health, Safety, and Security rules and regulations for this Project.
2. Address safe Work procedures for the activities within the **Contractor's** scope of Work.
3. Include a new employee orientation program to address job- and site-specific rules, regulations, and hazards.
4. Include the **Contractor's** Drug-Free Work Place Policy describing the substance abuse prevention and testing program.
5. Include provisions to protect the **Contractor's** employees, other persons, and organizations possibly affected by the Work from injury, damage, or loss.
6. Comply with current Fed/OSHA regulations; the Health, Safety, and Security Plan; the facility safety program (when applicable); and locally accepted safety codes, regulations, and practices.
7. Include a site-specific emergency action and evacuation plan.
8. Include Hazard Communication/Right-To-Know Program.
9. Include security procedures for the **Contractor's** Work, tools, and equipment.
10. Include the capability of providing the **County** with documentation to show compliance with the plan, plus accidents, and investigation reports.
11. Address other contract-specific requirements, including the Unique Requirements of these specifications.

C. Prior to the start of Work, **Contractor** shall provide Job Safety Analyses (JSAs) for unique Work activities necessary to prosecute the scope of Work.

D. Review of the **Contractor's** Health, Safety, and Security Plan by the **County** shall not impose any duty or responsibility upon the **County** for the **Contractor's** performance of the Work in a safe manner.

E. The **Contractor** shall be fully responsible for the safety and health of its employees, its subcontractors, and lower tier contractors during performance of its Work.

F. The **Contractor** shall provide the **County** with safety reports, training records, competent person list, and accident reports prepared in compliance with Fed/OSHA and the Project Health, Safety, and Security Plan.

1.06 PROJECT SAFETY COORDINATOR

A. The **Contractor** shall be responsible for the safety of the **Contractor's** and **County**'s employees, the **County's** personnel and other personnel at the Work site. The **Contractor** shall identify a Project Safety Coordinator (PSA) on the job with an appropriate office on the job site to maintain and keep available safety records and up-to-date copies of pertinent safety rules and regulations.

B. The Project Safety Coordinator shall:

1. Comply with applicable health and safety requirements of governing legislation.
2. Schedule and conduct safety meetings and safety training programs as required by law and included in the **Contractor** Health, Safety, and Security Plan for personnel engaged in the Work.
3. Post appropriate notices regarding safety and health regulations at locations that afford maximum exposure to personnel at the job site.
4. Post the name(s), address and hours of the nearest medical doctor(s), names and addresses of nearby clinics and hospitals, and the telephone numbers of the fire and police departments.
5. Post appropriate instructions and warning signs with regard to hazardous areas or conditions.
6. Have proper safety and rescue equipment adequately maintained and readily available for any contingency. This equipment shall include such applicable items as: proper fire extinguishers, first aid kits, safety ropes, and harnesses; stretcher, life preservers, oxygen breathing apparatus, resuscitators, gas detectors, oxygen deficiency indicators, explosion meters; and other equipment mandated by law.
7. Inspect each Work crew at least once daily in accordance with an Inspection Checklist Report Form to make sure that workers are wearing their appropriate personal safety equipment; machines, tools, and equipment are in safe operating condition; Work methods are not dangerous; and the Work site and Work methods are free of hazards.
8. Submit to the **County,** upon request, copies of inspection checklist report forms; safety records, safety inspection reports, and certifications from regulating agencies and insurance companies.
9. Immediately notify the **County** of a serious accident, followed by a detailed written report within 24 hours. "Serious accident" is defined as that requiring an absence of Work of more than two days and/or hospitalization.
10. Immediately notify the **County** in the event of a fatal accident.
11. Immediately notify the **County** of any accident claim against the **Contractor** or any subcontractor, followed by a detailed written report on the claim, and its resolution.
12. Review safety aspects of the **Contractor's** submittals as applicable.

1.07 IDENTIFICATION BADGES AND SECURITY

A. All **Contractor's** employees and subcontractors' staff who will be working on-site shall be issued an ID badge by the **County**.

B. Special Circumstances. The **County** can grant/permit a **Contractor** the right to badge their employees and subcontractors. However, the badge template shall be approved by **DWM** Safety Division. The ID badge shall include worker's name, date of issue, picture, and company affiliation.

C. It is the **Contractor's** responsibility to collect the ID badge from any employee who is been discharged or resign prior to completion of the project as well as at completion of the project. **Contractors** shall return all ID badges to the **DWM** Safety Division within 48 hours. The **Contractor** shall be charged a fee of $25.00 per badge for any badges not returned at completion of the project. For ID badges lost during the term of the project, there will be a reissued fee of $15.00 per ID badge. The **Contractor** shall deduct these charges from its periodic or closeout payment request or the **County** shall deduct them.

D. The **Contractor** shall be responsible for maintaining a safe "drug-free" work environment.

E. The **Contractor** shall develop a Security Plan for use on the job site during construction. The Plan shall encompass at a minimum such topics as the use of pre-employment background checks for specific project staff, drug tests, crime prevention and anti-theft procedures, workplace violence, and methods to secure project documents. The staff working on the site shall be familiar with the requirements of the Security Plan.

F. County Ordinances prohibit the carrying of weapons on County property/jobsites. The County Police Department shall be notified of any person bringing weapons to the jobsite; they shall be removed immediately and prosecuted.

G. Persons on the jobsite shall report any suspicious activity by workers or by others at the jobsite area first to the Project Management, and/or DeKalb County Police and/or Fire Department by calling 911 and immediately to the Engineering and Construction Management Service Division Head.

3.11 REMOVAL

A. The **Contractor** shall remove equipment and devices when no longer required and repair damage caused by installation.
B. Should the **Contractor** dismiss employees who have been given access to the DWM facilities while the contract is in force, the Contractor will advise the DWM Security Office.

C. The Owner may request the **Contractor** to immediately remove from the premises and/or dismiss any employee found unfit to perform duties due to one or more of the following reasons:

- Neglect of duty, absenteeism, security or safety problems and sleeping on the job.
- Disorderly conduct, use of abusive or offensive language, quarreling, intimidation by words, actions or fighting.
- Theft, vandalism, immoral conduct or any other criminal action.

- Selling, consuming, possessing, or being under the influence of intoxicants, alcohol or illegal substances, which produce similar effects while on duty.
- Involved in a vehicle accident while on the Owner's property or driving the Owner's equipment. No employee, Contractor, or Subcontractor will be extended privileges to drive the Owner's equipment on the Owner's property if driving privileges have been withdrawn by the person's State of residence.

D. All employees will be required to sign in and out on a designated log sheet.

E. All employees shall be required to wear at all times in an observable location, above the waist, on outer clothing, an appropriate photo I.D. badge to be furnished by the Contractor and approved by the Owner.

F. No one under age sixteen is permitted at work sites after normal working hours. Contractor's employees are allowed on work sites only during the specified hours and only when working on this contract. No Contractor employee will be allowed on sites when not specifically working on this Contract's predetermined times and dates.

G. All employees and agents of the Contractor must read the Project Site Rules statement and sign a log acknowledging understanding of project site rules provided in **(Sections A & C)**.

III. (DWM) Contractor Badge Procedures

The ID badge will provide proof of authorization to be on the construction site, and aid DWM staff in affirming the contractor's employee has received safety training prior to the start of work at DWM project, site or facility.

A. GENERAL REQUIREMENTS

1. All individuals working on any DeKalb County Department of Watershed Management – construction projects, sites, and facilities shall be required to wear a County issued ID badge.
2. Contractors and subcontractors working on (DWM) projects, sites and facilities must have their assigned badge on their person at all times.
3. All contractors and subcontractors personnel without a current badge will not be allowed to continue to work at a (DWM) project, site or facility.
4. All workers must obtain and display an identification badge issued by the County's Safety Representative **before** reporting to work on any (DWM) construction project.
5. Although a contractor may only be required to visit our sites/property on an infrequent basis, badging is still a requirement.
6. Contractors and subcontractors vendors or their transient onsite visitors, which are not full-time employees of the site, shall be escorted while onsite as a visitor by a Department of Watershed Management badged contractor.

7. Contractors shall maintain a daily sign-in sheet/record/log of their daily workers under its supervision which includes subcontractor's vendors or their transient onsite visitors.

B. TRAINING REQUIREMENTS

1. Contractor and subcontractor employees are required to attend safety training prior to receiving a badge.

2. The **Contractor** is responsible for conduction and/or arrangement of their employee's training.

    a. OSHA 10 hour, OSHA 30 hour or project site-specific safety training along with the contractor receiving a copy of DeKalb County Project Site Rules will suffice the training requirements to receive a badge and start work on the (DWM) construction project(s), site or facility.
    b. OSHA 10 hour and 30-hour safety training received within 12 months prior to the start of work on the (DWM) construction project(s), will qualify as current.
    c. Whereas the OSHA 10 hour and 30-hour training does not expire, the actual date of training must be less than 12 months prior to the start of work on the (DWM) construction project(s) to qualify as "current,"
    d. In the case where the OSHA 10 hour and 30-hour date of training are more than 12 months prior to the start of work on the (DWM) construction project(s), project site-specific safety verification of training is required.
    e. Contractor's training should include general construction safety and the specific safety concerns/hazards employees may encounter at the Watershed Management construction site.
    f. DMW' Safety Division shall review a copy of the contractor's project site-specific safety training topics outline prior to the contractor's employees were approved for badging.
    g. Contractor and subcontractor employees are required to read, understand and agree to abide by DeKalb County Project Site Rules. See **Sections A & C**.

C. VERIFICATION OF TRAINING

1. The contractor's management representative shall complete, sign and send a copy of each of their employee or their subcontractor's employee a copy of (DWM) Verification of Training Form. **See Section E.**

2. (DWM) Verification of Training Document will be sent to **VOTD@DeKalbcountyga.gov** prior to the contractor's employee badging date of appointment**.**

3. The contractor's/subcontractor's employee shall review and verify that the information on their individual (DWM) Verification of Training document is correct.

4. The contractor's employee shall also sign (DWM) Verification of Training Form verifying the information on the document is correct. The (DWM) Verification of Training Document signature statement is as follows:

"I have read, understand and agree to abide by the DEKALB COUNTY PROJECT SITE RULES. I have received a personal copy for my use and reference. Furthermore, I understand that knowingly or purposely falsifying records is grounds for being denied access to the project site."

D. VERIFICATION OF IDENTITY REQUIREMENTS

1.The contractor and subcontractor employees must provide documentation to DeKalb County to verify their identity and authorization to work.

DeKalb County only accepts **Form I-9 acceptable documents with accompanying the photo.**
I-9 acceptable documents must be from List A and List B (Examples)

* ID cards issued by federal, state, local governmental agencies
*TWIC (Transportation Worker Identification Credential)
* Driver License or Identification card issued by a state motor vehicle department with a photo that clearly identifies the individual.

E. DWM MANAGEMENT SITE INSPECTIONS AND AUDITS

Field verification will be done randomly by the DWM Safety staff to ensure employees were trained and following County, OSHA & State regulations.

F. BADGING OFFICE ADDRESS IS AS FOLLOWS

DeKalb County Watershed Management,
Safety Division
1641 Road haven Drive, Stone Mountain, GA 30083

Badging hours are Tuesdays & Thursdays from 9:00 am to 12:00 pm.

G. BADGE EXPIRATION DATE

Badges are valid until the expiration date of the prime contractor's contract.

H. TRANSFER CONTRACTORS

If a worker changes companies or projects, the badge must be surrendered and a new badge will be issued if needed.
If applicable, the new employer will provide the employee certification that the safety training is completed.
Only those employees registered in the badging system are eligible to receive a badge,
After verification by the safety representative, the badging database will be updated and a new badge issued.

I. SPECIAL CIRCUMSTANCES:

The County can grant/permit a Contractor the right to badge their employees and subcontractors. However, the badge template shall be approved by the DWM Safety Division. The ID badge shall include the worker's name, picture, and company affiliation.

J. ADDITIONAL TRAINING REQUIREMENTS:

Additional training requirements may be requested if there is a change in the contractor's scope of work or responsibilities.

K. BADGE REPLACEMENT

The contractor must notify DMW's Safety Division immediately if a badge is lost, stolen or an employee is no longer employed with the contractor.

L. BADGE COLLECTION/ RETURN POLICY

It shall be the **Contractor's** responsibility to collect the ID badge from any employee who is discharged or resigns prior to completion of the project as well as at the completion of the project. The **Contractor** shall return the ID badges to the **DMW' Safety Division** within 48 hours of their collection. The **Contractor** shall be charged a fee of $25.00 per badge for any badges not returned at the completion of the project. For ID badges lost during the term of the project, that shall be reissued, there shall be a charge of $15.00 per ID badge. The **Contractor** shall deduct these charges from its periodic or closeout payment request or the **County** shall deduct them.

SECTION A
VISTOR ACKNOWLEDGMENT OF THE PROJECT SITE RULES

By signing this Visitor's Log, I acknowledge that I understand and agree to abide by the project rules outlined below.

In consideration of my receipt of a visitor's pass as issued by the **County** directly or indirectly for the **County**, I waive on behalf of myself, my heirs, employer, legal representatives and assigns and hereby release and discharge the **County**, each of its directors, officers, employees, representatives, and agents from any and all claims, actions, causes of action, or any charge of any kind whatsoever that may arise or could arise in the future as a result of my being present at the facility including injury, death, or property damage whether or not caused by the fault or negligence of any of the parties released hereunder.

I further acknowledge that I have been briefed on specific hazards, hazardous substances that are on site, and the site emergency action procedure.

PROHIBITED ACTIVITIES

- Unauthorized removal or theft of County property
- Violation of safety or security rules or procedures
- Possession of firearms or lethal weapons on jobsite
- Acts of sabotage
- Destruction or defacing of County property
- Failure to use sanitary facilities
- Knowingly or purposely failing to report accidents/incidents or job-related injuries
- Being under the apparent influence of drugs, alcohol, or other intoxicants or in possession
  of drugs, alcohol, or other intoxicants on the job site
- Wearing shorts or tennis shoes on the job site
- Failure to wear required personal protective equipment (PPE)
- Gambling, fighting, threatening behavior or engaging in horseplay on the job site
- Smoking in unauthorized areas on the job site
- Open fire cooking or making unauthorized fires on job site
- Selling items or raffles without authorization
- Use of unauthorized cameras on the job site
- Use of radio or television in the construction area
- Failure to park personal vehicle in authorized parking area
- Failure to wear designated identification [Site Specific]
- Failure to use designated gates
- Condoning or knowingly allowing a person to engage in or work around a patently unsafe or environmental compromising act or condition
- Knowingly or purposely falsifying records, documents or providing false testimony

I have read, understand, and agree to abide by the PROJECT SITE RULES. Furthermore, I understand failure to abide by these rules is grounds for being denied access to the project site. I have received a personal copy for my use and reference.

_____ _____

Print Name: **Signature:**

_____

Date:

SECTION B
VISITOR LOG

THE SIGNING OF THIS LOG ACKNOWLEDGES I HAVE READ, UNDERSTAND, AND AGREE TO ABIDE BY THE PROJECT RULES OUTLINED ABOVE. **THIS IS NOT A VEHICLE ACCESS PERMIT.**

NAME PRINT	SIGNATURE	COMPANY/PERSON VISITED	DATE	IN	OUT
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
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				am/pm	am/pm
				am/pm	am/pm

SECTION C
EMPLOYEE ACKNOWLEDGMENT OF THE PROJECT SITE RULES

By signing this Employee Log, I acknowledge that I understand and agree to abide by the project rules outlined below.

PROHIBITED ACTIVITIES

- Unauthorized removal or theft of **County** property
- Violation of safety or security rules or procedures
- Possession of firearms or lethal weapons on jobsite
- Acts of sabotage
- Destruction or defacing **County** property
- Failure to use sanitary facilities
- Failure to report accidents or job-related injuries
- Under the apparent influence of drugs, alcohol, or other intoxicants or in possession of drugs, alcohol or, other intoxicants on the property
- Wearing shorts or tennis shoes on the jobsite
- Failure to wear a hardhat/safety glasses and safety vest
- Gambling at any time on the project
- Fighting, threatening behavior, or engaging in horseplay on the project
- Smoking in unauthorized areas on the project
- Open fire cooking or making unauthorized fires on project property
- Selling items or raffles without authorization
- Use of unauthorized cameras on the project
- Use of radio or television in the construction area
- Failure to park personal vehicle in authorized parking area
- Failure to wear designated identification [Site Specific]
- Failure to use designated gates

I have read, understand, and agree to abide by the PROJECT SITE RULES. Furthermore, I understand failure to abide by these rules is grounds for being denied access to the project site. I have received a personal copy for my use and reference.

_____ _____

Print Name: **Signature:**

_____

Date:

SECTION D
EMPLOYEE LOG

BY SIGNING THIS LOG ACKNOWLEDGMENT, I HAVE READ AND UNDERSTAND, AND AGREE TO ABIDE BY THE PROJECT RULES OUTLINED ABOVE AND ANY STATE, FEDERAL, LOCAL, OR ANY OTHER CONTRACT OBLIGATIONS THAT MAY APPLY. I FURTHER ACKNOWLEDGE THAT I HAVE BEEN ORIENTED AS TO THE SITE-SPECIFIC HAZARDS, ANY HAZARDOUS SUBSTANCES I MAY BE EXPOSED TO WHILE ON THE SITE, AND THE SITE/COMPANY EMERGENCY ACTION PROCEDURES, BY A REPRESENTATIVE OF THE COMPANY.

EMPLOYEES (PRINT)	SIGNATURE	COMPANY NAME	DATE
Signature of Company Representative:		*Date Signed:*	

SECTION E

DeKalb County Government Training Verification Form

Appointment Date: _____
(Tues./Thurs. 9am-12pm)

_____ Primary Contractor:

_____ DeKalb Contract #:

_____ Subcontractor Name:

_____ Contract End Date:

☐ **Course Name: Site Specific Safety Training in accordance with OSHA 29 CFR 1926 & 1910**

Successfully Completed: ☐ Yes ☐ No ☐ In Progress
Date Completed: _____

☐ **Course Name: OSHA 10 Hour**

Successfully Completed: ☐ Yes ☐ No ☐ In Progress
Date Completed: _____

☐ **Course Name: OSHA 24 HAZWOPER**

Successfully Completed: ☐ Yes ☐ No ☐ In Progress
Date Completed: _____

☐ **Course Name: OSHA 30 Hour**

Successfully Completed: ☐ Yes ☐ No ☐ In Progress
Date Completed: _____

☐ **Course Name: OSHA 40 HAZWOPER**

Successfully Completed: ☐ Yes ☐ No ☐ In Progress
Date Completed: _____

I HAVE READ, UNDERSTAND AND I HAVE BEEN PROVIDED A COPY OF THE DEKALB PROJECT SITE RULES. FURTHERMORE, I UNDERSTAND THAT KNOWINGLY OR PURPOSELY FALSIFYING RECORDS IS GROUNDS FOR BEING DENIED ACCESS TO THE PROJECT SITE. BY MY SIGNATURE BELOW, I AFFIRM THE ABOVE INFORMATION IS ACCURATE AND TRUE TO THE BEST OF MY KNOWLEDGE.

_____ **Employee's Name (Print):**

_____ **Employee's Name (Sign):**

_____ **Authorized Representative (Print):**

_____ **Authorized Representative (Sign):**

END OF SECTION 01540

SECTION 01600
GENERAL MATERIAL AND EQUIPMENT REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The **Contractor** shall use the latest version of the manufacturer's product line of installed materials and equipment at the time of purchase. The **Contractor** shall not purchase materials and equipment that have been outdated by newer versions at the time of purchasing. Materials and equipment that show any signs of extended storage such as corrosion, scratches, and dents shall not be accepted.

B. The **Contractor** shall use equipment for performing the Work that conforms to the latest version of applicable safety standards including, but not limited to, OSHA requirements. **Contractor** shall not exceed or ignore any requirements or recommendations of the equipment manufacturer. Equipment not meeting requirements of this Section shall be barred from use on the project.

C. The **Contractor** shall install material and equipment that meets or exceeds the latest applicable code requirements, including, but not limited to: Underwriters Laboratory, Standard Building Code, and OSHA, as well as requirements of these Specifications. Where there is conflict with requirements of the Contract Documents and code requirements, the **Contractor** shall comply with the more stringent requirements with no additional compensation to the **Contractor**.

PART 2 - MATERIALS AND EQUIPMENT

2.01 ANCHOR BOLTS

A. The **Contractor** shall use anchor bolts that are ANSI Type 316 stainless steel unless otherwise specified or indicated, and shall conform to requirements of this Section and the material articles in the appropriate Sections where they are used.

B. The **Contractor** shall use anchor bolts supplied by the manufacturer or fabricator of the specific material or equipment to be installed.

C. Design criteria for anchor bolts:

1. When the size, length, or load carrying capacity of an anchor bolt, expansion anchor, or concrete insert is not shown on the Drawings, provide the size, length and capacity required to carry the design load times a minimum safety factor of four.
2. Determine design loads as follows:
    a. For equipment anchors, use the design load recommended by the manufacturer and approved by the **County**.
    b. For pipe hangers and supports, use half the total weight of pipe, fittings, valves, accessories, and water contained in full pipe,

between the hanger or support in question and adjacent hangers and supports on both sides.

c. Allowances for vibration are included in the safety factor specified above.

d. Anchors shall develop ultimate shear and pull-out loads of not less than the following values in concrete:

Bolt Diameter (Inches)	Min. Shear (Pounds)	Min. Pull-Out Load (Pounds)
½	4,500	6,300
⅝	6,900	7,700
¾	10,500	9,900

3. Embedment depth shall be minimum 6 inches for epoxy anchors and 4 inches for steel expansion anchors, unless noted otherwise on the drawings.

D. Anchor Type and Manufacturer

1. Where epoxy anchors are noted on the drawings, provide ANSI Type 316 stainless steel threaded rod with Speed Bond #1 epoxy injection as manufactured by Prime Resins, Inc. or approved equal.

2. For other applications, provide ANSI Type 316 steel expansion anchors from one of the following manufacturers:

a. Hilti, Incorporated

b. Ramset, Incorporated

c. Approved equal

3. Install anchors per manufacturer's recommendations and this Section.

Drilled anchorage holes are to be blown out with compressed air before installing anchor.

2.02 CONNECTION BOLTS

A. Materials shall be as specified in other Sections of the Specifications, or as shown on the Drawings. Where materials are not specified or shown on the Drawings, they shall be of ANSI Type 316 stainless steel, with ANSI Type 316 stainless steel nuts and washers.

B. Unless otherwise specified, stud, tap, and machine bolts and nuts shall be ANSI Type 316 stainless steel and shall conform to the requirements of ASTM Standard Specification for Carbon Steel Externally and Internally Threaded Standard Fasteners, Designation A307-80. Hexagonal nuts of the same quality of metal as the bolts shall be used. Threads shall be clean cut and shall conform to ANSI Standard B1.1-1989 for Unified Inch Screw Threads (UN and UNR Thread Form).

2.03 CONCRETE INSERTS

Concrete inserts for hangers shall be designed to support safely, in the concrete that is used, the maximum load that can be imposed by the hangers used in the inserts. Inserts for hangers shall be of a type that permits adjustment of the hangers both horizontally (in one plane) and vertically and locking of the hanger head or nut. Inserts shall be galvanized, then epoxy phenolic primed and top coated with PVC, using thermal bond process.

2.04 SLEEVES

A. Unless otherwise indicated on the Drawings or specified, openings for the passage of pipes through floors and walls shall be formed of sleeves of standard-weight, stainless-steel pipe. The sleeves shall be of ample diameter to pass the pipe and its insulation, if any, and to permit such expansion as may occur. Sleeves shall be of sufficient length to be flush at the walls and the bottom of slabs and to project 4 inches above the finished floor surface. Threaded nipples shall not be used as sleeves.

B. Sleeves in exterior walls below grade or in walls to have liquids on one or both sides shall be as detailed on the Approved Drawings and specified in other sections.

C. Sleeves shall be set accurately before the concrete is placed or shall be built in accurately as the masonry is being built.

2.05 ELECTRICAL EQUIPMENT ENCLOSURES

Items of electrical equipment that are furnished with process equipment shall conform to the requirements specified under the appropriate electrical sections of the specifications. Enclosures for electrical equipment such as switches, starters, etc., shall conform to the requirements specified under the appropriate electrical sections of the specifications.

2.06 EQUIPMENT DRIVE GUARDS

Equipment driven by open shafts, belts, chains, or gears shall be provided with acceptable all-metal guards enclosing the drive mechanism. Guards shall be constructed of epoxy paint coated, galvanized sheet steel or galvanized woven wire or expanded metal set in a frame of galvanized steel members. Guards shall be secured in position by steel braces or straps that will permit easy removal for servicing the equipment. The guards shall conform to applicable safety codes and regulations.

2.07 NAMEPLATES

A. The **Contractor** shall provide each piece of equipment, with the exception of the items mentioned below, with a substantial nameplate of non-corrodible metal, securely fastened in place and clearly and permanently inscribed with the manufacturer's name, model or type designation, serial number, principal rated capacities, electrical or other power characteristics, and similar information as appropriate.

B. This requirement shall also apply to standard, manually operated gate, lobe, check, and plug valves.

C. Each process valve shall be provided with a substantial tag of noncorrodible metal securely fastened in place and inscribed with an identification number in conformance with the tag numbers indicated on the Process and Instrumentation Drawings.

2.08 LUBRICANTS

During testing and prior to acceptance, the **Contractor** shall furnish lubricants necessary for the proper lubrication of equipment furnished under this Contract.

2.09 PROTECTION AGAINST ELECTROLYSIS

Where dissimilar metals are used in conjunction with each other, the **Contractor** shall provide suitable insulation between adjoining surfaces to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators, or washers, or other approved acceptable materials.

2.10 TRANSPORTATION, HANDLING, STORAGE, AND PROTECTION

A. Packing and Shipping:

1. Product and materials shall be shipped and handled in ways that shall prevent damage.
2. Equipment shall be protected against damage from moisture, dust, handling, or other cause during transport from manufacturer's premises to the project site. Bearing housing, vents, and other types of openings shall be wrapped or otherwise sealed to prevent contamination by grit and dirt.
3. Ship equipment, material, and spare parts in assembled units except where partial disassembly is required by transportation regulations or for protection of components.
4. Pipe and appurtenances shall be handled, stored, and installed as recommended by the manufacturer. Pipes shipped with interior bracing shall have the bracing removed only when recommended by the pipe manufacturer.
5. Stiffeners shall be used where necessary to maintain shapes and to give rigidity.
6. Each item or package shall be marked with the number unique to the specification reference covering the item. Spare parts shall be packed in containers bearing labels clearly designating contents and pieces of equipment for which intended.

B. Acceptance at Site:

C. Damaged items shall not be permitted as part of the Work except in cases of minor damage that have been satisfactorily repaired and are acceptable to the **County**.

D. Damage shall be corrected to conform to the requirements of the Contract before the assembly is incorporated into the Work.

E. The **Contractor** shall bear the costs arising out of dismantling, inspection, repair, and reassembly.

F. Storage and Protection:

1. During the interval between the delivery to the site and installation, equipment and materials shall be stored in an enclosed space affording protection from weather, dust, and mechanical damage and providing favorable temperature, humidity, and ventilation conditions to protect against equipment deterioration. Manufacturer's recommendations shall be adhered to in addition to these requirements.

2. Equipment and materials to be located outdoors may be stored outdoors if protected against moisture condensation and ultraviolet (UV) degradation. Equipment shall be stored at least 6 inches above ground. Temporary power shall be provided to energize space heaters or other heat sources for control of moisture condensation. Space heaters or other heat sources shall be energized without disturbing the sealed enclosure.

2.11 UNIT RESPONSIBILITY

A. Equipment systems made up of two or more components shall be provided as a unit by the responsible manufacturer. Unless otherwise specified, the **Contractor** shall obtain each system from the supplier of the driven equipment, and the supplier shall provide components of the system to enhance compatibility, ease of construction, and efficient maintenance. The **Contractor** shall be responsible to the **County** for performance of systems in accordance with the provisions of the General Requirements of the Contract Documents.

B. Where the detailed specifications require the **Contractor** to furnish a certificate of unit responsibility, such certificate shall be executed by the manufacturer. No other submittal material shall be processed until the Certificate of Unit Responsibility has been received and has been found to be satisfactory.

END OF SECTION 01600

SECTION 01610
TRANSPORTATION AND HANDLING

PART 1 GENERAL

1.01 SCOPE

A. The **Contractor** shall provide transportation of equipment, materials, and products furnished under these Contract Documents to the Work site. In addition, the **Contractor** shall provide preparation for shipment, loading, unloading, handling, and preparation for installation, as well as other Work and incidental items necessary or convenient to the **Contractor** for the satisfactory prosecution and completion of the Work.

B. Equipment, materials, and products damaged during transportation or handling shall be repaired or replaced by the **Contractor** at no additional cost to the **County** prior to being incorporated into the Work. Acceptance of damaged goods is at the discretion of the **County**.

1.02 TRANSPORTATION

A. Equipment shall be suitably boxed, crated, or otherwise protected during transportation.

B. Where equipment will be installed using existing cranes or hoisting equipment, the **Contractor** shall confirm that the weights of the assembled sections do not exceed the actual capacity of the cranes or hoisting equipment.

C. Small items and appurtenances such as gauges, valves, switches, instruments, and probes that could be damaged during shipment shall be removed from the equipment prior to shipment, packaged, and shipped separately. Openings shall be plugged or sealed to prevent the entrance of water or dirt.

1.03 HANDLING

A. Equipment, materials, and products shall be carefully handled to prevent damage or excessive deflections during unloading or transportation.

B. Lifting and handling drawings and instructions furnished by the manufacturer or supplier shall be strictly followed. Eyebolts or lifting lugs furnished on the equipment shall be used in handling the equipment. Shafts and operating mechanisms shall not be used as lifting points. Spreader bars or lifting beams shall be used when the distance between lifting points exceeds that permitted by standard industry practice.

C. Under no circumstances shall equipment or products such as pipe, structural steel, castings, reinforcement, lumber, piles, poles, etc., be thrown or rolled off of trucks onto the ground.

D. Slings and chains shall be of size and capacity rating to safely support the weights of items to be unloaded. Slings and chains shall be regularly inspected and tagged as in good conditions in accord with OSHA requirements. Slings and chains shall be padded

as required to prevent damage to protective coatings and finishes.

+++END OF SECTION 01610+++

SECTION 01640
MANUFACTURERS' SERVICES

PART 1 - GENERAL

1.01 SCOPE OF WORK

The **Contractor** shall require manufacturers to provide Operations & Maintenance Manuals, onsite services of experienced technicians, and trainers to provide the services detailed hereinafter.

The **Contractor** shall submit approved Operations & Maintenance Manuals at least 30 days prior to scheduling training of **County** Operations Personnel.

1.01 DEFINITIONS

A. Reference Section 01650 - Facility Startup.

B. Man-Day: One person for 8 hours within regular **Contractor** working hours.

1.02 SUBMITTALS

A. Submittals shall be made in accordance with the requirements of the General Conditions of the Contract Documents. In addition, the following specific information shall be provided:

1. Preliminary Training Plan: Submit within 120 days after Notice to Proceed.

2. Training Schedule: Submit not less than 30 days prior to start of equipment installation and revise as necessary for acceptance.

3. Final Training Plan: Submit after training coordination meeting.

4. Training Materials:

   a. Submit written outlines of proposed training sessions not less than 30 days prior to scheduled training.
   b. Furnish complete training materials, to include operation and maintenance data as required in this section. Provide 12 extra copies of training materials to **County**.
   c. Quality Control Submittals: When specified in the individual Specifications, submit:
      i. Qualifications and resume of Manufacturer's Representative performing specified services
      ii. Manufacturer's authorized representative's signature on the Certificate of Proper Installation form appended to this section

1.03 QUALIFICATION OF MANUFACTURER'S REPRESENTATIVE

A. Authorized representative of the manufacturer shall be factory trained and experienced in the technical applications, installation, operation, and maintenance of

respective equipment, subsystem, or system. Additional qualifications may be specified elsewhere.

B. Representative is subject to acceptance by the **County**. No substitute representatives shall be allowed unless prior written approval by the **County** has been given.

1.04 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

A. Manufacturers' qualified representative services are required for operating equipment furnished under the Contract. Where time is necessary in excess of that stated in the Specifications for manufacturers' services, additional time required to perform the specified services shall be considered incidental Work.

B. Schedule manufacturer's services to avoid conflicting with other onsite testing or other manufacturer's onsite services.

1. Determine that conditions necessary to allow successful testing have been met before scheduling services.

2. Only those days of service approved by the **County** shall be credited to fulfill the specified minimum services.

3. If specified, manufacturer's onsite services shall be 8 hours minimum and include as a minimum:

i. Assistance during product (system, subsystem, or component) installation to include observation, guidance, instruction of **Contractor's** assembly, erection, installation, or application procedures.

ii. Inspection, checking, and adjustment as required for product (system, subsystem, or component) to function as warranted by manufacturer and necessary to furnish written approval of installation.

iii. Revisiting the Site as required to correct problems and until installation and operation are acceptable to **County**.

iv. Resolution of assembly or installation problems attributable to, or associated with, the respective manufacturer's products and systems.

v. Assistance during functional and performance testing and startup demonstration, and until product acceptance by the **County**.

vi. Training of **County's** personnel in the operation and maintenance of respective product as required.

vii. Completion of Manufacturer's Certificate of Proper Installation (form enclosed at end of this section) with applicable certificates for proper installation and initial, interim, and final test or service.

viii. Additional requirements that may be specified elsewhere.

1.05 TRAINING PLAN

A. Preliminary Training Plan: If specified, and within 120 days after Notice of Award, the **Contractor** shall submit for each proposed course:

1. Title and objectives
2. Training schedule
3. Prerequisite training and experience of attendees
4. Recommended types of attendees (e.g., managers, **County's** operators, maintenance)
5. Course description and outline of course content
6. Duration
7. Location (e.g., training center or site)
8. Format (e.g., lecture, self-study, demonstration, hands-on)
9. Instruction materials and equipment requirements

B. Final Training Plan: the **Contractor** shall submit the following after training coordination meeting, if specified:

1. Updated versions of course descriptions from preliminary training plan
2. Who will attend each course
3. Schedule of training courses including dates, durations, and locations of each class
4. Detailed course schedule for each day showing time allocated to each topic
5. Resumes of instructors providing the training

1.06 TRAINING SCHEDULE

A. The **Contractor** shall list specified equipment and systems with respective manufacturers that require training services of manufacturers' representatives and show:

1. Estimated dates for installation completion
2. Estimated training dates to allow for multiple sessions when several shifts are involved

B. The **Contractor** shall adjust training schedule to train appropriate personnel as deemed necessary by **County**, and to allow full participation by manufacturers' representatives. The **Contractor** shall adjust schedule for interruptions in operability of equipment.

C. The **Contractor** shall coordinate with Progress Schedules as specified in Special Conditions and Section 01650 - Facility Startup.

1.07 TRAINING COUNTY'S PERSONNEL

A. The **Contractor** shall furnish trained, articulate personnel to coordinate and expedite training, to be present during training coordination meetings with the **County**, and familiar with Operations & Maintenance manual information.

B. The **Contractor** shall furnish manufacturers' representatives for detailed classroom and hands-on training to **County**'s personnel on operation and maintenance of specified product (system, subsystem, component) and as may be required in applicable Specifications.

C. Manufacturer's Representative shall be familiar with plant operation and maintenance requirements as well as with specified equipment.

D. Pre-startup Training:

1. The **Contractor** shall coordinate training sessions with **County's** operating personnel and manufacturers' representatives.
2. Training shall be complete at least 7 days, but no more than 14 days, prior to actual startup.

E. Post-Startup Training:
1. Respective manufacturers' representatives shall furnish and coordinate training of **County**'s operating personnel.
2. Manufacturers' representatives shall be required for a follow-up visit of one day.

F. Taping of Training Sessions:
1. The **County** will provide audio/video taping of training sessions.
2. Manufacturer's trainer shall provide appropriate props, such as charts, photographs, and samples in large enough sizes to be videotaped.
3. Trainers shall provide their full cooperation to the **County**'s video technician.

1.08 SUPPLEMENTS

The supplements listed below, following "END OF SECTION," are part of this Specification.

A. Manufacturer's Certificate of Proper Installation
B. Manufacturer's Instruction Certification Form

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

+++END OF SECTION 01640+++

DEKALB COUNTY (Spec Writer - Insert Project Name)
MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

COUNTY _____ EQPT SERIAL NO:_____

EQPT TAG NO:_____ EQPT/SYSTEM:_____

PROJECT NO:_____ SPEC. SECTION:_____

SITE LOCATION: _____

I hereby certify that the above-referenced equipment/system has been:

(Check Applicable)

☐	Installed in accordance with Manufacturer's recommendations.
☐	Inspected, checked, and adjusted.
☐	Serviced with proper initial lubricants.
☐	Electrical and mechanical connections meet quality and safety standards.
☐	All applicable safety equipment has been properly installed.
☐	System has been performance tested, and meets or exceeds specified performance requirements (when complete system of one manufacturer).
☐	System has been started up and meets or exceeds performance requirements.

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: _____

Manufacturer:_____

By Manufacturer's Authorized Representative: _____
(Authorized Signature)

DEKALB COUNTY (Spec Writer - Insert Project Name)
MANUFACTURER'S INSTRUCTION CERTIFICATION FORM

Contract No.: _____

Specification Section: _____

Equipment Name: _____

Contractor: _____

Manufacturer of Equipment Item: _____

The undersigned manufacturer certifies that a service expert has instructed the **County** operating personnel in the proper maintenance and operation of the equipment designated herein.

Operations Check List (check appropriate spaces)

Startup procedure reviewed _____
Shutdown procedure reviewed _____
Normal operation procedure reviewed _____

Others: _____ _____
_____ _____

Maintenance Check List (check appropriate spaces)

Described normal oil changes (frequency) _____
Described special tools required _____
Described normal items to be reviewed for wear _____
Described preventive maintenance instructions _____
Described greasing frequency _____

Others: _____ _____
_____ _____

_____ _____
Date Manufacturer

_____
Signature of Authorized Representative

_____ _____
Date Signature of County's Representative

_____ _____
Date Signature of Contractor's Representative

SECTION 01650
FACILITY STARTUP

PART 1 - GENERAL

1.1 RELATED SECTIONS

There are multiple section specifications related to this specification.

1.2 DEFINITIONS

A. Pre-Operational Checkout (Step 1): Preparation of documented physical checks shall verify that piping systems and items of equipment or equipment systems are ready for functional testing. Example components of pre-operational checkout /testing include, but are not limited to, the following:

1. Pressure and/or leakage tests, water-tightness of concrete structures and pipe testing

2. Electrical testing, resistance testing in accordance with NETA - Section 16T Electrical Acceptance Tests and Phase/motor rotation checks

3. Instrument calibration and loop tests as well as pre-operational check-out of instrumentation system controls

4. Pre-operational checkout of mechanical and HVAC equipment to include alignment, lubrication, and other checks, as recommended by the manufacturer

B. Functional Test (Step 2): A test or tests, in the presence of the **County**, to demonstrate that the installed equipment or system meets manufacturer's installation and adjustment requirements and other requirements.

The testing of the individual items of equipment within a system shall be performed under simulated operating conditions to determine contract compliance. This test shall utilize plant effluent, potable water, or another acceptable substitute test media. The equipment shall be operated long enough to gather information (data) on noise, temperature, vibration, performance characteristics, and to make initial adjustments of any applicable controls. Initial baseline data shall be gathered on equipment with motors greater than 1 horsepower, including amperage, bearing temperatures, and vibration.

The instrumentation and control field testing (loop checks from the field devices to PLC or distributed control systems, as well as field calibrations), shall be accomplished during the pre-operational checkout and functional testing stages as defined above.

C. Operational Test (Step 3): A test, performed in the presence of the **County**, of components within a system collectively to verify that the system and its integral components function as intended. Water and/or other temporary media supplied by the **Contractor** shall be circulated through the completed facility/system for 5 days with systems operating under various loading conditions, as proposed by the **Contractor** and approved by the **County**.

The instrumentation and control system automatic function for the overall system shall be verified and documented during the operational testing stage described above.

D. Punch List: Items that could affect, or be affected by, the full-time operation of the system (as deemed critical by the **County**) shall be complete prior to the operational test phase.

E. Acceptance Test (Step 4): The startup and operation of the systems installed, under actual operating conditions, as part of the actual plant process. The acceptance test period is 30 days. **County** O&M staff will be responsible for running the system with the **Contractor's** support team available for assistance 24/7. Upon completion of this commissioning period, the **Contractor** may apply for a Substantial Completion certificate meeting the contract and General Requirements.

F. Performance Test: All special tests, performed in the presence of the **County**, called for by the specific equipment or system specifications that are to be performed in addition to the installation and acceptance tests noted in this start-up specification (pre-operational checkout, functional testing, operational testing, and acceptance testing).

G. System: The overall process, or a portion thereof, that performs a specific function. A system may consist of two or more subsystems as well as two or more types of equipment. Examples of systems on this Project are as follows:

1. Pumps, motors, and controls

2. Instrumentation and control system(s)

H. Substantial Completion: The date certified by the **County** when the entire, or a part of, the Work as identified in the **County**'s certification:
1. Has been properly installed per the contract documents and manufacturer recommendations,
2. Has been deemed operational through the completion of the pre-operational checkouts, functional tests, operational tests,
3. Has had every test document with Operation and Maintenance manuals delivered,
4. Is sufficiently completed in accordance with the requirements of the Contract Documents, and
5. Has been demonstrated through the 30-day Acceptance Test, proving that the identified portion of the Work can reliably be utilized for the purposes for which it is intended.

1.3 SUBMITTALS

A. Administrative Submittals:

1. Functional and performance test schedules and plan for equipment, units, and systems at least 14 days prior to start of related testing. Include test plan, procedures, and log format.

2. Schedule and plan of facility startup activities at least 60 days prior to commencement.

B. Quality Control Submittals:

1. Manufacturer's authorized representative's signature shall be on the Certificate of Proper Installation, as required.

2. Functional and performance test reports, in a format acceptable to the **County** and certification of functional and performance test for each piece of equipment or system specified.

3. Certifications of calibration of testing equipment.

1.4 CONTRACTOR FACILITY STARTUP RESPONSIBILITIES

A. General:

1. The **Contractor** shall provide, at no expense to the **County**: power, fuel, compressed air supplies, water, and chemicals; as well as labor, temporary piping, heating, ventilating, and air conditioning or bypass pumping, for any areas where the Improved Facilities are not complete and operable at the time of Acceptance Testing and its prerequisites. **Contractor** shall provide other items and Work required to complete Acceptance Testing and its prerequisites. Temporary facilities shall be maintained until permanent systems are in service.

2. The **Contractor** shall provide necessary qualified operations personnel and manufacturers' field service personnel of the major equipment suppliers on an 8-hour-per-day basis at the facilities and on a 24-hour-per-day basis locally during the operational and acceptance test periods.

3. At no time during startup shall the **Contractor** allow the facility to be operated in a manner that subjects equipment to conditions that are more severe than the maximum allowable operating conditions for which the equipment was designed.

B. Tie-Ins or Modifications to Existing Systems – Work Plan:

1. Each time the **Contractor** ties into or modifies an existing system, a detailed Work plan shall be required. Submittal of this Work plan shall be a minimum of 30 days in advance of commencement of the subject Work. This Work plan shall include a detailed description of the Work, a step-by-step plan of the modification or tie-in, a detailed timeline schedule, a detailed list of materials and equipment required, demonstrated communications capacity, and a listing of gates or valves that shall be operated. Working drawings shall be submitted as required for any permanent or temporary structural modifications. A temporary safety plan covering the period of the Work, and a listing of contingency plans and supplies, including, but not limited to, spill prevention planning and spill containment kits, shall be required. The **Contractor**, the **County,** and the Designer shall hold coordination meetings with the **County's** water/sewer systems operations staff, as required, at least 30 days prior to the commencement of the modification or tie-in. A final coordination meeting shall be held to provide final detailed Work assignments to the involved parties, the day before the commencement of the modification or tie-in.

2. The **County** has the right to require, at no additional cost to the **County**, stand-by equipment on item(s) deemed critical enough to delay the Work. The **Contractor** shall have available stand-by personnel to supplement the committed forces, should problems arise. The **Contractor** shall be responsible for meeting OSHA standards, including entrance and exit safety, confined space entry, fall protection, scaffolding, rigging, etc.

C. **Contractor's** Startup Manager:

The **Contractor** shall appoint a qualified Startup Manager to manage, coordinate, and supervise the varied aspects of the **Contractor's** startup and testing program, including, but not limited to, those components of the program as listed with this Section. The Startup Manager shall have at least 5 years of total experience, or experience on at least five separate projects, in managing the startup and commissioning of mechanical, electrical, instrumentation, HVAC, and piping systems. **Contractor** shall submit the Startup Manager's resume for review and approval a minimum of 6 months prior to any testing, or prior to 50% completion of the first constructed system.

D. **Contractor's** Testing Team – Quality Assurance Manager:

1. The **Contractor's** Testing Team shall include at a minimum the Quality Assurance Manager, **Contractor's** Operations Specialist, qualified Mechanical/Equipment Foreman, qualified Electrical Journeyman, qualified Instrument Technician, and qualified/Certified Plant Operations personnel. The Operations specialist shall be a graduate from a minimum four-year course in mechanical, civil, or a related program of study. The operations specialist shall have equivalent documented experience in plant operations and maintenance.

2. The **Contractor** shall have the appropriate personnel, procedures, and test forms at the test site when performing a scheduled checkout/testing activity that shall be witnessed by the **County**.

E. Test Equipment:

1. All test equipment (gauges, meters, thermometers, analysis instruments, and other equipment) used for calibrating or verifying the performance of equipment installed under this contract shall be calibrated to within plus or minus 2 percent of actual value at full scale. Test equipment employed for individual test runs shall be selected so that expected values as indicated by the detailed performance specifications fall between 60 and 85 percent of full scale. Pressure gauges shall be calibrated in accordance with ANSI/ASME B40.1. Thermometers shall be calibrated in accordance with ASTM E77 and shall be furnished with a certified calibration curve.

2 Test instruments shall be calibrated to references traceable to the National Bureau of Standards and shall have a current sticker showing date of calibration, deviation from standard, name of calibration laboratory and technician, and date recalibration is required.

3. Calibration equipment/test instruments utilized for startup and testing shall be documented to include identification (by make, manufacturer, model, and serial number) of the test equipment, date of original calibration, subsequent calibrations, calibration method, and test laboratory as well as documentation of current calibration.

4. All analysis instruments, sensors, gauges, and meters used for performance testing shall be subject to recalibration to confirm accuracy after completion, but prior to acceptance of each performance test. All analysis instruments, sensors, gauges, and meters installed under this Contract shall be subject to recalibration prior to Acceptance.

5. Test equipment used to simulate inputs and read outputs shall have a rated

accuracy at the point of measurement at least three times greater than the component under test. Buffer solutions and reference fluids shall be provided as necessary for tests of analytical equipment.

1.5 COUNTY'S FACILITY STARTUP RESPONSIBILITIES

A. General:

1. Review **Contractor's** Testing and Startup Plans and schedule.

2. Witness each functional, operational (portions of), and performance test.

3. Coordinate other plant operations, if necessary, to facilitate **Contractor's** tests.

B. Startup Test Period:

1. Operate process units and devices, with support of **Contractor**.

2. Provide sampling, labor, and materials as required and provide laboratory analyses.

3. Make available spare parts, special tools, operation, and maintenance information for **County**-furnished equipment.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 STARTUP PROGRAM IMPLEMENTATION

A. Startup Meetings:

1. The **Contractor** shall schedule and conduct regular periodic startup meetings (separate from regular progress meetings). The startup meetings shall be held at least every 10 days (once startup planning commences) and may be scheduled at a more frequent interval by the **County** if necessary. Startup meetings shall be held at a location designated by the **Contractor** and approved by the **County**.

2. Startup meetings shall be attended by the **County**, **Contractor**, subcontractors as appropriate to the agenda, suppliers as appropriate to the agenda, and others as required.

3. The meeting agenda shall generally include:
   i. Review and approval of minutes of previous meeting
   ii. Review of Startup Schedule and progress since the previous meeting
   iii. Problems which impede delivery schedules and Startup Schedule
   iv. Field observations, problems, and conflicts
   v. Corrective measures and procedures to regain the Startup Schedule
   vi. Revisions to Startup Schedule, progress and schedule of the preceding Work period
   vii. Coordination of schedules, review of start-up submittal schedules and status, status of start-up related requests for information
   viii. All other business deemed appropriate and timely

B. Startup and Testing Schedule:

1. The **Contractor** shall produce an overall testing schedule setting forth the sequence contemplated for performing the test Work. The schedule shall be in bar chart form plotted against calendar time, shall detail the equipment and systems to be tested, and shall be coordinated with the Construction Schedule. The testing schedule shall show the contemplated start date, duration of the test, and completion of each test.

2. The preliminary test schedule shall be submitted with an overall Start-up Acceptance Test Plan. The **County** shall not witness any testing Work until the **Contractor** has submitted a schedule. The **County** takes no exception. The test schedule shall be updated weekly, and presented at each start-up meeting, showing actual dates of test Work, indicating systems and equipment testing completed satisfactorily and meeting the requirements of the Contract Standards. The test schedule shall re-forecast the upcoming testing and reflect any schedule adjustments accompanied by written reason for the change. The **Contractor's** baseline start-up and testing schedule shall be submitted with the overall test plan.

C. Documentation:

1. The **Contractor** shall develop a recordkeeping system to document activities associated with Acceptance Testing and its prerequisites.

2. Equipment and system documentation shall include date of test, equipment number or system name, nature of test, test objectives, test results, test instruments employed for the test, and signature spaces for witness by the **County**, the **Contractor's** Start-Up/Quality Assurance Manager, and the Equipment Manufacturer. A separate file shall be established for each system, organized by startup phase (i.e., pre-operational, functional, operational, acceptance test phase), and shall include sections for each item of equipment. These files shall include the following information and documentation at a minimum. Test plan and documentation organization shall be as described below.

D. Test Plan Organization:

1. Index

2. Schedule

3. Steps 1 and 2: Each type of equipment shall have its own section within the system and include the following:

   a. The detailed Pre-Operational test procedures

   b. The detailed Functional Test procedures

   c. Customized mechanical equipment, customized electrical, and customized instrumentation pre-operational and functional test forms, as applicable

   d. Other pre-operational test documentation as required for piping and mechanical equipment

4. Step 3: A separate section shall be created for the system operational testing and include the following:

a. The detailed 5-day operational test procedure

b. A detailed operational system check/sign-off sheet (based on system tests, control checks, and interlock checks to be performed)

c. System operational test completion sign-off form

d. Punch list form

5. Step 4: Another section shall be designated for the Acceptance Testing, including the following:

a. Detailed Work plans, communications plan, safety plan, and contingencies, as well as other requirements

b. Thirty-day test overview and proposed spreadsheet forms to be utilized by the **Contractor's** staff to record appropriate operational and performance data on a regular interval for the 30 days

c. System acceptance test completion/sign-off form

6. The forms attached to this Section are samples showing the required format and level of detail for documentation. The **Contractor** is advised that these are samples only and are not specific to this project or to any item of equipment or system to be installed under this contract. The **Contractor** shall develop test documentation forms specific to each item of facilities, equipment, and systems installed under this contract. Acceptable example documentation forms for systems and items of equipment shall be produced and submitted for review and approval by the **County**. Submittal of Startup and Testing Plans are a condition precedent to the **Contractor's** receipt of progress payments in excess of 60%of the contract amount. Once the **County** has reviewed and taken no exception to the plans and forms proposed by the **Contractor**, the **Contractor** shall produce customized forms for each item of equipment and system and include these individual forms in the overall test plan that shall be submitted for approval.

7. The complete Test Plan and its sections shall be submitted 60 days prior to any testing and approved by the **County** prior to implementation (Code 1 or Code 1C).

3.2 TEST PLAN IMPLEMENTATION

. This program shall be implemented in four distinct steps.

3.3 STEP 1 - PRE-OPERATIONAL CHECKOUT AND TESTING

A. Pre-operational Checkout: This includes multi-discipline Work completion and physical checkout. The Pre-operational Completion Verification and Pre-operational test reports include the following required testing. Examples of these documented tests include, but are not limited to:

1. Field pressure/leakage test reports for pipes, valves, and appurtenances
2. Wire insulation megohm reports for 120V and greater wire

3. Phasing, ratio, polarity, ground resistance, current injection, insulation resistance, over potential test, and circuit breaker contact resistance reports for medium voltage switchgear
4. Insulation power factor and resistance test reports for surge arresters
5. Megger reports for Unit Substations, Three Winding Transformers, and 4160V motor control centers
6. Megger reports and ground connection tests
7. Loop Status Report and Component Calibration forms
8. Equipment installation checkout forms

B. Pipe Testing:

1. Prior to application of insulation on exposed piping, test the piping systems at the appropriate pressure according to the requirements of related piping specifications. All buried piping shall be tested prior to any backfill being placed, unless prior approval by the **County** is given in writing. Test duration shall be 120 minutes and witnessed by a **County** representative. Isolate equipment that may be damaged by the specified test conditions. Testing shall be performed using calibrated test gauges and calibrated volumetric measuring equipment to determine leakage rates. Each test gauge shall be selected so that the specified test pressure falls within the upper half of the gauge's range. Testing shall include existing piping systems that connect with new piping systems. Existing pipe shall be tested to the nearest existing valve. All piping that fails the test shall be repaired.

2. For gas, air, and vapor systems, the allowable leakage rate for systems tested with air shall be based on a maximum pressure drop of 5 percent of the specified test pressure for the duration of the period. Prior to starting a test interval using air, the air shall be at ambient temperature and specified test pressure. The allowable leakage rate for hazardous gas systems, insulated systems, and systems tested with water shall be zero at the specified test pressure throughout the specified test period. Hazardous gas systems shall include sulfur dioxide, chlorine, propane, sludge gas, and natural gas systems. Testing medium shall be as follows for gas, air, and vapor systems:

Pipeline size	**Specified test pressure**	**Testing medium**
2 inch and smaller	75 psi or less	Air or water
2 inch and smaller	Greater than 75 psi	Water
Greater than 2 inch	3 psi or less	Air or water
Greater than 2 inch	Greater than 3 psi	Water

3. For liquid systems, leakage shall be zero at the specified test pressure throughout the specified duration for exposed piping, buried insulated piping, and buried or exposed piping carrying liquid chemicals. Leakage from other buried liquid piping systems shall be less than 0.02 gallon per hour per inch diameter per 100 feet of buried piping. Drain systems, other than pumped drain systems, shall be tested in accordance with Georgia State Minimum Standards.

4. For hydraulic and lube oil systems, upon completion of cleaning, field connections shall be completed and the system tested at the specified pressure. Pressure loss shall be zero for the specified test period. For fluid power systems, the manufacturer shall supervise the installation and testing of system components including field

piping.

C. Pipe System Cleaning and Flushing:

1. Piping systems shall be cleaned following completion of testing and prior to connection to operating, control, regulating, or instrumentation equipment. The **Contractor** shall clean and test sections of buried or exposed piping systems. Unless specified otherwise, piping 24 inches in diameter and smaller shall first be cleaned by pulling a tightly fitting cleaning ball or swab through the system. Piping larger than 24 inches in diameter shall be cleaned manually or with a cleaning ball or swab.

2. Upon completion of the cleaning, the **Contractor** shall connect the piping systems to related process equipment. Temporary screens, provided with locator tabs that remain visible from the outside when the screens are in place, shall be inserted in pipelines at the suction of pumps and compressors in accordance with the following table:

Equipment suction or piping size, inches	**Maximum screen opening, inches**
0 to 1	1/16
1-1/4 to 3	1/4
3-1/2 to 6	1/2
Over 6	1

3. The **Contractor** shall maintain the screens during testing prior to the start of Acceptance testing. In special cases, screens may be removed as required for performance tests. Prior to the start of Acceptance Testing, the **Contractor** shall remove the temporary screens and make the final piping connections after the screens have remained clean for at least 24 consecutive hours of operation. Systems handling solids are exempted.

4. Gas and air system piping 6 inches in diameter and smaller shall be blown out, using air or the testing medium specified. Piping larger than 6 inches shall be cleaned by having a swab or "pig" drawn through the separate reaches of pipe. After connection to the equipment, it shall then be blown out using the equipment. Upon completion of cleaning, the piping shall be drained and dried with an air stream. Sludge gas, natural gas, and propane systems shall be purged with nitrogen and a nitrogen pad maintained at 10 psig until the piping is placed in service.

5. After completion of cleaning, liquid systems, unless otherwise specified, shall be flushed with clean water. With temporary screens in place, the liquid shall be circulated through the piping system using connected equipment for a minimum period of 15 minutes and until no debris is collected on the screens. Potable water piping systems shall be flushed and disinfected in accordance with AWWA C651-05.

6. Upon completion of field piping, but before connection to any control components, hydraulic and fluid power oil systems shall be flushed and cleaned by circulating special flushing oil through the system. Flushing oil and procedures shall comply with ASTM D4174. System shall be cleaned such that internal contamination of system, when tested using procedures specified in SAE J1227, Section 2.3, shall

not exceed the ACL. Unless otherwise specified, the ACL value shall be established by the manufacturer of the major hydraulic system components in accordance with SAE J1227, Section 9.1. System supplier shall provide certificate of compliance that the ACL has been met.

7. Cleaning/flushing fluids shall be disposed of in a lawful manner meeting Federal, State, and Local regulations.

8. The **Contractor** shall verify anchor bolt torque specifications on pipe harness and hangers.

D. Equipment Pre-Operational Checkout:

Equipment pre-operational checks and tests shall include, but are not limited to, the following:

1. Check for proper installation, alignment, support, and anchorage per the applicable manufacturer's operation and maintenance manual and in accordance with the Contract Documents.

2. Check the equipment for proper adjustment, packing of seals, lubrication, drive connection, motor connection, and belt/chain tension per the applicable manufacturer's operation and maintenance manual and in accordance with the Contract Documents.

3. Check the associated process, seal water, drain, and vent pipe connections for proper routing and connection. Check to make sure the pipe testing was performed and signed as completed for the associated piping.

4. Verify that the equipment is clean and free of any construction debris that could potentially cause a malfunction.

5. Warrant that safety guards, signage, and other safety measures such as hearing protection, etc., are in place.

6. Have the manufacturer's representative perform pre-operational tests per the manufacturer's recommendations and review the equipment installation and sign the manufacturer's installation portion of the certification form. If the manufacturer's representative brings his or her own checklist, obtain a copy of the completed form and attach it to the **Contractor's** completed forms. Note that the manufacturer shall also fill out the contract approved check-out form and that the manufacturer's own forms shall not serve as a substitute.

7. All gates and valves associated with the equipment system shall be checked for proper installation, adjustment, and lubrication, per the manufacturer's recommendations.

E. Concrete Tanks Pre-Operational Checkout:

1. Water-retaining concrete structures shall be tested for water tightness in accordance with ACI 350.1R. The maximum allowable leakage rate shall be 0.075 percent over a 24-hour period.

F. Electrical Pre-Operational Checks/Tests:

Prior to energizing electrical circuits, use a 1,000-volt megohmeter to measure insulation resistance on conductors and insulated parts of electrical equipment. Measurements shall meet or exceed the appropriate ICEA, NEMA, or ANSI standard. Any insulation resistance less than 10 megohms is unacceptable. Record results, as well as ambient temperature. See attached form for example.

1. Measure phase-to-ground insulation resistance for circuits 120 volts and above, with the exception of lighting circuits. Measurements may be made with motors and other equipment connected, except that solid state equipment shall be disconnected unless the equipment is normally tested by the manufacturer at voltages in excess of 1,000 volts DC.

2. Complete Test Form for each installed motor. Measure the insulation resistance of motors before connection. Measure the insulation resistance for motors at the time of delivery as well as when connected. Insulation resistance values less than 10 megohms are not acceptable.

3. Adjust protective devices and make operative. Perform a functional check of the control circuit prior to energizing the equipment.

4. Review associated electrical terminations, switches, and breakers for satisfactory installation.

G. Individual Component/Instrument Calibration Pre-Operational Check/Test:

1. Each instrument and final element shall be field calibrated in accordance with the manufacturer's recommended procedure. Instruments shall then be tested in compliance with ISA S51.1 and the data entered on the applicable test report form. Alarm trips, control trips, and switches shall be set to initial values specified in the design at this time. Final elements shall be checked for range, dead band, and speed of response.

2. Calibration of analysis instruments, sensors, gauges, and meters installed under this contract shall proceed on a system-by-system basis. No equipment or system operational, performance, or acceptance tests shall be performed until instruments, gauges, and meters to be installed in that particular system have been calibrated and the calibration Work has been witnessed by the **County**.

3. Testing of instrument process piping/tubing, wiring, and individual components shall be completed and documented on the approved test forms provided to the **County** as part of the pre-operational testing phase and prior to commencement of individual loop testing conducted during the pre-operational functional test phase.

4. All components that fail to meet the required tolerances shall be repaired or replaced by the manufacturer and the above tests repeated until the component is within tolerance.

5. System instrumentation equipment supplied and installed shall be reviewed for proper installation and termination as part of the pre-operational checkout.

H. Pre-Operational Checkout Summary:

1. The pre-operational checkout and testing for each item shall be carried out in

accordance with the **Contractor's** submitted and approved procedures and documented on the **Contractor's** approved pre-operational test forms.

2. The **Contractor** shall complete the pre-operational testing requirements listed above, at a minimum, for each item of mechanical, electrical, instrumentation, and HVAC equipment prior to beginning any functional testing with regard to the equipment or the systems in which the equipment functions.

3.4 STEP 2 - FUNCTIONAL TEST

A. General:

1. The second step in the program is the Functional Test. This is the functional testing of the equipment. These tests begin for each item of equipment only after the Pre-operational Checks have been completed for components for the particular equipment.

2. The functional testing for each item of equipment shall be carried out in accordance with the **Contractor's** submitted and approved procedures and documented on the **Contractor's** approved functional test forms.

3. Once affected equipment has been subjected to the required pre-operational testing procedures and the **County** has witnessed and has not found deficiencies in that portion of the Work, individual items of equipment and systems shall be started and operated under simulated operating conditions to determine as nearly as possible whether the equipment and systems meet the Contract Standards. If available, plant process media may be employed for the testing of liquid systems except gaseous, oil, or chemical systems. If not available, potable water shall be employed as the test medium. Test media for these systems shall be either the intended fluid or a compatible substitute. The equipment shall be operated for a sufficient period of time to determine machine operating characteristics, including noise, temperatures, and vibration; to observe performance characteristics; and to permit initial adjustment of operating controls. When testing requires the availability of auxiliary systems such as looped piping, electrical power, compressed air, control air, or instrumentation that have not yet been placed in service, the **Contractor** shall provide acceptable substitute sources, capable of meeting the requirements of the machine, device, or system at no additional cost to the **County**. Disposal methods for test media shall be subject to review by the **County**. During the functional test period, the **Contractor** shall obtain baseline operating data on equipment with motors greater than 1 horsepower to include amperage, bearing temperatures, and vibration. The baseline data shall be collected for use as needed.

4. Test results shall be within the tolerances set forth in the detailed specification sections of the Contract Documents and as indicated in the **Contractor's** functional test plan and the manufacturer's criteria. If no tolerances have been specified, test results shall conform to tolerances established by recognized industry practice. Where, in the case of an otherwise satisfactory functional test, any doubt, dispute, or difference should arise between the **County** and the **Contractor** regarding the test results or the methods or equipment used in the performance of such test, then the **County** shall have the right to order the test to be repeated at the **Contractor's** expense. Where the results of any functional test fail to comply with the Contract Standards for such test, then such repeat tests as may be necessary to achieve the Contract Standards shall be made by the **Contractor** at no additional expense to the **County**.

B. The **Functional Test** reports include the required testing. Examples of these types of reports include, but are not limited to:

   A. The Functional Field Test of valves

   B. The cycling/functions checks of the sluice gates, slide gates, weir gates, stop logs, and stop plates

   C. The leakage testing of sluice gates, slide gates, weir gates, stop logs, and stop plates in accordance with AWWA specifications

   D. Vibration, noise, and capacity testing of pumps and motors

   E. Air distribution and leakage test of any diffused air systems

   F. Loop functional test for Instrumentation and Control

C. Process/Mechanical/Equipment - (Functional Testing):

   1. During the **Functional Verification Check and Testing** process, the **Contractor** and the various Manufacturers' Technical representatives shall examine and record the initial start-up performance of the components provided by their respective firms in accordance with the **Contractor's** approved functional test procedure.

   2. The initial operation, testing, and adjustment shall be as required to prove that the equipment has been installed properly and operates under the conditions specified.

   3. Upon completion of this Work, the manufacturer's field service technician shall complete the **Contractor's** approved functional test form as well as their own signed report to record the results of the inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests, and adjustments made; quantitative results if such are specified; and suggestions for precautions to be taken to maintain proper maintenance.

D. Electrical - (Functional Testing):

   1. The **Contractor's** electrician shall be present during testing to confirm the electrical, provide troubleshooting assistance, repair as needed, and assist in gathering baseline data such as motor amperages.

   2. Energize each control circuit and operate each control, alarm, or malfunction device; and each interlock in turn to verify that the specified action occurs. The **Contractor** shall submit a description of the proposed functional electrical test procedures as part of the testing plan.

   3. Verify that motors are connected to rotate in the correct direction. Verification may be accomplished by momentarily energizing the motor, provided the **Contractor** confirms that neither the motor nor the driven equipment shall be damaged by reverse operation.

E. Instrumentation and Control - (Functional Testing):

   1. The **Contractor's** instrumentation representative shall be onsite full time during the functional test phase to perform loop checks and to support the **Contractor's** start-up team as needed. Any packaged equipment or manufacturer-supplied control panels shall be field tested to verify control interlocks and control functions during this phase of testing by the equipment supplier. Note that the **Contractor's**

functional test procedure for each piece of equipment shall define each interlock to be tested.

2. Each instrument loop shall be tested. This testing shall check operation from transmitter to readout components. Signals shall be generated utilizing the primary measuring elements where possible. Signals shall be injected only if the primary element is unavailable.

3. If any output device fails to indicate properly, corrections to the loop shall be made as necessary and the test repeated until instruments operate properly.

F. Functional Testing Summary:

The functional testing for each item of equipment, electrical, and instrumentation shall be carried out in accordance with the **Contractor's** submitted and approved procedures and documented on the **Contractor's** approved functional test forms.

3.5 STEP 3 – OPERATIONAL TESTING

A. The third step in the program is the Operational Testing. This step begins after Pre-operational checks and Functional tests have been satisfactorily completed. The **Contractor** shall plan activities to allow for **County's** witnessing of tests and shall provide 24 hours' advance notice of testing activities.

B. The **Contractor's** operational test plan shall be a detailed procedure to confirm System Automatic Mode functions, verify system interlocks, and reconfirm equipment functions and controls. Design and performance criteria shall be demonstrated and documented during this five-day period. The **Contractor's** manufacturer, electrical, and instrumentation representatives shall be onsite on an 8-hour-a-day basis and locally on a 24-hour-a-day basis during this period.

C. In the event of failure to demonstrate satisfactory performance of the system on the first or any subsequent attempt, necessary alterations, adjustments, repairs, and replacements shall be made. When the system is again ready for operation, it shall be brought online and a new test shall be started. This procedure shall be repeated as often as necessary until the system has operated continuously to the satisfaction of the **County**, for the specified duration.

3.6 STEP 4 – ACCEPTANCE TESTING

A. The fourth step in the program is Acceptance Testing. The acceptance test period shall not begin until new systems and equipment have successfully completed the operational test period.

B. The Operations and Maintenance staff shall receive spare parts, safety equipment, tools and maintenance equipment, lubricants, approved operation and maintenance data, and the specified operation and maintenance instruction prior to the startup with plant process media. Valve tagging shall also be complete prior to this startup.

C. As part of the acceptance test plan, the **Contractor** shall submit detailed Work plans, communications plan, safety plan, contingencies, and other requirements.

D. In addition, a 30-day test overview and proposed spreadsheet forms shall be utilized by

the **Contractor's** operations staff to record appropriate operational and performance data on a regular interval for these 30 days.

E. Prerequisites:

Prior to the **County's** issuance of a Certificate of Substantial Completion for Design/Build Improvements, the **Contractor** shall perform Acceptance Testing. Acceptance Testing and the Acceptance Test Plan shall comprehensively cover potential modes of operation, including failure scenarios, as well as the operation of ancillary systems, to demonstrate full functionality of the Improved Facilities. Any failures of process, equipment, or systems shall result in restarting the acceptance testing period. The testing period shall be a minimum of 30 days of continuous operation, during which the facility shall meet the following criteria:

1. Continuous satisfactory operation at the rated capacity

2. Operation without violating the Contract Standards

3. Operation without creating a materially unsafe condition, nuisance condition or unacceptable risk to personnel, facilities or the public

4. Operation without producing biosolids products, air or water emissions, traffic, noise, odors, or other environmental impacts that the **County**, in its sole discretion, determines to be unacceptable to public safety, health or welfare

5. All portions of the acceptance test phase shall be carried out by qualified/certified operations personnel (supplied by the **Contractor**) that have a thorough knowledge of the process and can fully implement and document the facility performance as well as the **Contractor's** acceptance test plan.

6. Instrumentation Acceptance Test:

   a) The instrument loop acceptance test shall fully demonstrate stable operation of the loop under normal operating conditions. This test shall be witnessed by the **County**, performed, and documented by the Instrumentation System Supplier.

   b) Tuning parameters (proportional gain, integral time constant, and derivative time constant) for each control loop shall be adjusted to provide 1/4 amplitude damping unless otherwise specified and witnessed during system supplier factory testing.

F. Flow Meters:

Liquid flow meters, including open channel flow meters and meters installed in pipelines with diameters greater than 2 inches shall be calibrated *in situ* using either the total count or dye dilution methods. Gas flow meters installed in piping systems with diameters greater than 6 inches shall be calibrated *in situ* using the Pitot tube velocity averaging method. Flow meter calibration Work shall be performed by individuals skilled in the techniques to be employed. Calibration tests for flow metering systems shall be performed over a range of not less than 10 percent to at least 75 percent of system full scale. At least five confirmed valid data points shall be obtained within this range and witnessed by the **County**. Confirmed data points shall be validated by not less than

three test runs with results that agree within plus or minus 2 percent.

G. In the event of failure to demonstrate satisfactory performance of the system on the first or any subsequent attempt, necessary alterations, adjustments, repairs and replacements shall be made. When the system is again ready for operation, it shall be brought online and a new test shall be started. This procedure shall be repeated as often as necessary until the system has operated continuously to the satisfaction of the **County**, for the specified duration.

H. Completed operational test forms shall be placed into the master record test plan binder and provided to the **County** prior to acceptance.

+++END OF SECTION 01650+++

SECTION 01664
TRAINING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Reference Sections 01640 - Manufacturers Services, and 01650 - Facility Startup.
B. This section contains requirements for training **County** personnel by persons retained by the **Contractor** specifically for the purpose, in the proper operation and maintenance of the equipment and systems installed under this Contract.

1.02 QUALITY ASSURANCE

Where required by the detailed specifications, the **Contractor** shall provide on-the-job training of **County** personnel. The training sessions shall be conducted by qualified, experienced, factory-trained representatives of the various equipment manufacturers. Training shall include instruction in both operation and maintenance of the subject equipment.

1.03 SUBMITTALS

The following information shall be submitted to the **County** in accordance with Section 01300 - Submittals. The material shall be reviewed and accepted by the **County** as a condition precedent to receiving progress payments in excess of 75% of the Contract amount and not less than 3 weeks prior to the commencement of training.

A. Lesson plans for each training session to be conducted by the manufacturer's representatives. In addition to training manuals, handouts, visual aids, and other reference materials shall be included.

B. Subject of each training session, identity, and qualifications of individuals to be conducting the training shall be included with tentative date and time of each training session.

PART 2 - PRODUCTS

2.01 GENERAL

Where specified, the **Contractor** shall conduct training sessions for the **County**'s personnel to instruct the staff on the proper operation, care, and maintenance of the equipment and systems installed under this contract. Training shall take place at the site of the Work after the equipment has been installed and tested and under the conditions specified in the following paragraphs. Approved operation and maintenance manuals shall be available at least 30 days prior to the date scheduled for the individual training session.

2.02 LOCATION

Training sessions shall take place at the site of the Work.

2.03 LESSON PLANS

A. Formal written lesson plans shall be prepared for each training session. Lesson plans shall contain an outline of the material to be presented, along with a description of visual

aids to be utilized during the session. Each plan shall contain a time allocation for each subject.

B. One complete set of originals of the lesson plans, training manuals, handouts, visual aids, and reference material shall be the property of the **County** and shall be suitably bound for proper organization and easy reproduction. The **Contractor** shall furnish at a minimum 10 copies of necessary training manuals, handouts, visual aids, and reference materials at least 1 week prior to each training session.

2.04 FORMAT AND CONTENT

A. Each training session shall be composed of time spent both in the classroom and at the specific location of the subject equipment or system. As a minimum, training sessions shall cover the following subjects for each item of equipment or system:

1. Familiarization:

    a. Review catalog, parts lists, drawings, etc., previously provided for the plant files and operation, and maintenance manuals.

    b. Check out the installation of the specific equipment items.

    c. Demonstrate the installed unit and indicate how each part of the Specifications is met.

    d. Answer questions.

2. Safety:

    a. Using material previously provided and installed equipment, review safety references.

    b. Discuss proper precautions around equipment.

3. Operation:

    a. Using material previously provided and installed equipment, review reference literature.

    b. Explain the modes of operation (including emergency).

    c. Check out **County** personnel on proper use of the equipment.

4. Preventive Maintenance:

    a. Using material previously provided and installed equipment, review preventive maintenance lists, including:

        i. Reference material shall indicate easy-to-find resources used.
        ii. Daily, weekly, monthly, quarterly, semi-annual, and annual maintenance jobs shall be explained.

    b. The **Contractor** shall show how to perform preventive maintenance.

c. The **Contractor** shall show **County** personnel what to look for as indicators of equipment problems.

5. Corrective Maintenance:

   a. List possible problems.

   b. Discuss repairs and point out special problems.

   c. Open up installed equipment and demonstrate procedures, where practical.

6. Parts:

   a. Show how to use previously provided parts list and order parts.

   b. Look over spare parts on hand. Make recommendations regarding additional parts that should be available.

7. Local Representatives:

   a. List Where to Order Parts: Name, address, and telephone.

   b. Service Problems:

      i. Who to call.
      ii. How to get emergency help.

8. Operation and Maintenance Manuals:

   a. Review any other material submitted.

   b. Update material, as required.

2.05 VIDEO RECORDING

The **County** will retain the services of a commercial videotaping service to record each training session. After taping, the material may be edited and supplemented by the **County** with professionally produced graphics to provide a permanent record. The **Contractor** shall advise manufacturers providing the training sessions that the material will be videotaped and shall make available to the **County**'s videotaping service such utility services and accommodation as may be required to facilitate the production of the videotape record.

PART 3 – EXECUTION

3.01 GENERAL

A. Training shall be conducted in conjunction with the operational testing and commissioning periods. The Contractor will be responsible for the training of the Plant operators and maintenance staff before commissioning commences and also during commissioning, therefore before the Pre-Operation Checkout begins up to the completion of the Operational Test.

The training will consist of both class room and practical training with pre-approved training materials developed for the specific installation. Training will not be less than 40 hours, which will include both a pre-assessment and post-assessment evaluation for the Owner's personnel. The materials will consist of hard copy manuals and video materials and will become the property of the Owner.

Integrated training for staff as equipment is being installed/tested will also be conducted.

B. Classes shall be scheduled such that classroom sessions are interspersed with field instruction in logical sequence. The **Contractor** shall arrange to have the training conducted on consecutive days, with no more than 6 hours of classes scheduled for any single day. Concurrent classes shall not be allowed. The **Contractor**/Manufacturer is to plan for up to three classes in any 24-hour period to properly train each shift.

C. Acceptable operation and maintenance manuals for the specific equipment shall be provided to the **County** prior to the start of any training. Videotaping shall take place concurrently with training sessions.

D. The following, and additional, services shall be provided for each item of equipment or system as required in individual specification sections.

a. At a minimum, classroom equipment training for operations personnel shall include:

i. Using slides and drawings, discuss the equipment's specific location in the plant and provide an operational overview.

ii. Discuss the purpose and plant function of the equipment, demonstrating a working knowledge of the operating theory of the equipment.

iii. Discuss or demonstrate startup, shutdown, normal operation, and emergency operating procedures, including a discussion on system integration and electrical interlocks, if any.

iv. Identify and discuss safety items and procedures.

v. Explain routine preventative maintenance, including specific details on lubrication and maintenance of corrosion protection of the equipment and ancillary components.

vi. Demonstrate operator detection, without test instruments, of specific equipment trouble symptoms.

vii. Show required equipment exercise procedures and intervals.

viii. Denote routine disassembly and assembly of equipment, if applicable (as judged by the **County** on a case-by-case basis) for purposes such as operator inspection of equipment.

1. At a minimum, hands-on equipment training for operations personnel shall include:

a. Identify location of equipment and review the purpose.

b. Identify piping and flow options.

c. Identify valves and their purpose.

d. Identify/discuss instrumentation:

i. Location of primary element
ii. Location of instrument readout
iii. Purpose, basic operation, and information interpretation

e. Discuss, demonstrate, and perform standard operating procedures and routine checks.

f. Discuss and perform the preventive maintenance activities.

g. Discuss and perform startup and shutdown procedures.

h. Perform the required equipment exercise procedures.

i. Perform routine disassembly and assembly of equipment, if applicable.

j. Identify and review safety items and perform safety procedures, if feasible.

3. Classroom equipment training for the maintenance and repair personnel shall include:

a. Discuss theory of operation.

b. Examine description and function of equipment.

c. Discuss startup and shutdown procedures

d. Review normal and major repair procedures.

e. Discuss equipment inspection and troubleshooting procedures, including the use of applicable test instruments and the "pass" and "no pass" test instrument readings

f. Understand routine and long-term calibration procedures.

g. Review safety procedures.

h. Discuss preventive maintenance such as routine lubrication; normal maintenance such as belt, seal, and bearing replacement; and major repairs such as replacement of major equipment part(s) with the use of special tools, bridge cranes, welding jigs, etc.

4. Hands-on equipment training for maintenance and repair personnel shall include:

a. Locating and identifying equipment components.

b. Reviewing the equipment function and theory of operation.

c. Reviewing normal repair procedures.

d. Performing startup and shutdown procedures.

e. Reviewing and performing the safety procedures.

f. Performing **County**-approved practice maintenance and repair job(s), including mechanical and electrical adjustments and calibration and troubleshooting equipment problems.

+++END OF SECTION 01664+++

SECTION 01700
CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures
2. Final completion procedures
3. Warranties
4. Final cleaning
5. Repair of the Work
6. Specific closeout and special cleaning requirements for the Work in those Sections

1.03 SUBMITTALS

Submit the following shop drawings in accordance with Section 01300:

A. Product Data: For cleaning agents.

B. **Contractor's** List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

D. Certificates of Release: From authorities having jurisdiction.

E. Certificate of Insurance: For continuing coverage.

F. Field Report: For pest control inspection.

G. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.04 SUBSTANTIAL COMPLETION PROCEDURES

A. **Contractor's** List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (**Contractor's** punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following: a minimum of (10) days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting **County** unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.

3. Submit closeout submittals specified in individual Divisions 02 through 16 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

4. Submit maintenance material submittals specified in individual Divisions 02 through 16 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by the **County.** Label with manufacturer's name and model number where applicable.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain the signature of an authorized **County** representative for receipt of submittals.

5. Submit test/adjust/balance records.

6. Submit sustainable design submittals required in Division 01 (sustainable design requirements Section) and in individual Division 02 through 16 Sections.

7. Submit changeover information related to **County's** occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following: a minimum of (10) days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise the **County** of pending insurance changeover requirements.

2. Make final changeover of permanent locks and deliver the keys to **County**. Advise the **County's** personnel of changeover in security provisions.

3. Complete startup and testing of systems and equipment.

4. Perform preventive maintenance on equipment used prior to Substantial Completion.

5. Instruct **County's** personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 01 Section - Training.

6. Advise **County** of changeover in heat and other utilities.

7. Participate with **County** in conducting inspection and walkthrough with local emergency responders.

8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.

9. Remove labels that are not permanent labels.

10. Complete final cleaning requirements, including touchup painting.

11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of ten (10) days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, **County** will either proceed with inspection or notify **Contractor** of unfulfilled requirements. **County** will prepare the Certificate of Substantial Completion after inspection or will notify **Contractor** of items, either on **Contractor's** list or additional items identified by **County**, that shall be completed or corrected before certificate shall be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection shall form the basis of requirements for final completion.

1.05 STARTING OF SYSTEMS

A. Conform to the requirements of sections within Division 1.

B. Coordinate schedule for start-up of various equipment and systems.

C. Notify **County** (seven) days prior to start-up of each item.

D. Verify each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

E. Verify tests, meter readings, and specified electrical characteristics agree with those required by equipment or system manufacturer.

F. Verify wiring and support components for equipment are complete and tested.

G. Execute start-up under supervision of applicable manufacturer's representative, **Contractors'** personnel, and **County** in accordance with manufacturers' instructions.

H. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, approve equipment or system installation prior to start-up, to supervise placing equipment or system in operation, and to train the **County's** staff.

1.06 DEMONSTRATION AND INSTRUCTIONS

A. Conform to the requirements of sections 01640 and 01650

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within (six) months.

C. Utilize operation and maintenance manuals as the basis for instruction. Review contents of manual with **County's** personnel in detail to comprehensively explain the operation and maintenance.

D. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at a scheduled and agreed time, for each piece of equipment at each designated location. Time shall be acceptable to the **County**.

E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

F. Required instruction time for each item of equipment and system is specified in individual sections.

1.07 TESTING, ADJUSTING, AND BALANCING

A. **County** shall appoint and employ services of independent firm to perform testing, adjusting, and balancing to ensure smooth and unhindered equipment operation. **Contractor** shall pay for services and funds shall be within the contract price.

Reports shall be submitted by independent firm to **County** indicating observations and results of tests and indicating compliance or non-compliance with requirements of Contract Documents.

1.08 PROJECT RECORDS DOCUMENTS

A. The **Contractor** shall record any actual revisions to the Work and maintain one set of the following Project Record Documents on Site:

1. Contract Drawings, Specifications, and Addenda.

2. Change Orders, Field Orders, and other written notices.

3. Shop drawings, Product data, and samples.

4. Records of surveying and layout Work.

5. Project Record Drawings.

B. The **Contractor** shall record information on the Project Record Documents concurrent with construction progress and store these documents separately from the documents used for construction.

1. The **County** will supply a set of Contract Drawings. The **Contractor** shall mark thereon each revision as the Work progresses in order to produce a set of as-built drawings.

2. The **Contractor** shall note any changes made during construction by any of the **Contractor's** forces or those of any subcontractors.

3. The **Contractor** shall dimension the locations of buried or concealed Work, especially piping and conduit, with reference to exposed structures.

4. The **Contractor** shall note the installed locations of concealed service lines on the Site or within the structure by reference from the center line of the service to the structure column lines, to other main finished faces, or to other structural points that are easily identified and located in the finished Work.

5. Certificates of Substantial Performance and Total Performance shall not be issued until as-built drawings are complete and submitted, and the **Contractor** has fully satisfied the requirements for Substantial Performance and Total Performance of the Work.

C. For Project Record Documents and Record Shop Drawings, the **Contractor** shall legibly mark each item to record actual construction, including:

1. Field changes of dimensions and details.

2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

3. Measured locations of internal utilities and appurtenances that are concealed in construction, referenced to visible and accessible features of the Work.

4. Any Changes in the Work from the contract documents.

5. The location of concealed mechanical services and electrical main feeders, junction boxes, and pullboxes.

D. Upon completion of the Work, the **Contractor** shall prepare two CD-ROM sets of the Record Shop Drawings and an index.

E. The **Contractor**-prepared Record Shop Drawings CD-ROM index shall identify the **County's** project number, project name, and Contract number and the contents of each CD in the format listed below.

1. The index shall include the following columns of information for each Record Shop Drawing:

    a. CD number

    b. Specification Section number

    c. Specification title

    d. Shop drawing transmittal number

    e. Shop drawing equipment description including preselected Equipment vendor and supplier.

2. The index shall be printed by the following two sorts:

    a. Primary sort: Specification Section number. Secondary sort: shop drawing transmittal number.

    b. Primary sort: CD number. Secondary sort: Specification Section number.

3. The index shall be generated using Microsoft Excel software. A copy of the electronic file shall be furnished to the **County**.

4. The **Contractor** shall provide a set of Project Record Documents on CD-ROM in an electronic format compatible with the plant CD-ROM record standards. All drawings are to be provided electronically on CD-ROM in both AutoCAD (latest version) and Adobe Acrobat PDF (latest version). Also provide a set of CD-ROMs containing the software implemented on this project, including standard software and custom application software. Also provide a set of CD-ROMs containing the various programming tools and files necessary for maintenance, editing, backing up, and restoring programmable equipment implemented on this project.

1.09 EQUIPMENT INVENTORY SPREADSHEET

A. As part of the **County's** asset management program, the **Contractor** shall complete each field for the equipment inventory file for each piece of equipment and device provided under this Contract, as a requirement for Substantial Performance. An electronic format of the equipment inventory spreadsheet shall be provided on a CD by the **Contractor**.

1.10 EQUIPMENT PREVENTIVE MAINTENANCE SPREADSHEET

A. As part of the **County's** asset management program, the **Contractor** shall complete each field for each piece of equipment and device provided under this Contract, as a requirement for Substantial Completion. The **Contractor** shall transfer the manufacturer's recommended preventive maintenance tasks and frequencies into the spreadsheet. An electronic format of the equipment inventory spreadsheet shall be provided on a CD by the **Contractor.**

1.11 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting them with durable sheet materials.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

1.12 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.

B. Deliver to location as directed by **County**; obtain receipt prior to final payment.

C. Crate in containers designed for prolonged storage suitable for handling with hoisting equipment containers:

D. Stencil on containers:

1. Manufacturer/supplier name
2. Unit name
3. Spare part name
4. Manufacturer catalog number
5. Other identifying information
6. Precautionary information

1.13 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1.
2. Certified List of Incomplete Items: Submit certified copy of **County's** Substantial Completion inspection list of items to be completed or corrected (punch list),

endorsed and dated by **County's** representative**.** Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

4. Submit pest-control final inspection report.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of the request, the **County** will either proceed with inspection or notify the **Contractor** of unfulfilled requirements. The **County** will prepare a final Certificate for Payment after inspection or will notify the **Contractor** of construction that shall be completed or corrected before the certificate will be issued.

C. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete has been completed or corrected.

1.14 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction, including, if necessary, areas disturbed by the **Contractor** that are outside the limits of construction.

1. Organize the list of spaces in sequential order, starting with exterior areas first, and proceeding from the lowest floor to highest floor.

2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

3. Include the following information at the top of each page:

   a. Project name

   b. Date

   c. Name of **Contractor**

   d. Page number

4. Submit list of incomplete items in the following format:

   a. PDF electronic file. **County** will return annotated file.

   b. Three paper copies. **County** will return two copies.

1.15 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of the **County** for designated portions of the Work where commencement of warranties other than the date of Substantial Completion is indicated, or when a delay in submittal of warranties might limit the **County's** rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within fifteen (15) days of completion of designated portions of the Work that are completed and occupied or used by **County** during the construction period, by separate agreement with **Contractor**.

C. Organize warranty documents into an orderly sequence based on the table of contents of Contract Documents.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper or as directed by the **County.**

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of installer.

3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of **Contractor**.

4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the Georgia Code of Regulations maximum allowable volatile organic compound (VOC) levels.

PART 3 - EXECUTION

3.01 FINAL CLEANING

A. General: Perform final cleaning as directed by the **County.**

B. Pest Control: Comply with pest control requirements in Division 01, Section, Temporary Facilities and Controls. Prepare and submit a written report to the **County**.

C. Construction Waste Disposal: Comply with waste disposal requirements in Division 1 and meet local laws.

3.02 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determining Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.

2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration. Do not paint over "UL" or other required labels and identification, including mechanical and electrical nameplates. Remove any paint that has been applied to required labels and identification.

3. Replace parts that have been subjected to operating conditions during construction that could impede operation or reduce longevity.

4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

3.03 ADJUSTING

Adjust operating products and equipment to ensure smooth and unhindered operation.

END OF SECTION - 01700

SECTION 01800
MAINTENANCE

PART 1 - GENERAL

1.01 DESCRIPTION

A. **Contractor** shall maintain stored and installed equipment and materials until Final Acceptance of the Work as defined by the General Requirements. Work includes, but is not limited to:

1. Perform required maintenance.

2. Repair and maintain protective coatings.

3. Repair and replace scratched and damaged materials and equipment.

4. Maintain and operate new equipment placed into service.

B. Work, per this Section, starts on the date the equipment and materials are received and continues until the Date of Final Acceptance.

C. **Contractor** shall monitor equipment storage, and subsequently, the operation and material functionality on a continual basis during the specified time period. Deterioration of materials or malfunction of equipment shall be followed by swift repair action to minimize the damage. Such repair shall include repair and technical services by an independent contractor if the **County** deems the **Contractor's** efforts are ineffective at correcting the problem.

D. All costs for maintenance and repair of stored and installed equipment and materials, including costs from an independent contractor, during the specified time period shall be the sole responsibility of the **Contractor**.

+++END OF SECTION 01800+++