



# **CONSTRUCTION PHASE PROCEDURES**

**NOVEMBER 2007**



# San Antonio Water System

## PROJECT CONSTRUCTION PROGRAM



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**INTRODUCTION:** These Construction Phase Procedures have been written to help direct and control activities during construction of projects for the San Antonio Water System (SAWS). The Construction Phase Procedures Manual is not intended to be a step-by-step procedure, instead it is a document which outlines general activities, procedures, and requirements by SAWS. Contractors and subcontractors working on SAWS Construction Projects are required to know all specification requirements for their project. This manual was designed to cover most issues involved in a large construction project. The size, scope, and/or technical complexity of the individual project will determine the extent the procedures in the manual are utilized. Many routine SAWS projects will not necessarily require use of every form listed in this manual. For projects being managed by Consultants, whether hired by SAWS or private businesses, it is allowable to use their pre-established forms and documents so long as they follow the general format of this manual and meet the general intent of the requirement.

**QUALITY CONTROL/QUALITY ASSURANCE:** SAWS has established a Construction Quality Control and Quality Assurance (QC/QA) Program. The Construction QC/QA Program has been written and distributed to facilitate the direction and control of entities and persons performing and managing construction for the SAWS Construction Projects.

**PARTNERING:** SAWS is committed to promoting partnering with all parties associated with a Construction Project. Shortly after the award of contracts, SAWS will invite Contractors and Consultants to participate in a Partnering Workshop Session, when considered in the best interest of the Construction Project.

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**PRE-CONSTRUCTION MEETING:** A Pre-Construction (PreCon) meeting will be sponsored by SAWS shortly after award of the project. The PreCon is designed to review the various administrative procedures and actions required by all involved parties. Depending upon the project scope and technical requirements, the PreCon may be conducted jointly with the Partnering meeting or held separately. In order to ensure all pertinent issues are covered during the PreCon, SAWS has developed a Pre-Construction checklist (Form 18).

**SAFETY:** SAWS is committed to ensuring that safety is a priority on SAWS Construction Projects. A Construction Safety and Health Program has been prepared and distributed to help prevent accidents, injuries, and damage to equipment and property. The Construction Safety and Health Program is not intended to be an all inclusive listing of safety procedures, rather it is a guidance document.

**REPONSIBILITIES AND COMMUNICATION:** The Construction Observer/Inspector (COI) is the individual who has been designated as the field representative of SAWS. The COI's primary responsibility is to observe construction activities, in accordance with SAWS directives, to assure completion of the project according to the plans and specifications. The COI and/or their Supervisor are also responsible for regular review of safety documentation and reports and forwarding such documents to SAWS. If the COI observes or perceives an unsafe work practice, he or she shall bring it to the attention of the Contractor's representative, and the SAWS Safety Officer.

The COI is responsible for coordinating between the various parties involved in the project, including the various departments within SAWS, and is the Contractor's primary point of contact

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on the project. Consequently, all communications will be directed through the COI by project participants.

The matrix shown in the Appendix lists the general responsibilities of various construction phase activities. The procedures in this document are based on the matrix. The contracts and construction documents for each individual project shall be reviewed and the procedures and responsibilities adjusted according to the specific project documents.

Note: when the term “COI” is used in this document, it refers to the overall SAWS Construction Inspection office. The term collectively means a combination of the individual Construction Inspector assigned to this project, another Construction Inspector temporarily assigned to oversee the project during the absence of the designated Inspector, his/her Area Supervisor, personnel in the Construction Inspection Administrative office, the Construction Inspection Project Engineer, the Manager of Construction Inspection, etc. Internal SAWS policies and procedures dictate the appropriate individual referenced as the “COI”.

**WRITTEN CORRESPONDENCE:** General correspondence to the contractor will be signed by the COI and/or the appropriate Construction Inspection personnel pertaining to legal and contracting issues.

Routing of data and information to outside organizations, without the need of a cover letter, will have a Transmittal form (Form 1). Written communications internal to SAWS will be prepared on the Memorandum form (Form 2). Telephone conversations with the Contractor, Design

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Engineer, other SAWS Representative, Suppliers, Subcontractors, Vendors, etc. will be noted on the Telephone Conversation Record (Form 3).

Written inquiries or questions on the Contract Documents from the contractor should be written on a Request For Information form (Form 4). If the Contractor asks a verbal question, the COI will either provide a verbal response or request the contractor submit a Request for Information (Form 4). The COI will determine where the question should be forwarded. All questions to the Design Engineer will be faxed or delivered the same day. The COI will monitor or prepare responses to minimize delays to the Contractor by maintaining a log of all Requests For Information (Log 1). The COI will forward the response to the Contractor when complete. The Contractor is required to review the response and return a copy of the form and indicate whether extra compensation is due. If the Contractor indicates extra compensation is due, the Construction Inspection office will review the response again and determine if the response should be amended.

A complete set of files will be maintained at the job site and/or SAWS Construction Inspection office by the COI in accordance with the File Code System in the Appendix of this document. A copy of all sensitive documents will be forwarded to the SAWS Construction Inspection Manager.

**ELETRONIC COMMUNICATION:** Electronic communication in the form of electronic mail (e-mail) is acceptable and should be used for most unofficial correspondence. Unofficial correspondence may be defined as transmittals, which do not require a signature. If correspondence is made via e-mail, hard copies do not need to follow. Hard copies of e-mail messages may be retained by the sender and may be printed by the recipient so that a record of

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the unofficial correspondence can be maintained. The recipient shall also return confirmation of e-mail receipt to the sender.

**SHOP DRAWINGS/SUBMITTALS:** The Contractor is responsible for ensuring that all information is submitted in a timely manner to prevent construction delays. The Contractor will transmit 8 copies of the shop drawings to the COI using the prescribed cover sheet Transmittal of Contractor's Submittal form (Form 5). The COI will log the shop drawings (Log 2). 6 copies will be sent to the Design Engineer, one copy to the appropriate SAWS office for comment, and one copy will be retained by the COI with suspense date for follow-up. The copies will be delivered to the Design Engineer and SAWS Engineer within 24 hours after the Contractor has made the submittal to the COI

The target date for the return of the documents from the Design Engineer shall be 10 calendar days from when the documents are submitted, even though contracts allows 20 calendar days. Before any shop drawings requiring "re-submittal" are returned to the Contractor, the Design Engineer and/or the COI will call the Contractor and give him/her an opportunity to correct the problems.

The Design Engineer will denote comment and retain 1 copy and return the remaining 5 marked-up copies to the COI. The COI will consolidate the comments from SAWS staff with the comments from the Design Engineer, retain one copy and return 5 copies to the Contractor.

**MEETINGS:** The COI will assure that minutes for all project meetings are prepared. The Conference Memorandum form (Form 6) will be used to document the meeting. A copy of the

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Conference Memorandum will be distributed to each attendant within seven working days of that meeting. Weekly meetings will follow the standard agenda below:

- Corrections to Previous Minutes
- Unresolved Items
- Administrative Items
- Change Orders
- Shop Drawings
- Problems, Conflicts, & Observations
- Coordination With Owner and/or Other Contractors
  - Bypasses and/or Shutdown
  - Other
- Progress Since Last Meeting
- Planned Progress for Next Meeting
- Other Business
- The latest copies of the Submittal Log and Request For Information Log will also be issued at each weekly meeting.

### **PROJECT REPORTS:**

DAILY REPORTS: The COI will prepare a Daily Construction Report form (Form 7) by no later than 10:00 am the next working day. The reports will be maintained in the job files. The reports begin on the first contract day so that the report number will correspond to contract day. This means that a report is to be prepared for every day including Saturdays, Sundays and holidays even if the Contractor doesn't work. The

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SAWS Daily Log (Form FN016-4) is an allowable substitution. Consultant developed daily logs can be used if the same basic information is recorded.

The information recorded includes project title, contractor's name, SAWS job number, day (Monday, Tuesday, Wednesday, etc.), date, Contractor work hours, report number, and weather conditions. Information recorded in the boxes includes the number and class (operators, carpenters, laborers, superintendent, foreman, clerical, electrician, etc.) of personnel for the Contractor and his Subcontractors working on the job site. This information can normally be determined from field observation and the Contractor's Daily Construction Report (Form 8). The number, description, and hours operated for all of the Contractor's and Subcontractor's equipment on the project site will also be recorded. The hours of operation do not have to be exact but, by observing the work, a reasonable estimate can be made. When Contractor's equipment arrives or departs from the project site, record the size, model number, or capacity in "The Work Performed" section. The information that is to be recorded under "The Work Performed" section is as follows:

- Description and/or condition of materials and equipment delivered.
- Description of items rejected and reasons therefor.
- Results of inspection tests which are not recorded on standard forms.
- Account of work accomplished during the day including location and quantity.
- Description of any deviations from plans and specifications, reasons for the deviations, and what was substituted.
- Record of specific instructions given to the contractor.

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- Details of discussions, or controversies with anyone connected with the work such as the contractor or their representatives, suppliers, property owners, city, county, state, or federal government personnel.
- List of visitors to the project and their business connection.
- Details of any personal or property damage that may have occurred as a result of the contractor's negligence.
- Observations of the condition of foundations and other items of work which will be covered.
- References to important phone calls. (Details of all phone calls should be recorded on telephone conversation forms.)

The above information could become invaluable if the project becomes involved in any type of claims. The number of employees and delays to equipment operation often are critical items in claims.

CONTRACTOR'S DAILY REPORTS: The Contractor is required to submit a Daily Construction Report (Form 8) to the COI. The Contractor may use his own form as long as it provides the same information as the form (Form 8) enclosed in the Appendix. The Contractor may submit these Daily Construction Reports on a weekly basis.

CONTRACTOR'S PAYROLL REPORTS: The Contractor must submit weekly compliance statements and payroll records directly to the Contract Administration Division of SAWS so that they may be reviewed for compliance with Wage and Labor Standard Provisions.

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MONTHLY REPORTS: Depending upon the scope, size, and/or complexity of the project, COI will prepare a Monthly Summary of Construction (Form 9) which will include a summary of progress payments, work progress, project work, delivery problems or delays, and potential modifications. COI shall also review the record documents maintained by the Contractor and shall report completeness in the remarks section of the monthly report. The COI shall submit 2 copies of the report with the Contractor's pay request to SAWS.

WATER USE LOGS: The contractor shall prepare a monthly summary of water usage using the Unmetered Water Use Log (Log 8) and the Contractor Tank Truck Water Use Log (Log 9). These reports should accompany the monthly invoices and are required before SAWS will process any payments.

**SAFETY:** The SAWS Project Construction Program and Safety and Health Program is not intended to be an all-inclusive listing of safety procedures. It is a guidance document which outlines general safety activities, procedures, and reporting requirements to be implemented by the Contractor. Contractors working on SAWS Construction Projects shall have their own Project Specific Safety Plan which complies with the general requirements of the Safety and Health Program and all applicable regulations. Individuals working on SAWS Construction Projects are responsible for knowing all safety rules, being alert and practicing good, sound judgment in the performance of their jobs, even if specific safety rules are omitted from either this SAWS Construction Program and Safety and Health Program or the Contractor's object-specific safety plan. Subcontractors and their employees are responsible for following all requirements of the Contractor's project-specific safety plan.

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Safety guidelines shall be understood and followed by all individuals while on the job site. Violation of Safety and Health guidelines either in job performance or in the letter of the project-specific safety plan may result in work stoppage until safety requirements are properly fulfilled.

**QUALITY CONTROL/QUALITY ASSURANCE:** An important tool in the success of construction projects is the implementation of a Construction QC/QA Program. Partnering will result in a quality completed project and provides for the development of trust and effective communication between the Contractor, Consultant, and SAWS.

**QUALITY CONTROL:** Quality Control (QC) is the Contractor's means of assuring conformity with the construction contract documents by defining procedures to manage and control his/her own activities, all Subcontractor's activities, and all suppliers' activities during construction. These procedures will be outlined in the Contractor's project-specific QC Plan, the foundation for quality work. The Contractor's QC plan shall be received and formally accepted before any construction begins. In some cases, this requirement can be met by an interim plan. As part of its QC activities, the Contractor shall document activities performed by the Contractor, Subcontractors, testing laboratories and vendors in accordance with the contract documents. It is imperative that the Contractor's QC representative review all submittals to make sure all requirements are met.

**TESTING:** Proper testing procedures, as described in the Construction Contract Documents, are forms of quality control to be performed by the Contractor ensuring delivery of an end product which meets the requirements in the contract documents. Testing requirements and procedures shall include but not be limited to the following:

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- Outline proposed testing procedures prior to construction.
- Provide a listing of all required tests as specified in the contract, in addition to providing a listing of all non-specified testing procedures pending approvals.
- Specify whether the tests are to be performed by an independent, SAWS approved, certified testing laboratory or by the Contractor with approved certified equipment and procedures or by others (Subcontractors or suppliers).
- Follow ASTM 3740-96 - Minimum Requirement for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction.
- Pipe Testing events will be recorded on a Pipe Leak Test Record (Form 10) and entered on the Pipe Testing Log (Log 3).

**QUALITY ASSURANCE:** Quality Assurance (QA) is the means by which SAWS assures that the project work complies with the quality established by the construction contract documents. QA will be achieved through a QA Plan which serves as a management tool to establish processes and procedures involving the SAWS and Consultant organization, staffing, training, pre-award activities and construction observation. The QA Plan will identify Quality Assurance personnel, special project requirements and construction administration and observation tasks so as to assure that a consistent process is followed by QA personnel. SAWS COI will perform QA through a combination of routine and random site inspections.

The QA representatives will review and accept the QC Plan and arrange and coordinate construction conferences, partnering workshops and other overall project meetings. The QA representatives will also document and review quality control activities. While QC testing will be completed by the Contractor, QA testing will be conducted by SAWS through the COI.

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Finally, once all QC activities have been met and verified through the QA process, SAWS will start the acceptance process of the completed work.

**PHOTOGRAPHS:** The COI may take photographs to document the progress of the project or if there is a potential problem or claim developing.

**CONSTRUCTION PROJECT SIGN:** The Contractor will provide and erect a construction project sign in a visible area of the specific project. The location of the project sign will be approved by the COI. The construction project sign shall meet specifications and guidelines as outlined in the San Antonio Water System Standard Drawings, Standard Drawing No. DD-845-02.

### **CHANGES:**

**CHANGE ORDERS:** Changes may be initiated by the Contractor, Design Engineer, or SAWS. When SAWS or the Design Engineer initiates a change, a Request For Proposal form (Form 11) will be prepared which describes the change. The request will be forwarded by the COI to the Contractor for pricing. Each Request For Proposal shall be sequentially numbered and its status shall be documented on the Change Order Proposal Log (Log 4). When the Contractor initiates the change, the Contractor shall request the next sequential number for the quotation and then submit the quotation to the COI

Upon receipt of the quotation from the Contractor, the COI will record the appropriate information on the Change Order Proposal Log. The COI shall participate, with other

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SAWS representatives as appropriate, in negotiation of equitable Change Orders with the Contractor. After negotiations have been complete and the results accepted by SAWS management, a Change Order form (Form 12) will be prepared for processing. Several proposals may be combined into a single Change Order. The Change Order Log (Log 5) is used to record information pertaining to the status of each Change Order.

The COI will send 6 copies to the Contractor for processing. The Contractor shall return 5 executed copies to SAWS Construction Inspection for processing.

Change Orders for aggregate amount greater than a positive or negative change of \$25,000.00 or that need additional contingency funds authorization require approval by the SAWS Board of Trustees (Board). The SAWS Board normally meets twice a month on the first and third Tuesday of each month. During the summer, the Board typically meets once a month. Due to the required review procedures for changes that must meet the Board for approval, the entire process from final agreement on the scope and price to Board approval can take 6 to 8 weeks. Changes less than \$25,000.00 may be processed by SAWS staff without Board approval if sufficient contingency funds are available. For change orders exceeding \$25,000.00 and requiring immediate action, the COI will initiate a ratification request through SAWS Construction Inspection.

PRICING CHANGES: For some changes, it may be advantageous for work to be performed on a time and materials basis. For this method the Contractor will track all employee hours, equipment hours, and quantity of materials used. This information must be recorded each day on the Daily Time & Material Record form (Form 14) or a similar form provided by the Contractor. The COI is required to monitor the work and check the

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forms submitted each day by the Contractor for accuracy. The General Conditions of the Contract Documents outline what type of overhead and profit that the Contractor may add for this type of charge. This method of pricing changes is not desirable because it places an extra administrative burden on the Contractor and COI and doesn't provide the Contractor with an incentive to work efficiently.

### **PAYMENTS:**

PROGRESS PAYMENTS: During the latter part of each month as the work progresses the COI and Contractor shall determine the cost of the labor and materials and/or the quantities incorporated into the work during that month. They will also determine the actual invoiced cost of Contractor-acquired materials stored on the Project site and/or within off-site storage facilities either owned or leased by the Contractor and approved by SAWS. The COI will review the draft quantities and percentages (commonly called the “scratch sheet”) and determine if they are appropriate. The COI will also check the stored material list for new items and verify that materials are actually on site and that the invoice is attached to the estimate. The previous list of stored material items will be checked for consumption, and removal of items from the list. The COI and Contractor will meet to discuss the estimate and resolve any disputed items. When correct, the Contractor shall obtain signature from the Design Engineer and forward 8 sets of the form 15 (Progress Payment) through SAWS for processing. SAWS will confirm that quantities, extensions, and totals are correct, and proceed with processing.

Upon receipt of the Payment Estimate (form 15), SAWS will process as follows: Construction Inspection will review, sign, and forward to Contract Administration and update the Contract Summary Sheet (form 16); Contract Administration will review,

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sign, and forward the payment estimate to the Accounting Department. Payment estimates received in the Accounting Department after Tuesday afternoon, will not be prepared until the following Friday; checks are printed on Friday, provided that there are no holidays in that time. IAW the contract General Conditions, SAWS will make payment within 30 days of receipt of the invoice at Construction Inspection.

SEMI-FINAL PAYMENTS: Upon completion of all work, an inspection will be performed by SAWS and an Inspection Letter of Conditional Approval will be issued. This letter will include a punch list of all items, if any, which must be completed before final acceptance of the work. The Contractor and COI will then prepare a semi-final payment request, which includes a recapitulation of project costs. The semi-final pay request will list the original contract amount, the total value of the work to date which was figured in the recapitulation of project cost, less the retainage and previous payments, and finally the total amount due for the semi-final payment. Payment procedures will follow the same protocol as the progress payment procedures outlined above.

FINAL PAYMENT: Upon final completion of all work (including punch list items), a final Certificate of Acceptance will be issued by SAWS. The Contractor and COI will then prepare the Final Payment Request. Along with the Final Payment Request the Contractor shall submit a notarized affidavit in duplicate stating under oath that all subcontractors, vendors, and other persons or firms who have furnished or performed labor or furnished materials for the work have been fully paid or satisfactorily secured. Such affidavit shall bear or be accompanied by a statement, signed by the surety company who provided the Payment Bond for the work, to the effect that said surety

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company consents to final payment to the Contractor being made by SAWS. SAWS will then release the retainage and make final payment to the Contractor. Payment procedures will follow the same protocol as progress payment and semi-final payment procedures described above.

**SPARE PARTS:** The Contractor will review the specifications and develop a list of all required spare parts and forward to the COI for verification. The list will be included on the Spare Parts Transfer Log (Log 6) prepared by the Contractor. Each package will have a tag or label with all the required information completed and placed on it. The Spare Parts Transmittal form (Form 17) will be completed when the spare parts are ready to be turned over to the SAWS operations staff. Separate forms will be used for spare parts from each specification section. A package and Spare Parts Transmittal Form for all parts from a specification section must be completed before the parts will be accepted from the Contractor (no partial submissions for a specification section will be accepted). The COI will verify that each submission is complete and correct before it is turned over to SAWS operations staff.

**PROJECT COMPLETION:** When the Contractor is nearing completion of a phase of the project, the Contractor will develop a preliminary punchlist of the items that are deficient on the project. Items may be added to the list as additional review of the project continues. When all or most of the items on the preliminary punchlist are corrected, the Contractor will request the Substantial Completion Inspection. The Substantial Completion Inspection will be conducted with representatives from the Contractor, SAWS, Design Engineer, Texas Water Development Board (if applicable) and any other appropriate personnel. During this inspection, the final punchlist will be developed. No additional items will be added to the list after this inspection.

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Any items discovered after the final list will be considered warranty items. The COI will include on the list any known administrative items remaining such as warranties, bonds, Record Documents, etc. The final punchlist will be attached to the Certificate of Substantial Completion issued by SAWS.

When the Contractor has completed the items on the final punchlist, a final inspection will be scheduled for representatives of the Contractor, SAWS, COI, Design Engineer, and any other appropriate organizations. The Final Inspection will be to check that the Contractor has corrected all of the items on the final punchlist. SAWS COI will use the Water Acceptance Checklist (Form 20) and Sewer Acceptance Checklist (Form 21) to ensure the work on these utilities meets our requirements. The Contractor will submit his final pay estimate, request release of retainage, and lien release. The Design Engineer will review the information and make a recommendation to SAWS. The request for release of retainage will be forwarded within the time frame established by the general conditions and through the same channels as the pay estimates. SAWS Contract Administration will issue final acceptance and payment. See the Project Closeout Process (Form 19) for the typical steps and actions necessary to close out the administrative requirements on the project.

**START UP:** Prior to initiation of start up of any facilities, the Contractor will review the specifications and prepare a checklist of requirements for the facilities start-up operation. This checklist of requirements will be verified by the COI. This will include a Training log (Log 7) of the training required by manufacturers. The COI will coordinate with SAWS operations staff and the Contractor for the date and time of the training. As the training is completed, it will be added to the log.

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When the Manufacturer's Representative reviews the installation of his equipment, the representative must certify the installation in writing before SAWS personnel will accept responsibility for the operation of the equipment.

The Contractor is required to develop a Start Up Plan prior to placing the facilities into operation. The plan must be submitted in advance of start up to allow review by the COI, Design Engineer, and SAWS operations staff. After all parties have reviewed the initial plan, a meeting will be held to discuss the plan and all parties' review comments, as appropriate. Contractor will revise the plan per the comments agreed upon at the meeting and will then resubmit. After review of the revised plan another meeting may be appropriate. This process will continue until an acceptable plan is developed.

Before start up is to begin, another meeting will be held to discuss the final plan and assure that everyone understands the schedule and responsibilities for startup.

## **APPENDIX**

- **Responsibility Matrix**
- **Project Filing System**
- **Forms**
- **Logs**

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### FILE SYSTEM

#### **1.0 CORRESPONDENCE** (Letters, Memos, TCRs)

- 1.1 Contractor
- 1.2 Engineer
- 1.3 SAWS
- 1.4 Request for Information

#### **2.0 MEETINGS**

#### **3.0 DESIGN REFERENCE DATA**

#### **4.0 PROGRESS PAYMENTS**

- 4.1 Contractor
- 4.2 Engineer
- 4.3 Other Consultants

#### **5.0 LEGAL** (Contracts, Bonds, Insurance, Notice to Proceed, Sub Approval, EEO, etc.)

- 5.1 Contractor
- 5.2 Engineer
- 5.3 Other Consultants

#### **6.0 PROGRESS REPORTS** (CPM Schedule, Monthly Reports)

- 6.1 Contractor
- 6.2 Engineer
- 6.3 SAWS

#### **7.0 CHANGES**

- 7.1 Change Proposal Log
  - 7.1.1 Change Proposal No. 1
- 7.2 Change Order Log
  - 7.2.1 Change Order No. 1
- 7.3 Directives
  - 7.3.1 Directive No. 1
- 7.4 Claims Log
  - 7.4.1 Claim No. 1

#### **8.0 TESTING REPORTS**

- 8.1 Concrete
- 8.2 Soil
- 8.3 Piping
- 8.4 Miscellaneous

#### **9.0 DAILY REPORTS**

- 9.1 Daily Reports
- 9.2 Safety Reports
- 9.3 Photos
- 9.4 Materials Storage Recommendations

#### **10.0 STARTUP**

- 10.1 Schedules/Plans
- 10.2 Training
- 10.3 Manufacturer's certifications
- 10.4 Spare Parts
- 10.5 O & M Manual Transfers

#### **11.0 PROJECT COMPLETION**

- 11.1 Punch List
- 11.2 Guarantees/Warranties
- 11.3 Final Inspection/Approval (Lien Release, Substantial Completion, Final Acceptance)
- 11.4 Record Documents

#### **12.0 ONE YEAR CORRECTION PERIOD**

- 12.1 Work Orders
- 12.2 Completed Work Orders

#### **13.0 SHOP DRAWING SUMITTALS** (Shop Drawings, O & M Manuals, Training Lesson Plans)

- 13.1 Submittal No. 1

#### **14.0 LOGS**

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