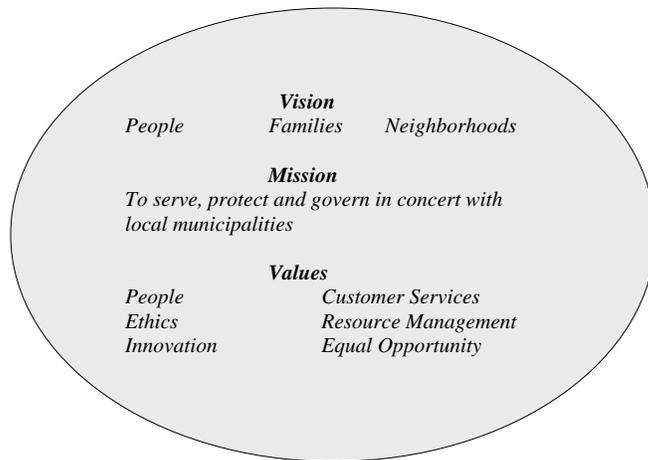




FULTON COUNTY



REQUEST FOR INVITATION TO BID NO.08ITB60386K-DJ

Wolf Creek Amphitheater

VOLUME II

For

GENERAL SERVICES DEPARTMENT

BID DUE DATE AND TIME: Monday, March 24, 2008 11:00 A.M.
BID ISSUANCE DATE: Tuesday, February 19, 2008
PURCHASING CONTACT: Donna Jenkins at (404) 730-4213
E-MAIL: Donna.Jenkins@fultoncountyga.gov

LOCATION: FULTON COUNTY DEPARTMENT OF PURCHASING &
CONTRACT COMPLIANCE
130 PEACHTREE STREET, S.W., SUITE 1168
ATLANTA, GA 30303

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1. Land Disturbance Permit: from Fulton County Development Services Department.
 2. Building Permit: Building Permit from Fulton County Development Services Department
- B. The Contractor is responsible for payment of fees associated with the permits and inspections per the following schedule. ANY FEE FOR REQUIRED PERMITS OR INSPECTIONS NOT SPECIFICALLY NOTED BELOW AS WAIVED IS THE RESPONSIBILITY OF THE DESIGN/BUILDER.
1. Land Disturbance Permitting-Fee Waived
 2. Fulton County Building Permit-Fee Waived
 3. ARC Review -Fee Waived
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 16. Wastewater Use Fee-Not Waived
 17. Water & Wastewater Tap Fee-Not Waived
 18. Tree Harvest Permit-Not Waived
 19. Health Department-various fees at the discretion of the Health Department
- C. Licensing & Codes: It is the Contractor's responsibility to possess all applicable licenses and to comply with all applicable laws, statutes, ordinances, building codes, rules and regulations applicable to the Work.

4. PROJECT DESCRIPTION & SUMMARY SCOPE OF SERVICES

- A. The project consists of a 5,000 seat capacity amphitheater. Seating capacity shall be achieved through a blend of table seating, VIP fixed chair seating and general lawn seating. The project also includes, but is not limited to:
1. Construction of a new amphitheater
 2. Covered stage with loading areas.
 3. Walkways and ramps
 5. Special sod installation
 6. Site lighting
 7. ADA accessibility to seating areas including stage by walks and ramps
 8. Fencing
 9. Site utilities for electric, water, sewer and storm water

- B. In addition, project includes alternates for addition of:
 - 1. Dressing Rooms and support spaces to amphitheater building
 - 2. Fixed Seating units to tiered seating area
 - 3. VIP Restroom and kitchen
 - 4. Public Restroom Building
 - 5. Ticket Booth Building
 - 6. Vendors Booth Facilities
 - 7. Expansion and improvements to existing parking lots and addition of new parking areas
 - 8. Use of transplanted trees

- C. Management of the contract and project for Fulton County shall be through the Fulton County General Services Department (GSD).

5. SCOPE OF WORK

- A. Work includes, but is not limited to, construction for sitework, demolition, fencing and gates, paving, landscaping, foundations, retaining walls, concrete slabs, substructure, superstructure, exterior envelope, waterproofing, sealants, insulation, railings, millwork, doors, door frames, finish hardware, interior walls and ceilings, interior finishes, toilet partitions and accessories, furnishings (including window blinds), equipment, signage, plumbing, HVAC, energy management and control system, electrical, lighting, telecommunications, and electronic fire alarm and security systems.

- B. The Contractor shall also be responsible for paying for and coordinating all the required Work with all utility companies required for services to the Project. Additionally, any disruption in service must be coordinated to the satisfaction of the Owner so as not to disrupt any ongoing activities and requirements of the Owner.

- C. Refer to Section 00 500 Contractual Agreement.

6. PROGRAM REQUIREMENTS

Project Overview

The Wolf Creek Amphitheater is to be constructed on an approximately six acre site behind the existing Fulton County Public Safety Training Center. The site is located off of Miles Road between Merk Road and Enon Road southwest of Camp Creek Parkway in College Park, Georgia. The site was formerly used as the Shooting Venue for the 1996 Centennial Olympic Games. The three existing shooting buildings and associated parking lots are presently being used by the Public Safety Training Center. The former skeet and trap shooting ranges behind the buildings form a natural bowl and are to be converted into the amphitheater and seating areas. The parking lots will serve the training center during the day and will provide VIP parking for the amphitheater during performances.

End of Section

SECTION 01 027 – UNIT PRICES

1. DEFINITIONS, STANDARDS AND SUBMITTALS

- A. The Unit Prices listed and described below have been established and shall include the following:
1. The furnishing of all management, supervision, submittals, installation, start-up and service labor, materials, tools, equipment, overhead and profit.
 2. Complete coordination of the work in each Unit Price's scope of work with the work of all other trades, regardless of whether these trades are in the employment of the Contractor, a separate contractor, or of the County or the Construction Manager.
 3. All appropriate corresponding additions or deductions for materials being replaced or modifications to the structure which must be made as a result of the addition or deletion of the item(s) covered by each Unit Price.
 4. Although such work may not be specifically indicated, the furnishing and installation of all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.
 5. If incorporated into the project, each Unit Price shall be considered to be subject to all terms and conditions of the Contract, including, but not necessarily limited to the Owner-Contractor Agreement, all Sections of the General Requirements, and all applicable Sections of the Technical Specifications.
- B. Quality Assurance: See individual Specification Sections and the Contract Drawings for required standards.
- C. Submittals: See individual Specification Sections and the Contract Drawings for required submittals.

2. ACCEPTANCE AND INCORPORATION OF UNIT PRICES

- A. The County reserves the right to accept or reject any and/or all of the Unit Prices. Unit Prices may be awarded after award of the Base Contract, and if so, shall be paid for by owner allowance, if any, or incorporated into the Contract by change order.
- B. The Contractor agrees that if the quantities of work change from the estimated quantities provided herein, the Contract Sum will be adjusted by an amount equal to the net difference of quantities multiplied by the agreed upon Unit Price. The Unit Price for additions to the estimated quantity shall be the same as that for deductions.
- C. The Contractor is advised that the quantities used for the basis of the Unit Prices are estimated and the actual quantities may vary significantly from the estimates. Unit Prices shall not be adjusted regardless of the difference between the actual and estimated quantities.
- D. The calculations for determining the number of actual units of work shall be based on actual surface area, volume, length, hours, or number of individual items, per the Unit Price descriptions, complete in place and accepted or omitted. No additional quantities or costs for waste, loss, breakage, or damage will be allowed.

3. DESCRIPTION OF UNIT PRICES

A. Unit Price No. 1: Rock Removal & Off-Site Disposal, per cubic yard.

Definition of Rock: Any material which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 56,000 pounds (comparable to Caterpillar D 8K or Caterpillar 977 front-end loader), and occupying an original volume of at least one cubic yard. The Construction Manager shall be the sole determiner as to the limits to which the material is classified as rock.

Note: There is no estimated quantity for this work item. The proposed unit price, if accepted by the County, will be applied to actual quantities in the event the work described above is required. **The Base Bid is not to contain any dollars for the above described scope of work.**

B. Unit Price No. 2: Unsuitable Soil Removal & Off-Site Disposal, per cubic yard.

Definition of Unsuitable Soil: Any material, in the opinion of the Engineer of Record (subject to the review of the Construction Manager), which is unsuitable for foundation, shall be removed and replaced with crushed stone, or with compacted fill material as directed by the Engineer of Record. No determination of unsuitability will be made until all requirements for dewatering are satisfactorily met.

Note: There is no estimated quantity for this work item. The proposed unit price, if accepted by the County, will be applied to actual quantities in the event the work described above is required and could not have been expected or reasonably anticipated from the preliminary geotechnical report or other information provided in the Contract Documents. **The Base Bid is not to contain any dollars for the above described scope of work.**

C. Unit Price No. 3: Importing soil suitable for structural backfilling, per cubic yard.

Definition of soil suitable for structural backfilling: All fill material shall be soil exclusive of organic matter, frozen lumps or other deleterious substances. It shall contain no rocks or lumps over 3-inches maximum in dimension.

Note: There is no estimated quantity for this work item. **This unit price shall only apply to suitable soil required to replace either rock or unsuitable soil removed and paid for utilizing Unit Price Nos. 1 and 2, as described above.** The proposed unit price, if accepted by the County, will be applied to actual quantities in the event the work described above is required and could not have been expected or reasonably anticipated from the preliminary geotechnical report or other information provided in the Contract Documents. **The Base Bid is not to contain any dollars for the above described scope of work.**

End of Section

SECTION 01 030 – COST PROPOSAL ALTERNATES

1. DEFINITIONS, STANDARDS AND SUBMITTALS

- A. The Cost Proposal Alternates listed and described below have been established and shall include the following:
1. The furnishing of all management, supervision, installation, start-up and service labor, materials, tools, equipment, overhead and profit.
 2. Complete coordination of the work in each Cost Proposal Alternate's scope of work with the work of all other trades, regardless of whether these trades are in the employment of the Contractor, or of the County or Construction Manager.
 3. All appropriate corresponding additions or deductions for materials being replaced or modifications to the structure, which must be made as a result of the addition or deletion of, the item(s) covered by each Cost Proposal Alternate.
 4. Although such work may not be specifically indicated, the furnishing and installation of all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.
 5. If incorporated into the project, each Cost Proposal Alternate shall be considered to be subject to all terms and conditions of the Contract, including, but not necessarily limited to the Owner-Contractor Agreement, all Sections of the General Requirements, and all applicable Sections of the Technical Specifications.
- B. Quality Assurance: See individual Specification Sections for required standards modified to conform to alternate conditions.
- C. Submittals: See individual Specification Sections for required submittals modified to conform to alternate conditions.

2. ACCEPTANCE AND INCORPORATION OF COST PROPOSAL ALTERNATES

- A. The County reserves the right to accept or reject any and/or all of the Cost Proposal Alternates. Cost Proposal Alternates shall remain valid for a period of ninety (90) days from the date of Cost Proposal. Cost Proposal Alternates may be awarded after award of the Base Contract, and if so, shall be incorporated into the Contract by change order.
- B. The price of each Cost Proposal Alternative and any combination thereof may be considered in the evaluation for award of any and/or all proposed prices for the Cost Proposal Alternates.

3. DESCRIPTION OF COST PROPOSAL ALTERNATES

- A. Base contract: Amphitheater structure without back-of-house support facilities; grading for site access and seating; concrete risers (without fixed seating); asphalt drives and paving as needed for access to amphitheater.
- B. Alternate No. 1: Add back-of-house support facilities.
- C. Alternate No. 2: Add fixed seating at VIP Area.
- D. Alternate No. 3: Add Building "B": VIP Restroom Building.

- E. Alternate No. 4: Add Building "C": Public Restroom Building.
- F. Alternate No. 5: Add Building "D": Ticket Booth/Window.
- G. Alternate No. 6: Add Building "E": Vendors Booth Area.
- H. Alternate No. 7: Add parking lot expansion, including landscaping and irrigation components.
- I. Alternate No. 8: Add transplanting, storing and protection of existing trees as indicated on drawings. Substitute transplanted trees for proposed trees as indicated on drawings.

End of Section

SECTION 01 040 – PROJECT COORDINATION

1. GENERAL

- A. The Contractor shall become thoroughly familiar with the requirements of the Contract Documents, as well as jobsite conditions and the work of separate contractors (if any), and shall make any adjustments necessary to maintain the Project schedule.
- B. Close coordination will be required by the Contractor with the County, Construction Manager, other authorities having jurisdiction, separate contractors (if any), and others having an interest in the Project to assure that all work on the site, access to and from the site, and the general conduct of the operations is maintained in a safe and efficient manner, and that disruption and inconvenience to existing streets and property are minimized.
- C. The Contractor and its subcontractors of all tiers shall be subject to such rules and regulations for the conduct of the Work as the County, Construction Manager, or other authority having jurisdiction may establish.

2. COORDINATION OF THE WORK

- A. The Contractor shall be completely responsible for the coordination of its Work, including the Work performed by its subcontractors of all tiers.
- B. Observation of the Work by the Construction Manager or others shall not be interpreted as relieving the Contractor of its responsibility for the coordination of all Work, superintendence of the Work, or scheduling and direction of the Work.
- C. The Contractor shall coordinate its Work with the work of any separate contractors through the Construction Manager for proper function and sequence, coordinating material deliveries and staging of same, all to avoid construction delays.
- D. The Contractor shall review material and equipment staging requirements with the Construction Manager prior to placing such materials or equipment on the site.
- E. The Contractor shall conduct the Work so as to provide the least possible interference to the activities of adjacent properties and traffic patterns. Confine operations only to areas where construction or support functions are required. Portions of the site beyond areas in which construction or support functions are required are not to be disturbed.
- F. Conceal pipes, ducts, and wiring in floor, wall, and ceiling construction of finished areas wherever possible. If doubt arises as to the means of concealment or the intent of the Contract Documents, request clarification from the Construction Manager prior to proceeding. Mechanical, plumbing, and electrical work shall be tested and inspected in advance of concealment.

3. ACCESS & TRAFFIC CONTROL

- A. The Contractor shall maintain free access to all buildings and areas of the site for emergency vehicles, service vehicles, and fire fighting equipment and at no time shall block off or close roadways or designated fire lanes without providing auxiliary roadways and means of entrance acceptable to the County, the Construction Manager, and any other authority having jurisdiction. Fire hydrants shall remain accessible at all times. The Contractor shall provide at least forty-eight (48) hours notice of any changes to such routes.

- B. The Contractor shall be responsible for security of the site and building(s) until acceptance of the Project by the County. The Contractor shall cooperate with the County, the Construction Manager, and any separate contractors with respect to entry into the Project when requested during non-standard working hours.
- C. The Contractor shall coordinate its operations to minimize the impact on vehicular and pedestrian traffic around the site. Operations and traffic control measures shall comply with the requirements of the authority having jurisdiction.
- D. The Contractor shall protect all street pavements, curbs, sidewalks, and other existing infrastructure not intended for demolition or alteration during the course of the Work, and shall repair all parts of same which become damaged.
- E. The Contractor shall be responsible for the cleaning of adjacent and surrounding streets and sidewalks from debris, dirt, mud, or other deleterious materials resulting from operations under this Contract. The Contractor shall immediately clean any such areas as directed by the Construction Manager.

4. WORKING HOURS

- A. The Contractor shall work whenever conditions permit (regardless of anticipated or orderly procedure, the operations of the County or other contractors, or conditions encountered) to proceed without delay and to maintain schedule dates. All operations shall be conducted so as to comply with all applicable laws, ordinances, and regulations regarding allowable hours of work.
- B. The Contractor shall notify the Construction Manager at least forty-eight (48) hours in advance of planned late night or weekend work. Failure to provide such notice may be cause for the Construction Manager to require the removal or uncovering of Work performed without the knowledge of the Construction Manager.

5. EXISTING UTILITIES AND OTHER SERVICES

- A. Utilities and/or other services which are shown, or not shown but encountered, shall be protected by the Contractor from any damage from any work operations of the Contract, unless or until they are abandoned. If the utilities or services are not abandoned at the time of damage, the Contractor shall immediately repair any damage from its work operations and restore the utilities or services to an equal or better conditions than that which existed prior to the damage.
- B. The Contractor and its subcontractors of all tiers shall be responsible for all damage to the Project including any existing buildings and grounds due to its operations under this Contract. Repair or replacement of damaged items shall be to the satisfaction of the County and the Construction Manager.

6. PROTECTION OF FINISHED WORK

- A. The Contractor shall be responsible for protecting its finished Work and materials from damage from any source, and shall maintain such protection until acceptance of the Work by the County. Any damage to finished Work caused by the work operations of this Contract shall be repaired, or such damaged Work replaced, by the Contractor at no additional cost to the County. No exceptions to this policy will be allowed.
- B. The Contractor shall coordinate the proper means by which materials and/or equipment are moved through the construction, ensuring that no structural overloading is allowed and that existing construction is protected from physical damage.

- C. Protect existing trees on the site to be saved, and those on adjacent properties where in close proximity to the Work. Carefully wrap trees adjacent to the construction work, material storage area, and trucking lanes in burlap and encase with protective framework. Protect roots during excavation and grading to minimize disturbance and damage.
- D. Keep concrete floors free of oils, grease, and other materials to prevent discoloring if to be left exposed, or to prevent adverse bonding affects if a finished floor is to be applied. Where work is performed over finished floors, the Contractor shall provide an acceptable cover to protect the finished surface against damage, paint, or stains.
- E. Load no part of the structure during construction with a load greater than calculated to bear safely when completed. Make temporary supports as strong as permanent supports. Place no load on a concrete slab until it has cured and achieved sufficient strength.
- F. Take strict precautions against unnecessary traffic on finished roofing surfaces.
- G. Protect all glass surfaces during construction. Prior to Substantial Completion, replace any broken, scratched, or otherwise damaged glass with glass of the same type, size, and quality as the original.

End of Section

SECTION 01 045 – CUTTING, CORING & PATCHING

1. GENERAL

- A. "Cutting, Coring and Patching" is hereby defined to include, but not necessarily be limited to, removal, cutting (including excavation), coring, fitting and patching of nominally completed and previously existing Work, as shown or required in order to accommodate the coordination of Work, installation of new Work, to uncover other Work for access or inspection, remove and replace defective Work or Work not conforming to the Contract Documents, or to obtain samples for testing or for similar purposes.
- B. For existing buildings, the sizes, dimensions, and elevations shown on the drawings represent measurements which should be regarded as typical dimensions; actual dimensions may and will vary due to prevailing building practices at the time of construction, and building settlement over time.
- C. The requirements of this section apply generally to all aspects of the Work, including mechanical, electrical and special systems work, unless otherwise indicated. The Technical Specifications may include additional or more specific requirements or limitations applicable to individual units of work.
- D. The Contractor shall note that it is its responsibility to coordinate the locations and sizes and to cut or core all openings and penetrations for all trades involved in the Work of this Contract. Any openings and penetrations which may be shown on drawings provided by the County are intended only to assist the Contractor in coordinating the major openings and penetrations and are not representative of all openings which will be required to complete the work.

2. QUALITY ASSURANCE

- A. The Contractor shall not cut, core and patch structural work in a manner resulting in a reduction of load-carrying capacity or load/deflection ratio. Prior to cutting, coring and patching structural work, obtain Architect's approval to proceed with cutting and patching as proposed in a written submittal by the Contractor.
- B. The Contractor's submittal requesting consent to proceed with cutting, coring and patching structural work must include:
 - 1. Identification of the Project
 - 2. Description of the affected Work
 - 3. Necessity for cutting or coring
 - 4. Affects on other Work, and on the structural integrity of the Work
 - 5. Description of the proposed Work, which designates:
 - a). Scope of cutting, coring and patching
 - b). Subcontractor who will execute the work
 - c). Products proposed to be used
 - d). Extent of refinishing required
 - 6. Alternates to cutting, coring and patching
 - 7. Designation of the responsibility for the costs associated with the cutting, coring and patching

- C. Prior to performing any cutting, coring and patching as extra work, the Contractor shall have submitted a written cost proposal and received written direction from the Construction Manager.
- D. The Contractor shall be responsible for providing, locating, and installing all embeds necessary for the completion of the Work, so as to avoid unnecessary cutting and patching.

3. OPERATIONAL AND SAFETY LIMITATIONS

- A. The Contractor shall not cut and patch operational elements and safety-related components in a manner resulting in a reduction of capacities to perform in the manner intended including energy performances, or resulting in decreased operational life, increased maintenance, or decreased safety.
- B. The Contractor shall not cut, core drill or otherwise penetrate any post-tensioned cast-in-place concrete elements.

4. VISUAL REQUIREMENTS

The Contractor shall not cut and patch work which is exposed on the exterior, or exposed on the interior in occupied spaces of the building, in a manner resulting in a reduction of visual qualities, or resulting in substantial evidence of cut and patch work, as judged solely by the Architect. The Contractor shall remove and replace work judged by the Architect to be cut and patched in a visually unsatisfactory manner.

5. MATERIALS

The Contractor shall provide materials for cutting and patching which will result in equal or better work than work being cut and patched, in terms of performance characteristics and including visual effect where applicable. The Contractor shall comply with requirements, and use materials identical with original materials where feasible and where recognized that satisfactory results can be produced thereby.

6. PREPARATION

- A. Inspection of Concealed Conditions (for construction existing prior to this Contract, if applicable) - Prior to beginning installation or preparation of shop drawings for each unit of work involving exposure of existing concealed construction, the Contractor shall remove the minimum of finishes, substrates and other existing construction as necessary to expose existing conditions where work is required behind existing surfaces. The Contractor shall verify that work can proceed in accordance with the requirements of the Contract Documents. The Contractor shall prepare detailed drawings of any existing conditions which differ substantially from conditions indicated or implied by the Contract Documents and the existing construction visible prior to exposure of concealed conditions. Submit drawings and a cost proposal to the Construction Manager for transmittal to the Architect a minimum of fourteen (14) calendar days prior to the scheduled installation of work in that area or the preparation of any required submittals relating to the area in question.

- B. Inspection of Concealed Conditions (for Work installed under this Contract) – In the event work is required behind existing surfaces previously installed under this Contract, the Contractor shall remove the minimum of finishes, substrates and other existing construction as necessary to expose existing conditions where work is required behind existing surfaces. Inspect and assess all conditions affecting the continued performance of the Work, and immediately report any circumstances which could have an adverse effect on the performance of the Work to the Construction Manager.
- C. Temporary Support - The Contractor shall provide shoring and protection and/or temporary support for work to be cut, to prevent failure. Do not endanger other work.
- D. Protection - The Contractor shall provide protection of other work during cutting and patching, to prevent damage and provide protection of the Work from adverse weather conditions. The Contractor shall not cut or alter work of another contractor without written consent of the Construction Manager.

7. CUTTING AND PATCHING

- A. The Contractor shall employ skilled tradesmen to perform all cutting, coring and patching and who have experience working with the materials involved. Except as otherwise indicated or approved by the Construction Manager or the Architect, the Contractor shall proceed with cutting and patching at earliest feasible time in each instance, and complete work without delay.
- B. The Contractor shall cut work by methods least likely to damage work to be retained and work adjoining. Employ the original installing subcontractor to perform cutting and patching for weather-exposed or moisture-resistant elements, and for exterior or interior surfaces exposed to view.
- C. In general, where physical cutting action is required, the Contractor shall cut work with sawing and grinding tools, not with hammering and chopping tools. Make cuttings to neat, straight lines and only to the size required to accommodate the construction to be installed. Core drill openings through finished concrete work.
- D. The Contractor shall patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work. Where feasible, inspect and test patched areas to demonstrate integrity of work.
- E. The Contractor shall restore exposed finishes of patched areas and extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching and refinishing. Where a patch occurs in a smooth painted surface, the Contractor shall extend the final paint coat over entire unbroken surface containing patch, after patched area has received prime and base coats.
- F. Wherever existing concrete floors are required to be patched or leveled, and where slabs are chopped out to provide for installation of new concrete floors, and where existing concrete is to be extended, the Contractor shall apply concrete bonding agent before placing new concrete. Apply such bonding agent in accordance with the manufacturer's specifications.

End of Section

SECTION 01 050 – LAYOUT OF THE WORK

1. PROJECT LAYOUT REQUIREMENTS

- A. The Contractor shall be responsible to accurately establish and maintain all principal lines, grades, and levels for the Work.
- B. Establish a minimum of two permanent bench marks on the site, referenced to data established by survey control points.
- C. Establish lines and levels, and locate and lay out by instrumentation and similar appropriate means, the following:
 1. Site improvements, including, but not limited to, pavement; stakes for grading, fill and topsoil placement; and utility slopes and invert elevations
 2. Grid and axes for structures
 3. Building foundations, column locations, and floor elevations
 4. Controlling lines and levels required for mechanical, electrical, and other trades
- D. Protect and preserve the established control points, monuments, stakes, bench marks, or other datum points. The Contractor shall not make any change in location without the written approval of the Construction Manager. Any control points lost or displaced through the neglect of the Contractor shall be replaced at no additional cost to the County.
- E. Verify the overall and critical dimensions and elevations for the Work prior to commencement of construction. Submit a written statement to the Construction Manager of the acceptance of the location of all existing conditions and previously completed construction, if any, as it relates to the Work of this Contract.
- F. Verify all drawing dimensions and existing measurements as the Work progresses at the site. No extra charges shall be allowed for differences between actual field measurements and any dimensions shown on the Contract Documents. Do not provide filler pieces or closures without approval from the Construction Manager.
- G. Verify and maintain layouts during construction operations, using the same methods as were used to establish original layouts.
- H. All Work, and in particular piping, ducts, conduit, and similar items, shall be neatly and carefully laid out to provide the most useful space utilization and the most orderly appearance. Except as otherwise indicated or directed, piping and similar work shall be installed as close to ceilings and walls as conditions reasonably permit. These items shall be located to prevent interference with other work and with the use of the spaces in the manner required by the functions of the space and the County. Valves shall be located in inconspicuous but accessible locations. Before proceeding with any work exposed to view, the Contractor shall carefully plan the layout and review any questionable installations with the Construction Manager.
- I. Maintain a complete and accurate log of control and survey work as it progresses. Indicate all control point locations, with horizontal and vertical data, on the record drawings submitted at Substantial Completion.

2. QUALITY ASSURANCE / QUALITY CONTROL

- A. The Contractor shall employ qualified personnel to stake out/locate the reference points as needed to properly locate the Work of the Contractor and all subcontractors. Land surveyors and engineers utilized in layout work shall be registered professionals, licensed in the State of Georgia, and acceptable to the Construction Manager.
- B. Provide certification by a registered land surveyor or engineer that elevations and locations of improvements are in conformance with the requirements of the Contract Documents.
- C. The Contractor shall be responsible for transferring all required measurements from the control points to the required locations throughout the Project. If, at any time, the Construction Manager questions the transference of such dimensions, the Contractor shall, at no additional cost to the County, verify the transference of questionable dimensions to the Construction Manager.

3. COORDINATION

- A. Upon Notice to Proceed, and again prior to commencement of construction, examine the site and the conditions under which the Work is to be installed, and notify the Construction Manager in writing of any discrepancies or conditions detrimental to the proper performance of the Work. The Contractor is not to proceed until any such discrepancies or detrimental conditions are corrected.
- C. Obtain accurate field dimensions in ample time to permit fabrication of items requiring same, and allow for delivery and installation in time to maintain the project schedule. The Contractor and all subcontractors shall cooperate and coordinate in completing the work phases to accommodate the schedule for obtaining dimensions and to prevent fabrication delay. In the event it is impractical to have work in place to permit field dimensions to be taken, the Contractor shall guarantee necessary dimensions to fabricators and be responsible to ensure those dimensions will be accurate.
- D. The Contractor shall furnish approved copies of all relevant information (shop drawings, diagrams, templates, technical data, etc.) to the County or to separate contractors, as required for coordination with any work of the Project by others.

End of Section

SECTION 01 090 – REFERENCE STANDARDS

1. APPLICABILITY OF STANDARDS

- A. Where reference is made to standards or specifications published by various organizations ("standards"), the Work shall conform to latest edition of such standards as amended and revised in effect at the date of Contract, unless a specific date is indicated.
- B. Where material is designated for certain applications, material shall conform to standards designated in the applicable building code governing the Work. Similarly, unless otherwise specified, installation methods and standards of workmanship shall also conform to standards required by such code. Where no particular material is specified for a certain use, the Contractor shall select from choices offered in the governing code.
- C. Where a standard does not provide all information necessary for the complete installation of an item, comply with manufacturer's instructions for installation and workmanship.
- D. Where specific articles, sections, divisions or headings for standards are not given, such standards shall apply as appropriate. Standards when included in the Contract Documents by abbreviations or otherwise, shall form a part of Contract Documents. In the event of conflicts between cited standards and/or the Contract Documents, the more stringent shall govern.

2. ABBREVIATIONS AND ACRONYMS

- A. Abbreviations and acronyms used throughout the Contract Documents refer to associations, institutes, societies and other public bodies who publish standards which are readily available to the public, and to the titles of the standards which they publish. Where such abbreviations or acronyms are used in the Contract Documents, they shall mean the recognized name of the trade association, standards-generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.
- B. Whenever initials representing such a body are shown, followed by a number or a combination of numerals and letters, reference is to a particular standard to which Contractor shall conform. The number or combination of numerals and letters following abbreviation designates the particular standard to be followed.

3. CONTRACTOR'S DUTIES AND RESPONSIBILITIES

The Contractor shall be responsible when required by Contract Documents, or upon written request from the Construction Manager, to deliver required proof that materials or workmanship, or both, meet or exceed the requirements of a reference standard.

4. CONFLICTING STANDARDS

Where compliance with two or more standards is specified and where the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different but apparently equal and other uncertainties to the Architect, through the Construction Manager, for a decision before proceeding.

5. COPIES OF STANDARDS

Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.

End of Section

SECTION 01 200 – PROJECT MEETINGS

1. GENERAL

- A. The Construction Manager will determine the agenda for and chair the meetings described below, and also shall prescribe the format for the documentation of the meetings to be produced by the Contractor.
- B. Representatives of the Contractor and its subcontractors and suppliers in attendance at any project meeting shall be qualified and authorized to act on behalf of the entity each represents.
- C. The Contractor shall schedule and administer project meetings throughout progress of Work where specified or required, and shall have the following specific responsibilities:
 - 1. Distribute Construction Manager's agenda for meetings
 - 2. Distribute written notice of each meeting a minimum of four days in advance of meeting date
 - 3. Make physical arrangements for meetings
 - 4. Record minutes, in the format to be provided by the Construction Manager, to include significant proceedings and decisions
 - 5. Reproduce and submit word processed minutes, within four working days after each meeting, to the Construction Manager for approval before further distribution. After approval, distribute copies as follows:
 - a. to all participants in the meeting
 - b. to all parties affected by decisions made at meeting
 - c. to all other parties as may be designated by the County or Construction Manager
- D. The County's user department(s) will be active participants in the design and construction process for this project, and their representative(s) shall be invited to all project meetings for which their presence and/or participation is appropriate.

2. PRE-CONSTRUCTION MEETING

- A. Scheduling: Meetings shall be held at least two weeks prior to any Work commencing on the site.
- B. Location: Designated by Construction Manager.
- C. Attendance:
 - 1. Owner/user group representative(s), as appropriate
 - 2. Construction Manager' representative
 - 3. Architect's representative (at it option)
 - 4. Contractor's Project Manager, Superintendent, and other representative(s) as appropriate
 - 5. Major subcontractors and suppliers
 - 6. Others as appropriate

D. Suggested Minimum Agenda:

1. Discussion of major subcontractors and suppliers
2. Projected construction schedules
3. Critical work sequencing
4. Major equipment deliveries and priorities
5. Project coordination and designation of responsible personnel
6. Procedures and processing of:
 - a. Design issues and decisions
 - b. Field decisions
 - c. Proposal requests
 - d. Submittals
 - e. Change orders
 - f. Applications for payment
7. Adequacy of distribution of Construction Documents
8. Procedures for maintaining record documents
9. Use of premises:
 - a. Office, work and storage areas
 - b. County's, Architect's, and Construction Manager's requirements
10. Construction facilities, controls and construction aids
11. Temporary utilities
12. Safety and first-aid procedures
13. Security procedures and site access controls
14. Housekeeping procedures
15. Traffic and parking procedures
16. Other administrative procedures

3. CONSTRUCTION PROGRESS MEETINGS

A. Scheduling: Meetings shall be conducted at least bi-weekly throughout the construction phase.

B. Location of the Meetings: Project field office of Contractor or other location designated by Construction Manager.

C. Attendance:

1. Owner/user group representative(s), as appropriate
2. Construction Manager' representative
3. Architect's representative (at its option)
4. Contractor's Project Manager, Superintendent, and other representative(s) as appropriate
5. Subcontractors and suppliers as appropriate to the agenda
6. Contractor's Architect (if Design/Build)
7. Others as appropriate

D. Suggested Minimum Agenda:

1. Actual vs. scheduled progress since previous meeting
2. Planned construction activities for the next four weeks

3. Problems with and revisions to construction schedule
4. Review of off-site fabrication and delivery schedules
5. Corrective measures and procedures to regain projected schedule
6. Submittal schedules and expediting
7. Construction Document clarifications
8. Field observations, problems, conflicts
9. Quality control
10. Material Inspections & Testing
11. Actual and potential changes and their impacts
12. Safety issues

4. PRE-INSTALLATION MEETINGS

- A. Scheduling: Schedule pre-installation meetings for installation of various aspects of the Work prior to the start of installation, or as otherwise specified in the Project Manual. Do not schedule pre-installation meetings until required submittals have been approved.
- B. Location: At jobsite.
- C. Meeting Requirements:
 1. Prior to installation of work, conduct pre-installation meeting at project site with Contractor's superintendent and foreman, primary materials installer, installer of each component of associated work, representative(s) of materials manufacturer(s), inspection and testing agency representative (if any), installers of other work requiring coordination, Construction Manager, Architect, and Owner's representative for the purpose of reviewing job mock-up (if any), job conditions, project requirements and procedures to be followed in performing work.
 2. At pre-installation meeting, examine areas and conditions under which work is to be performed. Report in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected. Commencement of work shall constitute acceptance of substrate conditions.
 3. At pre-installation meeting, the manufacturer's authorized representative shall inspect storage of job site materials, establish scheduling of initial and final installation of products, and establish the method of preparing written progress reports to Contractor (with copy to Construction Manager) of job conditions and installation.
 4. At pre-installation meeting, review manufacturer's product data publications and other published instructions for material installation compliance including shop drawings. Shop drawings and submittals shall be reviewed and approved prior to pre-installation meetings. Contractor shall provide a set of approved shop drawings and submittals for meeting use.

5. Where manufacturer's representative offers recommendations on material use, such recommendations shall be submitted in writing and substantiated by dated, printed, published product data or material use statement which is complete, definite, and clear, and signed by authorized company official.
6. Meeting Report: Submit copy of pre-installation job meeting report. Include copy of manufacturer's inspection report, manufacturer's recommendations, and any statement of non-compliance as applicable.
7. Pre-Installation meetings shall include, but not be exclusive of the following portions of the Work:
 - a. Roof System
 - b. Brick/Masonry
 - c. Glazing & Skylights
 - d. Hollow Metal & Hardware
 - e. Applied Wall Systems & Products
 - f. Equipment & Systems
 - g. Furnishings (prior to ordering)
 - h. Voice/Data/Paging System (prior to ordering)
 - i. Fire/Security Systems
 - j. Combined Mechanical/Electrical/Plumbing & Control Systems
 - k. Floor finishes

5. INSPECTION TOURS

- A. Formal inspection tours shall be made of the job progress for the Owner and any other officials as the occasion warrants and as scheduled by the Construction Manager.
- B. If requested by the Construction Manager, the Contractor shall be prepared to show and explain work completed and in progress throughout the Project to the inspection parties.

End of Section

SECTION 01 310 – SCHEDULING OF THE WORK

1. INTRODUCTION

- A. This Section describes the construction scheduling and progress reporting requirements of the Contract. The primary objectives of the requirements of this Section are:
1. to insure adequate planning and execution of the Work by the Contractor;
 2. to assist the County and Construction Manager in evaluating the progress of the Work;
 3. to provide for optimum coordination by Contractor of its trades, subcontractors and suppliers, and of its Work with the work or services provided by the County or any separate contractors; and
 4. to permit the timely prediction or detection of events or occurrences which may affect the timely prosecution of the Work.

2. GENERAL SCHEDULING REQUIREMENTS

- A. The Work of this Contract shall be planned, scheduled, executed, and reported using the critical path method (CPM). The Contractor shall use one of the following software programs to develop its Detailed Construction Schedule:
1. Primavera Project Planner, latest version
 2. SureTrak Project Manager, latest version
 3. Microsoft Project, latest version (MPX file)
- B. The Detailed Construction Schedule, as defined herein, shall represent the Contractor's commitment and intended plan for completion of the Work in compliance with the Contract completion date and interim milestone dates specified. The Detailed Construction Schedule shall take into account all foreseeable activities to be accomplished by any separate contractors or the County, and interface dates with utility companies, the County's operations, and others. The Detailed Construction Schedule shall anticipate all necessary manpower and resources to complete the Work within the dates set forth.
- C. Once approved by the Construction Manager, the Detailed Construction Schedule will become the Schedule of Record, and will be the basis for coordinating the Work, scheduling the Work, monitoring the Work, reviewing progress payment requests, evaluating time extension requests, and all other objectives listed above. No other schedule will be recognized for this Contract.
- D. The Contractor is responsible for determining the sequence of activities, the time estimates of the detailed construction activities and the means, methods, techniques and procedures to be employed. The Detailed Construction Schedule shall represent the Contractor's best judgment of how it will prosecute the Work in compliance with the Contract requirements. The Contractor shall ensure that Detailed Construction Schedule is current and accurate and is properly and timely monitored, updated and revised as Project conditions and the Contract Documents may require.
- E. When there are separate contractors working concurrently on the Project whose work must interface or be coordinated with the Work of the Contractor, the Contractor shall coordinate its activities with the activities of the separate contractors, and the Detailed Construction Schedule shall take into account and reflect such work by others.

- F. The Contractor shall be solely responsible for expediting the delivery of all materials and equipment to be furnished by it so that the progress of construction shall be maintained according to the currently approved construction schedule for the Work. The Contractor shall notify the Construction Manager in writing, and in a timely and reasonable manner, whenever the

Contractor determines or anticipates that the delivery date of any material or equipment to be furnished by the Contractor will be later than the delivery date indicated by the currently approved construction schedule, or required consistent with the completion requirements of this Contract, subject to schedule updates as herein provided.

3. DETAILED CONSTRUCTION SCHEDULE

- A. Within two (2) weeks after the Notice to Proceed, the Contractor shall submit a Detailed Construction Schedule according to the requirements established herein.
- B. The Detailed Construction Schedule shall consist of a time-scaled, detailed network graphic representation of all activities which are part of the Contractor's construction plan and an accompanying listing of activity's dependencies and interrelationships. The Detailed Construction Schedule submission shall include, but not be limited to, the following information:
1. Project name
 2. Distinct, logical and identifiable subdivisions of Work
 3. Activities for all aspects of the Work, with durations not exceeding fourteen (14) calendar days for all activities for which the Contractor will perform actual construction work. Material procurement, submittals, concrete curing and other similar activities may exceed fourteen (14) calendar days if approved by the Construction Manager. Related activities, each of a duration of five (5) calendar days or less, may be shown as one activity together, if not on the critical path of timely job completion.
 4. Outage schedules for existing utility services that will be interrupted during the performance of the Work
 5. Acquisition and installation of equipment and materials supplied and/or installed by the County or separate contractors
 6. All start dates, milestones, float and completion dates
 7. An accounting of the number of workdays anticipated to be lost due to weather. This accounting shall be in accordance with allowable days per month provided in Article 8 of the *Owner-Contractor Agreement* (Section 00 500).
 8. A tabular report listing all predecessor and successor activities for each activity
 9. A legible time scaled network diagram showing the critical path.
 10. A listing of the project calendar, indicating the anticipated days of work performance
 11. A floppy computer disk, in a form and format acceptable to the Construction Manager, of the Detailed Construction Schedule including all required submission information resident in the computer system and containing all of the files associated with the schedule.

- C. Activities and milestones to appear on the Detailed Construction Schedule shall include, but not be limited to, sitework, structure erection, roof close-in, exterior wall systems, paving, major material fabrication and delivery, shop drawings submittals, bi-weekly progress meetings, furniture delivery and installation, equipment delivery and installation, coordination requirements, mock-up installations and inspections, dates of Substantial and Final Completion, Certificate of Occupancy inspection, systems testing and instruction, and special County reviews and decision points that impact the Work.
- D. Schedule Reports: Schedule submissions will contain the following minimum information for each activity:
1. Activity number, description and estimated duration
 2. Anticipated start and finish dates
 3. Responsibility for activity
 4. The cost loading values for each activity.
- E. For all major equipment and materials to be fabricated or supplied for the Project, the Detailed Construction Schedule shall show a sequence of activities including:
1. Preparation of shop drawings and sample submissions
 2. A reasonable time for review of shop drawings and samples or such time as specified in the Contract Documents
 3. Shop fabrication, delivery and storage
 4. Erection or installation
 5. Testing of equipment and materials.
- F. The Contractor shall submit, as a part of the data submitted to the Construction Manager, a narrative report indicating the anticipated allocation by the Contractor of the following resources and work shifts for each activity which he proposes to be utilized on the Project:
1. labor resources;
 2. equipment resources; and
 3. whether it proposes the Work to be performed on single, double or triple shifts, and whether it is to be done on a 5, 6 or 7 day work week basis.
- G. The Construction Manager shall have the right to require the Contractor to modify any portion of the Contractor's Detailed Construction Schedule, or Recovery Schedule, as herein required, (including cost loading) with the Contractor bearing the expense thereof, which the Construction Manager reasonably determines to be:
1. impractical or unreasonable;
 2. based upon erroneous calculations or estimates;
 3. not in compliance with other provisions of the Contract Documents;
 4. required in order to ensure proper coordination by the Contractor of the Work of its subcontractors and with the work or services being provided by any separate contractors;
 5. necessary to avoid undue interference with the County's operations or those of any utility companies or adjoining property owners;
 6. necessary to ensure completion of the Work by the milestone and completion dates set forth in the Contract Documents;

7. required in order for the Contractor to comply with the requirements of this Section or any other requirements of the Contract Documents; or
8. not in accordance with the Contractor's actual operations.

5. COST LOADING

- A. As part of the submission of the Detailed Construction Schedule, the Contractor shall submit a breakdown of the expected value of each of the schedule activities for which payment is required.
- B. The cost breakdown of the Detailed Construction Schedule shall have a direct correlation to the Schedule of Values to be used as the basis for Applications for Payment.

6. UPDATING OF CONSTRUCTION SCHEDULE/PROGRESS REPORTS

- A. Not less than seven (7) calendar days before the submission of the monthly progress payment request, or on a date specified by the Construction Manager, the Contractor shall arrange for its Project Manager, Superintendent and necessary subcontractors and suppliers to attend a monthly schedule meeting with the Construction Manager to review the Contractor's report of actual progress. Said report shall set forth up-to-date and accurate progress data, and shall be prepared by the Contractor in consultation with all principal subcontractors and suppliers.
- B. The progress report of the Contractor shall show the activities, or portions of activities, completed during the reporting period, the actual start and finish dates for these activities, remaining duration and/or estimated completion dates for activities currently in progress, and quantities of material installed during the reporting period.
- C. The Construction Manager will produce a computerized update worksheet for the Contractor to complete as a part of this process.
- D. At the monthly schedule meeting a total review of the Project will take place including but not limited to, the following:
 1. Current update of the Detailed Construction Schedule
 2. Anticipated detailed construction activities for the subsequent report period
 3. Critical items pending
 4. Contractor requested changes to the Detailed Construction Schedule.
- E. The Contractor shall submit a narrative with the progress report which shall include, but not be limited to, a description of problem areas, current and anticipated delaying factors and their impact, explanations of corrective actions taken or planned, any proposed newly planned activities or changes in sequence, and proposed logic for a Recovery Schedule, if required, as further described herein. The report shall also include:
 1. A narrative describing actual Work accomplished during the reporting period
 2. A list of major construction equipment used on the Project during the reporting period
 3. The total number of men by craft actually engaged in the Work during the reporting period, with such total stated separately as to office, supervisory, and field personnel
 4. A manpower and equipment forecast for the succeeding thirty (30) days, stating the total number of men by craft, and separately stating such total as to office, supervisory and field personnel

5. A list of Contractor supplied materials and equipment, indicating current availability and anticipated job site delivery dates
 6. Anticipated changes or additions to Contractor's supervisory personnel.
- F. As part of the updating process, the Construction Manager will calculate, based upon progress data provided by the Contractor and agreed to by the Construction Manager, the value of Work completed based on the sum of the cost loading amounts for all activities, including activities specifically defined for stored materials, less the amount previously paid. Summation of all values of each activity less the appropriate percent of retainage shall be the maximum amount payable to the Contractor, provided that the Contractor has complied with all requirements of the Contract Documents.
- G. No invoice for payment shall be submitted and no payment whatsoever will be made to the Contractor until the required narrative reports, as defined herein, have been submitted and the Detailed Construction Schedule has been updated.

7. RECOVERY SCHEDULE

- A. Should the updated Detailed Construction Schedule, at any time during the Contractor's performance, show, in the sole opinion of the Construction Manager, that the Contractor is behind schedule for any milestone or completion date for any location or category of work, the Contractor, at the request of the Construction Manager, shall prepare a Recovery Schedule within five (5) days, at no additional cost to the County (unless the County is solely responsible for the event or occurrence which has caused the schedule slippage), explaining and displaying how the Contractor intends to reschedule its Work in order to regain compliance with the Detailed Construction Schedule within thirty (30) calendar days.
- B. If the Contractor believes that all of the time can be recovered within thirty (30) calendar days, the Contractor will be permitted to prepare a Recovery Schedule as set forth below. However, if the Contractor believes it will take more than thirty (30) days to recover all of the lost time, it shall prepare and submit a request for revision to the Detailed Construction Schedule and comply with all of the requirements of a Schedule Revision as set forth in Paragraph 8 below.
- C. The Contractor shall prepare and submit to the Construction Manager a one month maximum duration Recovery Schedule, incorporating the best available information from subconsultants, subcontractors and others which will permit a return to the Detailed Construction Schedule at the earliest possible time. The Contractor shall prepare a Recovery Schedule to the same level of detail as the Detailed Construction Schedule. The Recovery Schedule shall be prepared in coordination with other separate contractors on the Project.
- D. Within two (2) days after submission of the Recovery Schedule to the Construction Manager, the Contractor and any of the necessary subcontractors, suppliers, vendors, manufacturers, etc. shall participate in a conference with the Construction Manager to review and evaluate the Recovery Schedule. Within two (2) days of the conference, the Contractor shall submit the revisions necessitated by the review for the Construction Manager's review and approval. The Contractor shall use the approved Recovery Schedule as its plan for returning to the Detailed Construction Schedule.

- E. The Contractor shall confer continuously with the Construction Manager to assess the effectiveness of the Recovery Schedule. As a result of these conferences, the Construction Manager will direct the Contractor as follows:
1. If the Construction Manager determines the Contractor continues behind schedule, the Construction Manager will direct the Contractor to prepare a Schedule Revision and comply with all of the requirements of a Schedule Revision as stated herein and the other requirements of the Contract Documents; provided, however, that nothing herein shall limit in any way the rights and remedies of the County and Construction Manager as provided elsewhere in the Contract Documents; or
 2. If the Construction Manager determines the Contractor has successfully complied with provisions of the Recovery Schedule, the Construction Manager will direct the Contractor to return to the use of the approved Detailed Construction Schedule.
- F. In carrying out any approved Recovery Schedule, or whenever it becomes apparent that any critical activity completion date may not be met, the Contractor shall take any or all of the following minimum actions, as may be required, at no additional cost to the County:
1. Increase manpower to put the Work back on schedule.
 2. Increase the number of working hours per shift, shifts per working day, working days per week, amount of construction equipment, or any combination which will place the Work back on schedule.
 3. Reschedule activities to achieve maximum practical concurrence and place the Work back on schedule.
- G. If the Contractor fails to take appropriate action as required by this Paragraph 7 to recover delays in the schedule, the Construction Manager may take action to attempt to put the Work back on schedule and deduct the cost of such action from monies due or to become due the Contractor in accordance with the Contract Documents.

8. SCHEDULE REVISIONS

- A. Should the Contractor desire to or be otherwise required under the Contract Documents to make modifications or changes in its method of operation, its sequence of Work or the duration of the activities in its Construction Schedule, it shall do so in accordance with the requirements of this Paragraph and the Contract Documents. The approved Detailed Construction Schedule may only be revised by written approval of the Construction Manager as provided herein.
- B. The Contractor shall submit requests for revisions to the Detailed Construction Schedule to the Construction Manager, using a Schedule Revision Form provided by the Construction Manager, together with written rationale for revisions and description of logic for rescheduling work, substantiating that the milestone and completion dates will be met as listed in the Contract Documents. Proposed revisions acceptable to the Construction Manager and County will be approved in writing and incorporated into the Detailed Construction Schedule.

- C. Requests for revision will be accompanied by evidence acceptable to the Construction Manager that the Contractor's suppliers, subcontractors and sub-subcontractors are in agreement with the proposed revisions.
- D. If there are separate contractors on the Project, the approval of the separate contractors shall be obtained to make the proposed schedule revisions. If accepted by the Construction Manager and County, the revisions shall be binding upon the Contractor and all separate contractors on the Project.
- E. The impact of all change orders to this Contract shall be included in the Detailed Construction Schedule.

9. FLOAT TIME

- A. Float or slack time associated with one chain of activities is defined as the amount of time between earliest start date and latest start date or between earliest finish date and latest finish date for such activities, as calculated as part of the currently approved construction schedule. Float or slack time shown on the currently approved construction schedule is not for exclusive use or benefit of either the County or the Contractor and is available for use by either of them according to whichever first needs the benefit of the float to facilitate the effective use of available resources and to minimize the impact of Project problems, delays, impact, acceleration or changes in the Work which may arise during performance. The Contractor specifically agrees that float time may be used by the County or Construction Manager in conjunction with their review activities or to resolve Project problems. The Contractor agrees that there will be no basis for any modification of the milestone or completion dates or an extension of the Contract Time, or a claim for additional compensation as a result of any Project problem, delay, impact, acceleration, or change order which only results in the loss of available float on the currently approved construction schedule.
- B. Float time shown on any construction schedule shall not be used arbitrarily by the Contractor in a manner which, in the opinion of the Construction Manager, unnecessarily delays separate contractors from proceeding with their work in a way which is detrimental to the interests of the County.

End of Section

SECTION 01 320 – REPORTS

1. DAILY REPORTS

- A. The Contractor's Superintendent shall prepare and submit Daily Reports throughout the construction phase of the Work. Daily Reports shall be kept in an orderly manner at the site, available for inspection or review when requested by the Construction Manager or the Architect. Copies of Daily Reports shall be accumulated and submitted to the Construction Manager on a weekly basis, on a regular day and time to be determined by the Construction Manager. Failure to submit Daily Reports or to comply with the format requirements below is cause for the Construction Manager to retain additional monies due the Contractor from the monthly Application(s) for Payment until such time as the reports have been brought up to date by the Contractor.
- B. Each Daily Report shall include the following information at a minimum:
1. Manpower by subcontractor, trade, and skill level
 2. Weather and temperatures (AM and PM)
 3. List of visitors to the jobsite
 4. Specific work performed with locations
 5. Situations or circumstances which could delay the Work or give cause for a time extension or additional cost
 6. Instructions requested (and of whom)
 7. Materials received
 8. Major equipment arrival/departure
 9. Total days accrued under the terms of the Contract Documents
 10. Accidents and incidents
 11. Safety issues
 12. Meetings
 13. Other significant events at the jobsite
- C. The Contractor shall take the necessary action required to specifically alert the Construction Manager to items which could result in impacts to the progress of the Work. Such items shall be clearly highlighted in the report.
- D. All Daily Reports shall be clearly handwritten or typed. Poor copies, reports in sloppy or illegible handwriting, or on wrinkled paper will not be accepted.

End of Section

SECTION 01 340 – SHOP DRAWINGS, PRODUCT DATA & SAMPLES

1. GENERAL

- A. This Section covers provisions for the submittal of shop drawings, product data, and samples prior to construction, and supplements the Owner-Contractor Agreement.
- B. The Contractor is required to make all submittals in accordance with the Contract Documents. Refer to the individual Technical Specifications for identification of equipment and materials for which submittals are required.
- C. Provisions in this Section are mandatory procedures for preparing and submitting shop drawings, product data, and samples.
- D. Required shop drawings, product data, and samples shall be coordinated, prepared, and submitted so as not to impact the project schedule. Submittals for interfacing units of work, and different categories of submittals for the same work, shall be coordinated and sequenced so that one will not be delayed by another. Adequate time shall be allowed for review by the Architect, and for possible resubmittal. Delays or impacts due to the Contractor's failure to make or process submittals in a timely fashion are solely the responsibility of the Contractor. The Contractor has an obligation to notify the Construction Manager in a timely manner if the submittal review process, with respect to reviews by the Architect might cause a schedule impact on the required delivery of any materials or fabricated assemblies required to execute the Work.
- E. Project delays or delays in the purchasing of materials or equipment occasioned by the requirement for resubmission of shop drawings, product data, and samples not in accordance with the Contract Documents are the Contractor's sole responsibility and will not be considered valid justification for time extensions.
- F. No portion of the Work requiring the submittal of shop drawings, product data, or samples shall be commenced until each such submittal has been reviewed by the Architect, and the action required on the returned submittal does not require a correction and resubmittal (i.e., "No Exceptions Taken" or "Make Corrections Noted," or similar notation); and further, each installer shall have possession of such final reviewed submittal prior to commencing its portion of the Work.
- G. The Contractor shall be responsible for distribution of all copies of initial and approved submittals required for coordination with others concerned with the Work.
- H. Submittals requiring review by the Architect shall be delivered to the Construction Manager's office, unless directed otherwise by the Construction Manager. Submittals are to be scheduled and submitted to allow adequate time for review.

2. DEFINITIONS

- A. "Shop Drawings" are drawings, diagrams, illustrations, schedules, performance charts, manufacturer's data sheets, brochures and other data which are prepared and submitted by the Contractor and its subcontractors to illustrate in detail some portion of the Work. The Architect's drawings are not acceptable as shop drawings.

- B. "Product Data" are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor and its subcontractors to illustrate a material, product, or system for some portion of the Work.
- C. "Samples" are physical examples prepared for submission by the Contractor and its subcontractors to illustrate materials, equipment, or workmanship, and to establish standards by which the work will be judged as complying with the Contract Documents. Mock-ups are a special form of samples, too large or otherwise inconvenient for transmittal in the manner specified. Mock-up requirements are specified elsewhere in the Contract Documents.

3. SUBMITTAL REGISTER

- A. Within ten (10) days of the Contractor's receipt of the Notice of Award, the Contractor shall submit a comprehensive Submittal Register to the Construction Manager, showing all items requiring submission as defined in the General Requirements and the Technical Specifications.
- B. No submittals will be accepted or reviewed until the Submittal Register has been submitted, reviewed, and approved by the Architect and the Construction Manager as to content and format.
- C. The Submittal Register shall be updated by the Contractor and resubmitted on a monthly basis, or as otherwise required by the Construction Manager.
- D. The initial format of the Submittal Register shall be determined by the Contractor. If any aspect is lacking, the Submittal Register shall be reworked and resubmitted in a format as prescribed by and to the level of detail required by the Construction Manager.
- E. The Submittal Register shall be organized by Specification Section, and shall be further broken down as submittals from subcontractors will be structured.
- F. The Submittal Register shall include all required submittals for test procedures, training programs, operation and maintenance manuals, and any other submittals required by the General Requirements.
- G. The Submittal Register shall include the following information at a minimum:
 - 1. Submittal breakdown by Specification Section and Paragraph number.
 - 2. Scheduled date for initial submittal of each item.
 - 3. Number of calendar days required after review to fabricate and deliver the specified item to the jobsite (if applicable).

4. PREPARATION OF SUBMITTALS

- A. General Identification: All shop drawings, product data, and samples submitted for review shall have the following identification data, as applicable, contained thereon or permanently affixed thereto.
 - 1. Date of submission and the dates of any previous submissions
 - 2. Project title and location
 - 3. Job number
 - 4. Contract identification
 - 5. Names of the Contractor, subcontractor, installer, supplier, and manufacturer
 - 6. Identification of product (brand name, model number), use, and location
 - 7. For each shop drawing: drawing number, drawing title, revision number, and date of drawing and all subsequent revisions

8. Corresponding Specification Section and Paragraph reference from Contract Documents
9. Field dimensions, clearly identified as such
10. Relation to adjacent or critical features of Work or materials
11. Applicable standards, such as ASTM or Federal Specification numbers
12. Identification of deviations from the Contract Documents
13. Identification of revisions from previous submittals (if a resubmittal)
14. Contractor's stamp, initialed or signed, and dated

B. Shop Drawing Preparation

1. Provide newly-prepared information with graphics at accurate scale (except as otherwise indicated).
2. Number all sheets consecutively.
3. Indicate all working and erection dimensions. Identify all dimensions based on field measurement.
4. Show arrangements and sectional views.
5. Indicate kinds of materials and finishes, anchoring and fastening details, including information for making connections to other Work. Furnish installation instructions to be followed in the field to achieve manufacturer's designed and planned intentions.
6. Indicate corresponding detail numbers from Contract Drawings in addition to numbering systems used on shop drawings.
7. Form:
 - a. Up to 11" x 17" in size may be either prints on opaque paper, or reproducible transparency. The use of 8-1/2" x 14" size shall not be acceptable.
 - b. Prepare submissions larger than above on reproducible, correctable transparent sheets between 18" x 24" (minimum) and 30" x 45" (maximum) in size.
8. Number of copies to be submitted:
 - a. The Contractor shall submit one (1) reproducible copy and five (5) print copies for review.
 - b. Copies shall be grouped together such that one set of all copies can be removed immediately without the necessity to remove and re-sequence the remaining copies.
9. Associated drawings relating to a complete assembly shall be submitted simultaneously to the greatest extent possible, so that each may be checked in relation to each other and the total assembly.
10. Composite Coordination Shop Drawings:
 - a. The locations and routing of all mechanical and electrical systems shall be delineated on coordinated composite layout drawings, to be submitted by the Contractor and reviewed by the Architect and the Construction Manager according to the procedures above. Such coordination shall consider all other building systems, including structural members and their elevations.

- b. The composite drawings shall accommodate layering of ductwork, plumbing supply, waste, roof drainage and vent piping, fire protection piping, HVAC piping, electrical conduit, control systems conduit, light fixture locations, sprinkler head locations, HVAC ceiling-mounted and wall-mounted air devices, and life-safety system device locations.
- c. Provide plan views of all ceiling plenum spaces, duct and pipe shafts, and mechanical and electrical rooms. Show all ceiling grid patterns and walls. Clearly indicate top and bottom elevations of work, including elevations of wall-mounted devices.
- d. Clearly indicate all penetrations of smoke and fire-rated walls and ceilings. Indicate recommended smoke stop or fire stop method, cross-referenced to Division 7 Specification requirements.
- e. Composite drawings shall be 1/4" = 1'-0" minimum scale.

C. Product Data Preparation

1. Product data submittals shall be made by Specification Section. All items within a Specification Section requiring submissions shall be submitted together. If two or more Sections require inter-coordination (e.g. Air Handling Unit and Vibration Isolation, or Emergency Generator and Transfer Switch), they shall be submitted at the same time. Each individual submittal item shall be marked to show the Specification Paragraph number which pertains to that item.
2. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and coordination requirements.
3. Clearly mark each copy to identify pertinent products, brand names, or models, and to indicate which choices and options are applicable to the Work.
4. Modify each copy to delete information which is not applicable to the Work. Supplement standard information to provide information specifically applicable to the Work and to job conditions.
5. Include performance characteristics and capacities.
6. Include dimensions and clearances required.
7. Include wiring or piping diagrams and controls.
8. Form:
 - a. Submit all items within a Specification Section in a tabbed binder, with an index.
 - b. Submittals for multiple but related Specification Sections may be grouped in the same binder, if adequately indexed and tabbed for easy reference.
 - c. If product submittals bound together exceed the capacity of one binder, two or more binders shall be used, and notations shall be made on the covers of each indicating the number of binders in the set and the number of each binder (i.e., 2 of 3).
9. Number of copies to be submitted: five (5).

D. Sample Preparation

1. Provide samples which are identical with the final condition of proposed materials or products for the Work.
2. Provide "range" samples (not less than three (3) units) where unavoidable variations must be expected, and describe or identify variations between units of each set.
3. Provide a full set of optional samples where selection is required.
4. Provide information with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards.
5. Number of samples to be submitted: three (3).
6. Maintain one set of all approved samples at the jobsite, in suitable condition, for quality control comparisons by the Construction Manager. Jobsite quality control samples shall become the property of the County.
7. Returned submittals which are intended or permitted to be incorporated into the Work shall be so indicated in the individual Specification Sections, and shall be in a suitable and undamaged condition at the time of incorporation.

E. Other Submittals

1. Inspection and Test Reports: Classify each as either a "shop drawing" or "product data," depending on whether report is uniquely prepared for the Project or a standard publication of workmanship control testing at point of production, and process accordingly.
2. Letters of Material Certification: Submit for specified materials, items, or equipment, and when requested. Letters of certification shall certify that material or equipment submitted complies with the Contract Documents and shall be submitted with substantiating supporting data (i.e., test reports from approved independent testing laboratory or other approved source). Classify as "product data."
3. Fire Rating and Acoustical Rating Certifications: Submit notarized certifications with shop drawings and material samples which are required to show or have a fire or acoustical rating.

5. TRANSMITTAL

- A. Transmit all shop drawings, product data, and samples to the Construction Manager for transmittal to the Architect.
- B. Accompany each submittal to the Construction Manager with a transmittal letter, in duplicate, containing the Project name, Contractor's name, contract number and description, and brief description of submittal, including the number of drawing sets, data sets, and/or samples included. Include an outline of deviations, if any, from the requirements of the Contract Documents, and itemize proposed changes in the Contract Sum or Contract Time, if any. Where no change in the Contract Sum or Contract Time is indicated by the Contractor, it shall be concluded that no such change is involved for making the change.

6. CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall prepare and submit all submittals with promptness and in accordance with the project schedule.

- B. The Contractor shall determine and verify prior to submittal of any shop drawing, product data, or sample, the following:
 - 1. Field measurements
 - 2. Field construction criteria and job conditions
 - 3. Catalog numbers and similar data
 - 4. Conformance with Specifications
- C. Any deviation in a submittal from the requirements of the Contract Documents shall be called to the attention of the reviewing party in writing at the time of the submittal.
- D. The Contractor shall affix its stamp, with initials or signature, and date, prior to submittal to the Construction Manager, indicating its review and concurrence that the submittal conforms to the Contract Documents.
- E. All copies of submittals shall include the stamp indicated above, and previous revisions, if any, shall be clouded and noted. Failure to adhere to these requirements will result in the return of the unreviewed submittal to the Contractor for re-submittal, with the Contractor responsible for any impact to the project schedule resulting there from.
- F. If re-submittals are necessary, they shall be made as specified above for initial submittals. Re-submittals shall highlight all revisions made and the cover shall include the phrase, "Re-submittal No. _____."
- G. All re-submittals shall carry the same submittal number but shall have a suffix designation which is designed to signify that the package is a re-submittal. This suffix designation shall be changed for each subsequent re-submittal.

7. CONSTRUCTION MANAGER'S RESPONSIBILITIES

- A. The Construction Manager will provide a general review of all submittals for completeness and compliance with submittal procedures as outlined herein.
- B. The Construction Manager will return to the Contractor, without review, all submittals not bearing the Contractor's review stamp or not indicating that the submittal has been reviewed by the Contractor. All costs resulting from unnecessary delays of this type will be the responsibility of the Contractor.
- C. The Construction Manager will forward acceptable submittals to the Architect for review.
- D. After the Architect review, the Construction Manager will forward reviewed submittals to the Contractor and retain one copy for the County. The Contractor will provide additional distribution copies to the Construction Manager of any submittals in a "No Exceptions Taken" status as directed by the Construction Manager at any time during execution of the contract.

8. ARCHITECT'S RESPONSIBILITIES

- A. Shop drawings, product data, and samples will be examined by the Architect with reasonable promptness and returned to the Construction Manager. Allow a reasonable time for processing by the Architect and the Construction Manager in addition to transit time.
- B. Shop drawings, product data, and samples will be returned to the Contractor noted for action as follows:

1. "Rejected" – indicates that the submission is unacceptable and requires resubmission. In the case of a mock-up, reconstruction will be required. The Contractor shall make corrections as noted and resubmit. Fabrication shall not begin on items covered by submittals bearing this notation.
 2. "Make Corrections Noted" – indicates that the Contractor shall make the corrections indicated on the returned submittal. This notation will permit fabrication to begin on all items subject to the corrections indicated. If "Resubmit" has been added after "Make Corrections Noted," the Contractor shall delay fabrication on items affected by the corrections, make appropriate changes and resubmit.
 3. "No Exceptions Taken" – indicates that fabrication may begin on all items.
 4. "Not Required for Review" – indicates that no submittal is required.
- C. The Architect will apply its document review stamp, with signature or initials, on all reviewed copies of submittals. Through the Construction Manager, one copy of all reviewed submittals will be returned to the Contractor; for shop drawings where reproducible copies are submitted, one print and one reproducible copy will be returned.
- D. The Technical Specifications for structural, mechanical and electrical work may modify the above requirements and shall govern in the event of conflict.
- E. If the Contractor has a complaint with either the time required or the information provided by the Architect's review, it shall be expressed in writing at the time the submittal is returned. Failure by the Contractor to file such complaints at that time will prevent attempting to allege delays or impacts resulting there from at a later date. Such complaints must be fully detailed, and if additional information is requested by the Construction Manager, it shall be provided as soon as becomes available, but in no case later than ten (10) days from the return of the submittal in question.
- F. The Architect's review of a submittal shall not be construed as an indication that it is correct or suitable, nor that Work represented by a submittal complies with the Contract Documents, except as to matters of finish, color, and other aesthetic matters left to the Architect's decision by the Contract Documents. Further, reviews by the Architect of submittals of details for any material, apparatus, device, etc., will not relieve the Contractor from responsibility for furnishing same of proper dimension, size, quantity, and quality to efficiently perform the Work and carry out the requirements and intent of the Contract Documents.

9. RECORD SUBMITTALS

- A. At Substantial Completion of the Work, the Contractor shall deliver to the Construction Manager one copy of all final, approved submittals for the County's record.
- B. Record submittals not in the form of drawing rolls shall be neatly labeled and organized by Specification Section and boxed in a "Banker's Box" or equivalent. Rolls of shop drawings shall be labeled appropriately for easy reference.

End of Section

SECTION 01 370 - SCHEDULE OF VALUES

1. GENERAL SUMMARY

A. The Contractor shall submit to the Construction Manager a Schedule of Values for the entire Contract, either within ten (10) days of Contract award or fifteen (15) days prior to the first Application for Payment deadline, whichever comes first.

B. Breakdown and Content

The Schedule of Values will be submitted in a format as prescribed by and to the level of detail specified by the Construction Manager.

1. The sum of the parts of the Schedule of Values shall aggregate to the total Contract Sum.
2. The minimum level of breakdown will normally be:
 - a. General Conditions line item(s) as required
 - b. Construction costs, by CSI Division or major trade, and broken down into labor and material line items for specific areas of the facility
 - c. Stored material projections
3. Schedule of Values items shall have a direct and understandable relation to the Project CPM Schedule.

2. SCHEDULE OF VALUES UTILIZATION

A. Applications for Payment

The Schedule of Values, unless objected to by the Construction Manager or the Architect, shall be the basis for the Contractor's Applications for Payment.

B. Changes to the Schedule of Values

The Construction Manager shall have the right to require the Contractor to alter the value or add/delete categories listed on the Schedule of Values at any time for the following reasons:

1. The Schedule of Values appears to be incorrect or unbalanced.
2. A revision to the segregation of values is required due to the Contractor revising the sequence of construction or assembly of building components, which in turn invalidates the Schedule of Values.
3. Change Orders are issued to the Contractor and require incorporation into the Schedule of Values.

C. Stored Materials

The Contractor is required to correlate the documentation for payment of stored materials requested in the Application for Payment against the agreed upon breakdown of the Schedule of Values. The Construction Manager reserves the right to not process the Application for Payment if this correlation has not been submitted in conjunction with the Application.

End of Section

SECTION 01 400 – QUALITY CONTROL

1. GENERAL

- A. Refer to the Technical Specifications for specific quality control activities to be performed, and for the inspection and testing required by public authorities having jurisdiction.
- B. The Contractor shall furnish all labor, materials, tools, equipment and services for quality control of materials, components and systems incorporated or to be incorporated the Work, so as to adequately and acceptably perform the Work as required by the Contract Documents. All testing and inspection, whether required by the Contract Documents; by laws, ordinances, rules, regulations, codes or orders of any public authority having jurisdiction; or whether performed by the Contractor for qualification of materials or its convenience, shall be at the Contractor's expense unless otherwise indicated in the Contract Documents.
- C. The Contractor shall be fully responsible for quality control. The Contractor shall employ an individual on its staff who shall be primarily responsible for ensuring an acceptable level of quality on the Project. This individual shall not be the Contractor's Project Superintendent.
- D. The Contractor shall completely coordinate its Work internally and with the work of any separate contractors. Although such Work may not be specifically indicated in the Contract Documents, the Contractor shall furnish and install all supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a sound, secure, and complete installation.
- E. At any time during the execution of the Contract, the Construction Manager may notify the Contractor that some aspect of quality control is not being correctly performed. If the Contractor fails to respond to a request for quality control surveys or reports, or to a second request for proper preparatory work in an area for the purpose of a test or inspection, including a punch list inspection, the Construction Manager or the County may provide this work and deduct the cost of such work from the value of the Contract.

2. SPECIAL INSPECTIONS TESTING

- A. Special Inspections for the Wolf Creek Amphitheater project will be performed by a consultant to Fulton County.
- B. The Special Inspections consultant will provide a Schedule of Special Inspections and a stamped and dated Statement of Special Inspections for this project, per the Standard Building Code requirement for Special Inspections fro this project.
- C. Services shall include, at a minimum:
 - 1. Soils (compaction, moisture content, below pavement, foundations and slabs)
 - 2. Paving (compaction, moisture content)
 - 3. Concrete work (subgrade preparation, reinforcement and concrete)
 - 4. Masonry/reinforced masonry
 - 5. Structural steel connections (bolts and welds)

D. The contractor will be required to submit a Statement of Contractor's responsibility, per IBC 1705.3, to Fulton County Department of Environment and Community Development, to include:

1. Acknowledgement of awareness of the special requirements contained in the quality assurance plan.
2. Acknowledgement that control will be exercised to obtain conformance with the construction documents approved by the building official.
3. Procedures for exercising control within the contractor's organization, the method and frequency of reporting, and the distribution of the reports.
4. Identification and qualifications of the person (s) exercising such control and their position (s) in the organization.

3. OTHER REQUIRED TESTING AND INSPECTION

A. The Contractor shall be responsible for all other tests and inspections which may be required, including, but not limited to testing and certification of conveyances, mechanical systems (including balancing), electrical systems, fire alarm and security systems, and other special systems, any of which may or may not require the use of an independent testing and inspection agency.

4. JOB CONDITIONS

- A. Employment of an independent testing and inspection agency shall not relieve the Contractor of its obligation to comply with the Contract Documents.
- B. Where operating tests are specified, the Contractor shall test its Work as it progresses, at its own expense, and shall make satisfactory preliminary tests in all cases prior to applying for official tests. Tests shall be in the manner specified for the appropriate type of Work.
- C. Each test shall be made on the entire system for which such test is required wherever practical. In case it is necessary to test portions of the Work independently, the Contractor shall do so without additional compensation. Should defects appear, they shall be corrected by the Contractor and the test repeated until the installation is acceptable to the Architect and the Construction Manager. No Work of any kind shall be covered or enclosed before it has been tested and approved.

5. PROCEDURES AND REPORTS

- A. Prior to the start of construction, submit to the Construction Manager a complete list of proposed tests and inspections according to specification section and Schedule of Special Inspections.
- B. Perform, or cause to be performed, all required inspections, sampling and testing of materials and methods of construction, utilizing methods required by the specifications and applicable standards. The Contractor's quality assurance specialist shall observe all sampling and testing and shall review all test results.
- C. Test procedures:
1. Each test to be performed shall have a test procedure which shall include a detailed description of the specific steps which will be taken by the testing technician.
 2. Each test procedure shall be submitted to the Construction Manager for review at least four (4) weeks prior to the time that the Contractor wishes or is required to perform the test.

3. No formal acceptance test will be performed without an approved test procedure being utilized.
- D. Report each test/inspection/sampling in the form specified below. All reports shall be submitted promptly after completion of the test.
- E. Retest all failed materials, components, and systems.
- F. Record all test and inspection results and maintain a complete log of the testing and inspection program. This log shall be submitted for the Architect's or the Construction Manager's review upon request.
- G. Equipment testing:
 1. All pieces of rotating mechanical equipment and electrical equipment shall be formally tested prior to acceptance by the Architect, the Construction Manager and the County. This requirement will not be waived by temporary or permanent occupancy of some or all parts of the finished construction.
 2. The Construction Manager shall have the final determination as to whether or not a piece of equipment shall require a formal acceptance test.
 3. No equipment warranty period shall be started until a formal acceptance test has been successfully completed.
 4. No final payment for any such equipment shall be made until a formal acceptance test has been successfully completed.
- H. Test / inspection procedures and reports shall include the following information at a minimum:
 1. Project name and number
 2. Project location
 3. Applicable specification section and paragraph
 4. Type of test or inspection
 5. Name of testing/inspecting agency (if used)
 6. Name(s) of testing/inspecting personnel
 7. Date of test/inspection
 8. Record of field conditions encountered, including weather
 9. Observations regarding compliance
 10. Test method used
 11. Results of test/inspection
 12. Date of report
 13. Signature of testing/inspecting personnel
- I. Where test/inspection reports indicate non-compliance, provide report on colored bond paper.
- J. All testing/inspection reports produced by an independent testing and inspection agency shall be submitted to the Construction Manager directly from the independent testing and inspection agency, with copies to the Contractor.

6. SPECIAL INSPECTION TESTING AGENCY DUTIES AND LIMITATIONS OF AUTHORITY

- A. Provide qualified personnel at site after due notice; cooperate with the Contractor, the Architect, and the Construction Manager in performance of services.
- B. Promptly notify the Construction Manager of irregularities or non-conformance of Work which are observed during performance of services.

- C. Attend preconstruction conferences and progress meetings if an as requested by the Construction Manager.
- D. An independent testing and inspection agency is not authorized to:
 - 1. Release, revoke, alter, or enlarge on requirements of the Contract Documents.
 - 2. Approve or accept any portion of the Work.
 - 3. Assume any duties of the Contractor.
 - 4. Stop the Work.

7. CONTRACTOR'S DUTIES TO SPECIAL INSPECTION OR INDEPENDENT TESTING AND AGENCY

- A. The Contractor shall be responsible to coordinate all work of the testing and inspection agency including notifications, coordination on and off site and distribution of test reports.
- B. The Contractor shall cooperate with testing and inspection agency personnel, and provide access to Work.
- C. The Contractor shall provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, and for storage and curing of test samples.
- D. The Contractor shall notify the testing and inspection agency and the Construction Manager of any test or inspection 48 hours in advance to allow for proper coordination,
- E. Unless noted otherwise, field testing procedures shall be performed by the Contractor under the direction and observation of the independent testing and inspection agency.

8. MOCK-UPS

- A. Provide mock-ups and testing for Work as required by the Contract Documents.
- B. Build mock-ups to be used as specimens for visual inspection or testing. Use the same materials, finishes, details, methods and anchorage system proposed for the respective installations. Simulate actual construction conditions. Provide extra materials as may be required to replace any which fail during tests, except intentional failure tests beyond specified performance requirements.
- C. Schedule erection and approval inspections of mockups in the construction schedule.
- D. For waterproof or watertight assemblies, assemble and erect complete, with specified attachment and anchorage devices, flashings, seals, and finishes.
- E. Correct any deficiencies and repeat tests as may be required to show compliance with the Contract Documents. Incorporate corrective measures into the final system assembly.
- F. Remove mock-up and clear area when work of that section is complete, when approved by the Architect, County and/or Construction Manager.

9. PUNCH LIST INSPECTIONS

The preparation of the Work or a portion thereof prior to a punch list inspection shall be solely the Contractor's responsibility. The Contractor shall first verify, and then certify that the Work for which a punch list inspection is being requested is in such a state that it may be easily punched out for acceptance by the Architect, the Construction Manager and/or the County. Failure to properly prepare the Work for a punch list inspection shall constitute a failure to perform a quality control duty, and the Construction Manager may take appropriate action as defined in Paragraph 1.E above.

End of Section

SECTION 01 500 – CONSTRUCTION FACILITIES & TEMPORARY CONTROLS

1. INTRODUCTION

- A. The Contractor shall provide all construction facilities and temporary controls throughout the construction period unless otherwise indicated in the Contract Documents.
- B. The Contractor shall pay all costs for providing, maintaining, and removing all construction facilities and temporary controls unless otherwise indicated in the Contract Documents.

2. QUALITY ASSURANCE

All work specified herein shall be performed in a workmanlike manner and shall be in accordance with applicable codes, OSHA regulations, utility company rules and regulations, and other rules and regulations of any other authorities having jurisdiction.

3. JOB CONDITIONS

- A. The Contractor shall establish and initiate use of each construction facility or temporary control at the time first reasonably required for proper performance of Work. Terminate use and remove facilities and controls at earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.
- B. The Contractor shall install, operate, maintain and protect construction facilities and temporary controls in a manner and at locations which will be safe, non-hazardous, sanitary and protective of persons and property, and free of deleterious effects.
- C. Conservation: In compliance with County policy on energy/materials conservation, install and operate construction facilities and temporary controls and perform construction activities in a manner which reasonably will be conservative and avoid waste of energy and materials, including water and electric power.

4. TEMPORARY UTILITIES - GENERAL

- A. The Contractor shall provide and pay all costs for temporary utilities, including consumption costs. Do not use utilities of any existing, permanent operations at site.
- B. Make all temporary connections to utilities and services in locations acceptable to the local authorities having jurisdiction. Furnish all necessary labor and materials, and make all installations in a manner subject to the acceptance of such authorities.
- C. Maintain all temporary utility installations connections and remove them when no longer required. Restore the services and sources of supply to proper operating condition.
- D. The Contractor may extend and use permanent utilities installed for the Project for temporary facilities. Prior to Substantial Completion, remove temporary connections, replace lamps, filters, etc., and restore permanent utilities to specified condition.

- E. Metering: Comply with requirements of local utilities for installation of meters for water and electrical power services.

5. TEMPORARY POWER DISTRIBUTION

- A. Temporary electrical power service shall be installed and maintained such that power can be secured at any desired point with no more than a 60 foot extension cord.
- B. Service shall be sufficient for the following items:
1. Power centers for miscellaneous tools and equipment used in the construction work, each with a minimum of four 20-amp, 120 volt grounding type outlets. Each outlet shall provided with ground fault detecting circuit breaker protection.
 2. Adequate lighting for safe working conditions, provided and maintained on a 24-hour basis, throughout the building including stairways. At least 0.25 watts of incandescent lighting per square foot for general use must be installed and maintained in all areas where work is in progress. Each lamp must be rated at least 100 watts. Voltage of each socket must be at least 110 volts.
 3. Power for any equipment used for temporary heating and ventilation, and for start-up testing of any permanent electric-powered equipment prior to its connection to permanent electrical system.
- C. Power for electric welding shall be provided via the temporary electrical system or engine-driven power generator sets. Coordinate all connections for welding equipment with the Construction Manager.
- D. Regulatory Agency Requirements:
1. The Contractor shall obtain any and all permits required by local authorities having jurisdiction, as applicable to any temporary power work performed.
 2. The temporary electrical service shall comply with the National Electrical Code as currently adapted by local authorities, and all other applicable local codes and utility regulations.
- E. Materials:
1. The materials may be new or used, but must be adequate in capacity for the purposes intended and must not create unsafe conditions or violate the requirements of applicable codes.
 2. Use wire, cable, or busses of appropriate type, sized in accordance with the National Electrical Code for the applied loads. Use only UL-labeled wire and devices.
- F. Equipment: Provide appropriate enclosures for the environment in which equipment is placed and used, in compliance with NEMA standards.
- G. Installation:
1. Install all work with a neat and orderly appearance.
 2. Make the work structurally sound throughout.

3. Maintain the system to give continuous service and to provide safe working conditions.
4. Modify temporary power and lighting installation as job progress requires.
5. Locate work such that interference with storage areas, traffic areas and other work is avoided.
6. Remove all temporary equipment and materials completely upon completion of construction.
7. Repair all damage caused by the installation and restore to satisfactory condition.

6. TEMPORARY LIGHTING

- A. Provide task lighting of sufficient level for installation of the Work. If the Construction Manager does not deem the amount of task lighting to be adequate in a given area, the Contractor shall immediately increase the amount of task lighting at no additional cost. Verbal direction for the Construction Manager shall be adequate in this situation.
- B. Lighting at all interior areas receiving final finishes shall be at uniform levels and generated from the same type and color lamps.
- C. Lighting for field offices, storage trailers, shops and outdoor work areas shall be provided by the Contractor as necessary.
- D. Outdoor area lighting, in excess of any existing streetlight levels, of any site staging areas shall be provided by the Contractor. This lighting shall be in the form of dusk-to-dawn mercury vapor fixtures. Lighting shall be of sufficient levels to permit security checks of the areas and provide for minimal access, but not sufficient by itself for work activity. If the Construction Manager does not deem the amount of area lighting to be adequate in a given area, the Contractor shall immediately increase the amount of area lighting at no additional cost.

7. TEMPORARY WATER

- A. Water for Construction: Construction water may be provided from available existing water mains or by use of temporary tanks. When connecting to existing water service lines, perform all work according to the requirements of, and obtain any and all permits required by, local authorities having jurisdiction. Remove all temporary installations and equipment upon completion of construction.
- B. Drinking Water: Provide drinking water adequate in quantity, quality and locations for all personnel at the project site. Furnish paper drinking cups and waste receptacles at each drinking water dispensing location.

8. TEMPORARY HEAT AND VENTILATION

- A. The Contractor shall be responsible for providing heating and ventilation where required for satisfactory execution of the Work. Specifically, temporary heating and ventilation is required to:
 1. facilitate progress of the Work

2. protect materials from dampness and the adverse effects of low ambient temperatures
 3. prevent moisture condensation on surfaces
 4. provide suitable temperature and humidity levels for installation and curing of materials
- B. Temperature Requirements:
1. Generally, in semi-finished areas, a minimum of 50 degrees F shall be maintained 24 hours per day.
 2. During placing, setting, and curing of cementitious materials, temperatures shall be maintained as required by the Technical Specifications and applicable standards.
 3. Seven (7) days prior to, and during, the installation of interior finishes, the minimum temperature shall be 50 degrees F, 24 hours per day, unless noted otherwise in specific sections of the Technical Specifications.
 4. After application of interior finishes and until the permanent HVAC system is operable, the minimum temperature shall be 50 degrees F, 24 hours per day, except as otherwise noted in the specific sections of the Technical Specifications and unless higher temperatures are required for specific activities; then the temperature shall be maintained as per the specific material manufacturer's recommendations.
 5. Concrete Work: During the winter months (November through April), the Contractor shall provide winter weather protection for all concrete work if required. The heating may be accomplished by use of approved types of portable heaters. Review applicable sections of the Technical Specifications for specific cold weather requirements for concrete placement and curing.
- C. Use steam or hot water for temporary heating if and when available. If steam or hot water is not available, use gas from a piped distribution system if and when available. If none of the above sources are available, portable self-contained LP gas or fuel oil heaters may be used, equipped with individual space thermostatic controls.
- D. The Contractor shall provide heat as required for any work area outside the building confines.
- E. Safe Practices for Portable Heaters:
1. Locate heating units so as not to create a hazard to personnel, stored materials, or work of other contractors.
 2. Avoid locating heaters in the vicinity of volatile, combustible, or explosive materials.
 3. Ventilate areas occupied by personnel to avoid dangerous levels of exhaust gases and consumption of oxygen.
 4. Use heating units bearing UL, FM or other approved label(s) appropriate for application.

- F. Install all temporary heating and ventilation work in a workmanlike manner, and ensure all work complies with rules and recommendations of involved local utility company, if applicable, as well as OSHA requirements.

9. TEMPORARY FIRE PROTECTION

- A. Specific administrative and procedural minimum actions are specified in this Paragraph, as extensions of provisions in the Owner-Contractor Agreement and other Contract Documents. These requirements have been included for special purposes as indicated. Nothing in this Paragraph is intended to limit types and amounts of fire protection required, and no omission from this Paragraph will be recognized as an indication by the County or Construction Manager that such temporary activity is not required for successful completion of the Work and compliance with requirements of Contract Documents.
- B. Quality Assurance
 - 1. NFPA Code: Comply with NFPA Code 241 "Building Construction and Demolition Operations."
 - 2. The Contractor shall also comply with all applicable state, city and local fire codes.
- C. The Contractor shall take all necessary precautions to guard against all possible fire hazards and to prevent damage to any construction Work, building materials, equipment, field offices, storage sheds and all other property, both public and private, in accordance with all fire protection and prevention laws and codes. The Contractor will assume full responsibility for damage caused by fire to construction and building, building materials, equipment and all property, both public and private.
- D. The location of the nearest corporation or public fire alarm box and the number of the local fire department shall be conspicuously posted by the Contractor in its field office and in the construction area.
- E. The Contractor's superintendent in charge of the Work shall review the Project at least once a week to make certain that it adheres to the conditions and requirements set forth herein.

- F. No open fires shall be permitted. The Contractor and its subcontractors will not be allowed to start fires with gasoline, kerosene or other flammable materials. The bulk storage of all flammable liquids shall be located at least 75 feet from any inhabited trailer or office and from the yard storage of flammable building materials. All flammable liquids having a flash point of 100 degrees F or below, which must be brought into any building, shall be confined to the Underwriter's Laboratories' labeled safety cans. Drums containing flammable liquids are to be equipped with approved vent pumps and located per direction of the Construction Manager. Drums with spigots are prohibited for the storage of flammable liquids on the project site.
- G. Welding, flame cutting or other operations involving the use of flame, arcs or sparking devices will not be allowed without adequate protection and shielding. All combustible and flammable material shall be removed from the immediate working area. If removal is impossible, all flammable or combustible material shall be protected with a fire blanket or suitable noncombustible shields to prevent spark, flames or hot metal from reaching the flammable or combustible materials. The Contractor shall provide the necessary personnel and fire fighting equipment to effectively control incipient fires resulting from welding, flame cutting or other operations involving the use of flame, arcs or sparking devices.
- H. Only fire resistant tarpaulins with UL label and flame spread of 15 or less shall be used on this project.
- I. Use of only Underwriters Laboratory approved heaters and/or stoves is permitted in field offices or storage sheds and they shall have fire resistive material underneath and at the sides near partitions and walls. Pipe sleeves and covering shall be used where stove pipe runs through wall or roof.
- J. Smoking shall be prohibited around concentrations of combustibles and in particularly hazardous areas. Restricted areas must be plainly marked, with signs posted. No smoking rules must be strictly enforced.
- K. Fire Extinguishers
1. The Contractor shall provide and maintain in working order during construction, an adequate number of fire extinguishers for use by all trades in each area of work. Two (2) fire extinguishers shall also be placed in the vicinity of Contractor's construction office.
 2. In areas of flammable liquids, asphalt or electrical hazards, extinguishers of the 15 lb. carbon dioxide type or 20 lb. dry chemical type shall be provided.
 3. The Contractor shall maintain and inspect all fire extinguishers periodically. Fire extinguishers must be mounted in plain view and sealed, so that operation of the fire extinguisher will break the seal. In the event a fire extinguisher is discharged or damaged, it shall be removed from service and be replaced with a charged unit.

4. The Contractor shall post warnings and quick instructions at each extinguisher location. The Contractor and all of its subcontractors shall instruct their personnel at the project site, at the time of their first arrival, on proper use of extinguishers and other available facilities at the project site.

10. DEWATERING

Maintain the Project site and all Work free of water accumulation. Dewatering activities shall not infringe upon adjacent properties. Comply with all rules and regulations of authorities having jurisdiction and secure any and all permits required.

11. TEMPORARY ENCLOSURES

- A. Provide temporary enclosures reasonably required to ensure adequate workmanship and protection from the weather and unsatisfactory ambient conditions for the Work, including those enclosures inside which temporary heat is used.
- B. Provide fire-retardant treated lumber and plywood where used for temporary enclosures.

12. TEMPORARY SANITARY FACILITIES

- A. Provide and maintain sanitary toilet facilities for use of all personnel at the project site. Either piped (wet) toilet facilities or self-contained chemical toilet units may be used.
- B. The number of sanitary facilities required shall be based on the total number of workers employed on the site and shall be in accordance with the provisions of the applicable code. Separate toilet facilities for men and women shall be provided when both sexes are working in any capacity on the project site.
- C. All sanitary facilities shall be maintained by the Contractor in a safe, clean, and sanitary conditions at all times.

13. CONSTRUCTION TRAFFIC INGRESS TO AND EGRESS FROM SITE

- A. Routes to Construction Site: The Contractor shall inform and insure compliance of its subcontractors and suppliers regarding the recommended traffic route(s) from major highways to the jobsite. For all traffic off of the jobsite, the Contractor shall coordinate with, and obtain any necessary permits from, appropriate authorities having jurisdiction.
- B. Construction Site Access: All construction traffic, including deliveries of materials and equipment, shall enter and exit the site only by the routes prescribed on a site access and parking plan submitted by the Contractor and approved by the Construction Manager prior to start of construction (see Subparagraph 14.1 below).
- C. Cleaning: The Contractor shall take all precautions necessary to prevent the tracking of mud and debris onto paved roads adjacent to the jobsite. The Contractor shall immediately clean any affected area if directed by the Construction Manager. The utilization of wheel wash areas located at all site entrance/exit points is mandatory for all vehicles leaving the site if the tracking of mud or debris onto adjacent streets would result otherwise.

14. SITE ACCESS ROADS AND PARKING AREAS

- A. Provide and maintain vehicular access to and within the site for use by all persons and equipment involved in construction of the Project.
- B. New temporary access roads shall be constructed across designated easements from public thoroughfares only as allowable by local authority having jurisdiction.
- C. Provide adequate access for emergency vehicles.
- D. Provide and maintain temporary parking areas for use by construction personnel. Do not use any existing parking lots which may exist at existing facilities on the site unless specific authorization is given by the County. If parking needs exceed onsite capacity, provide offsite parking as necessary, as well as transportation to and from the site if distance dictates.
- E. All traffic and parking areas shall be filled, compacted, and graded as necessary to provide suitable support for vehicular traffic under anticipated loadings.
- F. Maintain all onsite traffic and parking areas free of excavated materials, construction equipment, construction materials, debris, snow and ice. Provide for surface drainage for all traffic and parking areas, and implement and maintain dewatering if and as necessary.
- G. Keep fire hydrants, water control valves, and all other utilities requiring possible access free from obstructions.
- H. Provide temporary directional signage as necessary.
- I. Prior to the start of construction, submit to the Construction Manager for approval a complete site access/utilization and parking plan, incorporating the requirements described above.

15. STORAGE AREAS

- A. The Contractor shall be responsible for all onsite and offsite storage of materials and equipment required for the Project. Onsite storage is subject to the review and approval of the Construction Manager.
- B. All combustible or flammable materials shall be safely stored in a secured area in strict accordance with regulations, codes, and laws enforced by local, State, or Federal agencies, whatsoever is the most stringent.
- C. If the Construction Manager, for good reason, directs that any or all materials stored on the site must be removed, the Contractor shall do so within ten (10) days of written notice of same. Stored materials not removed in a timely manner will be removed by the Construction Manager at the Contractor's expense.

16. TEMPORARY FIELD OFFICE AND TOOL STORAGE FACILITIES

- A. The Contractor shall provide a trailer or other suitable temporary building for a field office, which shall contain office space required for the Contractor's operations, a conference room of suitable size for regular progress meetings, toilet facilities, and a separate spare office for a County, Architect, or Construction Manager representative to use when onsite. Ample space shall be provided for storage of all construction documentation. The trailer shall have telephone service for use by the Contractor and its subcontractors, and shall also have a working intrusion alarm system. One sign with the Contractor's name may be placed on the trailer.

- B. The Contractor may provide other temporary trailers or buildings for storage and maintenance as required and as space permits.
- C. All field office and storage structures shall be placed or constructed in accordance with the regulations of the local Fire Marshal having jurisdiction.
- D. Field offices and sheds shall be of suitable design, maintenance, and appearance.
- E. The Contractor shall provide power and heat to its field office, and to storage sheds if storing climate-sensitive materials or equipment.
- F. The Contractor shall adequately maintain the designated space designated for its field office and storage sheds, including the removal of weeds, debris, and trash.
- G. Temporary field offices and sheds shall not be used for living quarters.
- H. If the Construction Manager, for good reason, directs that any or all field offices or storage sheds on the site must be removed, the Contractor shall do so within ten (10) days of written notice of same. Structures not removed in a timely manner will be removed by the Construction Manager at the Contractor's expense.

17. FIRST AID STATION

The Contractor shall provide and maintain at least one unmanned first aid station for its personnel and subcontractors.

18. SECURITY

- A. Neither the County or any of its agents assumes any responsibility for loss, theft or damage to the Work, tools, equipment and/or construction. In the instance of any such loss, theft or damage, the Contractor shall be responsible to renew, restore or remedy the Work, tools, equipment and construction in accordance with requirements of the Contract Documents without additional cost to the County.
 - 1. The Contractor shall immediately advise the Construction Manager of any theft or damage which may delay the execution of the Work.
 - 2. The Contractor shall furnish the Construction Manager with a copy of any theft report filed with appropriate law enforcement agencies.
- B. Site parked equipment, operable machinery and hazardous parts of the new construction subject to mischief and accidental operation shall be inaccessible, locked or otherwise made inoperable when left unattended.
- C. The Contractor shall utilize specific entrances for material deliveries, equipment deliveries, and worker access to the construction site as indicated on its site access/utilization plan and approved by the Construction Manager.
- D. The County or Construction Manager, as the Project progresses, may establish additional security policies and procedures. The Contractor shall cooperate with the County and/or Construction Manager in implementing such additional procedures.

19. TEMPORARY SIGNAGE

- A. Project Sign: The Contractor shall construct, erect and maintain one (1) 4 foot by 8 foot project sign of $\frac{3}{4}$ inch (minimum) exterior grade plywood, given two coats of paint and mounted securely on two 4 inch by 4 inch posts set 30 inches (minimum) into the ground. The sign shall be clearly lettered by one skilled in the sign trade with the facility name, address, County logo, names of County Commissioners, the County Manager and other County representatives, Contractor name, major subcontractors' names, and the jobsite telephone number. Locate the project sign as designated by the Construction Manager. Avoid a placement that may inhibit safe entry or exit from the site. Verify sign content with County, through the Construction Manager, prior to procuring and erecting the sign.
- B. No other signs or advertising shall be displayed on the premises without the approval of the Construction Manager, other than the posting of required notices and cautionary signage by the Contractor, and signage on equipment and trailers to designate ownership.

20. TRASH / DEBRIS DISPOSAL

- A. The Contractor shall provide dumpsters sufficient to hold site waste from its operations and that of its subcontractors, and shall remove same from the jobsite on a regular basis.
- B. Debris such as soil waste, concrete, steel, or other bulky items from excavation and/or demolition work not disposed of in dumpsters shall be removed and disposed off-site by appropriate means. Methods of debris removal and disposal shall be reviewed with the Construction Manager.

21. SITE CLEANING

- A. The Contractor shall be responsible for the maintenance of a clean, neat and safe project site. The Construction Manager is hereby placing the Contractor on notice that failure to clean up on a weekly basis will immediately result in the Construction Manager bringing in labor to perform this task and deducting the cost of such measures from the Contract Sum. The Construction Manager shall be the sole authority which shall determine the amounts to be deducted from the Contractor's contract for this type of cleaning.
- B. The Contractor shall assign at least five (5) percent of his own and his subcontractors' work forces to clean-up activities for at least four (4) hours per week, or as deemed necessary by the Construction Manager.
- C. No exceptions to these rules will be allowed. Failure to immediately adhere to all of the Construction Manager's directions in this regard will result in the holdup of Contractor's progress payments until compliance with these rules are obtained.

22. MISCELLANEOUS CONSTRUCTION FACILITIES

- A. The Contractor shall be responsible for providing and maintaining its own scaffolding and for conforming with all safety regulations related thereto.
- B. The Construction Manager retains the right to inspect all erected scaffolding, and to request written verification from an inspection agency as to the soundness of erected scaffolding to perform its intended function. However, the Construction Manager assumes no responsibility to do so, or of the results of such inspections.

- C. Except as otherwise provided, the Contractor shall provide and maintain all necessary temporary stairs, ladders, ramps and runways to facilitate conveyance of men, materials, tools, and equipment for proper execution of the Work.
- D. All protection and safety barricades, devices, covers, etc., shall be provided by the Contractor as it relates to the safe conduct of his work in accordance with OSHA requirements.
- E. The Contractor shall maintain safe temporary access to the work as construction progresses.
- F. All barriers and barricades shall comply with OSHA or other applicable safety requirements of the Project. All barriers and barricades shall be installed in a manner that will allow for the continued progress of the Work. Installation and removal of barriers, barricades and railings will be monitored by the Construction Manager.
- G. If the Contractor or any subcontractor, who in the course of its work, creates a hazard, it is responsible for providing, at its own expense, all required protection, including all safety barriers, barricades and perimeter protection as necessary.
- H. If any safety protection is required to be temporarily removed during the progress of the Work, it shall be reinstalled at the completion of the specific activity requiring such removal, and in a manner that provides a level of compliance equal to the initial installation.
- J. The Contractor shall enclose all construction areas in such a manner so as to protect the public from injury and in accordance with authorities having jurisdiction
- K. Provide any other types of construction facilities as may be reasonably required for performance of the Work and accommodation of personnel at the project site, including the County's and Construction Manager's personnel.

End of Section

SECTION 01 560 – ENVIRONMENTAL PROTECTION

1. GENERAL

- A. Provide all facilities, establish procedures, and conduct construction activities in a manner which will ensure compliance with the County's environmental requirements and other regulations controlling construction activities at the Project site.
- B. Definitions:
 - 1. Sediment: Soil that has been eroded and transported by runoff water.
 - 2. Degradable Debris: Debris which can undergo biodegradation or combustion, or which can be dissolved in or suspended by water.
 - 3. Non-degradable Debris: Inorganic debris which will not disintegrate nor dissolve when exposed to moisture or water.
 - 4. Chemicals: Petroleum or cementitious products, bituminous materials, salts, acids, solvents, alkalis, herbicides and pesticides.
 - 5. Waste: Sewage, including domestic sanitary sewage, garbage and trash resulting from food and food packaging.

2. PRODUCTS

- A. General: Products, devices and materials shall be approved by authorities having jurisdiction.
- B. Earth Stabilizer: Rye grass seed, hay, straw mulch, chemical stabilizer or any other device approved by authorities having jurisdiction.
- C. Hay Bales: Type and size as recommended by environmental protection authorities having jurisdiction.
- D. Silt Fence: Type and size as recommended by land disturbance and environmental protection authorities having jurisdiction.

3. ENVIRONMENTAL PROTECTION PROCEDURES

- A. General
 - 1. In the means and methods of construction, and in the coordination and control of the Work at the site, establish and enforce ecological preservation standards which avoid pollution of the atmosphere, waterways and vegetation.
 - 2. Conform to laws, ordinances, restrictions, and rules of governmental bodies having enforcement power in regard to site preservation and erosion control.
 - 3. Prevent droppings of petroleum products, cementitious waste and chemical substances on the ground or into storm, sanitary drains or waterways.
 - 4. This Section may be supplemented by notes on drawings relative to environmental protection.

5. In performing sitework, provide and maintain protection during sitework for all existing lawns, trees, curbs, gutters, hydrants, light standards, drives, walks, street signs and buildings not noted for removal. Damaged items shall be repaired or replaced.
6. The Contractor shall designate one person, the Superintendent or other, to enforce strict discipline on activities related to generation of wastes, pollution of air/water, generation of noise and similar harmful or deleterious effects which might violate regulations or reasonably irritate persons at or in vicinity of the Project site.
7. Take special precautions when working on floors directly above or below any occupied floors and adjacent to circulation or vehicular circulation. Minimize noise, dust, or other environmental hazards to spaces.

B. Noise Control

1. Provide mufflers on combustion engine powered equipment to minimize noise.
2. Blasting is strictly prohibited without written permission from first the Construction Manager and then all applicable State and Local regulatory agencies.

C. Air Quality Control: Maintain acceptable air quality at all times. Acceptable air quality shall also be maintained in any existing, operating buildings or structures during construction operations that require physical connection to such buildings or structures so as to not interfere with any existing operations.

D. Water Control

1. All pumping, bailing, or well point equipment necessary to keep excavations free from the accumulation of water during the entire progress of the Work shall be the responsibility of the Contractor.
2. Keep the building or portions thereof free from water ingress due to construction operations at all times until Final Completion of the Work.
3. Provide all pumping necessary to keep site utility lines, sewers, manholes and meter pit excavations and mass excavation free from water.
4. Dispose of water in such a manner as will not endanger public health or cause damage or expense to public or private property. Abide by the requirements of all public authorities having jurisdiction.

E. Dust Control

1. Effectively confine dust, dirt and noise to the actual construction area(s) until Substantial Completion of the Work.
2. Clean up operations shall be by vacuuming, wet mopping, wet sweeping, or wet power brooming. In sandblasting operations, if any, confine the dust.
3. Use wet-cutting methods for cutting concrete, asphalt, and masonry. Do not shake out bags containing cement, lime, and other dust-causing substances.
4. Do not leave areas of disturbed earth unworked for long periods of time. As the earth is disturbed, continue the work to achieve temporary or permanent earth stabilization promptly.
5. Keep dust down at all times, including non-working days, weekends and holidays. Temporary methods consisting of water sprinkling or similar methods will be permitted to control dust. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding and pollution.
6. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs.

F. Snow and Ice Removal

1. Arrange for removal of snow and ice in and about the premises, as necessary to conform with local regulations on public sidewalks adjacent to the site, and as necessary on and about the site and the Work to permit safe access to continue or perform work.
2. When performing work under exposed conditions, remove snow and ice for the protection and execution of the Work.

G. Controls During Earth Moving

1. Perform earth moving in such phases which minimize the area extent of exposed land.
2. Control the rate of water runoff by diversion ditches, benches, berms and other earth-formed shaping so the rate of flow is retarded and silting minimized. Reshape and restore conditions showing evidence of earth erosion without delay.
3. Stabilize disturbed earth with temporary seeding or temporary mulching, or other effective temporary means, such as a stabilizing sprayed application or anchored netting.
4. Establish and enforce the use of tarpaulin-covered dump trucks and avoid overfilling so that spillage of earth and other matter into highways and streets does not occur.

H. Vermin Control: Control vermin during the construction period. If vermin are encountered, provide extermination arrangements as necessary.

I. Disposal of Debris, Chemicals and Waste

1. Dispose of debris, chemicals, and waste off the site in compliance with Federal, State and local laws and regulations.
2. Collect and contain materials before disposal in an orderly fashion and by means which prevent contamination of air, water and soil.
3. Store chemicals in watertight containers.
4. Degradable debris, not contaminated by chemicals, e.g., leaves, tree limbs, twigs and logs, may be shredded on site and used as mulch. Exclude paper, cementitious waste, and material which could cause contamination of waterways. Non-degradable and degradable debris in excess of the above shall be disposed of off the site.
5. Do not burn materials on the site.

J. Clean-Up and Restoration of the Site

1. Maintain the site in good order through periodic pick up and clean-up of construction waste and wind-borne trash. Dispose of all waste and trash in tightly covered containers and schedule regular removal of trash and waste from the site.

2. Existing sitework damaged during construction shall be restored to good and acceptable condition.
- K. Damage from Storms: Secure the site to avoid damage to the Work and stored materials, as well as damage to adjacent property.

End of Section

SECTION 01 5639 - TREE PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the protection and trimming of existing trees that interfere with, or are affected by, execution of the Work, whether temporary or permanent construction, as well as trees to be transplanted, stored during the construction process and replanted on site.
- B. Related Sections include the following:
 - 1. Division 32 Section "Irrigation" for installation of underground irrigation adjacent to tree save areas.
 - 2. Division 32 Section "Landscape" for tree and shrub planting, tree support systems, and soil materials.

1.3 DEFINITIONS

- A. Tree Protection Zone: Area surrounding individual trees or groups of trees to remain during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Tree Pruning Schedule: Written schedule from arborist detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.
- C. Qualification Data: For tree service firm and arborist.
- D. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- E. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

1.5 QUALITY ASSURANCE

- A. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed tree protection and transplanting work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of tree protection and trimming.
- B. Arborist Qualifications: An arborist certified by ISA or licensed in the jurisdiction where Project is located.
- C. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
 - 1. Before tree protection and transplanting operations begin, meet with representatives of authorities having jurisdiction, Owner, Architect, consultants, and other concerned entities to review tree protection and transplanting procedures and responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plastic Mesh Fence: Plastic laminate fence material. 4 foot height minimum. Wood stakes located per tree protection detail shown on plans.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Temporary Fencing: Install temporary fencing around tree protection zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete.
 - 1. Install fence according to manufacturer's written instructions.
- B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.
- C. Mulch areas inside tree protection zones.
 - 1. Apply 3-inch (75-mm) average thickness of organic mulch. Do not place mulch within 6 inches (150 mm) of tree trunks.

- D. Do not store construction materials, debris, or excavated material inside tree protection zones. Do not permit vehicles or foot traffic within tree protection zones; prevent soil compaction over root systems.
- E. Maintain tree protection zones free of weeds and trash.
- F. Do not allow fires within tree protection zones.

3.2 EXCAVATION

- A. Install shoring or other protective support systems to minimize sloping or benching of excavations.
- B. Do not excavate within tree protection zones, unless otherwise indicated.
- C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots.
 - 1. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches (75 mm) back from new construction.
 - 2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.
- D. Where utility trenches are required within tree protection zones, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.
 - 1. Root Pruning: Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with sharp pruning instruments; do not break or chop.

3.3 REGRADING

- A. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade beyond tree protection zones. Maintain existing grades within tree protection zones.
- B. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist, unless otherwise indicated.
 - 1. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots with sharp pruning instruments; do not break or chop.

3.4 TREE PRUNING

- A. Prune trees to remain that are affected by temporary and permanent construction.
- B. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.
- C. Pruning Standards: Prune trees according to ANSI A300 (Part 1).
- D. Cut branches with sharp pruning instruments; do not break or chop.
- E. Chip removed tree branches and dispose of off-site.

3.5 TREE REPAIR AND REPLACEMENT

- A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
- B. Remove and replace trees indicated to remain that die or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.
 - 1. Provide new trees of 6-inch (150-mm) caliper size and of a species selected by Architect when damaged trees more than 6 inches (150 mm) in caliper size, measured 12 inches (300 mm) above grade, are required to be replaced. Plant and maintain new trees as specified in Division 2 Section "Exterior Plants."
- C. Aerate surface soil, compacted during construction, 10 feet (3 m) beyond drip line and no closer than 36 inches (900 mm) to tree trunk. Drill 2-inch- (50-mm-) diameter holes a minimum of 12 inches (300 mm) deep at 24 inches (600 mm) o.c. Backfill holes with an equal mix of augered soil and sand.

3.6 DISPOSAL OF WASTE MATERIALS

- A. Burning is not permitted.
- B. Disposal: Remove excess excavated material and displaced trees from Owner's property.

END OF SECTION 01 5639

SECTION 01 610 – MATERIAL & EQUIPMENT HANDLING

1. GENERAL SUMMARY

- A. Deliver, handle and store materials and equipment in accordance with manufacturer's recommendations and by methods and means which will prevent damage, deterioration and loss, including theft. Provide delivery/installation coordination to ensure minimum holding or storage times for products recognized to be flammable, hazardous, easily damaged or sensitive to deterioration, theft and other sources of loss.
- B. Prior to starting work, the Contractor shall meet with the Construction Manager to determine the use of available areas for site offices and storage.
 - 1. The Contractor shall confine his equipment, the storage of material and the operations of his workmen to limits indicated by the Contract Documents, laws, ordinances, permits or directions of the Construction Manager.
 - 2. Neat and orderly stockpiling of all materials shall be maintained.
 - 3. Materials which require significant amounts of storage space, as determined by the Construction Manager, shall be brought to the site in quantities no greater than required for two (2) weeks work.
 - 4. Delivery of materials shall be scheduled so as not to encumber the site with items which will not be required for a significant length of time.
- C. If at any time it becomes necessary to move material or equipment which have been stored during construction, the Contractor, when directed by the Construction Manager, shall move them to another location without charge.
- D. The Contractor shall not load or permit any part of the site or structures to be loaded with a weight that will endanger its safety.
- E. Storage of materials outside the limits of construction, but on the County's property, is strictly prohibited without written permission from the County through the Construction Manager.
- F. All costs relating to temporary storage and protection shall be borne by the Contractor or subcontractor requiring such storage and protection. The Contractor shall retain full responsibility for any form of damage or deterioration to stored materials and any form of damage or deterioration caused by materials to surrounding surfaces.

2. MATERIALS HANDLING PLAN

The Contractor shall develop and submit to the Construction Manager for approval, at least ten (10) days prior to the start of construction on the site, a comprehensive materials handling plan. This plan shall take into consideration the following:

- A. Control delivery of materials to maintain the construction schedule.
- B. Coordination with any separate contractors.

- C. The County's operation of adjacent facilities, if any.
- D. Provisions for both vertical and horizontal transportation and utilization of material and personnel hoists, if required.
- E. Limitations on space available for storage.
- F. Requirements for handling and installation of large equipment.

3. VERTICAL TRANSPORTATION

- A. The Contractor shall be responsible for providing vertical transportation for materials, equipment, and personnel if and as required for multi-story buildings or significant heights. Cranes, hoists, conveyors, and other equipment used for this purpose shall be placed/installed and maintained according to applicable codes and regulations of authorities having jurisdiction.
- B. Temporary hoists and permanent elevators used as construction lifts shall be provided with an operator at all times such equipment is in use.
- C. The Contractor shall cooperate with the County, the Construction Manager and any separate contractors in the event that hoists or elevators are required for use by such entities during the course of the Project.

4. MATERIAL AND EQUIPMENT REMOVAL

- A. Any required cranes, hoists, conveyors and other equipment mobilized and utilized by the Contractor shall be removed from the site within ten (10) days after completion of the Work.
- B. Upon completion of the Work, or sooner if directed by the Construction Manager, the Contractor shall remove his temporary structures and sheds and place the areas in a clean and orderly condition.
- C. No materials or equipment shall be removed from the site without the permission of the Construction Manager.

5. PASSAGE OF MATERIALS AND EQUIPMENT

- A. Establish passage clearances required to deliver and install materials and equipment.
- B. In case of insufficient clearance for passage of materials and equipment, deliver and protect such equipment before confining construction is installed.
- C. If existing structures, equipment and systems must be removed or altered to provide access for new materials and equipment, engage those skilled in the respective trade to restore structures, equipment and systems to their original condition at no additional cost. Do not alter structure, equipment or systems without written approval of the Construction Manager.

- D. In lieu of altering structures to provide passage of materials and equipment, provide materials and equipment that can be disassembled, brought into the building, and reassembled.

End of Section

SECTION 01 630 – PRODUCTS & SUBSTITUTIONS

1. GENERAL

A. This Section covers mandatory provisions for submission of product information and for substitution procedures, after Contract award.

B. Definitions:

1. "Products" are defined to include purchased items for incorporation into the Work, regardless of whether specifically purchased for this Project or taken from the Contractor's stock of previously purchased products.
2. "Materials" are defined as products which must be substantially cut, shaped, worked, mixed, finished, refined or otherwise fabricated, processed, installed or applied to form units of the Work.
3. "Equipment" is defined as a product with operational parts, regardless of whether motorized manually operated, and particularly including products with service connections (wiring, piping, etc.).
4. Definitions in this paragraph are not intended to negate the meaning of other terms used in the Contract Documents, including specialties, systems, finishes, accessories, furnishings, special construction and similar terms which are self-explanatory and have recognized meanings in the construction industry.

2. INITIAL PRODUCT SUBMISSION

- A. As part of the Submittal Register specified in Section 01 340 of the General Requirements, provide a list showing names of products together with the names of manufacturer of each and, where applicable, the name of the installing subcontractor.
- B. Only specified products will be reviewed, except as herein below provided for substitutions.

3. PRODUCTS

A. General Product Compliances

1. The compliance requirements for individual products as indicated by the Contract Documents are multiple in nature and may include generic, descriptive, proprietary, performance, prescriptive, compliance with standards, compliance with codes, conformance with graphic details and other similar forms and methods of indicating requirements, compliance with all of same being a requirement.
2. The Contractor's options for selection of products are limited by the Contract Document requirements and by governing regulations, and are NOT controlled by industry traditions or procedures experienced by the Contractor on previous construction projects. Required procedures for the selection of product options include, but are not limited to, the following:

- a) If material specified in the Contract Documents is not available on the current market, alternate materials may be proposed by the Contractor through the Construction Manager for Architect and County approval.
 - b) In the Contract Documents where a specific brand, make, or manufacturer is denoted, the intent is that it be considered the standard for establishing the style, type, character and quality level of the article desired, but not as a restriction in the selection process to the specific brand, make or manufacturer named.
 - c) Alternate brands, make of material, device or equipment which, in the opinion of the Architect, are recognized as the equal of that specified on the basis of quality, workmanship and economy of operation considerations and are suitable for the purpose intended may qualify for acceptance.
 - d) Standards, Codes and Regulations: Where only compliance with an imposed standard, code or regulation is required, selection from among products which comply with requirements including those standards, codes and regulations shall be at the Contractor's option.
 - e) Performance Requirements: Provide products which comply with the specific performances specified, and which are recommended by the manufacturer (in published product literature or by individual certification) for the application indicated. Overall performance of a product is implied where the product is specified with only certain performance requirements.
 - f) Prescriptive Requirements: Provide products which have been produced in accordance with prescriptive requirements, using specified ingredients and components, and complying with specified requirements for mixing, fabricating, curing, finishing, testing and similar operations during the manufacturing process.
3. Visual Matching: Where matching with an established sample is required, final judgment of whether a product proposed by the Contractor matches the sample satisfactorily lies with the Architect. Where no product within the specified cost range is available for a satisfactory match that complies with requirements, comply with the provisions in the Contract Documents related to "Substitutions" and "Change Orders" for the selection of a matching product outside the established cost category or of a product not complying with requirements.
 4. Visual Selection: Except as otherwise indicated, where specified product requirements include "...as selected from manufacturer's standard colors, patterns, textures..." or words of similar effect, the selection of manufacturer and basic product (complying with the requirements) is at the option of the Contractor with the subsequent selection of color, pattern and texture to be by the Architect.

B. Quality Assurance

1. Source Limitation: To the greatest extent possible for each unit of work, provide products, materials or equipment of a singular generic kind and from a single source.

2. **Compatibility of Options:** Where more than one choice is available as options for Contractor's selection of a product or material, select an option which is compatible with other products and materials already selected. Total compatibility among options is not assured by limitations within the Contract Documents, but must be provided by the Contractor. Compatibility is a basic general requirement of product and material selections.
3. Provide products and materials which are undamaged and unused at the time of installation, and which are complete with accessories, trim, finishes, safety guards and labels, maintenance instructions and other devices and details required for a complete installation and for the intended use and effect.
4. **Standard Products:** Where available, provide standard products of types which have been produced and used previously and successfully in similar applications on other projects.
5. **Continued Availability:** Where additional amounts of a product, by the nature of its application, are likely to be needed by the County at a later date for maintenance and repair or replacement work, provide a standard, domestically produced product which is likely to be available to the County at such later date.
6. **Warranties and Guarantees:** Warranties are in several categories including those indicated in the General Requirements and in the Technical Specifications.

C. Certification

1. Certification of compliance with specification performance standards and manufacturers' specifications and directions shall be furnished for any portion of the Work for which specific performance requirements and/or manufacturers' specifications are listed. The Contractor shall be responsible for securing two (2) copies of each certification as required and transmitting same to the Construction Manager.
2. Each item requiring certification shall be so noted and an affidavit must be filed singly to cover each specified material, installation, application and the like.

D. Certification of Compatibility: If requested, the material and equipment manufacturers shall certify in writing that:

1. Other manufacturers' materials and/or equipment coming in contact with their product are compatible with their product in every way and that the intended performance of the system in which their product is incorporated will not be affected as a result of such contact. Also, that a physical breakdown of their product by chemical reaction or otherwise will not occur as a result of such contact.
2. The combination of products by one manufacturer to make up the manufacturer's specified system will contribute to the performance of the system as intended, and will remain operational, reliable and durable. The manufacturer will be the source of routine maintenance and replacement parts.

- E. Nameplates: Except as otherwise indicated for required approval labels, and operating data, do not permanently attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view either in occupied spaces or on the exterior of the Work.
1. Labels: Locate required labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface which, in occupied spaces, is not conspicuous.
 2. Equipment Nameplates: Provide permanent nameplate on each item of service-connected or power operated equipment. Indicate manufacturer, product name, model number, serial number, capacity, speed, ratings and similar essential operating data. Locate nameplates on an easily accessed surface which, in occupied spaces, is not conspicuous.
- F. Reuse of Existing Material
1. Except where specified or approved in writing, materials and equipment removed from an existing structure shall not be used in the Work.
 2. Where use of existing materials and/or equipment is specified or approved in writing, use special care in removing, handling, storing and reinstallation to assure proper function of same in the completed Work.

4. CONSIDERATION OF SUBSTITUTIONS

- A. The requirements for substitutions do not apply to specified Contractor options on products and construction methods. Revisions to Contract Documents, where requested by the County or the Architect, are "changes" and not "substitutions." The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities do not constitute "substitutions", nor do they constitute a basis for change orders, except as provided for in the Contract Documents. Otherwise, the Contractor's requests for changes in products, materials and methods of construction required by the Contract Documents are considered requests for "substitutions", and are subject to the requirements herein.
- B. Substitutions for a specified product will be considered only if the specified product is not obtainable, or if delivery date of all such specified products is such that the scheduled date of Substantial Completion of the Work will be delayed if the specified product remains a requirement. The latter cause shall only be considered if the Construction Manager is notified of this condition within thirty (30) days of the Notice to Proceed for the Contract, or if after order has been placed, circumstances beyond the Contractor's control, such as labor disputes affecting manufacture or delivery of product cause such a delay. Under no circumstances will a substitution be allowed for reasons of potential delay due to Contractor's failure to execute timely purchase orders with the vendor or subcontractor, or due to Contractor's failure to submit product data or shop drawings in adequate time to allow for review and possible re-submittal prior to the required delivery date.

- C. Qualifications: Substitutions will only be considered for the reasons noted above, based upon the Contractor's representation that by submitting any Request for Substitution, the Contractor:
1. has researched the proposed substitution and has determined that it is equivalent to or superior in all respects to that specified.
 2. confirms that the same warranties or bonds apply for the substitution as for the specified product, material, system and/or construction method.
 3. has determined by its best judgment and experience that the proposed substitution is either necessary or in the County's best interest.
 4. will coordinate the installation of any accepted substitution into the Work, and will make such changes as may be required for the Work to be complete in all respects.
 5. waives claims for additional costs caused by the substitution which may subsequently become apparent.
 6. has submitted complete cost data which includes all related costs under its Contract.
- D. Disqualifications: No consideration will be given to proposed substitutions when:
1. they are indicated or implied on shop drawing submittals without having been formally requested in accord with provisions specified herein.
 2. for their implementation they require a major revision in the Work in order that their use may be accommodated.
 3. they materially alter the design concept including color or function originally intended by the specified product.

5. SUBMITTAL PROCEDURES ON SUBSTITUTIONS

- A. Substitution Request Form: The attached form must be filled out in its entirety and submitted in addition to the submittal information and data noted below. Submit a separate Substitution Request Form for each proposed substitution.
- B. Submittals: Submit three (3) copies of each Substitution Request Form and of each of the following related support items:
1. Identify product for which substitution is proposed by description, brand name and catalog number, giving specification section number where specified.
 2. Identify in similar manner the proposed substitution and include the manufacturer's name, address and telephone number.
 3. Itemize differences between product specified and proposed substitution, including but not limited to physical, color, function and guarantee considerations.

4. Itemize changes in adjacent work occasioned by proposed substitutions.
5. Accompany request with test data from independent laboratory substantiating quality and performance of proposed substitution.
6. Attach manufacturer's complete instructions on storage, handling and installation.
7. Provide list of three projects giving names, addresses and phone numbers of owners, general contractors, and architects where proposed product has been used.
8. State proposed change to the Contract Sum and proposed change to the Contract Time if substitution is accepted and confirmed by Change Order. If the proposed substitution involves a change to the Contract Sum, any change in cost of adjacent or related Work shall be included also.
9. State the number of days (not less than 15) during which the substitution as submitted is subjected to acceptance.
10. Include any cost savings to the County which might result from this substitution.

6.0 ACCEPTANCE OR REJECTION

- A. The Architect and/or the Construction Manager have the authority to reject any substitution submittals due to incompleteness or for other good reason.
- B. The Architect will be the sole judge of the acceptability of the proposed substitution.
- C. Only the Architect, with the County's approval, will have the authority to change the specified standards of quality. However, neither this authority to act under this provision, or any decision made in good faith either to exercise or not to exercise this authority, shall give rise to any duty or responsibility of the Architect to the Contractor, subcontractor of any tier, any or their agents or employees or other persons performing the Work or offering to perform the Work.
- D. The Construction Manager will attain a prompt review from the Architect of the Request for Substitution which complies with the above provisions.
- E. If no exceptions are taken, approval will be granted in writing. If the substitution represents a change to the Contract Documents, the substitution will be confirmed by Change Order.
- F. If accepted, the Contractor explicitly assumes all liability for the fit and function of all surrounding assemblies, and all interfacing devices.
- G. If rejected, the Contractor will be promptly notified, and the Contractor shall proceed with the Work in accordance with the Contract Documents.

**END OF SECTION 01 630, PRODUCTS & SUBSTITUTIONS
follows Substitution Request Form (three pages) attached**

SUBSTITUTION REQUEST FORM

(For use by

Architect)

A. **For Use Only After Contract Award**

___ Accepted

___ Accepted as

Noted

___ Not Accepted

___ Received Too

Late

From: _____

To: Vincent Pope + Associates, Inc.

Project: _____

Contract No. _____

We hereby submit for your consideration the following proposed substitution in lieu of the specified item for the above-named project:

Proposed Substitution:

Specified Item:

Reference Drawing No(s).

Reference Specification Section/Paragraph

1. Attach complete information and technical data on any changes to the program, drawings, specifications, or other Contract Documents which the proposed substitution will necessitate for its proper incorporation.
2. Accompany this request with all samples and substantiating data necessary to prove equal quality and performance levels of the proposed substitution to those of the specified item. Clearly mark manufacturer's literature to highlight the indicated equality in performance.
3. Respond to each of the following questions (use additional sheets if necessary):
 - A. What is the quality level of the proposed substitution versus that of the specified item?

- B. What are significant variations between the proposed substitution and the specified item?

C. What affect(s) would the proposed substitution have on the operation and maintenance of the completed facility?

SUBSTITUTION REQUEST FORM (continued)
For Use Only After Contract Award

D. Are manufacturer's warranties for the proposed substitution and the specified item the same?

Yes ____ No ____

If no, explain:

E. What effect would the proposed substitution have on other trades?

F. How would the proposed substitution affect the project schedule?

G. What are accurate comparative cost figures between the proposed substitution and the specified item?

H. What reason(s) justifies this request for a substitution?

The undersigned states and certifies that the function, appearance, and quality of the proposed substitution are equivalent or superior to those of the specified item and assumes the liability for the provision of equal performance of same as a minimum. **THIS FORM MUST BE SIGNED.**

SIGNATURE: _____ DATE: _____

NAME (type or print): _____

COMPANY: _____

ADDRESS: _____

TELEPHONE: _____

NOTE: Signature shall be by a person having authority to legally bind his/her firm to the above terms. Failure to provide a legally binding signature will result in the retraction of any approval of this proposed substitution.

SECTION 01 680 – EQUIPMENT & SYSTEMS INSTRUCTION

1. GENERAL

- A. Furnish all labor, materials, tools, equipment and services for the cleaning up or preparation of all equipment which is required in conjunction with the instruction work to be performed for County personnel.
- B. Coordinate additional instruction of County's personnel for any and all items of work of all trades that are incomplete at the time initial instruction sessions are scheduled.
- C. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation, and provide instructions upon the functions of that installation.
- D. Provide instruction for all equipment and systems for which operating and maintenance data is required. See General Requirements Section 01 730 for individual details of the operations and maintenance data requirements.
- E. Instruction sessions may be combined to some extent between several pieces of similar equipment within the same training session, but only if that combination is defined in the Contractor's instruction program submittal and approved by the Construction Manager.
- F. One instruction session for each major type of equipment will be required. The Contractor shall anticipate that up to ten (10) County employees will participate in any particular instruction session, and shall be prepared to provide the required number of manuals and tools for each session.
- G. The Contractor shall complete all instruction sessions in an acceptable manner prior to its request to receive a Certificate of Substantial Completion.

2. QUALITY ASSURANCE

Instructors for all sessions shall be member(s) of the installers' staff and authorized representative(s) of component, assembly, or system manufacturer(s). Refer to individual sections of the Technical Specifications for additional detailed requirements necessary to provide adequate instruction for specific systems or pieces of equipment.

3. PRESENTATION OF SUBMITTALS

- A. No later than ninety (90) days prior to scheduled Substantial Completion of the Work, the Contractor shall submit a list of proposed instruction sessions for the entire Project. This list shall be organized by Specification Section and its contents will be subject to the approval of the Construction Manager.
- B. After approval of the content of the required instruction program, submit course outlines for each of the approved instruction sessions. Outlines shall be organized by Specification Section, and their contents will also be subject to the approval of the County.

- C. After approval of the program content, the Contractor shall submit planned course schedules for each of the approved instruction sessions which are to be organized by Specification Section, and the scheduled dates will be subject to the approval of the Construction Manager and representatives of the County.
- D. All instruction courses will be planned and scheduled such that the County's participants will utilize copies of the Project Operations and Maintenance Manuals which will have been previously provided. These copies are in addition to the quantities which will have been provided to the County, through the Construction Manager, under General Requirements Section 01 730. The use of draft copies of these manuals will be acceptable only with the prior written approval of the Construction Manager.
- E. Submit a separate instruction request/report for each system or type of equipment, subject to the County's approval of availability of personnel.
 - 1. Submit request/report (form attached) with preliminary information indicated, to the Construction Manager at least two (2) weeks prior to first instruction period.
 - 2. After each instruction session, submit three (3) copies of the completed report to the Construction Manager.

4. PREPARATION

- A. Do not begin instructions until component, assembly or system has been tested as specified and is in satisfactory operating condition.
- B. Prior to instruction sessions, assemble instructional aids, tools, test equipment and any necessary copies of approved Operations and Maintenance Manuals. If the Operations and Maintenance Manuals have not been approved prior to this time, supply draft copies for use in the training courses.

5. INSTRUCTION

- A. Provide all instruction as required to ensure understanding of all operating and maintenance procedures by the County's designated personnel.
- B. Instruct County's personnel in operation and maintenance of equipment and systems. Provide all necessary instruction to satisfaction of County.
- C. Explain use of Operating and Maintenance Manuals.
- D. Tour building areas involved and identify:
 - 1. Maintenance points and access.
 - 2. Control locations and equipment.

- E. Explain operating sequences:
 - 1. Identify location and show operation of switches, valves, etc., used to start, stop and adjust systems.
 - 2. Explain use of flow diagrams, operating sequences, diagrams, etc.
 - 3. Demonstrate operation through complete cycle(s) and full range of operation in all modes, including testing and adjusting relevant to operation.
- F. Explain use of control equipment, including temperature settings, switch modes, available adjustments, reading of gauges, and functions that must be serviced only by authorized factory representative.
- G. Explain trouble shooting procedures:
 - 1. Demonstrate commonly occurring problems.
 - 2. Note procedures which must be performed by factory personnel.
- H. Explain maintenance procedures and requirements:
 - 1. Point out items requiring periodic maintenance.
 - 2. Demonstrate typical preventive maintenance procedures and recommend typical maintenance intervals.
 - 3. Demonstrate other commonly occurring maintenance procedures not part of preventive maintenance program.
 - 4. Identify maintenance materials to be used.
- I. Furnish all tools and/or test equipment required for proper instruction of the County's personnel. Tools and/or test equipment shall be distributed in "sets" with each two participants having a "set" to work with and retain upon completion of the instruction. Each participant shall sign for their tools at the start of the instruction session, and copies of the assignment documents shall be provided to the Construction Manager by the Contractor.
- J. Refer to commissioning requirements specified in Section 17 200

**END OF SECTION 01 680, EQUIPMENT & SYSTEMS INSTRUCTION
follows Equipment and Systems Instruction Report (one page) attached**

EQUIPMENT AND SYSTEMS INSTRUCTION REPORT

PROJECT: _____

SYSTEM OR EQUIPMENT: _____

CONTRACTOR NAME _____ **CONTRACT NO.** _____

SPECIFICATION SECTION _____

NOTE: The Contractor's Representative must maintain and complete this report during instruction.

PRELIMINARY INFORMATION

1. To be completed by the Contractor:
 - A. Proposed dates for instruction period: From _____ to _____
 - B. Name of Representative Instructor: _____
 - C. Approximate number of hours of training required: _____
2. To be completed by the County:
 - A. County's Designated Personnel to receive instruction: (Identify supervisor, if required).

1) _____	6) _____
2) _____	7) _____
3) _____	8) _____
4) _____	9) _____
5) _____	10) _____
 - B. Training Session Location: _____

RECORD INFORMATION

Instructor's Signature: _____

Date Instruction Completed: _____

Construction Manager's Signature: _____

County's Signature: _____

SPECIAL CONSIDERATIONS / NOTES:

SECTION 01 700 – PROJECT CLOSEOUT

1. GENERAL REQUIREMENTS

- A. Comply with requirements for administrative procedures stated in this and other sections of the Project Manual in closing out the Work. Closeout procedures are summarized in this Section.
- B. Contract requirements shall be met when construction activities have successfully produced, in order, completion of these three closeout stages:
 - 1. Substantial Completion
 - 2. Final Completion
 - 3. Final Payment
- C. The Contractor shall provide all written notices and supporting documentation as described in Paragraphs 2 and 3 below when requesting Substantial Completion and Final Completion, respectively. Partial submittals of the required documents shall not represent a valid request, and the County, Architect, and Construction Manager shall not be liable for any delays in the Substantial and Final Completion dates arising there from.

2. SUBSTANTIAL COMPLETION

- A. Reference the *Owner-Contractor Agreement*, Article 9, regarding Substantial Completion.
- B. Prerequisite - the commissioning, described in Division 17 must be complete, except for functional testing and controls training, prior to Substantial Completion, unless approved in writing by the Owner's Project Manager.
- C. When the Work is substantially complete, the Contractor shall submit to the Construction Manager:
 - 1. a written notice that the Work, or designated portion thereof, is substantially complete.
 - 2. an original Certificate of Occupancy for the Project.
 - 3. a list of items to be completed or corrected (hereinafter referred to as a "Punch List").
 - 4. a request for a Substantial Completion inspection on a date acceptable to the Architect and the Construction Manager.
 - 5. Project record documents, operation & maintenance manuals, warranties, and certificates for review and approval.

- D. Within a reasonable time after receipt of such notice, the Architect, the Construction Manager, the Contractor, and the County will make a joint inspection to determine the status of completion. County representatives for this inspection shall include, but not be limited to, the user department(s) and the Department of Personnel, Workers Compensation & Office Services Division. The Punch List submitted by the Contractor will be reviewed in detail during the inspection, with items added or deleted to indicate Work to be corrected or completed.
- E. After completion of the joint inspection described in Paragraph 2.C above, the Construction Manager will consolidate all Punch List comments and transmit them to the County Department of Public Buildings & Grounds (DPB&G). Within a reasonable amount of time after receipt of such consolidated Punch List, DPB&G shall conduct its own inspection, to include, but not be limited to, the installation and operation of all mechanical, electrical, plumbing, and other building systems. The consolidated Punch List will be reviewed in detail during the inspection, with items added or deleted to indicate Work to be corrected or completed.
- F. The County, the Architect, and/or the Construction Manager reserve the right to issue a revised Punch List based on the inspections described in 2.C and 2.D above. The Construction Manager will reproduce and distribute copies of any revised Punch List to the Contractor and see that the items requiring correction or completion are given prompt attention by the Contractor. Depending on the number and type of items on the Punch List, the Construction Manager may withhold the issuance of the Certificate of Substantial Completion until corrections required by said Punch List are made or all parties are satisfied that they will be made.
- G. Should the Architect and/or the Construction Manager determine that the Work is not substantially complete:
1. The Construction Manager will promptly notify the Contractor in writing, on behalf of the Architect, giving the reasons therefore.
 2. The Contractor shall remedy the deficiencies in the Work, and then send a second written notice of Substantial Completion to the Construction Manager.
- H. Paragraphs 2.B through 2.D will be repeated.
- I. Should it become necessary to perform more than one (1) reinspection due to the inaccurate claims of the status of completion made by the Contractor, the Construction Manager may deduct the costs of such reinspections from the final payment, including but not limited to costs incurred by the Construction Manager and the Architect, and costs incurred by the Owner for payment of compensation to the Construction Manager and the Architect, for services performed for the reinspection(s). Also refer to General Requirements Section 01 400, *Quality Control*.
- J. When the Architect and the Construction Manager concur that the Work is substantially complete, the Construction Manager will:
1. Prepare a Certificate of Substantial Completion accompanied by the Contractor's Punch List of items to be completed or corrected, as verified and amended by the Architect, the Construction Manager, and the County.

- a. Contract responsibilities are not altered by inclusion or omission of required Work for the Punch List.
 - b. The Construction Manager will coordinate with both the County and the Contractor to establish each parties' responsibilities with respect to security, maintenance, heat, utilities, damage to the Work, and insurance, all of which shall be clearly delineated on the Certificate of Substantial Completion.
2. Sign the Certificate of Substantial Completion and submit it to the County, the Architect, and the Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

3. FINAL COMPLETION

- A. Reference the *Owner-Contractor Agreement*, Article 9, regarding Final Completion.
- B. Prerequisites –
 1. All TAB work and the commissioning of Division 17 must be complete prior to Final Completion, unless approved in writing by the Owner's Project Manager. Exceptions to this are the planned control system training performed after occupancy and any required seasonal or approved deferred testing. This includes for all systems, but is not limited to:
 - a. Completed and signed start-up and prefunctional checklist documentation
 - b. Requested trend log data
 - c. Submission of final approved TAB report
 - d. Completion of all functional testing
 - e. Required training of Owner personnel completed and approved
 - f. Submission of the approved O&M manuals
 - g. All identified deficiencies have been corrected or are approved by the Owner to be exceptions from this milestone
 2. The Owner's Project Manager will determine the date of Final Completion after reviewing the Commissioning Agent's recommendation.
 3. Commissioning activities are non-compensable and cannot be a cause for delay claims.
- C. To attain Final Completion, the Contractor shall complete the activities pertaining to Substantial Completion Certificate and complete work on all Punch List items. Only then shall a written request to the Construction Manager for final inspection be submitted.
- D. When the Work is complete, the Contractor shall submit to the Construction Manager written certification that:
 1. the Contract Documents have been complied with in their entirety.
 2. the Work has been inspected for compliance with Contract Documents.
 3. the Work has been completed in accordance with Contract Documents.

4. the Work is completed and ready for final inspection.
- E. The Construction Manager, Architect, Contractor and County will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
- F. Should the Architect and/or Construction Manager determine that the Work is incomplete or defective:
 1. The Construction Manager will promptly notify the Contractor in writing, listing the incomplete or defective Work.
 2. The Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to the Construction Manager that the Work is complete.
- G. Paragraphs 3.B through 3.D will be repeated.
- H. Should it become necessary to perform more than one (1) reinspection due to failure of the Work to comply with the claims of status of completion made by the Contractor, the Construction Manager may deduct the costs of such reinspections from the final payment, including but not limited to costs incurred by the Construction Manager and the Architect, and costs incurred by the Owner for payment of compensation to the Construction Manager and the Architect, for services performed for the reinspection(s). Also refer to General Requirements Section 01 400, *Quality Control*.
- I. When the Architect and the Construction Manager find that the Work is acceptable under the Contract Documents, the Contractor will be requested to make a final closeout submittal.

4. CONTRACTOR'S CLOSEOUT SUBMITTALS

The Contractor shall provide to the Construction Manager the following documents in the quantity of one original and one copy unless otherwise noted. Note that with the exception of Subparagraphs 4.G, 4.H, 4.J, and 4.K below, submittal for approval shall have already been made prior to Substantial Completion. Submittal under this Paragraph would be for a final submittal should revisions or additional copies be required of previously submitted documentation.

- A. Evidence of Compliance with all requirements of governing authorities:
 1. Certificate(s) of Occupancy
 2. Certificates of Inspection, for Mechanical, Electrical, Plumbing, Fire Protection, and others as may be required.
- B. Project Record Documents: Refer to Section 01 720 of the General Requirements.
- C. Operation & Maintenance Manuals: Refer to Section 01 730 of the General Requirements.

- D. Subcontractor List: A complete listing of all subcontractors and their suppliers, indicating business addresses, telephone numbers, contact names, and items supplied by each.
- E. Manufacturer List: A listing of manufacturers of major materials, equipment and systems installed in the Work, and local contact addresses and phone numbers.
- F. Warranties: Refer to Section 01 740 of the General Requirements, and individual sections of the Technical Specifications.
- G. Payment of Debts and Claims and Consent of Surety: The Contractor shall submit adequate evidence that the Contractor has paid all obligations to date arising out of the Contract using AIA Document G706. Contractor shall also submit AIA Document G707, indicating written consent of its Surety to final payment.
- H. Release of Claims and Liens: The Contractor and each subcontractor shall also submit AIA Document G706A, indicating that the releases for waivers submitted are complete to the best of its knowledge and information.
- I. Final Approvals and Certificates:
 - 1. Plans and Certificates approved by the Fulton County Development Services Department which were maintained at the jobsite shall be amended to show construction changes and resubmitted as required by law.
 - 2. Contractors requiring filing shall complete all Fulton County inspections and permits records before Application for Final Payment. Submit all approvals and certificates required by the Specifications, Drawings and applicable codes and regulations of all relevant departments or agencies of Fulton County, State of Georgia, and local authority having jurisdiction.
- J. Shop Drawings, Manufacturer's Literature and Test Data (one copy only): The Contractor shall submit through the Construction Manager to the County, before final acceptance, all reviewed shop drawings (with all corrections noted), plus sets of all approved catalog cuts, equipment manuals, etc. All materials shall be indexed by Specification section. This submittal shall include a list of each room and its paint manufacturers and/or wall covering number for the County's use.
- K. Keys and Maintenance Materials: All keys, maintenance kits or stock, replacement parts or materials, spare construction materials, and equipment required under the Contract Documents shall be delivered or made available to the County. Also refer to Section 01 760 of the General Requirements.
- L. No partial submittals of the above items are to be made to the Construction Manager. All items of each category are to be collected by the Contractor and delivered at one time to the Construction Manager, together with a letter of transmittal listing all items. Where items are to be delivered to the County's representative, the Contractor shall include a copy of the transmittal letter listing all enclosures, signed by the County's representative acknowledging receipt.

End of Section

SECTION 01 710 – FINAL CLEANING

1. RELATED WORK SPECIFIED ELSEWHERE

- A. Periodic clean-up during construction - See General Requirements Section 01 500 for additional details of these requirements.
- B. Refer to appropriate sections of the Technical Specifications for special cleaning instructions for specific work. Lacking such specific instructions, provide final cleaning on all delivered materials and equipment as specified herein.

2. PRODUCTS

- A. The Contractor is to use only cleaning materials as recommended by manufacturer of surface to be cleaned.
- B. The Contractor is to use cleaning materials only on surfaces as recommended by the manufacturer of the cleaning material.

3. EXECUTION

- A. At the completion of the Work, the Contractor will remove all trash and debris and clean all surfaces associated with his work, and leave the project ready for occupancy by the County.
- B. Experienced workmen or professional cleaners only are to be employed for final cleaning.
- C. Paved surfaces are to be broom clean. Other porous surfaces are to be raked clean. All stone and non-porous surfaces shall be wiped clean.
- D. All surfaces shall have all stains removed.
- E. Electrical work, including lighting fixtures, is to be thoroughly cleaned.
- F. Prior to acceptance of any area of the project by the County, the Contractor is to notify the Construction Manager as each area becomes ready for inspection. The final clean-up will be inspected by the Construction Manager with the Architect and the County as required.
- G. The Construction Manager will notify the Contractor in writing if any clean-up is unacceptable. If the Contractor fails to comply after receiving written notice from the Construction Manager, the Construction Manager will perform whatever corrective action is necessary, with the resultant costs to be borne by the Contractor.
- H. The Contractor will maintain cleaning services until the Project or portion thereof is accepted by County.

End of Section

SECTION 01 720 – PROJECT RECORD DOCUMENTS

1. GENERAL

- A. Definition: Record Documents are defined to include those documents or copies relating directly to performance of the Work. Record Documents show changes in Work in relation to way in which Work was shown and specified by the original Contract Documents, and show additional information of value to County's records, but not indicated by the original Contract Documents. Record Documents include marked-up copies of Construction Drawings, Specifications, Field Orders and Change Orders, reviewed copies of Shop Drawings, Product Data and Samples, a final product list, test records, field records for variable and concealed conditions such as excavations and foundations, and miscellaneous record information on Work which is otherwise recorded only schematically or not at all. Certain portions of the Contract Documents may indicate specific Record Document requirements which extend the requirements of this Section.
- B. Throughout progress of the Work, maintain and continually update an accurate record of changes in the Contract Documents.
- C. Provide access to all Record Documents for the County's, Architect's, and Construction Manager's reference and review throughout the progress of the Work.
- D. As a condition of Substantial Completion of the Work, the Contractor shall deliver Record Documents to the Construction Manager as provided below.

2. MAINTENANCE OF DOCUMENTS

- A. One copy of current Record Documents shall be maintained at the Contractor's jobsite office at all times.
- B. Delegate responsibility for maintenance of Record Documents to one person.
- C. Provide files and racks for suitable storage of documents, and file all documents and samples in a neat and orderly manner.
- D. Protect Record Documents from loss in a secure location. Maintain documents in a clean, dry, legible condition, and in good order. Record Documents are not to be used for construction purposes.

3. RECORDING OF CHANGES AND OTHER PERTINENT INFORMATION

- A. Record all changes and other pertinent information concurrently with construction progress.
- B. Accuracy of Records: Coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other documents where such entry is required to show change. The accuracy of records shall be such that future searches for maintenance or analysis purposes may reasonably rely on information obtained from the Record Documents.

- C. Do not permanently conceal any of the Work until changes or other pertinent information has been recorded on the appropriate Record Documents with dimensions from a permanent reference point.
- D. Drawings:
1. Mark the drawing that is most capable of showing actual physical condition, fully and accurately.
 2. Where Shop Drawings are marked up, mark cross reference on Contract Drawings at corresponding location.
 3. Mark with erasable colored pencil, using separate colors where feasible to distinguish between changes for different categories of Work at same general location.
 4. Mark the location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 5. Indicate all changes of dimension and detail, whether a field change or a directed change. Note Change Order number, Request for Information number, and/or similar identification associated with the initiation of each specific change.
 6. Provide Contractor's construction details which may not have been shown on the original Contract Documents.
- E. Specifications:
1. Legibly mark each Section of the Technical Specifications with the manufacturer, trade name, catalog number, serial number and supplier of each product and item of equipment actually installed in the construction.
 2. Indicate all field changes and directed changes. Note Change Order number, Request for Information number, and/or similar identification associated with the initiation of each specific change.
- F. Shop Drawings, Product Data and Samples: Maintain as Record Documents. Legibly annotate any changes made after review(s).
- G. Label each Record Document "Project Record" in neat, large letters. This label shall appear in the same location on every record drawing.

4. SUBMITTAL OF RECORD DOCUMENTS

- A. With its request for Substantial Completion of the Work, the Contractor shall furnish one marked-up print set of all Record Drawings and Specifications for review by the Construction Manager.

- B. Submittals will be reviewed for adequacy only and returned with comments, if any, to the Contractor.
- C. The Contractor shall incorporate all review comments into the Record Documents.
- D. After incorporation of review comments in the Record Documents, the Contractor shall submit the following as a final submittal:
 - 1. Drawings: one (1) mylar reproducible set (full-size, reverse reading, 3 mil thick) and three print sets of final marked-up drawings.
 - 2. Specifications: two (2) sets of final marked-up specifications.
 - 3. Shop Drawings, Product Data and Samples: one (1) copy each, except those related to the irrigation system, which shall be two (2) copies.
 - 4. Test records, executed Change Orders, field orders, requests for information, supplemental instructions, and other pertinent documentation: two (2) copies each.
- E. The final submittal shall include a transmittal letter containing the date, Project name and number, Contractor's name and address, title and number of each Record Document, certification that each document as submitted is complete and accurate, and the signature of the Contractor or of its authorized representative.
- F. All revisions to and final submittal of Record Documents shall be completed to the acceptance of the Construction Manager and the County prior to Final Completion of the Work and final payment.

End of Section

SECTION 01 730 – OPERATING & MAINTENANCE DATA

1. GENERAL REQUIREMENTS

- A. Refer to individual sections of the Technical Specifications for specific requirements for instructions, maintenance manuals, and operating data, to be submitted by the Contractor in order to provide the County with all necessary documentation to adequately maintain and service materials, systems and equipment for the Project.
- B. The Contractor shall compile all such specified instructions, maintenance manuals and operating data as specified under the appropriate Technical Specification sections, and submit as described below in comprehensive sets of Operation and Maintenance Manuals.
- C. Coordinate the compiling and submittal of Operation and Maintenance Manuals with instructions to the County for equipment and systems, as described in General Requirements Section 01 680, *Equipment & Systems Instruction*. All complete Operation and Maintenance Manuals shall be submitted prior to the Contractor's request to receive a Certificate of Substantial Completion.

2. SUBMITTAL REQUIREMENTS

- A. Develop a sequential program for the development of the Operation and Maintenance Manuals. This program shall provide a step-by-step review of the development of the manuals. The following is an abbreviation of the required sequence of development of the manuals.
 1. Submittal of the Table of Contents
 2. Submittal of draft sections for County's, Architect's and Construction Manager's review
 3. Submittal of list of proposed attachments and appendices
 4. Submittal of initial draft of complete manual
 5. Submittal of final copies of all manuals with approved contents
- B. After all approvals have been obtained, submit to the Construction Manager four (4) sets of bound, clear and complete instructions for maintenance of materials, finishes, machinery and other items to ensure proper care and reasonable life expectancy thereof.
- C. Print or type, in orderly sequence, the required information for each item:
 1. Data shall include recommendations for inspection procedures, frequency of maintenance in cleaning, lubricating, type of lubricant, replacement items such as filters, product source locations, and servicing agencies and their phone numbers and additional data, if any, as specified in more detail elsewhere in the specifications.
 2. Include data for all finishes, whether painted, coated, fabric, polished and satin finish metals, glass, natural finishes on wood, natural stone, manufactured stone and various masonry finishes to the extent that such finishes occur on the project.

3. For machinery, provide maintenance manuals and include complete parts lists showing the source(s) of genuine replacement parts (with current list prices indicated for same if requested by the County).
- D. Bind each set of data in a manageable number of 8 ½" by 11" sturdy three-ring binders, indexed and clearly labeled by Specification Section and item description. Each set shall be indexed and tabbed for the completed manual regardless of its completeness at the time of its submittal.

Additional data will be added behind its tabbed location as received by the Construction Manager. Include an index for the completed set in each binder. Mark identification on both front and spine of each binder.

- E. Where the complexity of machinery is such that regular maintenance by a specialty service company is normal, or may be required by law, give notice thereof to the County in writing.

End of Section

SECTION 01 740 – WARRANTIES

1. GENERAL

- A. Unless additional maintenance or performance warranties are required, all the Work shall be warranted by the Contractor for one year after the date of Substantial Completion of the Contract.
- B. Project warranties submitted by the Contractor do not reduce the County's warranty rights provided under State laws and regulations.
- C. Where products, materials, equipment, or systems are not properly performing or operating, the warranty shall not be considered in effect until corrective work is provided and the items are properly performing or operating.
- D. Warranties shall not include replaceable items such as light bulbs or cleaning materials, or damage by wear, vandalism or unusual climatic phenomenon, except water and air leaks caused by such phenomena.
- E. Warranties shall be signed by representatives that are expressly authorized to bind the Contractor to the warranties' terms and conditions. This requirement shall also apply to signatures on warranties of subcontractors, installers, manufacturers, and other entities engaged by the Contractor which are required by the Contract Documents.

2. DEFINITIONS

- A. Warranties on the Work are in several categories, including those of the Owner-Contractor Agreement, and including (but not necessarily limited to) the following specific categories related to individual units of Work specified in Division 2 through 17 of the Technical Specifications:
 - 1. Special Project Warranty (Guarantee): A warranty specifically written and signed by the Contractor for a defined portion of the Work; and, where required, countersigned by a subcontractor, installer, manufacturer and/or other entity engaged by the Contractor.
 - 2. Specified Product Warranty: A warranty which is required by the Contract Documents, to be provided for a manufactured product incorporated into the Work; regardless of whether the manufacturer has published a similar warranty without regard for specific incorporation of product into the Work, or has written and executed a special project warranty as a direct result of Contract Document requirements.

The Contractor shall issue four (4) copies of a special product warranty if required by the Technical Specifications. Examples of items which will require a special product warranty include roofing, waterproofing, certain insulation, caulking, wood and automatic doors, carpet and certain equipment.

3. Coincidental Product Warranty: A warranty which is not specifically required by Contract Documents (other than as specified in this Section), but which is available on a product incorporated into the Work, by virtue of the fact that manufacturer of product has published a warranty in connection with purchases and uses of product without regard for specific applications except as otherwise limited by terms of warranty.

- B. Refer to the individual sections of the Technical Specifications for the determination of portions of the Work which are required to be specifically or individually warranted, and for the specific requirements and terms of those warranties (or guarantees).

3. SCOPE OF WARRANTIES

- A. Scope: The Contractor shall submit to the Construction Manager for transmittal to the Architect, upon completion of all the Work under the Contract, its written warranty made out to the County and in a form satisfactory to the Architect and the County, warranting all of the Work under the Contract to be free from faulty materials and improper workmanship, and warranting the Work against injury in the proper and usual use thereof. Under the warranty, the Contractor shall replace Work as may be found by the County to be improper or imperfect and to make good all damage caused to other work or materials by the imperfection or removal and replacement of the imperfect Work.
- B. Time Limit / Individual Warranties: A specific warranty of the Contractor may cover a longer period than that stated above where so stipulated in the Contract Documents. Warranties under service policies and warranties for individual pieces of equipment shall be assigned and delivered to County prior to the date of Final Acceptance, but said individual warranties shall in no way modify or shorten the one year overall warranty to be provided by the Contractor.
- C. Extended Warranties: Certain extended warranties by the Contractor or subcontractors, or maintenance contracts which are longer than one year's duration, may be required by the Contract Documents. At the completion of the Work, all such warranties or maintenance contracts covering materials, workmanship, maintenance, or other items as specified, shall be forwarded in duplicate to the Architect through the Construction Manager, together with a letter addressed to the County giving a summary of each said warranty as follows:

1. Character of Work covered by warranty
 2. Name of subcontractor furnishing warranty
 3. Period of warranty
 4. Conditions of warranty
- D. General Limitations: It is recognized that specific warranties are intended primarily to protect County against failure of the Work to perform as required, and against deficient, defective and faulty materials and workmanship, regardless of sources. Except as otherwise indicated, specific warranties do not cover failures in the Work which result from:
1. unusual and abnormal phenomena of the elements,
 2. the County's misuse, maltreatment or improper maintenance of the Work,
 3. vandalism after the time of Substantial Completion, or
 4. insurrection or acts of aggression, including war.
- E. Cost: Contractor warranties shall provide for the correction of work performed without additional charge. Any additional expense or damage resulting from imperfect work or the removal or replacement of imperfect work shall also be covered by said Contractor warranties.

4. CONTRACTOR OBLIGATIONS

- A. Related Damages and Losses: The Contractor shall be responsible for the correction of warranted Work which has failed. The Contractor shall remove and replace other Work which has been damaged as a result of such failure, or which must be removed and replaced to provide access for correction of warranted Work.
1. Consequential Damages: Except as otherwise indicated or required by governing regulations, special project warranties and product warranties are not extended to cover damage to building contents (other than Work of the Contractor) which occurs as a result of failure of warranted Work.
- B. Reinstatement of Warranty Period: Except as otherwise indicated, when Work covered by a special project warranty or product warranty has failed and has been corrected by replacement or restoration, reinstate warranty by written endorsement for a period of time equal to original warranty period of time, starting on date of acceptance of replaced or restored Work.

- C. Replacement Cost, Obligations: Except as otherwise indicated, costs of replacing or restoring failing warranted units or products is the Contractor's obligation, without regard for whether the County has already benefited from use through a portion of anticipated useful service lives.
- D. Contractor's Procurement Obligations: Do not purchase, subcontract for, or allow others to purchase or subcontract for materials or units of work for the Project where a special project warranty, specified product warranty, certification or similar commitment is required, until it has been determined that entities required to countersign such commitments are willing to do so.
- E. Rejection of Warranties: The County reserves the right, at the time of Substantial Completion or thereafter, to reject coincidental product warranties submitted by the Contractor, which in the opinion of the County tend to detract from or confuse interpretation of the requirements of the Contract Documents.

5. TRANSFER OF WARRANTIES TO OWNER

- A. Format: The warranties shall cover all the Work done under this Contract. All Contractor warranties shall bear the endorsement of the Construction Manager in writing, as per the attached format on the following page:

FORMAT FOR THE TRANSFER OF WARRANTIES TO OWNER

TO: Fulton County Board of Commissioners

c/o: Fulton County Construction Manager

Re: (Work Covered in Warranty)

Project: _____

Name of Contractor: _____

Address of Contractor: _____

Dear County's Representative,

The undersigned warrants to the County that he will be responsible for all faulty or defective materials, equipment and workmanship, in the Work or portion thereof as referenced above, and that he will remedy any defects due thereto and pay for all damage to other work resulting thereof which shall appear within a period of _____ () year(s) from the date of Substantial Completion, as defined in the Contract Documents.

(Add additional conditions of warranty as noted in various technical sections of the Specifications.)

During the warranty period, upon written notice from County, the undersigned shall proceed with due diligence at the undersigned's sole expense to remove and replace properly any defective materials and equipment or perform any labor necessary to correct any such defect in the above. In case that the undersigned fails to remedy such defects, then the County may furnish such materials and equipment or labor as are necessary to correct the work, and the undersigned agrees to reimburse the County for any expense therefore promptly and fully.

Signed: _____ **

Date: _____

Type/Print Name: _____

Witness: _____ **

Construction Manager endorsement of the above-noted warranty:

Signed: _____

Date: _____

*** Signatures must be notarized.*

End of Section

SECTION 01 760 – SPARE PARTS & MAINTENANCE MATERIALS

1. GENERAL

- A. The Contractor shall furnish all labor, materials, tools, equipment and services for the provision of spare parts and maintenance materials as required in conjunction with all of the Work performed, as indicated or as required, in accordance with the provisions of the Contract Documents.
- B. Refer to the individual sections of the Technical Specifications for items of Work required.
 - 1. Spare parts shall be as specified in the Technical Specifications, or if not specifically specified, as adequate to fulfill one year's usage of such parts.
 - 2. Maintenance materials ("attic stock") shall be as specified in the Technical Specifications.

2. PACKAGING AND LABELING

- A. Package all parts and materials in sturdy boxes suitable in size to accommodate the quantity of items being packaged.
- B. All boxes shall have a single, standardized label which shall provide locations to write or type all necessary information. This label shall include the Project name, and shall be large enough so as to be easily read from a distance of several feet. The following information shall be included on each label:
 - 1. Manufacturer's name, part or trade name and stock number.
 - 2. The piece of equipment or finish for which the part or material is to be used.
 - 3. Name, address and phone number of the closest supplier.

3. DELIVERY

- A. Spare parts and maintenance materials shall be submitted directly to the County, with a letter of transmittal which shall itemize all items being submitted, and which shall be signed by an representative of the County as acknowledgement of receipt.
- B. Delivery of all parts and materials shall take place at a single time, unless previous approval is obtained from the Construction Manager. The time and location(s) of delivery shall be as determined by the County.
- C. A copy of all signed letters of transmittal shall be provided to the Construction Manager.
- D. The Contractor shall be responsible for the safe storage of all parts and materials until the designated time of inventory and acceptance by the County.

End of Section

SECTION 01 800 – SAFETY, HEALTH & LOSS PREVENTION PROGRAM GUIDELINES

SAFETY POLICY STATEMENT

It is the policy of Fulton County to establish a comprehensive accident and loss prevention process for all Capital Projects implemented by Fulton County or its agents.

The goals of this comprehensive accident and loss prevention process are as follows:

- To prevent personal injury, property damage, and injury to the public.
- To implement safety and loss prevention processes as critical elements in the complete design and build process.
- To establish a proactive safety and health process that complies with all laws, regulations, consensus standards, and good management practices.
- To have the Contractors partner with Fulton County in the implementation of a Safety and Loss Prevention Process and Owner Controlled Insurance Program to minimize loss potential and to minimize risk.

Fulton County requires safety, health and loss prevention requirements and expectations to be included in project design, in the invitation to bid, in bid award and project meetings, and in the post job evaluations. The Contractor is required to develop and submit a project safety and health program for acceptance by Fulton County prior to Notice to Proceed. The Contractor is required to implement these requirements, and develop a management system to ensure compliance following the safety and health process outlined in this document and the bid documents.

The Contractor and other entities placed under contract with Fulton County will be obligated to implement, adhere to and enforce this Policy. The safety and health of the Contractor's employees, Sub-Contractors, and the public are the sole responsibility of the Contractor. The County may use and direct designated Representatives to implement and enforce this policy. **Failure of the Contractor to comply with this policy or any Safety related obligations may be grounds for contract termination.**

Safety Professionals, Fulton County's designated Representative and Insurance Carrier will periodically inspect all Fulton County construction projects to identify safety hazards and make recommendations to resolve the issues. Contractor will be responsible for abating the identified issues in a timely manner, and submitting written description of corrective action within 48 hours to Fulton County designated Representatives. Failure to bring timely resolution to the issues may result in work stoppage at Contractor's expense.

Prior to commencing work under this contract, Contractor's Project Manager and Project Superintendent shall attend a Pre-Construction Meeting and Safety Pre-Planning meeting to address insurance and safety issues/requirements.

CONTRACTOR SAFETY AND HEALTH MANAGEMENT PROCESS

1.01 NOT USED

1.02 REFERENCES

- 1.1 Occupational Safety and Health Regulations (OSHA) 29CFR1910 and 29CFR1926
- 1.2 Environmental Protection Agency Regulations (EPA) 40CFR
- 1.3 Fulton County Safety and Health and Requirements
- 1.4 Georgia Department of Transportation Regulations and Requirements
- 1.5 US Department of Transportation Requirements
- 1.6 Manual of Uniform Traffic Control Devices for Streets and Highways (ANSI D6.1)
- 1.7 Georgia Department of Natural Resources Environmental Protection Division Regulations

Safety rules and regulations will be followed using federal, state or local regulations in force. Should a Contractor's rule be in use which is more effective, the most stringent rule or regulation will be enforced by the Contractor, Sub-Contractor's and Fulton County designated Safety Representative(s).

1.02 RESPONSIBILITY

The Contractor receiving the bid has the ultimate responsibility for the safety and health of all Sub-Contractors, all employees on the project, and the general public and complying with all governmental regulations and requirements (OSHA, EPA, DOT, state, local). Nothing contained herein shall relieve the Contractor or any Sub-Contractor of such responsibility or liability.

1.04 PROCEDURE

- 4.1 The Contractor and each Sub-Contractor must implement a written safety and health prevention process and program following the guidelines contained in this document and in any other relevant portion of the Contract Documents. This program must be accepted by Fulton County or its Representatives prior to Notice to Proceed.
- 4.2 The Contractor and each Sub-Contractor must implement a drug and alcohol policy following the guidelines contained in this document and in the bid specific actions. This program must be accepted by Fulton County or its Representatives prior to Notice to Proceed.
- 4.3 The Contractor must designate a person responsible for site safety. Each Sub-Contractor must designate a person responsible for site safety.
- 4.4 Not Used.
- 4.5 Contractor is responsible for providing all necessary safety supplies and personal protective equipment required to protect its employees, Sub-Contractors, and the general public.
- 4.6 Contractor shall make available certified First-aid services, First-aid supplies, and provisions for medical care for all employees at the construction site prior to beginning work on site.
- 4.7 Contractor shall maintain a competent person at the construction site at all times with an OSHA 10-hour certification. Said person shall have the knowledge to recognize hazards or potential hazards and has the authority to correct such hazards.

- 4.8 The status of project safety shall be included in the Contractor's agenda, which is required in Progress Meetings.

1.05 DRUG AND ALCOHOL POLICY

The Contractor and each Sub-Contractor must implement a drug and alcohol policy in order to maintain a safe and efficient work environment. This policy must include the following elements.

1. Written policy that prohibits the use, transportation, sale and possession of these materials.
2. Disciplinary action plan for violations
3. Any treatment or reinstatement/reemployment options
4. Drug and alcohol testing schedule that includes pre-employment, periodic for safety sensitive or critical jobs, and for cause

Note: AGC, ABC and/or Fulton County programs may be used as guidance documents.

1.06 OTHER CONTROLLED ITEMS

The Contractor and each Sub-Contractor is required to include in the Project Safety Program a prohibition against the use, possession, concealment, transportation, promotion or sale of the following controlled items

1. Firearms, weapons, and ammunition.
2. Switchblades
3. Unauthorized explosives including fireworks
4. Stolen property or contraband
5. Controlled chemicals or chemicals recognized as being able to be used for improper purposes.

1.07 EMERGENCY PROCEDURES/GUIDELINES

- 7.1 The Contractor is required to establish site specific emergency procedures in the Project Safety Program to manage emergencies that may occur at any time in the following categories:

1. Fire
2. Employee injury
3. Pedestrian injury due to work activity of any kind
4. Property damage and damage to various utilities (i.e., electrical, gas, sewerage, water, telephone or public roadways)
5. Public demonstrations
6. Bomb threats
7. Flood, Wind, Lightening, Hail
8. Terrorists Threats
9. Work place violence

- 7.2 These Emergency Procedures will be made part of the Contractor's Project Safety Program submittal and shall include but not be limited to the following elements:

1. A list of emergency phone numbers posted at the job site, along with information to be transmitted in such emergencies.

2. An incident command structure defining duties and responsibilities
3. A system to train supervisors and employees on this emergency plan
4. Procedures on how to handle emergencies including access to the site by emergency responders, accounting for workers, and securing the area.
5. Procedures for media releases. These releases must be coordinated through the Fulton County Information and Public Affairs Office in coordination with the County's designated Representative.
6. A plan that addresses serious incidents that includes notification to Fulton County, Fulton County's designated Representative, the OCIP Administrator, and the Insurance Carrier immediately after the incident.
7. A review and updating frequency that includes forwarding a copy to Fulton County and the County's designated Representative.

1.08 ACCIDENT AND INCIDENT INVESTIGATION AND REPORTING

- 8.1 The Contractor is responsible for reporting all accidents and incidents on the project site to the County's designated Representative within (1) business day. Accidents or incidents resulting in a fatality, property loss in excess of \$5,000, or involvement with the general public must be reported immediately to Fulton County's designated Representative and the investigation of the accident or incident coordinated with Fulton County Safety staff and Insurance Carrier.
- 8.2 The Contractor will maintain a log of all injuries that occur on the job site. This log will be current and available for review.
- 8.3 For any incidents such as fires, explosions, fatalities, etc., the Contractor must notify Fulton County's designated Representative immediately and must coordinate any releases to the news media through the County's designated Representative and the County's Information and Public Affairs Office.
- 8.4 If a work-related injury should occur on this project, Contractor shall perform a thorough investigation of the incident and document the information on a worker's compensation 1st Report of Injury. This report shall be submitted to the Insurance Carrier within 24 hours of the incident.
- 8.5 A written accident investigation report containing the following information as a minimum must be forwarded to the Fulton County's designated Representative and OCIP Administrator within 24 hours of incident.
 1. Company Name
 2. Location
 3. Date and Time of incident
 4. Description of incident
 5. Names of all parties involved and all witnesses
 6. Corrective action(s) taken to prevent recurrence
 7. If the incident involves injury or illness, the following information must be provided:
 - (1) A medical description of the injury or illness
 - (2) OSHA recordability status i.e. first aid, medical treatment, lost time, days of restricted work.
 - (3) If the public is involved, information about treatment and treatment location.
 9. Any pictures, site drawings, etc. if they assist in describing the incident.

If the investigation cannot be completed in 24 hours, a preliminary report marked as such shall be forwarded and the report completed and forwarded as soon as possible.

1.09 JOB SAFETY ANALYSIS

- 1.9 The Contractor and each Sub-Contractor must implement a procedure to conduct a written job safety analysis or job hazard analysis for all project work tasks prior to beginning each task. Reference Appendix A.
- 8.2 The job safety analysis should follow National Safety Council, AGC, or other recognized guidelines and address all safety and health hazards for the work, identify personal protective and other safety equipment required, identify potential hazards to the general public if applicable, and identify any safety equipment, training, or controls that must be implemented prior to starting the work.
- 8.3 The Contractor must maintain a file for all job safety analysis forms, which is accessible for review.

1.10 SAFETY AND HEALTH COMPLIANCE AUDITING

9.1 Self Auditing Requirements

- 9.1.1 The Contractor and each Sub-Contractor must implement a procedure to assure that written safety and health audits or inspections are conducted at least biweekly (every 2 weeks). Safety checklists used by Fulton County's designated Representative may be used. The Contractor may use this checklist or an equivalent approved by Fulton County's designated Representative.
- 9.1.2 Each written safety audit must be filed on the site and a copy forwarded to Fulton County designated Representative. This audit will be routed to Fulton County's Insurance Carrier for review and comment and then filed in the Construction Project files.

9.2 NOT USED

9.3 INSPECTIONS BY REGULATORY AGENCIES

- 9.3.1 The Contractor must notify the Fulton County designated Representative whenever an OSHA compliance officer, health inspector, or EPA or Georgia Environmental Protection Division Representative arrives at the project site to conduct an inspection.
- 9.3.2 The Contractor is required to forward a copy of all regulatory citations, notice of violations, or similar for this project to Fulton County's designated Representative. Copies must be forwarded to the Insurance Carrier.
- 9.3.3 These records will be reviewed with Fulton County designated Representative and included in the Construction Project files.

9.4 SAFETY INSPECTION AND AUDIT FOLLOW UP

- 9.4.1 Every safety audit or regulatory inspection conducted per the requirements above may be reviewed by the Fulton County designated Representative and/or Insurance Carrier loss control staff. This review may identify serious and repeat safety items, look at trends, identify risks and potential losses, and site safety and loss prevention activities.
- 9.4.2 After this review the findings may identify areas needing improvement.
- 9.4.3 A copy of the audit and any areas identified, as needing improvement will be forwarded to the Contractor's senior management.
- 9.4.4 For findings that indicate major loss potential or serious concerns about site safety, the areas identified as needing improvement and the overall performance may be reviewed in a meeting with the OCIP Administrator, Fulton County's designated Representative, and the Insurance Carrier loss control staff. A written action plan to address the Contractor's performance issues may be developed.
- 9.4.5 Fulton County or designated Representative may meet the Contractor's senior management to discuss the findings, contract requirements, and their plans to address the findings.
- 9.4.6 The number and frequency of safety audits and site visits may be increased until improvements are noted.

1.10 SAFETY MEETINGS

- 10.1 The Contractor will conduct weekly safety meetings with all Contractor and Sub-Contractor employees on the site.
- 10.2 The Contractor will keep safety-meeting records that include meeting topic(s), outline of items discussed, and attendance and sign in sheet. At this meeting any accidents or audit findings and corrective actions from the previous week will be discussed.
- 10.3 The Contractor will maintain a job site file that contains copies of the safety meeting records.

1.11 TRAINING, INSPECTION AND CERTIFICATION

11.1 Employee Training

- 11.1.1 The Contractor must be able to show when requested the required safety training for all Contractor and Sub-Contractor employees and competent persons working on the site including any required craft training.
- 11.1.2 The Contractor must be able to show when requested that all employees operating mobile equipment or cranes have met or exceeded training and licensing requirements.
- 11.1.3 The Contractor must be able to show when requested that all scaffolds are erected under the direction of a competent scaffold builder, that all users are properly trained, and that the scaffold is inspected daily.
- 11.1.4 The Contractor shall ensure that each employee is properly trained in the recognition and avoidance of unsafe conditions and the regulations applicable to his or her work environment to control or eliminate any hazards or other exposure to illness or injury.

- 11.1.5 If Contractor or Sub-Contractor employs anyone who cannot effectively communicate using the English language, a translator must be maintained on site who can relay instructions, questions, or concerns in a manner that the non-English and English-speaking employees will understand. The identification of this translator shall be provided to Fulton County's designated Representative.
- 11.1.6 Contractor shall orient all supervision and employees concerning safety requirements before working on the project site.

11.2 Equipment Certification and Inspection

- 11.1.1 The Contractor must be able to document that all cranes and mobile equipment used on the job site have current inspections and certifications.
- 11.1.2 The Contractor must assure that required daily and weekly equipment inspections are performed and documented in writing per governmental regulations and the requirements of this policy.
- 11.1.3 The Contractor must maintain a job site file for these required inspections and certifications.
- 11.1.4 Equipment identified as having safety problems or not meeting standards or codes shall be tagged as defective and shall not be used until those identified items have been corrected.
- 11.1.5 Contractor shall maintain, and have available for viewing, safety inspection reports for ladder, electrical cords, scaffolds, and trenches/excavations.

1.12 SAFETY AND HEALTH PROGRAM ELEMENTS

Note: Based on the project work activities and scope of work, some program elements may be not applicable to the project work and therefore do not have to be implemented. Elements marked with an asterisk are applicable to all Projects.

12.1 Return to Work Policy*

The Contractor and each Sub-Contractor will be required to establish a transitional work program for employees injured at work, which provides modified duty within the employee's physical limitations.

12.2 Fire Prevention Program*

The Contractor and each Sub-Contractor will be required to submit a temporary fire protection plan to be in effect for the duration of the contract. This plan must be submitted as part of the Contractor's Safety Program submittal. It must include provisions for fire protection systems and equipment, as identified in OSHA Safety and Health for Construction 1926, Sub-Part F, Fire Protection and Prevention.

12.3 Hazard Communication (HAZCOM)*

The Contractor and each Sub-Contractor shall have a written HAZCOM Program. The program shall meet OSHA 1926 Requirements and provide for training so that all employees will be able to:

- Understand the program and identify hazardous chemicals with which they work.
- Understand product-warning labels.
- Have MSDSs for all potentially hazardous materials brought onto, used on, or stored at the job site.
- Know the physical location of the Material Safety Data Sheets (MSDS).

12.4 Personal Protective Equipment(PPE)*

All Contractor and Sub-Contractor employees and other site visitors will be required to wear the PPE necessary to accomplish the work in a safe manner. PPE required will vary from job to job and must be based on a written hazard assessment. A list of PPE that is required is identified below:

- Hard Hats shall be worn at all times on all projects
- Hearing Protection for operations that create noise in excess of 85 dBA is required.
- Contractor shall provide eye or face protection equipment when machines or operations present potential eye or face injury from physical, chemical, or radiation agents.
- Work boots or work shoes made of leather shall be required. No open toed shoes or canvas shoes are allowed
- Shirts with sleeves at least 4 inches long are required. Tank tops and mesh shirt are not allowed.
- Full Body Safety Harnesses with shock absorbing lanyards for fall protection are required.
- Full body and chemical splash protection is required when handling hazardous chemicals.
- Respirators are required when employees maybe exposed to dust and/or chemicals in excess of the OSHA permissible exposure limits.
- Long pants are required.

12.5 Confined Space Entry

If the project work involves permit required confined spaces, a permit required confined space entry program that meets OSHA requirements must be established. This program must include but is not limited to the following elements.

- Confined Space Identification
- Environmental Testing
- Rescue
- Communication with employees in the confined space
- Employee Training
- Permit System for entry

12.6 Excavations

If the Contractor or Sub-Contractor must make a cut, cavity, trench or depression in an earth surface formed by earth removal, the work must comply with the OSHA Regulations on trenching and excavations. A competent person must be assigned for each excavation. Requirements include but are not limited to

- Employee Training
- Daily inspections
- Soil testing
- Protective or support systems.

12.7 Electrical Tools, Equipment, and Systems*

- The Contractor and each Sub-Contractor must implement Assured Grounding Program or use Ground Fault Circuit Interrupter (GFCI) devices on all electrical tools and extension cords.
- All electrical work must be performed in accordance with the National Electrical Code (NEC) and OSHA.
- All electrical tools and extension cords must be in good repair and the Contractor must establish a written inspection program for all electrical tools. The frequency of inspection shall be at least monthly.

12.8 Lockout/Tagout Procedure

The Contractor and each Sub-Contractor will be required to implement a written Lockout/Tag procedure that meets OSHA requirements if their work requires energy isolation. Program elements include but are not limited to the following:

- Energy isolation lists for each piece of equipment
- Employee training
- Individually keyed locks and danger tags
- Written Procedure that assigns responsibilities

12.9 Fall Protection*

Contractor shall provide an approved fall protection system for all employees working at an elevation of 6 feet or higher on this project, including scaffolding work and steel erection. Employees will be responsible for utilizing the fall protection 100% of the time. Sub-Contractor will be responsible for ascertaining their employees' compliance with this requirement. The plan must address the following items:

- Only full body harnesses with shock absorbing lanyards and double locking hooks shall be use.
- Falls should be limited to less than 6 feet such than employee can neither fall more than 6 feet nor contact any lower level.
- Fall protection systems must be planned into the job and must be designed to handle loads and forces expected. The project goal is 100% fall protection.
- Employee training and enforcement of these requirements are mandatory to assure an effective program.

12.10 Scaffolding*

All scaffolds and work platforms shall be constructed to meet the requirements of OSHA 1926.451 and ANSI A10.8. Some program elements include but are not limited to

- User training for all employees who may use scaffolds
- Scaffolding is to be designed and erected by competent person(s) following manufacturer's guidelines. Employees must use fall protection when erecting scaffolding.
- Daily inspection by competent person. Must implement daily tag system to document inspection.
- Must have engineering approval for scaffolds above 100 feet in height.
- Must be able to document competent person credentials.
- Scaffolds must have proper egress (ladder/stairs) and should have guardrails, complete deck, toe boards and netting if anything can fall on people below. If guardrails or decking is not complete, fall protection must be used.

12.11 Cranes And Other Lifting Devices

- Trained and experienced operators shall operate Cranes in accordance with the applicable OSHA and ANSI/ASME.
- The Contractor is responsible for ensuring that the crane is properly sized for the job and that all required inspections and maintenance required by OSHA and ANSI/ASME standards have been conducted.
- All cranes should have anti-two block devices installed and operational. Cranes lifting employees in personnel baskets must have an anti-two block device to stop the crane if this condition occurs (positive acting).
- Tag lines are required to secure materials while being moved or handled by cranes.
- All cranes working in the vicinity of overhead power lines shall be grounded and be equipped with proximity guards.
- A lift plan must be submitted for all lifts that exceed 20,000 pounds or 75% of the crane's lift capacity. This plan must be reviewed and approved by the Contractor.
- Slings, hooks, and other lifting devices must be inspected on regular basis and stored properly.

12.12 Use Of Personnel Baskets

- Personnel baskets should only be used as the last practical means after documenting that all other means are unacceptable.
- The personnel basket must be manufactured, tested, and used in accordance with OSHA 1926.550. The crane lifting the basket must also meet OSHA requirements.

12.13 Personal Lifts With Articulating Booms (Jlg) And Scissors Lifts

- Operators must be trained in the safe operation of the lift including daily inspection procedures prior to use.
- Operators of JLG lifts must wear a full body harness with shock absorbing lanyard and be tied off while the lift is operation. Operators in a scissors lift must use fall protection anytime the guardrail system removed or altered.

12.14 Ladders*

- Ladders are acceptable means of access when used in compliance with OSHA 1926.1053.
- Ladders must be in good repair, have safety feet and be inspected.
- Extension ladders must be either held by an employee on the ground or tied off at the top.
- Homemade ladders not meeting OSHA requirements should not be used.
- Non-conducting ladders are required for electrical work.
- Fall protection is encouraged for employees working on ladders especially if they will be leaning and turning in their work activities.

12.15 Tools And Equipment*

All tools and equipment used on the project must be in a safe operating condition, with all guards in place, and must meet or exceed all governmental regulations (OSHA, EPA, DOT, etc.). Tools and equipment must be maintained, inspected, tested, and used in accordance with OSHA regulations.

12.16 Compressed Gas Cylinders*

- Compressed gas cylinders must be used, stored, and transported in accordance with OSHA requirements, DOT requirements, and Compressed Gas Association standards.
- Fuel and oxygen cylinders must be store separately or separated by a ½ hour rated firewall.
- Compressed gas cylinders are not allowed inside confined spaces.

12.17 Welding, Burning, And Cutting*

- The Contractor's program must meet or exceed OSHA and NFPA requirements.
- All flammables must be removed from work area and a fire watch posted in area until 30 minutes after the job is completed.
- At a minimum a 10 LB ABC rated fire extinguisher must be available in the immediate work area.
- Regulators must be in good working order and must have anti-flash back and check valves.
- Welding shields and burning goggles must be used.

12.18 Sanitation And Housekeeping*

- The project site shall have an adequate number of portable toilets and hand washing facilities.
- The project site must establish a housekeeping plan that includes daily site clean up and trash and debris removal.

12.19 Hearing Conservation*

The Contractor and each Sub-Contractor who has employees exposed to noise levels exceeding 85 dBA must establish a hearing conservation program that meets or exceeds OSHA requirements. Minimum program elements include audiometric testing, noise monitoring, use of hearing protectors, and employee training.

12.20 Respiratory Protection

The Contractor and each Sub-Contractor who has employees who wear respiratory protection must implement a respiratory protection program that meets or exceeds OSHA requirements. Minimum program elements include risk based respirator selection, medical surveillance, employee training, respirator fit testing, and written operating procedures.

1.13 SPECIALIZED SAFETY PROGRAM ELEMENTS

If required by the project scope of work and specific work site or activities, specialized programs listed below shall be included in the Contractor's Safety Program submittal. The Contractor is required to implement the required programs and assure that they meet or exceed all contractual, regulatory and Fulton County's requirements applicable. Details for specific program elements may be included in the contract documents.

- 13.1 Asbestos Removal
- 13.2 Lead Based Paint Removal
- 13.3 Exposure Assessment and Employee Monitoring (Industrial Hygiene)
- 13.4 Hazardous Waste Operations and Training
- 13.5 Overhead Power Lines
- 13.6 Locating underground utilities
- 13.7 Dust Control
- 13.8 Guarding for floor holes and roof openings
- 13.9 Heavy Equipment, Truck and Earth Moving Equipment requirements
- 13.10 Environmental Requirements

1.14 ROAD AND TRANSPORTATION SAFETY REQUIREMENTS

The Contractor shall implement the following into its safety program whether required by the contract or any other authority having jurisdiction if required to perform the work and maintain vehicular and pedestrian traffic safety:

- 14.1 Barricades and Cones
- 14.2 Traffic and Warning Signs
- 14.3 Traffic control devices
- 14.4 Equipment and materials storage
- 14.5 Reflective Clothing and other personal protective equipment
- 14.6 Excavation and road hole protection
- 14.7 Erosion protection
- 14.8 Trained flaggers

1.16 ADDITIONAL REQUIREMENTS TO PROTECT THE GENERAL PUBLIC

Based on the Contractor's scope of work and specific work activities or location the Contractor may be required to implement the following into its safety program to protect the general public:

- 16.1 Fencing and other measures for site security
- 16.2 Warning, direction and no trespassing signs
- 16.3 Alternate public walk ways
- 16.4 Protection of the public from over head and other construction hazards
- 16.5 Site Traffic Control
- 16.6 Barricading off hazardous areas and open pits and holes

Section 01 800, Exhibit A - Job Safety Analysis Worksheet Example and Information

Job Safety Analysis/ Job Pre-Planning Worksheet

Job Name and #:		Completed By:	
Date:		Phase/Operation:	
Task	Hazard	Control	

PRE-OPERATIONAL PLANNING
FACT FINDING GUIDE - GL

I. Evaluate present conditions at job site to determine items that could lead to liability claims during work and after completion of the project.

A. PRESENT OCCUPANCY OR USE OF THE SITE

- Demolition to be done?
- Structures will remain (condition)?

Q. HISTORY OF THE SITE

- For what was the site used before?
- Underground tanks?
- Underground utilities?

Q. GEOLOGY OF THE SITE

- Rock to be blasted?
- Water to be removed/diverted?
- Fill needed? (where and how obtained?)
- Excavation needed? (where and how disposed of?)

XVII. Evaluate controls needed in reference to site security and public protection.

A. FENCING NEEDED?

B. ACCESS/GATES

- Can traffic be routed past office or checkpoint?
- "Non-Vendor" visitors escorted?
- Gate lockable after hours?
- "Hard Hat" signs at entrance?
- Dirt removal/tarpping area at exit?
- Ready Mix chute wash area?

Q. PEDESTRIANS

- Sidewalk maintained outside fence?
- Covered sidewalk needed?
- Special access requirements for neighboring occupants?
- Special after-hours considerations?

Q. ENVIRONMENTAL

- Dust control?
- Silt control?
- Mud control on streets?

- Vibration control?

Q. UTILITIES

- Underground utilities located?
- Overhead power lines in work area relocated, removed, or deenergized?
- Temporary power service away from high traffic areas?

Q. SUB-CONTRACTORS

- Method to secure proof of adequate insurance coverage in place?
- List of hazardous materials obtained?
- List of hazardous materials provided?
- Responsibilities established
 - Job site safety meetings
 - Materials delivery
 - Debris removal
 - Access to site
 - Weekly Sub-Contractors' meetings
 - Schedule of safety inspections
 - Emergency Procedures

Q. MATERIALS HANDLING

- Crane selection criteria established
 - Maximum weight to be handled
 - Maximum lifting height
 - Maximum horizontal reach needed
 - Amount of travel needed
 - Swing radius available
 - Set-up area available
 - Ground bearing capacity
 - Approximate frequency of lifts
- Crane operations responsibilities established
 - Triangle or leasing company crane to be used?
 - Operator trained and experienced on specific machine?
 - Operator can accurately read and interpret machine load chart?
 - Critical lift identified (75% of net capacity)?
 - Machine fully inspected by a qualified outside agency?
 - Rigging hardware properly selected?
 - Inspecting and maintaining the crane per owner/manufacture specifications?

XVII. Start Up.

A. ELECTRICAL

- Temporary Power
 - Underground service possible?

- Maintenance responsibilities established?
- Main circuit panel barricaded?
- Lighting planned?

- Circuit Protection
 - Ground fault circuit interrupt protection?
 - Assured grounding conductor program?
 - Responsibilities established?

Q. FIRE PROTECTION

- ABC extinguishers adequately distributed?
- Properly sized?
- Maintenance of fire extinguishers?
- Stand pipe/hydrant available? Adequate?
- Housekeeping checks/inspections?

Q. FALL PROTECTION

- Critical Job Phases Identified?
 - Critical exposures identified by phase? (e.g. "Worker falls into basement excavation")
 - Scheduled start dates for critical phases?

- General Fall Protection Procedures
 - Perimeters
 - Floor openings
 - Working deck
 - Work area access
 - Ladders
 - Elevator hatchways

Q. PERSONAL PROTECTIVE EQUIPMENT

- General
 - Hard hats
 - Work shoes
- Specific by Task

Q. HAZARD COMMUNICATION PROGRAM ESTABLISHED AND EMPLOYEES TRAINED

R. CONFINED SPACE ENTRY

- Procedures established and task(s) identified requiring use of procedures?

Q. TRENCHING

- Procedures established and task(s) requiring procedures identified?

Q. PHASE PRE-PLANNING

- Job schedules established?
- Agreed upon target dates for meeting?
- Follow up system

End of Section

SECTION 02 4116

DEMOLITION, BUILDING

PART 1 - GENERAL

1.1 SUMMARY:

- A. Related work specified in other sections: Temporary facilities and controls.

1.2 JOB CONDITIONS:

- A. During demolition operations, should suspect asbestos or asbestos-containing materials, or any other material listed as a hazardous material by the Environmental Protection Agency be discovered, notify Architect and Owner and discontinue that portion of the work until further instructed.
- B. Conduct demolition operations without interference of vehicle and pedestrian traffic in adjacent areas.
- C. Protect portions of existing buildings indicated to remain, utilities and benchmarks from damage. At no additional cost, repair or replace if damaged by this work.
- D. Use sprinkling, temporary enclosures or other methods as necessary to limit the amount of dust. Comply with the governing regulations regarding air pollution.
- E. During operations, maintain site security. Equip gates and doors with locks. Secure building during non-working hours.
- F. Provide flagmen and cleaning crews if public thoroughfares are used for material removal.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Visit project site and compare locations of utilities, site appurtenances and landscaping with indications in Contract Documents. Report any discrepancies discovered for resolution. Submit plan of execution for approval, including barricades, fencing, enclosures and temporary use of public thoroughfares.

3.2 PREPARATION:

- A. Erect protected walkways in accord with Temporary Facilities and Controls section. Secure approval of local authorities prior to commencement of work. Schedule removal of debris and operations so that they do not interfere with pedestrian and vehicular traffic.
- B. Conduct a photographic survey and record condition of adjacent walls, piers and foundations. Pay particular attention to existing cracks and irregularities.
- C. Establish level and line benchmarks on adjacent buildings prior to start of demolition work.

3.3 DEMOLITION:

- A. Site demolition: Remove existing above and below grade construction indicated to be removed, to the limit indicated.
- B. Building demolition: Remove as indicated. Include portions of the building above and below grade, including floor slabs and foundations, as required for new construction.

3.4 CLEANING AND PROTECTION:

- A. Erect and maintain temporary ditches, barriers, straw bale dams or skirts to prevent surface water from carrying debris beyond contract limits, onto adjacent properties or into storm drainage system.
- B. Provide explanatory/directional signage, barricades and protective enclosures at demolition areas to protect pedestrian and vehicular traffic. Coordinate placement and location of all protective enclosures with Owner. Entrances and exits shall not be made inaccessible unless approved in advance by Owner and local fire officials.
- C. Post flagmen and place temporary barriers and cleaning crews during operations. Clean spilled debris immediately and remove. Obtain permission from governing authorities when parts of public thoroughfares are to be blocked or used for extended time.
- D. Security:
 - 1. Contractor shall provide safe access to occupied areas during the course of the work.
 - 2. Provide fences, enclosures or partitions to segregate work areas from occupied and used areas.
 - 3. Provide guards or lockable closures for off-hours to secure occupied and used areas of building.
- E. Plant protection:
 - 1. Cover, barricade or otherwise protect foliage of plants or trees designated to remain.
 - 2. Rinse dust from foliage and maintain plants watered during operations.
 - 3. Prevent spillage of demolition runoff or solutions of harmful liquids on root systems of plants or trees.

4. At no cost to Owner, replace landscape items damaged by demolition operations.

End of Section

SUBSURFACE CONDITIONS

SECTION 02 0010 – 1

PART 1 – GENERAL

1.01 DESCRIPTION

It is understood and agreed that the Contractor has made or will make a thorough investigation of the surface and subsurface conditions of the site and any special construction problems which might arise as a result of nearby watercourses and floodplains, particularly in areas where construction activities may encounter water bearing sands and gravels or limestone solution channels.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related Sections: The following Specification Sections contain requirements that relate to this Section.
 - 1. Division 2: Site Work

1.03 SUMMARY

- A. No classification of excavated materials will be made. Excavation work shall include the removal and subsequent handling of all materials excavated or otherwise removed in performance of the contract work, regardless of the type, character, composition, or condition thereof.
- B. The Contractor shall be responsible for providing all services, labor, equipment, and materials necessary or convenient to him for completing the work within the time specified in these Contract Documents.
- C. The Contractor shall perform all excavation of every description, and of whatever substances encountered, to the dimensions and levels shown on the Drawings and/or specified.

SUBSURFACE CONDITIONS

SECTION 02 0010 – 2

- D. Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of materials and obstructions encountered.

- E. The Contractor shall satisfy himself as to rock and other materials which may be encountered in excavation, and make proper allowances for all contingencies in his lump sum or unit price bid. Neither the Owner nor the Engineer will be responsible for subsurface conditions found.

END OF SECTION

REMOVAL OF EXISTING EQUIPMENT

SECTION 02 0062 - 1

PART 1 - GENERAL

1.01 SCOPE OF WORK

Furnish all labor, equipment, materials, and incidentals required and remove all existing equipment and all pipe, fittings, valves, and appurtenances not required for the proper operation of the expanded systems. Removal will be consistent with the final configuration of the new systems as indicated on the Drawings, as specified herein or as required by the Engineer. The equipment and piping shall be removed from their present locations and shall be stored on campus at a location determined by the Owner.

1.02 RELATED WORK

- A. Storage of existing equipment is included in Section 02063.
- B. Modifications to Existing Structures, Piping, and Equipment is included in Section 02064.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall not proceed with the removal of any equipment, piping, or appurtenances without specific approval of the Engineer. Any equipment, piping or appurtenances removed without proper authorization, which are necessary for the operation of the existing systems or of the extended systems, shall be replaced to the satisfaction of the Engineer at the Contractor's expense.
- B. All existing tubing, insulation, hangers, and supports shall become the property of the Contractor immediately upon removal from their present locations. The Contractor shall remove such material from the plant site at his own expense and it shall not be reused.

REMOVAL OF EXISTING EQUIPMENT

SECTION 02 0062 - 2

- C. All existing valves, strainers, and other special line elements, greater than 3-in. diameter, removed shall remain the property of the Owner. The Contractor shall furnish all labor and material to identify, clean, protect, crate, and box and store them at a place designated by the Owner.
- D. Pieces of equipment weighing 150 lbs or more shall be provided with suitable skids before storing.
- E. Wherever piping is removed for disposition, adjacent pipe, and headers that are to remain in service shall be blanked off or plugged and then anchored in an approved manner.
- F. Equipment to be retained by the Owner shall be carefully removed from the present location, cleaned, and immediately stored, at a place designated by the Owner.
- G. The Contractor shall take all necessary precautions against damaging the material and equipment to be stored. The Contractor shall repair any damage resulting from his operation, as directed by and to the satisfaction of the Engineer. Itemized lists of materials removed and stored shall be given to the Engineer daily. A final typed itemized list shall be furnished to the Engineer in 6 copies at the completion of construction. The list shall include items, method of packaging, and place of storage.

3.02 STORAGE LOCATIONS

It is the general intent of this specification that all equipment to be retained by the Owner shall be stored on campus as directed by the Owner.

3.03 EQUIPMENT TO BE RETAINED

- A. The following is a list of items which shall be removed and remain the property of the Owner. Items shall be packaged and stored as specified in Section 02063 and Part III of this Section. The list is not intended to be complete, but only to convey the general types of equipment to be retained by the Owner.
 - 1. Blowers and motors
 - 2. Air diffuser mechanisms
 - 3. All electric panels and motor control centers

REMOVAL OF EXISTING EQUIPMENT

SECTION 02 0062 - 3

4. All pumps and drive units
 5. All flow meters
 6. Pipes and valves greater than 3" in diameter (not including buried pipes and valves)
- B. If the Owner elects not to retain ownership of a certain item, the item shall become the property of the Contractor and shall be removed from the plant site at the Contractor's expense.

END OF SECTION

**PACKAGING AND STORAGE
OF EXISTING EQUIPMENT**

SECTION 02 0063 - 1

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, equipment, material, power and incidentals required and clean, prepare, crate and store all existing equipment to be retained by the Owner, The equipment will be removed from its existing installation and stored in locations as directed by the Engineer.
- B. Any items of equipment, damaged or lost due to the Contractor's carelessness, mishandling, or faulty procedures and/or workmanship shall be repaired or replaced in kind to the satisfaction of the Engineer.
- C. Before packaging, the Owner shall be permitted to perform any routine maintenance on the equipment which he deems necessary.
- D. Equipment which has been installed indoors shall not be exposed to the weather at any point of the salvaging and storage operation.

1.02 RELATED WORK

- A. Removal of existing equipment is included in Section 02062.
- B. Demolition of existing structures is included in Section 02060.

1.03 SUBMITTALS

- A. In accordance with the provisions of the General Conditions, submit to the Engineer for approval the following:
 - 1. Description of the salvaging procedure for each item of equipment covering the cleaning, preparation, and protection aspects of the operation.
 - 2. Submittals shall include the type of rust resistant coatings and all other materials to be used.

**PACKAGING AND STORAGE
OF EXISTING EQUIPMENT**

SECTION 02 0063 - 2

PART 2 - PRODUCTS
(Not Used)

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

- A. The surfaces of all equipment and materials to be salvaged and stored shall be thoroughly cleaned, dried, and free of all rust, loose paint, dirt, and foreign matter. If required, in the opinion of the Engineer, equipment and materials shall be steam cleaned.
- B. The interior of all equipment shall be cleaned, flushed, and dried. Oil shall be flushed from all oil lubricated gear reducers and other related equipment.
- C. Gears, bearing surfaces, other similar surfaces, and other surfaces which have started to rust shall be given a coat of grease or other suitable rust resistant coating.

3.02 PROTECTION

- A. All equipment and materials to be salvaged and stored shall be properly protected from damage. All nozzles and overhung loads shall be suitably braced as to prevent the development of any damaging stresses.
- B. Crates shall not be larger than 3' high x 3' wide x 5' long, in general, and the weight of the crate and its contents shall not exceed 2000 lbs.
- C. Equipment shall be packaged as complete assemblies, where possible. Equipment assemblies which are larger than the above dimensions or weight requirements permit shall be broken down into subassemblies, where possible, before crating. Equipment which, in the opinion of the Engineer, cannot be readily broken down or which should not be broken down shall not be crated.
- D. Crates shall have cradles or supports built-in to the bottom of the crates such that the bottoms of the crates will not rest directly on the floor.

**PACKAGING AND STORAGE
OF EXISTING EQUIPMENT**

SECTION 02 0063 - 3

- E. Crates shall be labeled in indelible markings which describe completely the item and quantity of the equipment. All crates shall be numbered. A list giving each crate number and a description of its contents shall be prepared by the Contractor and submitted to the Engineer.

END OF SECTION

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR STRUCTURES**

SECTION 02 0220 - 1

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals necessary to perform all excavation, backfill, fill, grading for structures, and finish grading in preparation for landscaping and grassing, required to complete the work shown and specified. The work shall include, but not necessarily be limited to: excavation for structures, footings, all backfilling and fill: embankment and grading for structures; disposal of waste and surplus materials; and all related work such as sheeting, bracing and pumping.
- B. Topsoil, if any, excavated under this Section may be salvaged for convenience for use as necessary for landscaping.

1.02 RELATED WORK

- A. Section 02100: Site Preparation
- B. Section 02221: Excavation Backfill, Fill & Grading for Pipe

1.03 QUALITY ASSURANCE

- A. Provide services of a registered engineer or land surveyor to lay out site.
- B. Establish and maintain bench marks on the site for reference. All vertical dimensions shall be checked from these bench marks.
- C. Finished grades, as used herein, mean the required final grade elevations indicated on the drawings. Should finished grades shown on spot elevations conflict with those shown by the contours the spot elevations shall govern.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR STRUCTURES**

SECTION 02 0220 - 2

- D. Soil moisture during fill placement should be maintained within four percent (4%) of the optimum value determined by ASTM D 698 for general area and structural fill and within two percent (2%) of optimum for wall and backfill.
- E. All fill areas and areas at grade shall be proof-rolled with a fully loaded tri-axle dump truck or a 20-ton roller to detect any soft areas. Any areas which pump or rut excessively and cannot be densified by continued rolling shall be undercut.

1.04 JOB CONDITIONS

- A. Consider the Limits of Work indicated to make determination of the amount of grading. Limit grading to the work as shown and do not disturb the existing terrain or trees outside this work.
- B. Subsurface soil data: Subsurface investigation has been performed and data is available for reference. However, neither Architect, nor Owner assumes responsibility for completeness or accuracy of data contained therein and no claims for extra compensation or extension of time will be considered based on assumptions. Data may be examined in Owner's office.
- C. Items of historic or archaeological value discovered during earthwork operations shall remain property of the Owner.

1.05 PROTECTION

- A. Lateral Support of Excavation for Structures: Furnish, put in place, and maintain sheeting and bracing required to support the sides of the excavations, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction, and to protect streets and utilities from damage due to lateral movement or settlement of ground.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR STRUCTURES**

SECTION 02 0220 - 3

- B. Control of Groundwater Level:
1. Maintain the groundwater level below subgrade of the structure until the concrete structures are up high enough to prevent flooding the structure. Support shall be maintained at both bottom and top levels of wall to prevent flotation.
 2. After the structure has been completed in its entirety, backfill as described hereinafter.
 3. Flotation shall be prevented by maintaining a positive and continuous operation of the dewatering system. The responsibility and liability for all damages which may result from failure of this system shall be included in the work of this Section.
 4. Disposal of drainage water shall be in an area approved by the Owner. Precautions shall be taken to prevent the flow or seepage of drainage back into the drainage area. Particular care shall be taken to prevent the discharge of unsuitable drainage to a water supply or surface water body.
 5. Removal of dewatering system shall be accomplished after the dewatering system is no longer required; the material and equipment constitute the system.

1.06 TESTING

- A. Soil testing shall be performed by an independent testing agency selected and paid by the Owner.
- B. Testing agency shall perform the following testing:
1. Compaction tests in accord with ASTM D698-78.
 2. Field density tests for each 2'-0" lift, in accord with ASTM D2937-76 one test for each 10,000 sq. ft. of fill. One test is to be conducted for at least every 500 cubic feet of fill in trenches or restricted area fills.
 3. Inspection and testing subgrades and proposed fill materials.
 4. Examination of foundation excavations to determine if required soil bearing has been achieved.
 5. Examination of excavations to determine that required rock has been removed prior to fill placing and compacting.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR STRUCTURES**

SECTION 02 0220 - 4

6. Verification of unsuitable soil materials to be removed, where classified excavation is indicated.
- C. Duties relative to testing include:
1. Provide representative fill soil samples to testing agency for test purposes. Provide 50 lb. of samples of each fill soil.
 2. Advise testing agency sufficiently in advance of operations to allow for completion of quality tests and for assignment of personnel.
- D. The responsibility for paying costs of additional testing beyond scope of that required and for retesting if initial test reveals nonconformance with specified requirements shall be included as part of the work in this Section.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Structural Fill:
1. Compacted granular fill which will provide support for building or structure foundations will be referred to as structural fill. Backfill which is placed against the exterior side of the building walls or as fill over pipe lines will be referred to as common fill.
 2. The soil subgrade immediately beneath pavements and floor slabs should be compacted to at least 98% in the upper 18" of fill areas and the upper 12" of cut areas if they become disturbed during construction.
 3. Materials for compacted granular fill shall be gravel, sandy gravel, or gravelly sand free of organic material, loam, wood, trash, and other objectionable material and shall be will graded within the following limits:

Sieve Size	Percent Finer by Weight
6"	100
No. 4	20-95
No. 40	0-60
No. 200	0-8

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR STRUCTURES**

SECTION 02 0220 - 5

Fill soils should be non-expansive material with a plasticity index of less than 30, a liquid limit of less than 50 and a maximum dry density (standard proctor ASTM D 698) of at least 90 pcf. Soil classifications GM, GC, SW, SP, SM, SC, ML, and CL will be allowed provided they meet the above criteria.

- B. Common Fill: Mineral soil, substantially free of clay, organic material, loam, wood, trash, or other objectionable material which may be compressible or which cannot be properly compacted. Common fill shall not contain stones larger than 10" (6" max. for within 2'-0" of roadway surface) in any dimension. Common fill shall not contain broken concrete, masonry, rubble, asphalt pavement or other similar materials. It shall have physical properties such that it can be readily spread and compacted during filling.
- C. Except as noted in the following paragraph, material used below subgrade within the limits of support of structures shall consist of lean concrete or material meeting the requirements for structural fill as defined above. Crushed stone of #57 size or finer may be used.
- D. Where excavation occurs in rock, the working mat shall consist of a lean concrete placed directly on firm rock after all loose rock has been removed.

PART 3 - EXECUTION

3.01 EXCAVATION BELOW GRADE

- A. If the bottom of any excavation is taken out below the limits indicated or specified, it shall be refilled with concrete or 6" layers of compacted structural fill.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR STRUCTURES**

SECTION 02 0220 - 6

- B. If the subgrade surface is not cared for through failure to postpone final excavation immediately above the subgrade until shortly before placing of the new work thereon, or other failure, or neglect to conduct the excavation work properly so that the surface of the subgrade is in proper condition when ready for construction, remove the unsuitable material and replace it with concrete or compacted structural fill.

3.02 STRUCTURE EXCAVATION AND COMPACTION PROCEDURES

- A. Excavation shall be made to such widths as will give suitable room for construction of the structures, for bracing and supporting, pumping and draining; and the bottom of the excavations shall be rendered firm and dry in all respects.
- B. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of subgrade soils. Subgrade soils which become soft, loose, quick, or otherwise unsatisfactory for support of structures as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced by structural fill.
- C. Dewatering shall be such as to prevent boiling or detrimental saturation at the base of the excavation as specified herein. Install such means as required to preserve the stability of the base of the operation.
- D. Excavating equipment shall be satisfactory for carrying out the work in accordance with the Specification. In no case shall earth be plowed, scraped, or dug with machinery so near to the finished subgrade as to result in excavation of, or disturbance of material below grade.
- E. During final excavation to subgrade level, take whatever precautions are required to prevent disturbance and remolding of the subgrade. Material which has become softened and mixed with water shall be removed. Hand excavation of the final 3" to 6" will be required as necessary to obtain a satisfactory undisturbed bottom.
- F. When excavation for foundations has reached prescribed depths, the Owner's Representative shall be notified, and he will inspect conditions.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR STRUCTURES**

SECTION 02 0220 - 7

- G. The fill shall be placed in layers having a maximum thickness of 8" measured before compaction. Each layer of fill shall be compacted to at least 95% of maximum dry density determined by ASTM Compaction Test, Designation D 698.
- H. Large compaction equipment should operate no closer than 5' from backfilled wall.

3.05 COMPACTION

- A. Compaction shall be performed as specified hereinafter for the particular materials and operations.
 - 1. Self-propelled compactors shall make compaction passes at a speed of approximately 5 miles per hour.
 - 2. Areas adjacent to structures, and other areas inaccessible to a roller, shall be compacted with hand operated mechanical compaction equipment. Compaction of the fill by such means shall be to the same degree of compaction as obtained by other approved equipment, and the Owner may make the necessary tests to determine the amount of compactive effort necessary to obtain equal compaction. Unless such tests indicated that modifications may be made, the fill compacted by mechanical compactors shall be placed in 6" layers and thoroughly tamped over the entire surface. Compaction equipment is subject to approval by the Owner.
- B. Compacted structural fill for structural foundations shall be placed in layers not to exceed 8" thickness by loose measure and shall be compacted to at least 95% of maximum dry density as determined by ASTM Test Designation D 698. The upper one foot of material in fill or at grade areas or cut surfaces should be scarified and compacted to a 98% criteria.
- C. The surface of filled areas shall be graded to smooth, true lines, strictly conforming to grades indicated, and no soft spots or uncompacted areas will be allowed in the work.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR STRUCTURES**

SECTION 02 0220 - 8

- D. Temporary bracing shall be provided as required during filling and backfilling of all structures to protect partially completed structures against all construction equipment loads, hydraulic pressures and earth pressures.

3.06 BACKFILLING - COMMON FILL

- A. Common fill may be used as backfill against the exterior walls of the structures. Material conforming to the requirements of common fill shall be placed in layers having a maximum thickness of 8" measured before compaction.
- B. Common fill shall be compacted to at least 95% of maximum density as determined by ASTM compaction tests, Designation D 698.
- C. Materials placed in fill areas shall be deposited to the lines and grades shown making due allowance for settlement of the material and for the placing of topsoil thereon.
- D. The surfaces of filled areas shall be graded to smooth, true lines, strictly conforming to grades indicated on the paving and grading drawings, and no soft spots or uncompacted areas will be allowed in the work.
- E. No compacting shall be done when the material is too wet either from rain or from excess application of water. At such times, work shall be suspended until the previously placed and new materials have dried sufficiently to permit proper compaction.

3.07 EARTH EMBANKMENTS

- A. All organic materials, including peat and loam, shall be removed from areas beneath new embankments. If the subgrade slopes are excessive, the subgrade shall be stepped to produce a stable surface for the placement of the embankments. The natural subgrade shall then be compacted by mechanical compaction equipment. The prepared subgrade shall be inspected and approved by the Owner's Representative prior to the placement of structural fill.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR STRUCTURES**

SECTION 02 0220 - 9

- B. Fill shall be placed in layers 8" thick measured before compaction. Each layer shall be compacted to at least 95% of the maximum dry density as determined by the ASTM compaction test, Designation D-698.
- C. Existing slopes shall be reconstructed as shown.

3.08 DISPOSAL OF UNSUITABLE AND SURPLUS MATERIAL

- A. Unsuitable excavated materials and pavement shall become the property of the Contractor and removed and disposed of by him off the project site.
- B. Suitable excavated material may be used for fill or backfill if it meets the specifications for common fill and is approved by the Owner's Representative. Excavated material so approved may be neatly stockpiled at the site. If space limitations do not permit stock piling on the site, the Contractor will be required to make arrangements for off-site stockpiling. Transport of such material from and to the immediate site, including any stockpiling agreements, shall be entirely at the Contractor's expense and shall not constitute grounds for additional payment.
- C. Surplus excavated material shall be used to fill depressions or for other purposes as the Owner may direct; otherwise, it shall become the property of the Contractor and shall be removed and disposed of by the Contractor off the project site.

3.09 GRADING

- A. Grading in preparation for placing of topsoil, planting areas, paved walks and drives and appurtenances shall be performed at all places indicated, to the lines, grades, and elevations shown, and shall be performed in such a manner that the requirements for formation of slopes, lines and grades can be followed. All material encountered, of whatever nature, within the limits indicated, shall be removed and disposed of as directed. During the process of grading, the subgrade shall be maintained in such condition that it will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the prosecution or condition of the work.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR STRUCTURES**

SECTION 02 0220 - 10

- B. If at the time of grading it is not possible to place any material in its proper section of the permanent structure, it shall be stockpiled in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.
- C. The right is reserved to make minor adjustments or revisions in lines or grades if found necessary as the work progresses, due to discrepancies or in order to obtain satisfactory construction.
- D. Stones or rock fragments larger than 4" in their greatest dimensions will not be permitted in the top 6" of the finished subgrade of all fills or embankments.
- E. In cuts, all loose or protruding rocks on the backslopes shall be barred loose or otherwise removed to line or finished grade of slope. All cut and fill slopes shall be uniformly dressed to the slope, cross section and alignment shown.

3.10 DEFINITION OF ROCK

- A. General Excavation - Any material which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a draw bar pull rated at not less than 56,000 pounds (Caterpillar D8K or equivalent) or excavated by a front-end loader with a minimum bucket breakout force of 25,600 pounds (Caterpillar 977 or equivalent).
- B. Trench Excavation - Any material which cannot be excavated with a backhoe having a bucket curling force rated at not less than 33,000 pounds (Caterpillar 225B or equivalent).

END OF SECTION

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR PIPE**

SECTION 02 0221 - 1

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. This section includes, except as elsewhere provided, all excavation for piping and associated appurtenances including; filling, backfilling, grading, disposal of surplus material and restoration of trench surfaces and easements.
- B. Furnish and place all sheeting, bracing, and supports and remove from the excavation all materials which the Engineer may deem unsuitable for backfilling. The bottom of the excavation shall be firm, dry and in all respects acceptable. Deposit pipe bedding, or refill for excavation below grade, directly on the bottom of the trench immediately after excavation has reached the proper depth and before the bottom of the trench has become softened or disturbed by any cause whatever. The length of open trench shall be related closely to the rate of pipe laying. All excavation shall be made in open trenches.

1.02 RELATED WORK

- A. Section 02100: Site Preparation.
- B. Section 02220: Excavation, Filling, Backfilling, Grading for Structures

PART 2 - MATERIALS

2.01 MATERIALS

- A. General:
 - 1. Materials for use as fill shall be as described below. For each material, notify the Owner's representative of the source of the material and furnish, for approval, a representative sample weighing approximately 50 pounds, at least ten calendar days prior to the date of anticipated use of such material.
 - 2. Materials shall be furnished as required from off site sources and hauled to the site.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR PIPE**

SECTION 02 0221 - 2

3. Disposal of unsuitable materials is specified in this Section. See paragraph 3.01.
- B. Common Fill:
1. Common Fill shall consist of mineral soil, free of organic material, loam, wood, trash, snow, ice, frozen soil and other objectionable material which may be compressible or which cannot be compacted properly. Common fill shall not contain stones larger than 10" in any dimension, broken concrete, masonry, rubble, or other similar materials. It shall have physical properties such that it can be readily spread and compacted during filling.
 2. Material falling within the above specification, encountered during the excavation, may be stored in segregated stockpiles for reuse. All material which, in the opinion of the Owner's Representative, is not suitable for reuse shall be spoiled as specified herein for disposal of unsuitable materials.
- C. Crushed Stone:
1. Crushed stone shall be used for pipe bedding, manhole bases, as a drainage layer below structures with underdrains and at other locations indicated on the drawings.
 2. Crushed stone shall be size No. 57.

PART 3 - EXECUTION

3.01 DISPOSAL OF MATERIALS

- A. Excavated material shall be stacked without excessive surcharge on the trench bank. Inconvenience to traffic and abutters shall be avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.
- B. Surplus excavated material which is suitable for use in backfilling or for replacing rock and boulders shall be stockpiled. Unsatisfactory surplus material including paving, rock or boulders and other material, shall be disposed of.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR PIPE**

SECTION 02 0221 - 3

- C. It is expressly understood that no excavated material shall be removed from the site of the work or disposed of by the Contractor except as directed by the Owner's representative.
- D. Should conditions make it impracticable or unsafe to stack material adjacent to the trench, the material shall be hauled and stored. When required, it shall be re-handled and used in backfilling the trench. No extra compensation will be made for re-handling material.

3.02 SHEETING AND BRACING

Furnish, put in place, and maintain sheeting and bracing required to support the sides of the excavation and prevent loss of ground which could damage or delay the work or endanger adjacent structures. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.

3.03 TEST PITS

- A. Contact and coordinate with local utilities before excavating test pits for the purpose of locating underground utilities of structures as an aid in establishing the precise location of new work. Test pits shall be backfilled as soon as the desired information has been obtained. The backfilled surface shall be maintained in a satisfactory condition for travel until resurfaced as hereinafter specified.
- B. Excavation of test pits shall be considered work incidental to furnishing and laying sewer pipe.
- C. If, for any reason, a test pit is left open for any period of time, it shall be barricaded and lighted.

3.04 DRAINAGE

- A. Furnish all materials and equipment and perform all incidental work required to install and maintain the drainage system proposed for handling groundwater or surface water encountered. Construction shall not begin until the Owner's representative is assured that the proposed method will

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR PIPE**

SECTION 02 0221 - 4

be satisfactory. The requirements for a stable subgrade are indicated above, and the Contractor must alter his drainage methods if the trench bottom is unsatisfactory.

- B. Provide pumping equipment and devices to properly remove and dispose of all water entering trench and excavation for structures. The grade shall be maintained acceptably dry until structures to be built therein are completed. All drainage shall be performed without damage to the trench, pavements, pipes or other utilities.
- C. Pipe and masonry shall not be laid in water or submerged within 24 hours after being placed. Water shall not flow over new masonry within four days after placement.
- D. In no event shall water rise to cause unbalanced pressure on structures until the concrete or mortar has set at least 24 hours. Prevent flotation of the pipe by promptly placing backfill.
- E. If underdrains are used for handling water, furnish and install pipe and crushed stone graded from coarse to fine, and furnish and install all pumps and equipment necessary to maintain the water level continuously at the required elevation. Pipe underdrains shall be laid with open joints and bedded in crushed stone for the full width of trench, to a depth of 6" below the invert of underdrain.
- F. The invert of underdrain shall be 12" below the normal subgrade. Pipe underdrains shall have no permanent outlet and shall be sealed at the completion of the work. The length of continuous underdrain to be used shall be limited as conditions require. An impervious bulkhead of clay or concrete shall be constructed in the trench bottom between 100 ft. lengths of the underdrainage system to obstruct the free flow of groundwater after construction is completed. For all excavation below normal grade for the purpose of installing underdrains, the crushed stone and underdrain pipe shall be considered a part of the drainage work to be done under the pipe items. Continuously guard against the loss of earth through subbase or the underdrain. Should loss of either take place, alter the stone size to provide a satisfactory barrier or filter.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR PIPE**

SECTION 02 0221 - 5

- G. Where other methods of handling water prove inadequate, furnish, install, operate, and remove proper well point facilities.

3.05 TRENCH EXCAVATION (UNCLASSIFIED)

- A. Excavation shall be made for all trenches which are required for the installation of pipes and manholes.
- B. Make excavations to the depth indicated on the drawings and in such a manner and to such widths as will give suitable room for laying the pipe within the trenches, for bracing and supporting, and for pumping and drainage facilities. Render the bottom of the excavations firm and dry in all respects.
- C. The trench may be excavated by machinery to, or just below the designated subgrade provided that the material remaining in the bottom of the trench is no more than slightly disturbed.
- D. Rock shall be removed to a minimum of 8" clearance around the bottom and sides of the pipe being laid.
- E. Where the pipes or ducts are to be laid directly on the trench bottom, the lower part of the trenches shall not be excavated to grade by machinery. The last of the material being excavated manually shall be done in such a manner that it will give a flat bottom true to grade, so that pipe or duct can be evenly supported on undisturbed material. Bell holes shall be made to provide proper bedding.

3.06 PIPE BEDDING

- A. The Contractor shall furnish and install pipe on the type of bedding shown on the drawings and as specified herein. Regardless of the type of bedding used, holes in the trench shall be provided to receive the pipe bell. The hole excavated shall be sufficient to relieve pipe bells of all loads and yet provide support over the total length of the pipe barrel.
- B. Bedding classes are as defined below and shown on the drawings:
 - 1. Two (2) types of bedding are specified:

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR PIPE**

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- a. For Class D Bedding, the trench bottom shall be hand shaped to receive the portion of the circumference of the pipe barrel shown on the drawings. Class D bedding shall be used for all pipe bedding unless shown otherwise in the drawings.
- b. For Class C bedding, sand shall be compacted in the trench bottom, and compacted around the pipe to a depth shown on the drawings.
 - (1) Where the trench bottom has been excavated below grade, C bedding shall be used.
 - (2) Where consolidated rock has been moved from the trench bottom, Class C bedding shall be used.

3.07 BACKFILLING

- A. As soon as practicable after the pipe has been laid and jointed, backfilling shall begin and thereafter be prosecuted expeditiously. Where indicated on the drawings, crushed stone shall be placed and compacted to a point indicated on the detailed drawing.
- B. After the required crushed stone bedding has been placed, or after the pipe has been properly bedded on a shaped trench bottom, Common Fill material shall be placed to a depth of 1'-0" over the top of the pipe. Backfill shall be thoroughly compacted by hand-tamping as placed.
- C. Any space remaining between the pipe and side of the trench shall be packed full by hand shovel with sand, free from stones having a diameter greater than 2", and thoroughly compacted with a tamper as fast as placed up to a level of one (1) foot above the top of the pipe.
- D. The filling shall be carried up evenly on both sides with at least one person tamping for each person shoveling material into the trench.
- E. The remainder of the trench above the compacted backfill, as just described shall be filled and thoroughly compacted by rolling, ramming, or puddling, to prevent subsequent settling.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR PIPE**

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- F. Where the pipes are laid across country, the trench backfill material shall be mounded 6" above the existing grade or as directed. Wherever a loam or gravel surface exists prior to cross country excavations, it shall be removed, conserved, and replaced to the full original depth as part of the work under the pipe items. In some areas it may be necessary to remove excess material during the cleanup process, so that the ground may be restored to its original level and condition. If loam or topsoil is not stored it may be replaced with loam or topsoil of equal quality and quantity.
- G. Where the pipes are laid in streets, the last 1'-0" layer shall be of Aggregate Base material otherwise thoroughly compacted.
- H. Backfill around manholes shall be selected material, compacted by puddling. All backfill shall be compacted, especially under and over pipes connected to the structures. Selected backfill shall be free from stones larger than 3".
- I. Rock fragments shall not be placed until the pipe has at least 2'-0" of earth cover. Small stones and rocks shall be placed in thin layers alternating with earth to insure that all voids are completely filled. Filling shall not be dropped into the trench in a manner to endanger the pipe. Rock fragments used shall not exceed 10 pounds.
- J. Bituminous paving adjacent to or effected by the excavation shall be broomed and hosed-clean immediately after backfilling. Dust control measures shall be employed at all times.

3.08 RESTORING TRENCH SURFACE

- A. Where the trench occurs adjacent to paved street, in shoulders, sidewalks, or in cross-country areas, thoroughly consolidate the backfill and maintain the surface as the work progresses. If settlement takes place, immediately deposit additional fill to restore the level of the ground.
- B. The surface of any driveway or any other area which is disturbed by the trench excavation and which is not a part of the paved highway shall be restored to a condition at least equal to that existing before work began.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR PIPE**

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- C. In sections where the sewer passes through grassy areas, remove and replace the soil, or loam seed. The depth of loam replaced shall be at least equal to that removed during trenching operations, but in no event shall it be placed less than 4" in depth.

3.09 FILL PLACEMENT

A. General:

1. Material placed in fill areas under and around structures shall be deposited within the lines and to the grades shown on the drawings, making due allowance for settlement of the material. Fill shall be placed only on properly prepared surfaces which have been inspected and approved by the Owner's Representative. No fill shall be placed on a frozen surface, nor shall snow, ice, or frozen material of any sort be placed in fill. If sufficient common fill material is not available from excavation on site, provide borrow as may be required.
2. Gravel base course material and crushed stone shall be provided as borrow.
3. Fill shall be brought up to substantial level lifts throughout the site, starting in the deepest portion of the fill. The entire surface of the work shall be maintained free from ruts, and in such condition that construction equipment can readily travel over any section. Fill shall not be placed against concrete structures until they have attained sufficient strength.
4. Fill shall be dumped and spread in layers by a bulldozer or other approved method. During the process of dumping and spreading, all roots shall be removed from the fill areas.
5. If the compacted surface of any layer of material is determined to be too smooth to bond properly with the succeeding layer, it shall be loosened by harrowing or by another approved method before the succeeding layer is placed.
6. All fill materials shall be placed and compacted in a dry condition. Dewater excavated areas as required to perform the work and in such a manner as to preserve the undisturbed state of the natural inorganic soils.

3.10 COMPACTION

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR PIPE**

SECTION 02 0221 - 9

- A. Common Fill backfill material in trenches shall be placed in layers not to exceed eight (8) inches in depth as measured before compaction. Each layer shall be compacted by a minimum of four (4) coverages with the equipment described below, to at least 98% of maximum dry density as determined by ASTM D698, unless under a structure in which case 100% compaction shall be obtained. Incidental compaction due to traffic by construction equipment will not be credited toward the required minimum four (4) coverages.
- B. Common fill not within trenches shall be placed and compacted in a manner similar to that described above, with the following exceptions: layer thickness prior to compaction may be increased to 10" in open areas; and common fill except dike fill, required below water level in peat excavation areas may be placed as one lift, in-the-wet, to an elevation one (1) foot above the water level at the time of filling.
- C. Compaction equipment in open areas shall consist of fully loaded ten-wheel dump trucks, tractor dozers weighing at least 30,000 pounds and operated at top speed, or by vibratory roller.
- D. Areas adjacent to structures and other confined areas inaccessible to the roller or truck, the Common Fill shall be compacted with approved hand guided mechanical compaction equipment. Compaction of the Common Fill by such means shall be to the same degree of compaction as obtained by the rubber-tired equipment. Common Fill compacted by mechanical compactors shall be placed in loose lifts not to exceed 6" maximum thickness and to at least 98% of the standard Proctor maximum dry density.
- E. It is the intention that the fill materials, with respect to moisture, be used in the condition they are excavated insofar as this is practicable. Material which is too wet shall be spread on the fill area and permitted to dry, assisted by harrowing if necessary, until the moisture content is reduced to allowable limits.
- F. If the Owner's Representative shall determine that added moisture is required, water shall be applied by sprinkler tanks or other sprinkler

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR PIPE**

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systems, which will ensure uniform distribution of the water over the area to be treated, and give complete and accurate control of the amount of water to be used. If too much water is added, the area shall be permitted to dry before compaction is continued.

3.11 GRADING

- A. Grading shall be performed at such places as are indicated on the drawings, to the lines, grades, and elevations shown and shall be made in such a manner that the requirements for formation of embankments can be followed. All unacceptable material encountered, of whatever nature within the limits indicated, shall be removed and disposed of as directed. During the process of excavation, the grade shall be maintained in such condition that it will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the progress or condition of the work.
- B. If at the time of excavation it is not possible to place any material in its proper section of the permanent structure, it shall be stockpiled in approved areas for later use.
- C. The right is reserved to make minute adjustments or revisions in lines or grades if found necessary as the work progresses, due to discrepancies on the drawings or in order to obtain satisfactory construction.
- D. Stones or rock fragments larger than 4" in their greatest dimensions will not be permitted in the top 6" of the subgrade line of all dikes, fills or embankments.
- E. All fill slopes shall be uniformly dressed to the slope, cross-section and alignment on the drawings.
- F. In cuts, all loose or protruding rocks on the back slopes shall be barred loose or otherwise removed to line or finished grade of slope. All cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the drawings.

**EXCAVATION, BACKFILL, FILL
AND GRADING FOR PIPE**

SECTION 02 0221 - 11

- G. No grading is to be done in areas where there are existing pipe lines that may be uncovered or damaged until such lines which must be maintained are relocated, or where lines are to be abandoned, all required valves are closed and drains are plugged at manholes.

3.12 DISPOSAL OF UNSUITABLE SURPLUS MATERIAL

- A. Unsuitable and surplus activated materials and pavement shall become the property of the Contractor and removed and disposed of by him off the project site.
- B. Suitable excavated materials may be used for fill or backfill if it meets the Specification for common fill. Excavated material so approved may be neatly stockpiled at the site. If space limitations do not permit stockpiling on the site, make arrangements for offsite stockpiling.
- C. Surplus excavated materials may be used to fill depressions or other purposes as the Owner's Representative may direct.

3.13 DISPOSAL AND REPLACING OF ROCK

Remove and dispose of all pieces of rock which are not suitable for use in other parts of the work. Rock disposed of by hauling away to spoil area is to be replaced by approved surplus excavation obtained elsewhere on the site, insofar as it is available. Any deficiency in the backfill material shall be made up with acceptable material from outside sources as approved by the Owner's Representative.

END OF SECTION

**EXCAVATION BELOW NORMAL
GRADE AND GRAVEL REFILL**

SECTION 02 0223 - 1

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. If the material at or below the normal grade of the bottom of the trench (0.7-ft. below the invert of the pipe) is unsuitable for foundation, provide all labor, materials, equipment and incidentals necessary to be removed and replaced by crushed stone material specified in Section 02221.

1.02 WORK SPECIFIED IN OTHER SECTIONS

- A. Section 02220: Excavation, Filling, Backfilling and Grading for Structures
- B. Section 02221: Excavation, Backfill, Fill and Grading for Pipe

PART 2 - PRODUCTS
(Not Used)

PART 3 - EXECUTION

3.01 EXCAVATION AND DRAINAGE

- A. Whatever the nature of the unstable material encountered or the groundwater conditions, trench drainage shall be complete and effective.
- B. If the Contractor excavates below grade through error or for his own convenience, or through failure to properly dewater the trench, or disturbs the subgrade before dewatering is sufficiently complete, he shall excavate below grade as set forth in the preceding paragraph, in which case the work of excavating below grade and finishing and placing the refill shall be performed at his own expense.

**EXCAVATION BELOW NORMAL
GRADE AND GRAVEL REFILL**

SECTION 02 0223 - 2

3.02 REFILL

If the material at the level of trench bottom consists of fine sand, sand and silt, or soft earth which may work into the aggregate bedding notwithstanding effective drainage, the subgrade material shall be removed to the extent directed and the excavation refilled with coarse sand, or a mixture graded from coarse sand to the fine pea-stone, to form a filter layer preserving the voids in the gravel bed of the pipe. The composition and gradation of gravel shall be submitted for approval prior to placement. Aggregate shall be placed in 6" layers and thoroughly compacted.

END OF SECTION

BORE AND JACK CASINGS

SECTION 02 0229 - 1

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, equipment and incidentals required to bore and jack casings and to properly complete pipeline construction as shown on the Drawings and as specified herein.
- B. Supply all materials and perform all work in accordance with applicable American Society for Testing and Materials (ASTM), American Water Works Association (AWWA), American National Standards Institute (ANSI) or other recognized standards. Latest revisions of all standards are applicable. If requested by the Engineer, submit evidence that manufacturer has consistently produced products of satisfactory quality and performance over a period of at least two years.
- C. A minimum of five continuous years of experience in steel casing construction is required of the casing installer.

1.02 RELATED WORK

- A. Section 02100: Site Preparation
- B. Section 02221: Excavation, Backfill, Fill, and Grading for Pipe
- C. Section 02276: Temporary Erosion and Sediment Control
- D. Section 02615: Exterior Ductile Iron Pipe and Fittings

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Casing
 - 1. The casing shall be new and unused pipe. The casing shall be made from steel plate having a minimum yield strength of 35,000 psi. The steel plate shall also meet the chemical requirements of ASTM A 36.
 - 2. The casing shall be uncoated, both inside and outside.

BORE AND JACK CASINGS

SECTION 02 0229 - 2

3. The thicknesses of casing shown in paragraph B. below are minimum thickness. Actual thicknesses shall be determined by the casing installer, based on an evaluation of the required forces to be exerted on the casing when jacking. Any buckling of the casing due to jacking forces shall be repaired at no additional cost to the Owner.
4. The diameters of casing shown in paragraph B. below and shown on the Drawings are minimum. Larger casings, with the Engineer's approval, may be provided at no additional cost to the Owner, for whatever reasons the Contractor may decide, whether casing size availability, line and grade tolerances, soil conditions, etc.

B. Casing Sizes

UNDER HIGHWAYS

<u>Pipe Diameter, Inches</u>	<u>Casing Diameter, Inches</u>	<u>Wall Thickness, Inches</u>
6	14	0.250
8	16	0.250
10	18	0.250
12	20	0.250
16	24	0.250
18	28	0.312
20	30	0.312

UNDER RAILROADS

<u>Pipe Diameter, Inches</u>	<u>Casing Diameter, Inches</u>	<u>Wall Thickness, Inches</u>
6	16	0.250
8	18	0.250
10	20	0.281
12	22	0.312
16	27	0.375
18	30	0.406
20	32	0.438

BORE AND JACK CASINGS

SECTION 02 0229 - 3

- C. Grout: Grout shall be used for filling the void between the casing pipe and the carrier pipe, except as specified herein. Cement shall conform to ASTM C 150, Type I or Type II; water shall be fresh, clean and potable. Grout shall have a minimum compressive strength of 1,000 psi attained within 24 hours.
- D. Carrier Pipe: Carrier pipes shall meet requirements as specified in Section 02616 of these Specifications.
- E. Surface Settlement Markers: Surface settlement markers within pavement areas shall be P.K. nails. Surface settlement markers within non-paved areas shall be wooden hubs.

2.02 EQUIPMENT

- A. A cutting head shall be attached to a continuous auger mounted inside the casing pipe.
- B. On casing pipe for gravity sewer over 60 feet in length, the installation equipment shall include a steering head and a grade indicator.
- C. The steering head shall be controlled manually from the bore pit. The grade indicator shall consist of a water level attached to the casing which would indicate the elevation of the front end of the casing or some other means for grade indication approved by the Engineer.

PART 3 - EXECUTION

3.01 GENERAL

- A. Interpretation of soil investigation reports and data, investigating the site and determination of the site soil conditions prior to bidding is the sole responsibility of the Contractor. DOT, the Railroad or local government road department must approve any subsurface investigation by the Bidder or Contractor. Rock and/or water, if encountered, shall not entitle the Contractor to additional compensation.

BORE AND JACK CASINGS

SECTION 02 0229 - 4

- B. When water is encountered, provide and maintain a dewatering system of sufficient capacity to remove water on a 24-hour basis keeping excavations free of water until the backfill operation is in progress. Dewatering shall be performed in such a manner that removal of soil particles is held to a minimum. Dewater into a sediment trap and comply with requirements specified in Section 02276 of these Specifications.
- C. Methods of dewatering shall be at the option and responsibility of the Contractor. Maintain close observation to detect settlement or displacement of surface facilities due to dewatering. Should settlement or displacement be detected, notify the Engineer immediately and take such action as necessary to maintain safe conditions and prevent damage.
- D. Casing construction shall be performed so as not to interfere with, interrupt or endanger roadway surface and activity thereon, and minimize subsidence of the surface, structures, and utilities above and in the vicinity of the casing. Support the ground continuously in a manner that will prevent loss of ground and keep the perimeters and face of the casing, passages and shafts stable. The Contractor shall be responsible for all settlement resulting from casing operations and shall repair and restore damaged property to its original or better condition at no cost to the Owner.
- E. Comply with applicable ordinances, codes, statutes, rules and regulations of the State of Georgia, applicable County and City building codes, DOT and the Railroad.
- F. Highway Crossings
 - 1. The Contractor shall be held responsible and accountable for the coordinating and scheduling of all construction work within the highway right-of-way.
 - 2. Work along or across the state highway department rights-of-way shall be subject to inspection by the state highway department.
 - 3. All installations shall be performed to leave free flows in drainage ditches, pipes, culverts or other surface drainage facilities of the highway, street or its connections.

BORE AND JACK CASINGS

SECTION 02 0229 - 5

4. No excavated material or equipment shall be placed on the pavement or shoulders of the highway without the express approval of the state highway department or local governing authority that has jurisdiction.
5. In no instance will the Contractor be permitted to leave equipment (trucks, backhoes, etc.) on the pavement or shoulder overnight. Construction materials to be installed, which are placed on the right-of-way in advance of construction, shall be placed in such a manner as not to interfere with the safe operation of the highway.
6. The Contractor shall be responsible for providing the Owner sufficient information to obtain a blasting permit in a timely manner.

G. Railroad Crossings

1. The Contractor shall secure permission from the Railroad to schedule work so as not to interfere with the operation of the Railroad. All work will be done under the supervision of the Engineer and the Railroads involved.
2. Additional insurance is required for each railroad crossing. The Contractor will furnish the Railroad with such additional insurance as may be needed, cost to the same shall be borne by the Contractor.
3. All work on the Railroad right-of-way, including necessary support of tracks, safety of operations and other standard and incidental operation procedures may be under the supervision of the appropriate authorized representative of the Railroad affected and any decisions of this representative pertaining to construction and/or operations shall be final and construction must be governed by such decisions.
4. If, in the opinion of the Railroad, it becomes necessary to provide flagging protection, watchmen or the performance of any other work in order to keep the tracks safe for traffic, the Contractor shall coordinate such work and shall reimburse the Railroad, in cash, for such services, in accordance with accounting procedures agreed on by the Contractor and affected Railroad before construction is started.
5. No blasting shall be permitted within the Railroad right-of-way.

BORE AND JACK CASINGS

SECTION 02 0229 - 6

3.02 SAFETY

- A. Provide all necessary bracing, bulkheads and shields to ensure complete safety to all traffic, persons and property at all times during the work. Perform the work in such a manner as to not permanently damage the roadbed or interfere with normal traffic over it.
- B. Observe all applicable requirements of DOT and Railroad regulations. Conduct the operations in such a manner that all work will be performed below the level of the roadbed.
- C. If, in the opinion of the Engineer, the Railroad or the DOT, the casing installation work is being conducted in an unsafe manner or in a manner detrimental to the overpassing roadway or to the safety of the traveling public, all operations of boring shall cease until the necessary corrections have been made. In the event that distress occurs to the roadway due to boring, the Contractor shall be required to submit a plan to repair the roadway. The plan must be acceptable to DOT, the Railroad and the Engineer.
- D. Perform all activities in accordance with the Occupational Safety and Health Act of 1970 (PL-596), as amended, applicable regulations of the Federal Government, OSHA 29CFR 1926 and applicable criteria of ANSI A10.16-81, "Safety Requirements for Construction of Tunnel Shafts and Caissons".

3.03 SURFACE SETTLEMENT MONITORING

- A. Provide surface settlement markers, placed as specified and as directed by the Engineer. The Contractor shall place settlement markers outside of pavement area, along the centerline of the casing at 20-foot intervals and offset 10 feet each way from the centerline of the tunnel. Markers shall also be placed at each shoulder of the roadway, at each edge of pavement, at the centerline of the pavement and at 10 and 25 feet in each direction from the centerline of the casing. Tie settlement markers to bench marks and indices sufficiently removed as not to be affected by the casing operations.

BORE AND JACK CASINGS

SECTION 02 0229 - 7

- B. Make observations of surface settlement markers, placed as required herein, at regular time intervals acceptable to the Engineer. In the event settlement or heave on any marker exceeds 1-inch, the Contractor shall immediately cease work and using a method approved by DOT and the Railroad, take immediate action to restore surface elevations to that existing prior to start of casing operations.
- C. Take readings and permanently record surface elevations prior to start of dewatering operations and/or shaft excavation. The following schedule shall be used for obtaining and recording elevation readings: all settlement markers, once beginning of each day; more frequently at the Engineer's direction if settlement is identified. Make all elevation measurements to the nearest 0.01 foot.
- D. The Contractor shall cooperate fully with jurisdictional personnel. Any settlement shall be corrected by, and at the expense of, the Contractor.

3.04 BORING AND JACKING

- A. Shaft
 - 1. Conduct boring and jacking operations from a shaft excavated at one end of the section to be bored. Where conditions and accessibility are suitable, place the shaft on the downstream end of the bore.
 - 2. The shaft shall be rectangular and excavated to a width and length required for ample working space. If necessary, sheet and shore shaft properly on all sides. Shaft sheeting shall be timber or steel piling of ample strength to safely withstand all structural loadings of whatever nature due to site and soil conditions. Keep preparations dry during all operations. Perform pumping operations as necessary.
 - 3. The bottom of the shaft shall be firm and unyielding to form and adequate foundation upon which to work. In the event the shaft bottom is not stable, excavate to such additional depth as required and place a gravel sub-base or a concrete sub-base if directed by the Engineer due to soil conditions.
- B. Jacking Rails and Frame
 - 1. Set jacking rails to proper line and grade within the shaft. Secure rails in place to prevent settlement or movement during operations.

BORE AND JACK CASINGS

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- The jacking rails shall cradle and hold the casing pipe on true line and grade during the process of installing the casing.
2. Place backing between the heels of jacking rails and the rear of the shaft. The backing shall be adequate to withstand all jacking forces and loads.
 3. The jacking frame shall be of adequate design for the magnitude of the job. Apply thrust to the end of the pipe in such a manner to impart a uniformly balanced load to the pipe barrel without damaging the joint ends of the pipe.
- C. Boring and jacking of casing pipes shall be accomplished by the dry auger boring method without jetting, sluicing or wet boring.
- D. Auger the hole and jack the casing through the soil simultaneously.
- E. Bored installations shall have a bored-hole diameter essentially the same as the outside diameter of the casing pipe to be installed.
- F. Execute boring ahead of the casing pipe with extreme care, commensurate with the rate of casing pipe penetration. Boring may proceed slightly in advance of the penetrating pipe and shall be made in such a manner to prevent any voids in the earth around the outside perimeter of the pipe. Make all investigations and determine if the soil conditions are such as to require the use of a shield.
- G. As the casing is installed, check the horizontal and vertical alignment frequently. Make corrections prior to continuing operation. For casing pipe installations over 100 feet in length, the auger shall be removed and the alignment and grade checked at minimum intervals of 60 feet.
- H. Any casing pipe damaged in jacking operations shall be repaired, if approved by the Owner, or removed and replaced at Contractor's own expense.
- I. Lengths of casing pipe, as long as practical, shall be used except as restricted otherwise. Joints between sections shall be completely welded in accordance with AWS recommended procedures. Prior to welding the joints, the Contractor shall ensure that both ends of the casing sections being welded are square.

BORE AND JACK CASINGS

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- J. The Contractor shall prepare a contingency plan which will allow the use of a casing lubricant, such as bentonite, in the event excessive frictional forces jeopardize the successful completion of the casing installation.
- K. Once the jacking procedure has begun, it should be continued without stopping until completed, subject to weather and conditions beyond the control of the Contractor.
- L. Care shall be taken to ensure that casing pipe installed by boring and jacking method will be at the proper alignment and grade.
- M. The Contractor shall maintain and operate pumps and other necessary drainage system equipment to keep work dewatered at all times.
- N. Adequate sheeting, shoring and bracing for embankments, operating pits and other appurtenances shall be placed and maintained to ensure that work proceeds safely and expeditiously. Upon completion of the required work, the sheeting, shoring and bracing shall be left in place, cut off or removed, as designated by the Engineer.
- O. Trench excavation, all classes and type of excavation, the removal of rock, muck, debris, the excavation of all working pits and backfill requirements of Section 02221 are included under this Section.
- P. All surplus material shall be removed from the right-of-way and the excavation finished flush with the surrounding ground.

3.05 VENTILATION AND AIR QUALITY

Provide, operate and maintain for the duration of casing project a ventilation system to meet safety and OSHA requirements.

3.06 ROCK EXCAVATION

- A. In the event that rock is encountered during the installation of the casing pipe which, in the opinion of the Engineer, cannot be removed through the casing, the Engineer may authorize the Contractor to complete the crossing with a tunnel.

BORE AND JACK CASINGS

SECTION 02 0229 - 10

- B. At the Contractor's option, the Contractor may continue to install the casing and remove the rock through the casing at no additional cost to the Owner.

3.07 INSTALLATION OF CARRIER PIPE

- A. After construction of the casing is complete, and has been accepted by the Engineer, install the pipeline in accordance with the Drawings and Specifications.
- B. Check the alignment and grade of the casing and submit a plan to the Engineer for approval to set the pipe at proper alignment, grade and elevation, without any sags or high spots.
- C. The pipe shall be supported within the casing by the use of hardwood blocks spaced radially around the pipe and secured together so that they remain firmly in place. The spacing of such blocks longitudinally in the casing pipe shall not be greater than 10 feet.
- D. Fill the void between the carrier pipe and casing pipe with grout under roadways and sand under railroads. Measures shall be taken by the Contractor to prevent floatation and other movement of the pipe as the grout or sand is filling the void.
- E. Close the ends of the casing with 4-inch brick walls.

3.08 SHEETING REMOVAL

Remove sheeting used for shoring from the shaft and off the job site. The removal of sheeting, shoring and bracing shall be done in such a manner as not to endanger or damage either new or existing new or existing structures, private or public properties and also to avoid cave-ins or sliding in the banks.

END OF SECTION

SECTION 02 0271 - 1

PART 1 – GENERAL

1.01 WORK INCLUDED

The work covered by this Section includes furnishing all labor, equipment and materials required to furnish and install rip rap as specified herein and as shown on the Drawings.

1.02 RELATED WORK

- A. Division 2: Site Work

PART 2 - PRODUCTS

2.01 ROCK RIP RAP

- A. Rock rip rap shall be constructed using sound, dense, durable stones, or rock fragments, free from cracks, pyrite intrusions and other structural defects. Stones which will be used with mortar shall be free from dirt, oil, or other material that might prevent good adhesion with the mortar. Stones with a laminated structure shall be avoided. Field stones shall not be used as a source of rock for rip rap. Only rock that has been approved by the Engineer shall be used for rip rap.
- B. When the crushed aggregate is subjected to five alternations of the sodium sulfate soundness test, the weighted percentage of loss shall be not more than 12 percent.
- C. Shape of the stones shall be generally rectangular or cubic. Flat or elongated stones having a small dimension less than 1/3 of the large dimension shall not be used.
- D. At least 35 percent of the stones or rock fragments for plain rock rip rap shall weigh 125 pounds or more. The sizes of the stones shall be well graded from the smaller to the larger, with the largest stones being a maximum of two cubic feet in size.
- E. At least 90 percent of the stones or rock fragments for hand placed rock rip rap shall weigh 100 pounds or more and shall be not less than 12 inches long, 12 inches deep, and 8 inches wide.

SECTION 02 0271 - 2

PART 3 - EXECUTION

3.01 CREEK CROSSINGS

- A. Rip rap shall be installed at all creek and storm drain crossings where shown or required by the Engineer in accordance with the Drawing details and specifications. The dimensional width of rip rap material at creek or storm drain crossings shall be equal to the trench width cut to install the pipe line plus 6 feet.
- B. Installation of rip rap shall be kept up as closely as possible with the progress of pipe laying so as to perform the work in a uniform workmanlike manner.

3.02 CONSTRUCTION METHODS

- A. Unless otherwise shown or specified, plain rock rip rap shall be placed using a crane and clamshell or other suitable equipment approved by the Engineer. The rock shall be placed as nearly as practicable in final position using powered equipment. If necessary, larger rocks shall be worked up to the surface when the material on the surface does not meet the weight specification or when the voids next to the foundation material are too large.
- B. The quantity of small stones shall be kept as low as possible, sufficient only to fill the voids between the larger stones. Care shall be taken that this small material is well distributed throughout the mass and not allowed to segregate or form pockets of small stone. All bridging shall be broken down. Large interstices, or open channels, or voids shall be filled by chinking or otherwise manipulating the stones.
- C. When rip rap is to be built on existing rip rap, special care shall be taken to provide positive anchorage of the new rip rap to the existing rip rap.
- D. The finished rip rap surface shall in general conform to the slope lines shown on the Drawings. No objectionable, hazardous, or unsightly projections above the general plane surface will be permitted.
- E. The main stones shall be thoroughly chinked and filled with the smaller stones by throwing them over the surface in any manner that is practicable for the smaller stones to fill the voids. This work shall continue with the

SECTION 02 0271 - 3

progress of the construction. Tamping of the stones will not be required if the stones have been placed in a reasonable and satisfactory manner.

- F. Knapping of the stones will not be required except stone protruding more than 4 inches above what is considered the normal surface of the stones, in which case these stones shall be broken down to come within 4 inches of the normal surface.

END OF SECTION

TEMPORARY EROSION AND SEDIMENT CONTROL

SECTION 02 0276 - 1

PART 1 - GENERAL REQUIREMENTS

1.01 DESCRIPTION

- A. The work specified in this Section consists of providing, maintaining and removing temporary erosion and sedimentation controls as necessary.
- B. Temporary erosion controls include, but are not limited to, grassing, mulching, netting, and watering, and reseeding on-site surfaces and spoil and borrow area surfaces and providing interceptor ditches at ends of berms and at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by the Owner, City and State.
- C. Temporary sedimentation controls include, but are not limited to, silt fencing, silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained.
- D. Provide effective temporary erosion and sediment control measures during construction or until final controls become effective.
- E. Erosion, Sedimentation and Pollution Control shall be performed in accordance with Georgia's NPDES Permit No. GAR100000 and as detailed in the drawings.

1.02 WORK SPECIFIED IN OTHER SECTIONS

- A. Excavation, Backfill, Fill and Grading for Pipe: Section 02221.
- B. Seeding: Section 02486.
- C. Silt Fence: Section 02542.

1.03 REFERENCE DOCUMENTS

- A. Georgia Building Code.
- B. Any Soil Erosion and Sediment Control Ordinances in force by the local Government.
- C. State of Georgia, Department of Transportation, Standard Specifications.

TEMPORARY EROSION AND SEDIMENT CONTROL

SECTION 02 0276 - 2

PART 2 - PRODUCTS

2.01 EROSION CONTROL

- A. Seeding
- B. Sodding
- C. Netting - fabricated of material acceptable to the Owner.

2.02 SEDIMENTATION CONTROL

- A. Bales - clean, seedfree cereal hay type.
- B. Netting - fabricated of material acceptable to the Owner.
- C. Filter stone - No. 57 - crushed stone.

PART 3 - EXECUTION

3.01 EROSION CONTROL

- A. Minimum procedures for grassing are:
 - 1. Scarify slopes to a depth of not less than 6" and remove large clods, rock, stumps, roots larger than 1/2" in diameter and debris.
 - 2. Sow seed within 24 hours after the ground is scarified with either mechanical seed drills or rotary hand seeders.
 - 3. Apply mulch loosely and to a thickness of between 3/4" and 1-1/2".
 - 4. Apply netting over mulched areas of sloped surfaces.
 - 5. Roll and water seeded areas in a manner which will encourage sprouting of seeds and growing of grass. Reseed areas which exhibit un-satisfactory growth. Backfill and seed eroded areas.

3.02 SEDIMENTATION CONTROL

- A. Install and maintain silt fencing, silt dams, traps, barriers and appurtenances as shown on the approved descriptions and working drawings. Hay bales which deteriorate and filter stone which is dislodged shall be replaced.

3.03 PERFORMANCE

TEMPORARY EROSION AND SEDIMENT CONTROL

SECTION 02 0276 - 3

- A. Should any of the temporary erosion and sediment control measures employed fail to produce results which comply with the requirements of the State, immediately take whatever steps are necessary to correct the deficiency.

3.04 MONITORING, REPORTING AND RETENTION OF RECORDS

Contractor shall monitor, report and retain records as required by the GA NPDES Permit No. GAR100000. Attached to the end of this section are the minimal reports which should be performed and maintained. The following are the attached reports:

- A. Erosion and Sedimentation Inspection and Maintenance Reports
- B. Daily Rainfall Monitoring Report
- C. Stormwater Monitoring Data

END OF SECTION

Erosion & Sedimentation Inspection and Maintenance Report

To be completed every 7 days AND within 24-hours of a qualifying rainfall event of 0.5-inches or more.

Project: _____

Time/date of last rainfall: _____ Amount of last rainfall: _____ inches

Inspector: _____ Date: _____ Time: _____

Describe the most recent land disturbance/phase of the project: _____

Date of the most recent disturbance: _____

Weather: Cold Mild Hot Clear Cloudy Rain Windy

Erosion Control:

- | | | | | | |
|----------------------------|-------------------------------|------------------------------|------------------------------------|--------------------------------------|--------------------------------|
| 1. Construction Exit: | <input type="checkbox"/> Good | <input type="checkbox"/> N/A | <input type="checkbox"/> Deficient | <input type="checkbox"/> Redress | <input type="checkbox"/> Other |
| 2. Silt Fence: | <input type="checkbox"/> Good | <input type="checkbox"/> N/A | <input type="checkbox"/> Deficient | <input type="checkbox"/> Remove Silt | <input type="checkbox"/> Other |
| 3. Sediment Traps: | <input type="checkbox"/> Good | <input type="checkbox"/> N/A | <input type="checkbox"/> Deficient | <input type="checkbox"/> Remove Silt | <input type="checkbox"/> Other |
| 4. Sediment Ponds: | <input type="checkbox"/> Good | <input type="checkbox"/> N/A | <input type="checkbox"/> Deficient | <input type="checkbox"/> Remove Silt | <input type="checkbox"/> Other |
| 5. Outlet Protection: | <input type="checkbox"/> Good | <input type="checkbox"/> N/A | <input type="checkbox"/> Deficient | <input type="checkbox"/> Remove Silt | <input type="checkbox"/> Other |
| 6. Temporary Ground Cover: | <input type="checkbox"/> Good | <input type="checkbox"/> N/A | <input type="checkbox"/> Deficient | <input type="checkbox"/> Remove Silt | <input type="checkbox"/> Other |
| 7. Permanent Vegetation: | <input type="checkbox"/> Good | <input type="checkbox"/> N/A | <input type="checkbox"/> Deficient | <input type="checkbox"/> Remove Silt | <input type="checkbox"/> Other |

Other Erosion Control Comments: _____

Has Silt Left the Site: Yes Not Apparent N/A

Drainage:

- | | | | |
|----------------------------|-------------------------------|------------------------------|------------------------------------|
| Detention Pond Grade: | <input type="checkbox"/> Good | <input type="checkbox"/> N/A | <input type="checkbox"/> Deficient |
| Detention Pond Outlets: | <input type="checkbox"/> Good | <input type="checkbox"/> N/A | <input type="checkbox"/> Deficient |
| Detention Pond Vegetation: | <input type="checkbox"/> Good | <input type="checkbox"/> N/A | <input type="checkbox"/> Deficient |

Other Drainage Comments: _____

Other Additional Notes: _____

Deficiencies:

Is this site in compliance? Y or N If not, complete the following information for each deficiency.

1. Deficiency(ies):	Location: _____	Code: I M GC
Corrective actions:		

2. Deficiency(ies):	Location: _____	Code: I M GC
Corrective actions:		

3. Deficiency(ies):	Location: _____	Code: I M GC
Corrective actions:		

4. Deficiency(ies):	Location: _____	Code: I M GC
Corrective actions:		

Required under the EPD NPDES Construction Permit for sites between 5 and 250 acres.

Photo document deficiencies and retain in permanent file.
Include site map identifying location of all deficiencies.
Return original reports to construction site file and copy in
Permanent office file.

Codes: I Immediate – Must be corrected in 24 hours.
M Minor – Must be corrected within 72 hours.
GC General Condition – Must be maintained monthly.

Please contact _____ for questions regarding this report.

**REINFORCED CONCRETE
PIPE FOR STORM DRAINS**

SECTION 02 0433 - 1

PART 1 - GENERAL

1.01 SCOPE OF WORK

Furnish all labor, materials, equipment and incidentals necessary to install reinforced concrete pipe and fittings as shown on the drawings and required by the Specifications.

1.02 SHOP DRAWINGS

Submit shop drawings showing piping and drainage structure layout and details of reinforcement, joint and method of construction and installation of reinforced concrete pipe, specials, and fittings required.

1.03 RELATED WORK

- A. Section 02221: Excavation, Backfill, Fill and Grading for Pipe
- B. Section 02999: Miscellaneous Work and Clean-up
- C. Division 3: Concrete

PART 2 - PRODUCTS

2.01 REINFORCED CONCRETE PIPE

- A. Except as otherwise specified within, pipe shall conform to ASTM Standard Specifications for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe, Designation C76, Class III, Wall B. The tabulated reinforcement given in the tables in ASTM Standard C76 shall be the minimum required.

**REINFORCED CONCRETE
PIPE FOR STORM DRAINS**

SECTION 02 0433 - 2

- B. The pipe shall be capable of withstanding construction equipment loading which may be encountered during the progress of work. Any pipe damage during construction operations shall be promptly and satisfactorily repaired.
- C. Non-air-entraining Portland cement conforming to ASTM Specification C150, Type I shall be used, except as otherwise approved in writing. The use of a non-bleeding, water-reducing, dispersing agent may be permitted subject to the specific approval. The use of any other admixture will not be permitted.
- D. Fine aggregate shall consist of washed inert natural sand conforming to the requirements of ASTM Specification C33, except for gradation, with a maximum loss of 5% when subjected to 5 cycles of the soundness test using magnesium sulfate.
- E. Coarse aggregate shall consist of well-graded crushed stone or washed gravel conforming to the requirements of ASTM Specification C33, with a maximum loss of 5% when subjected to 5 cycles of the soundness test using magnesium sulfate.
- F. The 28-day compressive strength of the concrete, as indicated by cores cut from the pipe shall be not less than 4,000 psi. The pipe interior shall comprise a continuous integral cement skin and shall be smooth and even, free from roughness, projections, indentations, offsets or irregularities. The concrete mass shall be dense and uniform. The average absorption shall not exceed 5.3%. Reinforcement shall be circular for all concrete pipe. Reinforcement in the bell and spigot shall be adequate to prevent damage to concrete during shipping, handling and installation. Cores indicating reinforcing steel having less than 85% bond shall be cause for rejection of the lot of pipes.
- G. The pipe shall be clearly marked as required by ASTM C76. The markings may be at either end of the pipe for the convenience of the manufacturer, but for any one size shall always be at the same end of

**REINFORCED CONCRETE
PIPE FOR STORM DRAINS**

SECTION 02 0433 - 3

each pipe length. Pipe shall not be shipped until compressive strength of the concrete has attained 3,000 psi and not before 5 days after manufacture and/or repaired, whichever is the longer.

- H. Pipes shall have a minimum laying length of approximately 8', except for closure and other special pieces. The length of the incoming and outgoing concrete pipe at each structure shall not exceed 4', except where the joint is cast flush with the exterior wall of the structure. Maximum laying length shall not exceed 16', but the installation of 16' lengths will depend upon the ability of the Contractor to handle such lengths of pipe. In deep sheeted trenches comply with trench width requirements, maintain the integrity of the sheeting and avoid disturbance to adjacent ground. If in the opinion of the Owner's Representative the use of 16' lengths is impracticable, shorter lengths shall be used.
- I. The quality of all materials and the finished pipe shall be subject to inspection and approval of a representative of the Owner. Such inspection may be made at both places, and the pipe shall be subject to rejection at any time because of failure to meet any of the specification requirements, even though sample pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the job at once.
- J. At the time of inspection, the pipe will be carefully examined for compliance with the appropriate ASTM and project specification, and inspected for general appearance, dimension, "scratch-strength", blisters, cracks, roughness, soundness, and other features. All pipes will be checked for soundness by being tapped and scratched over a reasonable portion of the area, at least once on every 20 sq. inches of pipe surface. The surface shall be dense and close-textured. Cores shall also serve as a basis for rejection of pipe, particularly if lamination or poor bond of reinforcement is apparent.

**REINFORCED CONCRETE
PIPE FOR STORM DRAINS**

SECTION 02 0433 - 4

- K. The manufacturer shall inspect all pipe joints for out-of-roundness and pipe ends for squareness. The manufacturer shall furnish a notarized affidavit stating all pipes meet the requirements of ASTM C76, these specifications, and the joint design with respect to square ends and out-of-round joint surfaces.
- L. Unsatisfactory or damaged pipe will be either permanently rejected or returned for minor repairs. Only that pipe actually conforming to the specifications and accepted will be listed for approval, shipment and payment. Approved pipe will be so stamped or stenciled on the inside before it is shipped. All pipe which has been damaged after delivery will be rejected, and if such pipe already has been laid in the trench, it shall be acceptably repaired, if permitted, or removed and replaced.
- M. Pits, blisters, rough spots breakage and other imperfections may be repaired, subject to the approval of the Owner's Representative, after demonstration by the manufacturer that strong permanent repairs result. Repairs shall be carefully inspected before final approval. Non-shrink cement mortar used for repairs shall have a minimum compressive strength of 6,000 psi at the end of 7 days and 7,000 psi at the end of 28 days, when tested in 3" cylinders store in the standard manner. Epoxy mortar may be utilized for repairs.

2.02 JOINTS FOR CONCRETE PIPE

- A. Joints for concrete pipe shall be the tongue and groove or bell and spigot type of joint with provisions for using a round rubber "O-Ring" gasket in recess in the spigot end of the pipe. The bevel on the bell of the pipe shall be between 1-1/2 degree and 2-1/2 degree and the annular open spaced at the gasket when the joint is made up and pipes are centered in line shall not exceed 1/8". The faces of pipe in contact with the gasket shall be true, and free of irregularities. Joints for drain pipe may be made with mortar.
- B. The round rubber "O-Ring" gaskets for either joint shall conform to ASTM C443 Specifications for joints for Circular Concrete Sewer and Culvert Pipe using rubber gaskets.

PART 3 - EXECUTION

**REINFORCED CONCRETE
PIPE FOR STORM DRAINS**

SECTION 02 0433 - 5

3.01 LAYING REINFORCED CONCRETE PIPE FOR DRAINS

- A. Bell and spigot pipe joints shall be made by caulking all around with twisted jute of proper size to give proper alignment of the pipe. Inner surfaces of abutting sections shall be flush and on a smooth grade. Brush and wet the jointing surfaces and fill the annular opening with mortar to a minimum depth of 2", sufficient to form a bead around the outside face of the bell.
- B. Mortar for jointing shall consist of one part Portland cement and two parts sand, using a minimum amount of water-sufficient to make a workable mortar.
- C. Joints shall be immediately protected from freezing or excessive drying by covering with earth, burlap or other approved material.

3.02 CLEANING

At the conclusion of the work, thoroughly clean all of the new pipe lines by flushing with water or other means to remove all dirt, stones, pieces of wood or other material which may have entered during the construction period. Debris cleaned from the lines shall be removed from the lowest outlet. If, after this outlet cleaning, obstructions remain, they shall be removed.

END OF SECTION

SECTION 02 0444 - 1

PART 1 - GENERAL

1.01 APPLICABLE PUBLICATIONS

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. Federal Specifications(Fed. Spec.):

FF-P-101E	Padlocks & Am 2
RR-F-191J/GEN	Fencing, Wire and Post, Metal(and Gages, Chain-Link Fence Fabric, and Accessories) (General Specifications)
RR-F-191/1C	Fencing, Wire and Post, Metal (Chain-Link Fence Fabric) (Detail Specification)
RR-F-191/2C	Fencing, Wire and Post, Metal (Chain-Link Fence Gates) (Detail Specification)
RR-F-191/3C	Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces) (Detail Specification)
RR-F-191/4C	Fencing, Wire and Posts, Metal (Chain-Link Fence Accessories) (Detail Specification)

B. American Society for Testing and Materials (ASTM) Publication:

C 94-86	Ready-Mixed Concrete
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SECTION 02 0444 - 2

1.02 SUBMITTALS

- A. Shop Drawings: Submit shop drawings or catalog cuts showing all fencing components and details of fencing, gates, post tops, [barbed wire and extension arms] [barbed tape and wire and extension arms,] tension bands and bars, sleeves, ties, and clips. These drawings or cuts shall be accompanied by a lay-out drawing showing spacing of posts and location of gate, corner, end, and pull posts.
- B. Certificates of Conformance: Submit certificates from the manufacturer attesting that all materials meet requirements specified herein.
- C. Tests: Test for [spelter coat gage for zinc coating] [thickness of polyvinyl chloride (PVC) coating] [chemical composition and thickness of aluminum alloy coating] shall be performed on each shipment of fencing.

1.03 DELIVERY, STORAGE, AND PROTECTION

Deliver materials to the site in an undamaged condition. Store materials off the ground to provide protection against oxidation caused by ground contact.

PART 2 - PRODUCTS

2.01 FABRIC, GATES, POSTS, TOP RAILS, BRACES, AND ACCESSORIES

Fed. Spec. RR-F-191/Gen and detailed specifications as referenced herein.

- A. Concrete: [ASTM C 94, 3000 psi compressive strength at 28 days, using 3/4-inch maximum size aggregate. Site mixed concrete will be acceptable. Grout shall consist of one part cement to three parts clean, well-graded sand, and the minimum amount of water required to produce a workable mix.] [As specified in Section "Cast-In-Place Concrete."]
- B. Fabric: Fed. Spec. RR-F-191/1; Type [I, zinc-coated steel, 9-gage coated wire size] [II, aluminum-coated steel, 9-gage coated wire size] [III, aluminum alloy, 6-gage wire size] [IV, PVC coated steel, with minimum 9-gage wire core]. Mesh size shall be 2-inch. [Minimum weight of zinc for Type I zinc-coated steel shall be [1.2] [2.0] ounces per square foot of uncoated wire.] Selvage shall be [knuckled at one selvage and twisted and

FENCE, CHAIN LINK

SECTION 02 0444 - 3

barbed at the other] [twisted and barbed at both selvages] [knuckled at both selvages]. Height of fabric shall be as indicated.

- C. Gates: Fed.Spec. RR-F-191/2; Type(s) [I, single swing] [II, double swing] [III, single cantilever sliding, wheel sliding] [IV, double cantilever sliding] [V, single overhead sliding] [VI, double over-head sliding] [VII, vertical lift] [VIII, special]. Shape and size of the gate frame shall be [as indicated] [_____]. Framing and bracing members shall be [round or square] of [steel or aluminum alloy]. [Steel member finish shall be [zinc coated] [PVC coated]. Gate fabric shall be as specified herein for chain-link fencing fabric. Special gate frames shall be as [as indicated] [_____]. [Gate leaves more than 8 feet wide shall have intermediate members as necessary to provide rigid construction, free from sag or twist.] [Gate leaves less than 8 feet wide shall have truss rods or intermediate braces.] Attach gate fabric to the gate frame by method standard with the manufacturer, except that welding will not be permitted. Arrange padlocking latches to be accessible from both sides of the gate regardless of latching arrangement.
1. Latches, Hinges, Stops, Keepers, and Accessories: [PVC-coated.] [Zinc-coated steel, with weight of zinc-coating not less than [1.2] [2.0] ounces per square foot.]
 - a. Single Gate Latches: [Fork type.] [Plunger bar type of full gate height.] [Gravity drop bar type with positive locking features.]
 - b. Double Gate Latches: [Fork type with center drop rod.] [Plunger bar type of full gate height arranged to engage the gate stop.] [A positive locking gravity device.]
 2. Padlocks: Fed. Spec. FF-P-101, [Type EPB, 1 3/4-inch size, with chain.] [_____].
- D. Posts [,Top Rails,] and Braces: Fed. Spec. RR-F-191/3, [zinc-coated steel] [vinyl-coated steel] (aluminum alloy). Minimum size of [top rails and] braces shall be as listed in Fed. Spec. RR-F-191/3 for each class and grade.
1. Posts: Class [1, steel pipe, Grade A] [or] [2, aluminum pipe] [or] [3, formed steel sections] [or] [6, steel square sections] [or] [7, aluminum square sections].
 2. Braces: Class [1, steel pipe, Grade A] [2, aluminum pipe]. [3. Top Rails: Class [1, steel pipe, Grade A] [2, aluminum pipe].]

FENCE, CHAIN LINK

SECTION 02 0444 - 4

- E. Accessories: Fed. Spec. RR-F-191/4, [zinc-coated steel] [aluminum-coated steel or aluminum alloy] [PVC coated].

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: Install fencing to line and grade indicated. Fencing shall conform to the applicable details shown. In lieu of accessory details shown, approved types standard with the manufacturer may be provided.
- B. Grading: Establish a graded fence line prior to the installation of fencing. The grade shall be such that [a maximum] [an approximate] clearance of 2 inches between the fence fabric and the ground shall be held along the line of the fence. The ground along the line of the fence shall be solid, and dirt fill used to establish the fence line shall be thoroughly compacted. Clear the fence line of all trees, brush, or other obstacles that will interfere with the fencing.
- C. Excavation: Excavate for concrete embedded items to dimensions specified in Table "I", except in bedrock. If bedrock is encountered before reaching the required depth, continue the excavation to the depth in Table "I" or 18 inches into the bedrock, whichever is less, and shall be a minimum of 2 inches larger in diameter than the outside diameter of the post. Clear post holes of loose material. Dispose of waste material on the work site, as directed.

TABLE I

<u>Types of Post</u>	<u>Fabric Height</u>	<u>Hole Diameter</u>	<u>Hole Depth</u>	<u>Post Embedment</u>
Line and Terminal	3'-0" to 4'-0"	6"	26"	24"
Line and Terminal	5'-0"	8"	32"	30"
Line and Terminal	6'-0" to 9'-0"	12"	38"	36"
Line and Terminal	10'-0" to 12'-0"	18"	38"	36"
Line and Terminal	13'-0" to 18'-0"	24"	42"	40"

- D. Posts:

FENCE, CHAIN LINK

SECTION 02 0444 - 5

1. Post Spacing: Space posts at intervals not to exceed 10 feet center to center. Space posts as necessary for the size of gate openings. Straight runs between braced posts shall not exceed 500 feet.
 2. Post Setting: Set posts plumb. After the posts have been set, fill holes with concrete, except that where bedrock is encountered fill the holes with grout. Compact concrete to eliminate voids and crown to shed water. Work grout into holes to eliminate voids and crown to shed water. Allow concrete and grout to set a minimum of 72 hours before further work is done on posts.
 3. Posts Set in Concrete Slabs: Set into zinc-coated sleeves, previously set in the concrete slab, to a minimum depth of 12 inches. Set posts plumb and fill sleeve joints with lead or other approved material. Set posts for support of removable fence sections into sleeves that provide a tightsliding joint and hold the posts in aligned and plumbed positions without the use of lead or setting material.
 4. Terminal Posts, Including End, Corner, Gate and Pull Posts: Set and space as specified herein- before, brace to the nearest post with a horizontal brace used as a compression member, and a diagonal truss rod and truss tightener used as a tension member. Consider changes in direction of fence line of 30 degrees or more as corners. Use pull posts at all abrupt changes in grade.
- E. Tension Wire[s]: Install prior to the installation of chain-link fabric and pull taut. Install bottom tension wire on all fences, and place within 8 inches of the bottom of the fabric line. [Install top tension wire on fences where top rail is not required and place within 8 inches of the top of the fabric line.]
- F. Fabric: Set [approximately] [not more than] 2 inches above the ground, and install on the side of the fence as directed. Cut fabric at all terminal posts and attach each span independently thereon. Pull fabric taut and secure to each supporting post. Fastening to terminal posts shall be at 15 inches maximum intervals using stretcher bars and stretcher bar bands or other approved devices standard with the manufacturer. Rolls of fence fabric to be joined shall have a strand of fabric woven through the ends of rolls to form a continuous mesh.

FENCE, CHAIN LINK

SECTION 02 0444 - 6

- [G. Extension (Supporting) Arms: Install arms as recommended by the manufacturer. In addition to manufacturer's standard connections, permanently fasten arms to posts to prevent easy removal with hand tools. Studs driven by low-velocity powder-actuated tools may be used with steel, wrought iron, ductile iron, or malleable iron. Studs driven by any powder-actuated tool will not be used with gray iron or other material that may be fractured.]
- [H. Barbed Wire: Install on arms above fence posts, and on arms or end frame extensions above gates. Pull each strand taut, and secure to each arm or end frame extension in a manner recommended by the manufacturer.]
- I. Fastening: All fastening and hinge hardware shall be secured in place by peening or welding to allow proper operation of components, but to prevent disassembly of fencing or removal of gates. Fastenings, hardware, and all other connections which have been peened or welded shall be covered with a heated re-galvanizing alloy.
- [J. Top Rails: Install prior to chain-link fabric and pass through intermediate post tops to form a continuous brace from end to end of each stretch of fence. Join top rails with expansion couplings spaced to adequately allow for expansion and contraction of fence. Attach top rail to each gate, pull, brace, corner and end post.]

3.02 CLEANUP

Remove waste fencing materials and other debris from the fencing site.

3.03 GROUNDING FOR FENCING

Ground as [indicated] [specified in Section entitled, "_____"].

END OF SECTION

SECTION 02 0486 - 1

PART 1 - GENERAL

1.01 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment and incidentals necessary and place seed and maintain all seeded areas as shown on the Drawings and as specified herein including all areas disturbed by the Contractor's operations.

1.02 RELATED WORK

- A. Section 02100: Site Preparation
- B. Section 02221: Earth Excavation and backfill including the stockpiling of topsoil

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Fertilizer shall be a complete commercial fertilizer. It shall be delivered to the site in the original unopened containers each showing the manufacturer's guaranteed analysis. Store fertilizer so that when used it shall be dry and free flowing.
- B. Lime shall be ground limestone containing not less than 85 percent calcium and magnesium carbonates.
- C. Seed shall be from the same or previous year's crop; each variety of seed shall have a percentage of germination not less than 90, a percentage purity of not less than 85, and shall have not more than one percent weed content.
- D. The mixture for lawn areas shall consist of seed proportioned by weight as indicated on the drawings.
- E. Seed shall be delivered in sealed containers bearing the dealer's guaranteed analysis.