



**CITY OF GRIFFIN
12TH STREET CULVERT REPLACEMENT**

GRIFFIN, GEORGIA

*PROJECT MANUAL AND SPECIFICATIONS
BOOK 2 – PROJECT MANUAL AND SPECIFICATIONS*

Prepared for
CITY OF GRIFFIN

APRIL 2017

Project No. 16054.00

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This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

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These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order

following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
2. a preliminary Schedule of Submittals; and
3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 Intent

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 Reference Standards

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 Reporting and Resolving Discrepancies

A. Reporting Discrepancies:

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
 1. A Field Order;
 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
 3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments*:

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to

be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 Contractor's Insurance

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:
1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
 2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
 3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
 2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other

and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:
1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *“Or-Equal” Items:* If in Engineer’s sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an “or-equal” item, in which case review and approval of the proposed item may, in Engineer’s sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
 - 3) it has a proven record of performance and availability of responsive service.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
2. *Substitute Items:*
 - a. If in Engineer’s sole discretion an item of material or equipment proposed by Contractor does not qualify as an “or-equal” item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
 - b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
 - c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
 - d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and

- c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
 - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and
 - 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for

making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

- 1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
 3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
 - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
 - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
 - E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
 - F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

- a. Submit number of Samples specified in the Specifications.
- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

- C. *Submittal Procedures:*

- i. Before submitting each Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

- c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 - 1. observations by Engineer;
 - 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. use or occupancy of the Work or any part thereof by Owner;
 - 5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
 - 6. any inspection, test, or approval by others; or
 - 7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of

or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 Related Work at Site

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
1. written notice thereof will be given to Contractor prior to starting any such other work; and
 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 Coordination

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and

tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents

or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
 - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 - 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 - 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start

of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
 2. approve the Claim; or
 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel

employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:*
 - 1. Contractor agrees that:
 - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance:*
 - 1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 Change of Contract Price

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:
 - 1. a mutually acceptable fixed fee; or
 - 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

- b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
- c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
- d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
- e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 Notice of Defects

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 Access to Work

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 Tests and Inspections

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 3. as otherwise specifically provided in the Contract Documents.

- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. repair such defective land or areas; or
 - 2. correct such defective Work; or
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute

resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees,

Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 Schedule of Values

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 Progress Payments

A. Applications for Payments:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications:

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

- d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment:

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or
 - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any

adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
 2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:
 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or

suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
 3. Contractor's repeated disregard of the authority of Engineer; or
 4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
 2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation

will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
 - 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agrees with the other party to submit the Claim to another dispute resolution process; or
 - 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

Defined Terms

The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract have the meanings assigned to them in the General Conditions.

S.C.-2.01 **Delivery of Bonds and Evidence of Insurance:**

Delete paragraph and caption of paragraph 2.01 of the General Conditions in its entirety and insert the following in its place:

Delivery of Bonds and Certifications of Insurance:

2.01 When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds and Certifications of Insurance as CONTRACTOR may be required to furnish in accordance with paragraphs 5.01 and 5.04.

S.C.-2.02 **Copies of Documents:**

Delete paragraph 2.02 of the General Conditions in its entirety and insert the following in its place:

2.02 OWNER shall furnish to CONTRACTOR up to six copies of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the ENGINEER's cost of reproduction.

S.C.-2.03 **Commencement of Contract Times; Notice to Proceed:**

Amend the last sentence of paragraph 2.03 of the General Conditions by striking out the word "sixtieth" and adding the words "ninetieth" and as so amended paragraph 2.03 remains in effect.

S.C.-2.05 Before Starting Construction:

Add a new paragraph immediately after paragraph 2.05A of the General Conditions which is to read as follows:

2.05A.1 Before any work at the site is started which is governed by the Rules and Regulations of the Construction Industry Licensing Board of Georgia (O.C.G.A. 43-14 & 121-2), CONTRACTOR shall inform himself of those rules and regulations and qualifications for licensure, and if requested, shall deliver proof of compliance to the OWNER and ENGINEER.

S.C.-3.01 Intent:

Add a new paragraph immediately after paragraph 3.01A of the General Conditions which is to read as follows:

3.01A.1 The Drawings are intended to conform and agree with the Specifications; if, however, discrepancies occur, the ENGINEER will decide which shall govern. Special specifications stated on the Drawings govern that particular piece of Work and have equal weight and importance as the printed specifications. In the event of any discrepancies between the Drawings and the figures written thereon, the figures are to be taken as correct.

S.C.-4.01 Availability of Lands:

Add the following paragraph immediately after paragraph 4.01A of the General Conditions which is to read as follows:

4.01A.1 The OWNER has endeavored to obtain all lands, rights-of-way and easements as indicated in the Contract Documents; however, delays obtaining such lands may occur. If the OWNER is unable to obtain lands as indicated in the Contract Documents, the OWNER will notify the CONTRACTOR of those lands which are differing from those indicated in the Contract Documents, and will inform the CONTRACTOR of those areas where lands are available.

4.01A.2 The Engineer has applied for all known applicable permits relating to this project. It is not anticipated that any delays will result as a result of not obtaining any permit relating to the Work; however, Contractor should note that some limited portion of the land may not be available and should be prepared to make modifications to the project work sequencing if delays to the permit process occur. Engineer will inform Contractor immediately upon notification of these delays.

S.C.-5.01 Performance, Payment and Other Bonds:

Change the first sentence of paragraph 5.01A of the General Conditions by deleting the words "amount at least equal to" and substituting the words "amount at least equal to **110 percent of**"; and

Change the second sentence of paragraph 5.01A of the General Conditions (which begins with "These Bonds") by deleting the words "one year" and substituting "two years", and as amended, paragraph 5.01A remains in effect.

S.C.-5.04 Liability Insurance Requirements:

The limits of liability for the insurance required by paragraph 5.04 of the General Conditions shall provide the following coverages for not less than the following amounts or greater where required by Laws and Regulations:

5.04A.1 and 5.4A.2 Workers' Compensation, etc. under paragraphs 5.04A.1 and 5.04A.2 of the General Conditions:

- | | | |
|-----|--|--|
| (1) | State: | Statutory |
| (2) | Applicable Federal
(e.g. Longshoreman's): | Statutory |
| (3) | Employer's Liability: | \$1,000,000 per occurrence
\$1,000,000 per person |

5.04A.3, 5.04A.4 and 5.04A.5. Contractor's Liability Insurance under paragraphs 5.04A.3 through 5.04A.5 of the General Conditions which shall also include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Contractor:

- | | | |
|-----|--|--------------------|
| (1) | General Aggregate
(Except Products -- Completed Operations | <u>\$1,000,000</u> |
| (2) | Products -- Completed Operations Aggregate | <u>\$1,000,000</u> |
| (3) | Personnel and Advertising
Injury (Per Person/Organization) | <u>\$1,000,000</u> |
| (4) | Each Occurrence
(Bodily Injury and Property Damage) | <u>\$1,000,000</u> |
| (5) | Property Damage liability insurance will provide Explosion, Collapse and Underground coverages where applicable. | |
| (6) | Excess Liability
General Aggregate | <u>\$3,000,000</u> |
| | Each Occurrence | <u>\$1,000,000</u> |

5.04A.6 Automobile Liability:

(1) Bodily Injury:

<u>\$1,000,000</u>	Each Person
<u>\$1,000,000</u>	Each Accident

Property Damage:

<u>\$1,000,000</u>	Each Accident
--------------------	---------------

or

(2) Combined Single Limit (Bodily Injury and Property Damage):

<u>\$1,000,000</u>	Each Accident
--------------------	---------------

S.C.-5.04B Contractual Endorsement

The Contractual Liability coverage required by paragraph 5.04B.4 of the General Conditions shall provide coverage for not less than the following amounts:

- | | |
|--|--------------------|
| (1) General Aggregate | <u>\$1,000,000</u> |
| (2) Each Occurrence
(Bodily Injury and Property Damage) | <u>\$1,000,000</u> |

S.C.-5.04B.1 Additional Insureds

Additional insureds on all insurance shall be listed as follows: City of Griffin, City of Griffin Public Works and Utilities; Paragon Consulting Group, Inc.

Additional insured on all insurance shall be notified directly in writing by insurance provider a minimum of 45 days prior to any change or potential cancellation in policy. Insurance carrier shall acknowledge this requirement in writing to Engineer prior to issuance of Notice to Proceed.

S.C.-6.02 **Labor; Working Hours:**

Add the following language at the end of the last sentence of paragraph 6.02B of the General Conditions:

This written consent given after prior written notice to ENGINEER, relates to having access to the work at all times, in advance of when it is in progress. Any Work performed by the CONTRACTOR after regular working hours, on Sundays or Legal Holidays shall be performed without additional expense to the OWNER.

S.C.-6.06

Add the following 2 paragraphs after paragraph 6.06B:

6.06B.1 Within five (5) days after Bid opening, apparent successful Bidder and any other Bidder so requested, shall submit to Owner a list revealing identity of all Subcontractors, suppliers and any other persons and organizations (including those who furnish the principal items of material and equipment). Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualifications for each such Subcontractor, supplies, person or organization if requested by Owner. Owner or Engineer, who after due investigation, has reasonable objection to any proposed Subcontractor or supplier or other person or organization, may before Notice to Award is given, request apparent successful Bidder to submit an acceptable substitute, in which case apparent successful Bidder shall submit an acceptable substitute, that Bidder's price will be increased (or decreased) by the difference in cost occasioned by such substitution and Owner may consider such price adjustment in evaluating Bids and make the contract award.

6.06B.2 If the apparent successful Bidder declines to make any such substitution, Owner may award the contract to the next lowest Bidder that proposes to use acceptable Subcontractors, suppliers and other persons and organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, supplier, other person or organization listed and to whom Owner or Engineer does not make written objection prior to the giving of Notice of Award will be deemed acceptable to Owner and Engineer, subject to revocation of such acceptance after the effective date of the Agreement.

S.C.-6.09 Laws and Regulations:

Add a new paragraph immediately after paragraph 6.09C of the General Conditions which is to read as follows:

6.09D CONTRACTOR shall perform those duties as they relate to Section 36-82-104 of the Official Code of Georgia Annotated, and shall file the Notice of Commencement, and Notice to Contractor. CONTRACTOR shall provide OWNER and ENGINEER with proof of having performed these duties before any progress payments or final payment shall be considered due and payable to the CONTRACTOR.

S.C. 12.04 – 12.07 Change of Contract Price; Change of Contract Time

Add the following Subparagraphs after Subparagraph 12.03 of the General Conditions:

12.04 In the event the Contractor shall be delinquent in respect to compliance with the time limits established in the construction progress schedule (not due to any of the causes indicated in Paragraph 12.03 and 12.05), he shall, within seven days after receipt of written demand of the Owner, COMMENCE WORKING NOT LESS THAN A TWELVE-HOUR DAY AND NOT LESS THAN SIX DAYS A WEEK UNTIL SUCH TIME AS HE

SHALL HAVE BROUGHT THE AMOUNT OF WORK IN PLACE INTO COMPLIANCE WITH THE CONSTRUCTION PROGRESS SCHEDULE. Fulfillment of this requirement as to overtime work (hereinafter referred to as "recovery of lost time required of the Contractor for his breach of the covenant as to time) shall not relieve the Contractor from liability for breach of the covenant as to time (See Article 3 (Contract Times) of The Agreement Between Owner and Contractor (AG-1). For account of recovery of lost time required of the Contractor for his breach of the covenant as to time, the Contractor shall be entitled to no claim against the Owner for any payment, repayment, reimbursement, remittance, remuneration, compensation, profit, cost, overhead, expense, loss expenditure, allowance, charge, demand, hire, wages, salary, tax, cash, assessment, price, money, bill, statement, dues, recovery, restitution, benefit, recoupment, exaction, injury or damages.

12.05 The Contractor agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will insure full completion thereof within the time called for in the Contract Documents. It is expressly understood and agreed that the Contractor has considered all contingencies and factors affecting his ability to perform all the work within this time, including among others, delays caused by bad weather (as detailed in 12.09 below) and other possible delays caused by the industrial conditions prevailing in this locality, and after consideration of these factors, he had made an allowance for such factors before agreeing to completion date specified in the Contract Documents, and does further agree that all things considered, such completion date is a reasonable time for completion of all Work to be performed hereunder, without the need for any extension of time for any reason.

12.06 Completion time will not be extended for normal bad weather. The time for completion as stated in the Contract Documents includes due allowance for calendar days on which work cannot be performed. For the purpose of this Contract, the Contractor agrees that he may expect to lose calendar days due to weather in accordance with the following table:

Jan. 10 days	May 8 days	Sep. 7 days
Feb. 9 days	June 8 days	Oct. 6 days
Mar. 9 days	July 11 days	Nov. 7 days
Apr. 8 days	Aug. 9 days	Dec. 8 days

Also, the Contractor agrees that the measure of extreme weather during the period covered by this Contract shall be the number of days in excess of those shown for each month in the table above, in which precipitation exceeded .10 inch and the average temperature failed to exceed 40 degrees F., averaged from the Georgia Experiment Station weather station in Griffin, Georgia. This is the same source of data used to determine normal weather losses. If the total accumulated number of calendar days lost to weather, from the start of work until the completion of project exceeds that total accumulated number to be expected for the same period from the table above, time for completion will be extended by the number of calendar days needed to include the excess number of calendar days lost. Request for extension in contract time shall be done as specified in change order request procedures.

12.07 No change in Contract Sum will be authorized because of adjustments of Contract

Time due to Owner's acceptance of Contract Claims for adjustments to Time due to abnormal weather conditions.

S.C.-13.07 Correction Period:

Change the first line of paragraph 13.07A from "If within one year after the date of Substantial" to read as follows: "If within two years after the date of Substantial", and as amended paragraph 13.07A remains in effect.

S.C.-14.02 Progress Payments:

Amend the third word of the first sentence in paragraph 14.02A.1 of the General Conditions by striking out the word "20" and adding the word "thirty" and as so amended paragraph 14.02A.1 remains in effect.

The submittal schedule for payment shall be as follows:

1. Contractor submits **individual pay request for each project** on 10th of the current month for work previously done and not invoiced.
2. Engineer reviews and sends recommended pay request (either as submitted by Contractor or revised) to Owner by 17th of current month.
3. Owner pays pay request (either as recommended by Engineer or revised) to Contractor by 10th of following month.

Delete section 14.02.C1 of the General Conditions in its entirety and insert the following in its place:

1. Within 30 days of receipt of pay request that is approved by Engineer, Owner shall make payment to Contractor.
2. If Engineer rejects pay request as inaccurate or lacking documentation, the payment schedule will reset at the time Contractor resubmits the revised pay request.

S.C.-16.01

Delete paragraph 16.01C3 of the General Conditions in its entirety and insert the following in its place:

gives written notice to the other party of their intent to submit the Claim to the Superior Court of Spalding County, Georgia.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Work consists of:

Demolition of approximately 31 linear feet of concrete arch culvert, installation of 48 linear feet of a new 9 foot span aluminum arch culvert and related aluminum wing walls, relocation of approximately 57 linear feet of 6 inch water main, installation of 117 linear feet of guard rail, and paving related to the project.

1. Project Location: City of Griffin, Spalding County, Georgia
(Lyndon Street & Melrose Street Bridge)

Owner: City of Griffin
100 South Hill Street
Griffin, Georgia 30223

- B. Contract Documents, JUNE 2017 were prepared for the Project by Paragon Consulting Group Inc., 118 North Expressway in Griffin, Georgia 30223.
- C. The Work will be constructed under a single prime contract, based on available funds.

1.3 CONTRACTOR USE OF PREMISES

- A. General: During the construction period the Contractor shall have use of the designated construction area but must coordinate construction with City of Griffin Public Works Director.

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 01010

SECTION 01026 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for unit prices.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Modification Procedures" for procedures for submitting and handling Change Orders.
 - 2. Division 2 Section "Earthwork" for procedures for measurement and payment for rock excavation.

1.3 DEFINITIONS

- A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if the estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. The Bid Tabulation identifies all payment items for this project. No additional bid items will be added at any time during this project. Contractor should add any cost that is determined not to be associated with a specific bid item within the General Conditions item as a portion of the lump sum pay item.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

- D. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this work measured, at the Owner's expense, by an independent surveyor.

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 01026

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

SECTION 01027 - APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
 - 1. Schedules: The Contractor's Construction Schedule and Submittal Schedule are specified in Division 1 Section "Submittals."

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.
- B. Coordination: Contractor shall coordinate preparation of its Schedule of Values for its part of the Work with preparation of the Contractors' Construction Schedule. This Schedule of Values should be consistent with the Unit Price Schedule submitted as a part of the Bid Form.
 - 1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
 - a. Contractor's Construction Schedule.
 - b. Application for Payment forms, including Continuation Sheets.
 - c. List of subcontractors.
 - d. List of products.
 - e. List of principal suppliers and fabricators.
 - f. Waiver of Mechanics Lien.
 - 2. Submit the Schedule of Values to the Engineer at the earliest possible date but no later than 7 days before the date scheduled for submittal of the initial Applications for Payment.

C. Format and Content:

1. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of Work.
 - c. Name of subcontractor.
 - d. Change Orders (numbers) that affect value.
 - e. Dollar value.
 - 1) Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
2. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal lump sum line items amounts down into several line items.
3. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.
4. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment, purchased and stored on-site, but not yet installed.
5. Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete and correspond with the Bid Form. Include the total cost and proportionate share of general overhead and profit margin for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at the Contractor's option. Mobilization items will be considered complete when inspection of these items is deemed complete. Payment will be made when complete. The Schedule of Values needs to show a detailed breakdown of mobilization items. General Conditions items will be considered a pro-rated cost of the entire project. Payment will be made on General Condition items as a percentage of the entire completed project.
6. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Engineer and paid for by the Owner.
 - 1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.
- B. Payment-Application Times: The date for each progress payment is the 10th day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends 5 days prior to the date for each progress payment.
- C. Payment-Application Forms: Use EJCDC Document No. 1910-8-E (1990 Edition) as the form for Applications for Payment. An example is attached on the following pages.

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

CITY OF GRIFFIN
12TH STREET CULVERT REPLACEMENT
APPLICATION FOR PAYMENT NO. _____

APRIL 2017

To: _____ (OWNER)

From: _____ (CONTRACTOR)

Contract: _____

Project: _____

OWNER's Contract No. _____ ENGINEER's Project No. _____

For Work accomplished through the date of: _____

1. Original Contract Price: \$ _____
2. Net change by Change Orders and Written Amendments (+ or -): \$ _____
3. Current Contract Price (1 plus 2): \$ _____
4. Total completed and stored to date: \$ _____
5. Retainage (per Agreement):
 _____% of completed Work: \$ _____
 _____% of stored material: \$ _____
 Total Retainage: \$ _____
6. Total completed and stored to date less retainage (4 minus 5): \$ _____
7. Less previous Application for Payments: \$ _____
8. **DUE THIS APPLICATION (6 MINUS 7):** \$ _____

Accompanying Documentation:

CONTRACTOR'S Certification:

The undersigned CONTRACTOR certifies that (1) all previous progress payments received from OWNER on account of Work done under the Contract referred to above have been applied on account to discharge CONTRACTOR's legitimate obligations incurred in connection with Work covered by prior Applications for Payment numbered 1 through _____ inclusive; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to OWNER at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to OWNER indemnifying OWNER against any such Lien, security interest or encumbrance); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and not defective.

Dated _____ CONTRACTOR

By: _____

State of _____

County of _____

Subscribed and sworn to before me this _____

day of _____, _____

Notary Public

My Commission expires: _____

Payment of the above AMOUNT DUE THIS APPLICATION is recommended.

Dated _____ ENGINEER

By: _____

EJCDC No. 1910-8-E (1996 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specification Institute.

APPLICATION FOR PAYMENT

INSTRUCTIONS

A. GENERAL INFORMATION

The sample form of Schedule of Values is intended as a guide only. Many projects require a more extensive form with space for numerous items, descriptions of Change Orders, identification of variable quantity adjustments, summary of materials and equipment stored at the site and other information. It is expected that a separate form will be developed by Engineer and Contractor at the time Contractor's Schedule of Values is finalized. Note also that the format for retainage must be changed if the Contract permits (or the law provides), and Contractor elects to deposit securities in lieu of retainage. Refer to Article 14 of the General Conditions for provisions concerning payments to Contractor.

B. COMPLETING THE FORM

The Schedule of Values, submitted and approved as provided in paragraphs 2.05.B.3 and 2.07 of the General Conditions, should be reproduced as appropriate in the space indicated on the Application for Payment form. Note that the cost of materials and equipment is often listed separately from the cost of installation. Also, note that each Unit Price is deemed to include Contractor's overhead and profit.

All Change Orders affecting the Contract Price should be identified and included in the Schedule of Values as required for progress payments.

The form is suitable for use in the Final Application for Payment as well as for Progress Payments; however, the required accompanying documentation is usually more extensive for final payment. All accompanying documentation should be identified in the space provided on the form.

C. LEGAL REVIEW

All accompanying documentation of a legal nature, such as Lien waivers, should be reviewed by an attorney, and Engineer should so advise Owner.

- D. Application Preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The Engineer will return incomplete applications without action.
1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
- E. Transmittal: Submit 5 signed and notarized original copies of each Application for Payment to the Engineer with all corresponding attachments including waivers of lien, etc. by a method ensuring receipt within 24 hours.
- F. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics lien from every entity who is lawfully entitled to file a mechanics lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
 2. When an application shows completion of an item, submit final or full waivers.
 3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Delays: Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the application.
 - a. Submit final Applications for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit waivers of lien on forms (pre-approved by Engineer), and executed in a manner, acceptable to the Owner.
- G. Initial Application for Payment: Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, include the following:
1. List of subcontractors.
 2. List of principal suppliers and fabricators.
 3. Schedule of Values.
 4. Contractor's Construction Schedule (preliminary if not final).
 5. Schedule of unit prices.
 6. Submittal Schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.

9. Copies of building permits.
 10. Copies of authorizations and licenses from governing authorities for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction meeting.
 13. Certificates of insurance and insurance policies.
 14. Performance and payment bonds.
 15. Initial settlement survey and damage report, if required.
 16. Contractor's Affidavit of Payment to Subcontractors
- H. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
 2. Administrative actions and submittals that shall precede or coincide with this application include:
 - a. Occupancy permits and similar approvals.
 - b. Warranties (guarantees) and maintenance agreements.
 - c. Final cleaning.
 - d. Application for reduction of retainage and consent of surety.
 - e. Advice on shifting insurance coverages.
 - f. List of incomplete Work, recognized as exceptions to Engineer's Certificate of Substantial Completion.
 - g. Contractor Lien Waiver.
 - h. Subcontractor/Supplier Lien Waivers.
- I. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
1. Completion of Project closeout requirements.
 2. Completion of items specified for completion after Substantial Completion.
 3. Ensure that unsettled claims will be settled.
 4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
 5. Transmittal of required Project construction records to the Owner.
 6. Certified property survey.
 7. Proof that taxes, fees, and similar obligations were paid.
 8. Removal of temporary facilities and services.
 9. Removal of surplus materials, rubbish, and similar elements.

1.5 REQUIRED SUBMITTALS

A. The following submittals must accompany the initial Application for Payment:

1. Contractor's Affidavit of Payment to Subcontractors with an attached list of subcontractors and/or suppliers due monies for work and/or materials for the period covered by the Application for Payment.

B. The following submittals must accompany each Application for Payment following the initial:

1. Contractor's Affidavit of Payment to Subcontractors with an attached list of subcontractors and suppliers due monies for work and/or materials for the period covered by the Application for Payment.
2. Contractor Lien Waiver matching the amount paid by the Owner from the previous Application for Payment.
3. Subcontractor/Supplier Lien Waivers matching the amounts on the list attached to the Contractor's Affidavit of Payment to Subcontractors covering the prior Application for Payment.

C. Failure to present the required submittals with each Application for Payment will result in payment by the Owner being delayed until all submittal requirements are met.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01027

SECTION 01035 - MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing contract modifications.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
 - 1. Division 1 Section "Unit Prices" for administrative requirements governing use of unit prices.
 - 2. Division 1 Section "Applications for Payment" for administrative procedures governing Applications for Payment.

1.3 CHANGE ORDER PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: The Engineer will issue a detailed description of proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal requests issued by the Engineer are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
 - 2. Within 2 days of receipt of a proposal request, submit an estimate of cost necessary to execute the change to the Engineer for the Owner's review.
 - a. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

- c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.
- B. Contractor-Initiated Proposals: When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Engineer. The submittal of this proposal shall in no way constitute authority to stop work in progress or proceed with proposed modifications.
1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 2. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
- C. Proposal Request Form: Use EJCDC Document No. 1910-8-B (1996 Edition) for Change Order Proposal Requests.

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

CITY OF GRIFFIN
12TH STREET CULVERT REPLACEMENT

APRIL 2017

CHANGE ORDER

No. _____

DATE OF ISSUANCE _____

EFFECTIVE DATE _____

OWNER _____
 CONTRACTOR _____
 Contract: _____
 Project: _____
 OWNER's Contract No. _____ ENGINEER's Contract No. _____
 ENGINEER _____

You are directed to make the following changes in the Contract Documents:
 Description:

Reason for Change Order:

Attachments: (List documents supporting change)

CHANGE IN CONTRACT PRICE:
Original Contract Price \$ _____
Net Increase (Decrease) from previous Change Orders No. ___ to ___: \$ _____
Contract Price prior to this Change Order: \$ _____
Net increase (decrease) of this Change Order: \$ _____
Contract Price with all approved Change Orders: \$ _____

CHANGE IN CONTRACT TIMES:
Original Contract Times: Substantial Completion: _____ Ready for final payment: _____ (days or dates)
Net change from previous Change Orders No. ___ to ___ No. ___: Substantial Completion: _____ Ready for final payment: _____ (days)
Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____ (days or dates)
Net increase (decrease) this Change Order: Substantial Completion: _____ Ready for final payment: _____ (days)
Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____ (days or dates)

RECOMMENDED:
By: _____
ENGINEER (Authorized Signature)

APPROVED:
By: _____
OWNER (Authorized Signature)

ACCEPTED:
By: _____
CONTRACTOR (Authorized Signature)

Date: _____

Date: _____

Date: _____

EJCDC 1910-8-B (1996 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specifications Institute.

CHANGE ORDER

INSTRUCTIONS

A. GENERAL INFORMATION

This document was developed to provide a uniform format for handling contract changes that affect Contract Price or Contract Times. Changes that have been initiated by a Work Change Directive must be incorporated into a subsequent Change Order if they affect Price or Times.

Changes that affect Contract Price or Contract Times should be promptly covered by a Change Order. The practice of accumulating Change Orders to reduce the administrative burden may lead to unnecessary disputes.

If Milestones have been listed in the Agreement, any effect of a Change Order thereon should be addressed.

For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Times, a Field Order should be used.

B. COMPLETING THE CHANGE ORDER FORM

Engineer normally initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by Contractor, or requests from Owner, or both.

Once Engineer has completed and signed the form, all copies should be sent to Owner or Contractor for approval, depending on whether the Change Order is a true order to the Contractor or the formalization of a negotiated agreement for a previously performed change. After approval by one contracting party, all copies should be sent to the other party for approval. Engineer should make distribution of executed copies after approval by both parties.

If a change only applies to price or to times, cross out the part of the tabulation that does not apply.

1.4 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: When the Owner and the Contractor disagree on the terms of a Proposal Request, the Engineer may issue a Work Directive Change EJDC Document No. 1910-8-F (1996 Edition). The Work Directive Change instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. The Work Directive Change contains a complete description of the change in the Work. It also designates the method to be followed to determine change in the Contract Sum or Contract Time.

WORK CHANGE DIRECTIVE

No. _____

DATE OF ISSUANCE _____

EFFECTIVE DATE _____

OWNER _____

CONTRACTOR _____

Contract: _____

Project: _____

OWNER's Contract No. _____

ENGINEER's Project No. _____

You are directed to proceed promptly with the following change(s):

Description:

Purpose of Work Change Directive:

Attachments: (List documents supporting change)

If OWNER or CONTRACTOR believe that the above change has affected Contract Price any Claim for a Change Order based thereon will involve one or more of the following methods as defined in the Contract Documents.

Method of determining change in
Contract Price:

- Unit Prices
- Lump Sum
- Cost of the Work _____

Estimated increase (decrease) in Contract Price:
\$ _____

If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

Estimated increase (decrease) in Contract Times:

Substantial Completion: _____ days;

Ready for final payment: _____ days.

RECOMMENDED:

AUTHORIZED:

ENGINEER

OWNER

By: _____

By: _____

EJCDC No. 1910-8-F (1996 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specifications Institute.

WORK CHANGE DIRECTIVE

INSTRUCTIONS

A. GENERAL INFORMATION

This document was developed for use in situations involving changes in the Work which, if not processed expeditiously, might delay the Project. These changes are often initiated in the field and may affect the Contract Price or the Contract Times. This is not a Change Order, but only a directive to proceed with Work that may be included in a subsequent Change Order.

For supplemental instructions and minor changes not involving a change in the Contract Price or the Contract Times a Field Order should be used.

B. COMPLETING THE WORK CHANGE DIRECTIVE FORM

Engineer initiates the form, including a description of the items involved and attachments.

Based on conversations between Engineer and Contractor, Engineer completes the following:

METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT PRICE: Mark the method to be used in determining the final cost of Work involved and the estimated net effect on the Contract Price. If the change involves an increase in the Contract Price and the estimated amount is approached before the additional or changed Work is completed, another Work Change Directive must be issued to change the estimated price or Contractor may stop the changed Work when the estimated time is reached. If the Work Change Directive is not likely to change the Contract Price, the space for estimated increase (decrease) should be marked "Not Applicable".

Once Engineer has completed and signed the form, all copies should be sent to Owner for authorization because Engineer alone does not have authority to authorize changes in Price or Times. Once authorized by Owner, a copy should be sent by Engineer to Contractor. Price and Times may only be changed by Change Order signed by Owner and Contractor with Engineer's recommendation.

Paragraph 10.03.A.2 of the General Conditions requires that a Change Order be initiated and processed to cover any undisputed sum or amount of time for Work actually performed pursuant to this Work Change Directive.

Once the Work covered by this directive is completed or final cost and times are determined, Contractor should submit documentation for inclusion in a Change Order.

THIS IS A DIRECTIVE TO PROCEED WITH A CHANGE THAT MAY AFFECT THE CONTRACT PRICE OR CONTRACT TIMES. A CHANGE ORDER, IF ANY, SHOULD BE CONSIDERED PROMPTLY.

1. Documentation: Maintain detailed records on a time and material basis of work required by the Work Directive Change.
 - a. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

2. Change Order Procedures:
 - a. Upon the Owner's approval of a Proposal Request, the Engineer will issue a Change Order for signatures of the Owner and the Contractor on EJCDC 1910-8-B (1996 Edition).

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01035

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:

1. General project coordination procedures.
2. Conservation.
3. Coordination Drawings.
4. Administrative and supervisory personnel.
5. Cleaning and protection.

- B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Special Conditions" for scheduling specific portions of the Work.
2. Division 1 Section "Field Engineering" specifies procedures for field engineering services, including establishment of benchmarks and control points.
3. Division 1 Section "Project Meetings" for progress meetings, coordination meetings, and preinstallation conferences.
4. Division 1 Section "Submittals" for preparing and submitting the Contractor's Construction Schedule.
5. Division 1 Section "Contract Closeout" for coordinating contract closeout.

1.3 COORDINATION

- A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.

1. Priority should be placed on construction of the waterline as described in Section 01000 – Special Conditions.
 2. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 3. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
 4. Make provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of schedules.
 2. Installation and removal of temporary facilities.
 3. Delivery and processing of submittals.
 4. Progress meetings with Owner, other Contractors and future tenants.
 5. Project closeout activities.
- D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.
- 1.4 SUBMITTALS
- A. Coordination Drawings: Prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components.
1. Show the relationship of components shown on separate Shop Drawings.
 2. Indicate required installation sequences.
 3. Comply with requirements contained in Section "Submittals."

- B. Staff Names: At commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 GENERAL COORDINATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.2 CLEANING AND PROTECTION

- A. Clean and protect construction in progress. Apply protective covering where required to assure protection from damage or deterioration at Substantial Completion.
- B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period.
- C. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
1. Excessive static or dynamic loading.
 2. Excessively high or low temperatures.
 3. Thermal shock.
 4. Air contamination or pollution.
 5. Water or ice.
 6. Solvents.
 7. Chemicals.
 8. Heavy traffic.

CITY OF GRIFFIN
12TH STREET CULVERT REPLACEMENT

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9. Soiling, staining, and corrosion.
10. Rodent and insect infestation.
11. Combustion.
12. Contact between incompatible materials.
13. Destructive testing.
14. Excessive weathering.
15. Unprotected storage.
16. Improper shipping or handling.
17. Theft.
18. Vandalism.

END OF SECTION 01040

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

SECTION 01050 - FIELD ENGINEERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. General: This Section specifies administrative and procedural requirements for field-engineering services including, but not limited to, the following:

1. Land survey work.
2. Civil engineering services.
3. Damage surveys.
4. Geotechnical engineering and construction materials testing.
5. Topographic surveys for pay requests.

- B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Coordination" for procedures for coordinating field engineering with other construction activities.
2. Division 1 Section "Submittals" for submitting Project record surveys.
3. Division 1 Section "Contract Closeout" for submitting final property survey with Project Record Documents and recording of Owner-accepted deviations from indicated lines and levels.

1.3 SUBMITTALS

- A. Certificates: Submit a certificate signed by the land surveyor certifying the location and elevation of improvements.

- B. Final Record Drawing Source of Constructed Conditions: Submit 10 copies and electronic file of final improvements to include water main, joints, valve encasement, SSMH location and elevations, pipe materials, storm systems and utilities and final road elevations. Datum must be set to City of Griffin monuments located throughout the City of Griffin. The water line asbuilt and sewer asbuilt shall be shown on separate plans for submittal to the City of Griffin.

- C. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of "Submittals" and "Contract Closeout" Sections.

1.4 QUALITY ASSURANCE

- A. Surveyor Qualifications: Engage a land surveyor registered in the State of Georgia, to perform required land-surveying services.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Identification: The Owner will identify existing control points and property line corner stakes.
- B. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks, before proceeding to lay out the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
 - 1. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points or requirements to relocate reference points because of necessary changes in grades or locations.
 - 2. Promptly replace lost or destroyed Project control points. Base replacements on the original survey control points.
 - 3. Notify Engineer of the condition immediately.
- C. Establish and maintain a minimum of 5 permanent benchmarks on the site, referenced to data established by survey control points.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
- D. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction. Call Utilities Protection Center at 1-800-282-7411.

3.2 PERFORMANCE

- A. Work from lines and levels established by the property survey. Establish benchmarks and markers to set lines and levels at each stage of construction and elsewhere as needed to locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
 2. As construction proceeds, check every major element for line, level, and plumb.
- B. Surveyor's Log: Maintain a surveyor's log of control and other survey work. Make this log available for reference.
1. Record deviations from required lines and levels, and advise the Engineer when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
 2. On completion of site improvements for the Project as described in Section 01000 – Special Conditions, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and utilities.
- C. Site Improvements: Locate and lay out site improvements, including arch culvert, pavements, stakes for grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Existing Utilities: Furnish information necessary to adjust, move, or relocate existing structures, utility poles, lines, services, or other appurtenances located in or affected by construction. Coordinate with local authorities having jurisdiction.
- E. Final Boundary Survey: N/A
- F. Final Record Drawing Survey of Constructed Condition: Prepare a final topographic survey overlaid on the original topographic map and showing final boundary survey. Provide actual graded and improved items on the project. This survey should include all items such as drainage structures, paving conditions, graded areas, etc. It should be a complete survey and should be provided in .DWG format as an electronic file (AutoCAD 2008 or newer version). The water line asbuilt and sewer asbuilt shall be shown on separate plans for submittal to the City of Griffin.

END OF SECTION 01050

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:
 - 1. Preconstruction conferences.
 - 2. Progress meetings.

1.3 PRECONSTRUCTION CONFERENCE

- A. Schedule a preconstruction conference before starting construction, at a time convenient to the Owner and the Engineer, but no later than 5 days after execution of the Agreement. Hold the conference at the Project Site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
- B. Attendees: Authorized representatives of the Owner, Engineer, and their consultants; the Contractor and its superintendent; major subcontractors; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
- C. Agenda: Discuss items of significance that could affect progress, including, but not limited to, the following:
 - 1. Tentative construction schedule.
 - 2. Critical work sequencing.
 - 3. Designation of responsible personnel.
 - 4. Procedures for processing field decisions and Change Orders.
 - 5. Procedures for processing Applications for Payment.
 - 6. Distribution of Contract Documents.
 - 7. Submittal of Shop Drawings, Product Data, and Samples.
 - 8. Preparation of record documents.
 - 9. Use of the premises.

10. Parking availability.
11. Office, work, and storage areas.
12. Safety procedures.
13. First aid.
14. Security.
15. Housekeeping.
16. Working hours.

- D. Contractor should submit all documentation as described at the conference. *NOTE: No Notice To Proceed will be issued until documentation is submitted as outlined in Section 01027 – Application For Payment, Section 01200 – Project Meetings and Section 01300-Submittals.*

1.5 PROGRESS MEETINGS

- A. Conduct progress meetings at the Project Site at regular intervals. Notify the Owner and the Engineer of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.
- B. Attendees: In addition to representatives of the Owner and the Engineer, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.
1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.
 2. Review the present and future needs of each entity present, including the following:
 - a. Time.
 - b. Sequences.
 - c. Status of submittals.
 - d. Deliveries.
 - e. Access.
 - f. Site utilization.

- g. Hours of work.
 - h. Hazards and risks.
 - i. Housekeeping.
 - j. Quality and work standards.
 - k. Change Orders.
 - l. Documentation of information for payment requests.
- D. Reporting: No later than 3 days after each meeting, distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
- 1. Schedule Updating: Revise the Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01200

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including the following (dates due are shown in red):

1. Contractor's construction schedule. (prior to Notice to Proceed)
2. Submittal schedule.
3. Daily construction reports.
4. Shop Drawings. (prior to Notice to Proceed)
5. Product Data. (prior to Notice to Proceed)
6. Samples.
7. Quality assurance submittals.
8. Project meeting schedule.

- B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following (dates due are shown in red):

1. Permits. (prior to Notice to Proceed)
2. Applications for Payment. (10th of each month)
3. Performance and payment bonds. (prior to Notice of Award)
4. Insurance certificates and acknowledgement. (prior to Notice to Proceed)
5. List of subcontractors and suppliers. (prior to Notice to Proceed)
6. Contractor's Affidavit of Payment to Subcontractors. (with each Pay App.)
7. Contractor Lien Waivers. (with each Pay App. after No. 1)
8. Subcontractor/Supplier Lien Waivers. (with each Pay App. after No. 1)

- C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Special Conditions" for scheduling specific portions of the Work.

2. Division 1 Section "Applications for Payment" specifies requirements for submittal of the Schedule of Values.
3. Division 1 Section "Coordination" specifies requirements governing preparation and submittal of required Coordination Drawings.
4. Division 1 Section "Project Meetings" specifies requirements for submittal and distribution of meeting and conference minutes.
5. Division 1 Section "Quality Control" specifies requirements for submittal of inspection and test reports.
6. Division 1 Section "Contract Closeout" specifies requirements for submittal of Project Record Documents and warranties at project closeout.

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

- a. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

2. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.

- a. Allow 1 week for initial review. Allow additional time if the Engineer must delay processing to permit coordination with subsequent submittals.

- b. If an intermediate submittal is necessary, process the same as the initial submittal.

- c. Allow 2 weeks for reprocessing each submittal.

- d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer sufficiently in advance of the Work to permit processing.

- B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4 by 5 inches on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.

2. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of the Engineer.
 - d. Name and address of the Contractor.
 - e. Name and address of the subcontractor.
 - f. Name and address of the supplier.
 - g. Name of the manufacturer.
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Engineer using a transmittal form. The Engineer will not accept submittals received from sources other than the Contractor.

1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart-type, contractor's construction schedule. Submit within 7 days after "Notice of Award."
1. Provide a separate time bar for each significant construction activity including each "milestone" as described in Section 01000 "Special Conditions. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values."
 2. Within each time bar, indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
 3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
 4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.

5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.
 6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Engineer's procedures necessary for certification of Substantial Completion.
- B. Phasing: On the schedule, show how requirements for phased completion to permit Work by separate Contractors and partial occupancy by the Owner affect the sequence of Work.
- C. Work Stages: Indicate important stages of construction for each major portion of the Work, including submittal review, testing, and installation.
- D. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities. Show initial phase of work on the construction of the pad and truck access road.
- E. Cost Correlation: At the head of the schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of Work performed as of the dates used for preparation of payment requests.
1. Refer to Division 1 Section "Applications for Payment" for cost reporting and payment procedures.
- F. Distribution: Following response to the initial submittal, print and distribute copies to the Engineer, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- G. Schedule Updating: Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.5 SUBMITTAL SCHEDULE

- A. After development and acceptance of the Contractor's Construction Schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for submittal of the Contractor's Construction Schedule.

1. Coordinate Submittal Schedule with the list of subcontracts and the Schedule of Values, as well as the Contractor's Construction Schedule.
2. Prepare the schedule in chronological order. Provide the following information:
 - a. Scheduled date for the first submittal.
 - b. Related Section number.
 - c. Submittal category (Shop Drawings, Product Data, or Samples).
 - d. Name of the subcontractor.
 - e. Description of the part of the Work covered.
 - f. Scheduled date for resubmittal.
 - g. Scheduled date for the Engineer's final release or approval.

B. Distribution: Following response to the initial submittal, print and distribute copies to the Engineer, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

C. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.6 DAILY CONSTRUCTION REPORTS

A. Prepare a daily construction report recording the following information concerning events at the site, and submit duplicate copies to the Engineer at weekly intervals:

1. List of subcontractors at the site.
2. Approximate count of personnel at the site.
3. High and low temperatures, general weather conditions.
4. Accidents and unusual events.
5. Meetings and significant decisions.
6. Stoppages, delays, shortages, and losses.
7. Emergency procedures.
8. Orders and requests of governing authorities.
9. Change Orders received, implemented.
10. Partial Completions.
11. Substantial Completions authorized.

1.7 SHOP DRAWINGS

- A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
- B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:
 1. Dimensions.
 2. Identification of products and materials included by sheet and detail number.
 3. Compliance with specified standards.
 4. Notation of coordination requirements.
 5. Notation of dimensions established by field measurement.
 6. Initial Submittal: Submit one correctable, translucent, reproducible print and one blue- or black-line print for the Engineer's review. The Engineer will return the reproducible print.
 7. Initial Submittal: Submit 2 blue- or black-line prints for the Engineer's review. The Engineer will return one print.
 8. Final Submittal: Submit 3 blue- or black-line prints; submit 5 prints where required for maintenance manuals. The Engineer will retain 2 prints and return the remainder.
 9. Final Submittal: Submit 3 blue- or black-line prints and 2 additional prints where required for maintenance manuals, plus the number of prints needed by the Engineer for distribution. The Engineer will retain 2 prints and return the remainder.
 - a. One of the prints returned shall be marked up and maintained as a "Record Document."
 10. Do not use Shop Drawings without an appropriate final stamp indicating action taken.

1.8 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction. Product Data includes printed information, such as manufacturer's installation instructions.
 1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.

- e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
 3. Preliminary Submittal: Submit a preliminary single copy of Product Data where selection of options is required.
 4. Submittals: Submit 2 copies of each required submittal. The Engineer will retain one and will return the other marked with action taken and corrections or modifications required.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, and others required for performance of construction activities. Show distribution on transmittal forms.
 - a. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
 - b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.9 QUALITY ASSURANCE SUBMITTALS

- A. Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.
- B. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.

Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.
- C. Inspection and Test Reports: Requirements for submittal of inspection and test reports from independent testing agencies are specified in Division 1 Section "Quality Control."

1.10 ENGINEER'S ACTION

- A. Except for submittals for the record or information, where action and return is required, the Engineer will review each submittal, mark to indicate action taken, and return promptly.
 - 1. Compliance with specified characteristics is the Contractor's responsibility.
- B. Unsolicited Submittals: The Engineer will return unsolicited submittals to the sender without action.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01300

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for schedules and reports required for proper performance of the Work, including:

1. Preliminary construction schedule.
2. Contractor's construction schedule.
3. Schedule of inspections and tests.
4. Unit-price schedule.
5. Daily construction reports.
6. Material location reports.
7. Field correction reports.
8. Special reports.

- B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Special Conditions" for scheduling specific portions of the Work.
2. Division 1 Section "Applications for Payment" specifies requirements for submittal of the Schedule of Values.
3. Division 1 Section "Project Meetings" specifies requirements for submittal and distribution of meeting and conference minutes.
4. Division 1 Section "Quality Control" specifies requirements for submittal of inspection and test reports.

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of schedules and reports with performance of other construction activities.

1.4 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit a preliminary horizontal bar-chart-type construction schedule within 7 days after Notice of Award.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Prepare a comprehensive, fully developed, horizontal bar-chart-type, contractor's construction schedule. Base the schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of the Project.

- B. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by the following:

1. Requirements for achieving "milestones".
2. Requirements for phased completion.
3. Uninterruptible services.
4. Site restrictions.
5. Provisions for future construction.
6. Seasonal variations.
7. Environmental control.

- C. Work Stages: Use crosshatched bars to indicate important stages of construction for each major portion of the Work. Such stages include, but are not necessarily limited to, the following:

1. Milestones.
2. Subcontract awards.
3. Submittals.
4. Testing.

- D. Area Separations: Provide a separate time bar to identify each major area of construction for each major portion of the Work. For the purposes of this Article, a "major area" is a prioritized area of work or type of construction.

- E. Distribution: Following response to the initial submittal, print and distribute copies to the Engineer, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

- F. Schedule Updating: Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.6 UNIT-PRICE SCHEDULE

- A. Within 15 days of the date established for commencement of the Work, prepare and submit a unit-price schedule established in the Agreement. Follow item format as set forth in the Bid Form.
 - 1. Refer to Division 1 Section "Unit Prices" for a listing of categories of Work where unit prices are required.
 - 2. Refer to individual Specification Sections for portions of the Work that require establishment of unit prices. Methods of measurement and pricing are specified.
- B. Prepare the schedule in tabular form, including the following items and as used in the Bid Form:
 - 1. Name of the part of the Work.
 - 2. Related Specification Section.
 - 3. Name of subcontractor assigned.
 - 4. Unit of measurement.
 - 5. Price per unit.
 - a. Indicate whether established add prices are different from deduct prices.
- C. Distribution: Distribute schedule to the Owner, Engineer, and each party involved in performance Work where established unit prices could come into force and effect.

1.7 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at the site. Submit duplicate copies to the Engineer at weekly intervals:
 - 1. List of subcontractors at the site.
 - 2. List of separate contractors at the site.
 - 3. Approximate count of personnel at the site.
 - 4. High and low temperatures, general weather conditions. Explain any weather conditions that impact predetermined completion dates.
 - 5. Accidents.
 - 6. Meetings and significant decisions.
 - 7. Unusual events (refer to special reports).

8. Stoppages, delays, shortages, and losses.
9. Emergency procedures.
10. Orders and requests of governing authorities.
11. Change Orders received, implemented.
12. Substantial Completions authorized.

B. Material Location Reports: At weekly intervals, prepare a comprehensive list of materials delivered to and stored at the site. The list shall be cumulative, showing materials previously reported plus items recently delivered. Submit copies of the list to the Engineer at weekly intervals.

C. Field Correction Reports: When the need to take corrective action that requires a departure from the Contract Documents arises, prepare a detailed report. Include a statement describing the problem and recommended changes. Indicate reasons the Contract Documents cannot be followed. Submit a copy to the Engineer immediately.

1.8 SPECIAL REPORTS

A. General: Submit special reports directly to the Owner within one day of an occurrence. Submit a copy to the Engineer and other parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at the site, prepare and submit a special report. List the chain of events, persons participating, response by the Contractor's personnel, an evaluation of the results or effects and similar pertinent information. Advise the Owner in advance when such events are known or predictable.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01311

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality-control services.
- B. Quality-control services include inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by Engineer.
- C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.
- D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
 - 1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- E. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Submittals" specifies requirements for development of a schedule of required tests and inspections.

1.3 RESPONSIBILITIES

- A. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Owner's responsibility, the Owner will engage the services of a qualified independent testing agency to perform those services. Payment for these services will be made by Owner. Water main testing and chlorine will be provided by the Contractor and is included as a line item in this bid.
- B. Retesting: The Contractor is responsible for retesting where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.
1. The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated noncompliance with Contract Document requirements.
- C. Associated Services: Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:
1. Provide access to the Work.
 2. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
 3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
 4. Provide security and protection of samples and test equipment at the Project Site.
- D. Duties of the Testing Agency: The independent agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with the Engineer and the Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and tests.
1. The agency shall notify the Engineer and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
 3. The agency shall not perform any duties of the Contractor.
- E. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.
2. The contractor shall notify the Engineer at least 24 hours in advance of the necessity for testing services.

1.4 SUBMITTALS

- A. Unless the Contractor is responsible for this service, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Engineer. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test, or similar service through the Contractor.
1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
 2. Report Data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:
 - a. Date of issue.
 - b. Project title and number.
 - c. Name, address, and telephone number of testing agency.
 - d. Dates and locations of samples and tests or inspections.
 - e. Names of individuals making the inspection or test.
 - f. Designation of the Work and test method.
 - g. Identification of product and Specification Section.
 - h. Complete inspection or test data.
 - i. Test results and an interpretation of test results.
 - j. Ambient conditions at the time of sample taking and testing.
 - k. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
 - l. Name and signature of laboratory inspector.
 - m. Recommendations on retesting.

1.5 QUALITY ASSURANCE

- A. Qualifications for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, that are prequalified as complying with the American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in the types of inspections and tests to be performed.
1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with Contract Document requirements for Division 1 Section "Cutting and Patching."
- B. Protect construction exposed by or for quality-control service activities, and protect repaired construction.
- C. Repair and protection is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION 01400

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SECTION 01421 - REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

NOTE: MAJOR PORTIONS OF THIS SPECIFICATION MAY NOT APPLY TO THE SPECIFIC WORK AS DESCRIBED IN THE PROJECT. ITEMS THAT DO NOT APPLY ARE TO BE DISREGARDED.

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic contract definitions are included in the Conditions of the Contract.
- B. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings; or to other paragraphs or schedules in the Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference. Location is not limited.
- C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Engineer, requested by the Engineer, and similar phrases.
- D. "Approved": The term "approved," when used in conjunction with the Engineer's action on the Contractor's submittals, applications, and requests, is limited to the Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": The term "furnish" means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": The term "install" describes operations at the Project site including the actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.

- I. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
 2. Trades: Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
 3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
 - a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.
- J. "Project site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- K. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on the 16-division format and CSI/CSC's "MasterFormat" numbering system.
- B. Specification Content: These Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Section Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of the date of the Contract Documents.
- C. Conflicting Requirements: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to the Engineer for a decision before proceeding.
 1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Engineer for a decision before proceeding.
- D. Copies of Standards: Each entity engaged in construction on the Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source and make them available on request.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-producing organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the U.S.," which are available in most libraries.

F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following abbreviations and acronyms as referenced in the Contract Documents, mean the associated names. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association 900 19th St., NW, Suite 300 Washington, DC 20006 www.aluminum.org	(202) 862-5100
AABC	Associated Air Balance Council 1518 K St., NW, Suite 503 Washington, DC 20005 www.aabchq.com	(202) 737-0202
AAMA	American Engineering Manufacturers Association 1827 Walden Office Sq., Suite 104 Schaumburg, IL 60173-4268 www.aamanet.org	(847) 303-5664
AAN	American Association of Nurserymen (See ANLA)	
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol St., NW, Suite 249 Washington, DC 20001 www.aashto.org	(202) 624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 One Davis Dr. Research Triangle Park, NC 27709-2215 www.aatcc.org	(919) 549-8141
ABMA	American Bearing Manufacturers Association (Formerly: Anti-Friction Bearing Manufacturers Association) 1200 19th St., NW, Suite 300	(202) 429-5155

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	Washington, DC 20036-2401 www.abma-dc.org	
ABMA	American Boiler Manufacturers Association 950 North Glebe Rd., Suite 160 Arlington, VA 22203-1824 www.abma.com	(703) 522-7350
ACI	American Concrete Institute P.O. Box 9094 Farmington Hills, MI 48333-9094 www.aci-int.org	(248) 848-3700
ACIL	ACIL: The Association of Independent Scientific, Engineering, and Testing Firms 1629 K St., NW, Suite 400 Washington, DC 20006 www.acil.org	(202) 887-5872
ACPA	American Concrete Pipe Association 222 West Las Colinas Blvd., Suite 641 Irving, TX 75039-5423 www.concrete-pipe.org	(972) 506-7216
ADC	Air Diffusion Council 11 South LaSalle St., Suite 1400 Chicago, IL 60603	(312) 201-0101
AEIC	Association of Edison Illuminating Companies 600 N. 18th St. P.O. Box 2641 Birmingham, AL 35291-0992	(205) 250-2530
AFBMA	Anti-Friction Bearing Manufacturers Association (See ABMA)	
AFPA	American Forest and Paper Association (Formerly: National Forest Products Association) 1111 19th St., NW, Suite 800 Washington, DC 20036	(800) 878-8878 (202) 463-2700
AGA	American Gas Association 1515 Wilson Blvd. Arlington, VA 22209 www.aga.com	(703) 841-8400
AHA	American Hardboard Association 1210 W. Northwest Hwy Palatine, IL 60067-1897	(847) 934-8800
AHAM	Association of Home Appliance Manufacturers 20 N. Wacker Dr., Suite 1500 Chicago, IL 60606	(312) 984-5800

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	www.aham.org	
AI	Asphalt Institute Research Park Dr. P.O. Box 14052 Lexington, KY 40512-4052 www.asphaltinstitute.org	(606) 288-4960
AIA	The American Institute of Engineers 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	(202) 626-7300
AIA	American Insurance Association 1130 Connecticut Ave., NW, Suite 1000 Washington, DC 20036	(202) 828-7100
AIHA	American Industrial Hygiene Association 2700 Prosperity Ave., Suite 250 Fairfax, VA 22031	(703) 849-888
AISC	American Institute of Steel Construction One East Wacker Dr., Suite 3100 Chicago, IL 60601-2001	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute 1101 17th St., NW Washington, DC 20036-4700 www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction 7012 S. Revere Pkwy, Suite 140 Englewood, CO 80112 www.aitc-glulam.org	(303) 792-9559
ALA	American Laminators Association (See LMA)	
ALCA	Associated Landscape Contractors of America 12200 Sunrise Valley Dr., Suite 150 Reston, VA 20191 www.alca.org	(703) 620-6363
ALI	Associated Laboratories, Inc. P.O. Box 152837 1323 Wall St. Dallas, TX 75315	(214) 565-0593
ALSC	American Lumber Standards Committee P.O. Box 210 Germantown, MD 20875	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Dr.	(847) 394-0150

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Arlington Heights, IL 60004-1893
www.amca.org

ANLA	American Nursery and Landscape Association (Formerly: American Association of Nurserymen) 1250 Eye St., NW, Suite 500 Washington, DC 20005	(202) 789-2900
ANSI	American National Standards Institute 11 West 42nd St., 13th Floor New York, NY 10036-8002 www.ansi.org	(212) 642-4900
AOAC	AOAC International 481 N. Frederick Ave., Suite 500 Gaithersburg, MD 20877	(301) 924-7077
AOSA	Association of Official Seed Analysts 201 N. 8th St., Suite 400 P.O. Box 81152 Lincoln, NE 68501-1152	(402) 476-3852
APA	APA-The Engineered Wood Association (Formerly: American Plywood Association) P.O. Box 11700 Tacoma, WA 98411-0700 www.apawood.org	(206) 565-6600
APA	Engineerural Precast Association P.O. Box 08669 Fort Myers, FL 33908-0669	(941) 454-6989
API	American Petroleum Institute 1220 L St., NW, Suite 900 Washington, DC 20005-8029	(202) 682-8000
ARI	Air-Conditioning and Refrigeration Institute 4301 Fairfax Dr., Suite 425 Arlington, VA 22203 www.ari.org	(703) 524-8800
ARMA	Asphalt Roofing Manufacturers Association Center Park 4041 Powder Mill Rd., Suite 404 Calverton, MD 20705	(301) 231-9050
ASA	Acoustical Society of America 500 Sunnyside Blvd. Woodbury, NY 11797	(516) 576-2360
ASC	Adhesive and Sealant Council 1627 K St., NW, Suite 1000 Washington, DC 20006-1707	(202) 452-1500
ASCA	Engineerural Spray Coaters Association	(414) 273-3430

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230 W. Wells St., Suite 311
Milwaukee, WI 53203

ASCE	American Society of Civil Engineers-World Headquarters 1801 Alexander Bell Dr. Reston, VA 20191-4400 www.asce.org	(800) 548-2723 (703) 295-6000
ASHES	American Society for Healthcare Environmental Services - Division of the American Hospital Assoc. One North Franklin, Suite 2700 Chicago, IL 60606	(800) 424-2626 (312) 422-3860
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329-2305 www.ashrae.org	(800) 527-4723 (404) 636-8400
ASLA	American Society of Landscape Engineers 4401 Connecticut Ave., NW, 5th Floor Washington, DC 20008-2369 www.asla.org	(202) 686-2752
ASME	American Society of Mechanical Engineers 345 East 47th St. New York, NY 10017-2392 www.asme.org	(800) 434-2763 (212) 705-7722
ASPA	American Sod Producers Association (See TPI)	
ASPE	American Society of Plumbing Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake Village, CA 91362-3649	(805) 495-7120
ASQC	American Society for Quality Control 611 East Wisconsin, Ave. Milwaukee, WI 53201-3005 www.asqc.org	(800) 248-1946 (414) 272-8575
ASSE	American Society of Sanitary Engineering 28901 Clemens Rd. Westlake, OH 44145 www.asse-plumbing.org	(216) 835-3040
ASTM	American Society for Testing and Materials 100 Barr Harbor Dr. West Conshohocken, PA 19428-2959 www.astm.org	(610) 832-9500

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ATIS	Alliance for Telecommunications Industry Solutions (Formerly: Exchange Carriers Standards Association) 1200 G St., NW, Suite 500 Washington, DC 20005	(202) 628-6380
AWCI	Association of the Wall and Ceiling Industries--International 307 E. Annandale Rd., Suite 200 Falls Church, VA 22042-2433 www.awci.org	(703) 534-8300
AWCMA	American Window Covering Manufacturers Association (See WCMA)	
AWI	Engineerural Woodwork Institute 1952 Isaac Newton Sq. Reston, VA 20190 www.awinet.org	(703) 733-0600
AWPA	American Wood Preservers' Association 3246 Fall Creek Hwy, Suite 1900 Granbury, TX 76049-7979	(817) 326-6300
AWPB	American Wood Preservers' Bureau (This organization is now defunct.)	
AWS	American Welding Society 550 NW LeJeune Rd. Miami, FL 33126 www.amweld.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association 6666 W. Quincy Ave. Denver, CO 80235 www.awwa.org	(800) 926-7337 (303) 794-7711
BANC	Brick Association of North Carolina P.O. Box 13290 Greensboro, NC 27415-3290	(800) 622-7425 (910) 273-5566
BHMA	Builders Hardware Manufacturers Association 355 Lexington Ave., 17th Floor New York, NY 10017-6603	(212) 661-4261
BIA	Brick Institute of America 11490 Commerce Park Dr. Reston, VA 22091-1525 www.bia.org	(703) 620-0010
BIFMA	The Business and Institutional Furniture Manufacturer's Association 2680 Horizon Dr., SE, Suite A1 Grand Rapids, MI 49546-7500 www.bifma.com	(616) 285-3963

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CAGI	Compressed Air and Gas Institute c/o Thomas Associates, Inc. 1300 Sumner Ave. Cleveland, OH 44115-2851 www.taol.com/cagi	(216) 241-7333
CAUS	Color Association of the United States 409 W. 44th St. New York, NY 10036-4402	(212) 582-6884
CBM	Certified Ballast Manufacturers Association 1422 Euclid Ave., Suite 402 Cleveland, OH 44115-2094	(216) 241-0711
CCC	Carpet Cushion Council P.O. Box 546 Riverside, CT 06878-0546	(203) 637-1312
CDA	Copper Development Association Inc. 260 Madison Ave., 16th Floor New York, NY 10016-2401 www.copper.org	(800) 232-3282 (212) 251-7200
CFFA	Chemical Fabrics & Film Association, Inc. c/o Thomas Associates, Inc. 1300 Sumner Ave. Cleveland, OH 44115-2851 www.taol.com/cffa	(216) 241-7333
CGA	Compressed Gas Association 1725 Jefferson Davis Hwy, Suite 1004 Arlington, VA 22202-4102 www.cganet.com	(703) 412-0900
CGSB	Canadian General Standards Board Place du Portage Phase III, 6B1 11 Laurier St. Hull, Quebec K1A 1G6 CANADA www.pwgsc.gc.ca/cgsb	(819) 956-3500
	Mailing Address: Canadian General Standards Board Sales Centre Ottawa K1A 1G5 CANADA	(800) 665-2472 (819) 956-0425
CISCA	Ceilings and Interior Systems Construction Association 1500 Lincoln Hwy, Suite 202 St. Charles, IL 60174 www.cisca.org	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute	(423) 892-0137

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	5959 Shallowford Rd., Suite 419 Chattanooga, TN 37421	
CLFMI	Chain Link Fence Manufacturers Institute 9891 Broken Land Pkwy, Suite 300 Columbia, MD 21046	(301) 596-2584
CPPA	Corrugated Polyethylene Pipe Association 432 N. Superior St. Toledo, OH 43604	(800) 510-2772 (419) 241-2221
CRI	Carpet and Rug Institute 310 S. Holiday, Ave. Dalton, GA 30722-2048 www.carpet-rug.com	(800) 882-8846 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Rd. Schaumburg, IL 60173-4758 www.crsi.org	(847) 517-1200
CSSB	Cedar Shake and Shingle Bureau 515 116th Ave., NE, Suite 275 Bellevue, WA 98004-5294	(206) 453-1323
CTI	Ceramic Tile Institute of America 12061 West Jefferson Blvd. Culver City, CA 90230-6219	(310) 574-7800
CTI	Cooling Tower Institute P.O. Box 73383 Houston, TX 77273	(281) 583-4087
DASMA	Door and Access Systems Manufacturers Association, International (Formerly: National Association of Garage Door Manufacturers) c/o Thomas Associates, Inc. 1300 Sumner Ave. Cleveland, OH 44115-2851 www.taol.com/dasma	(216) 241-7333
DHI	Door and Hardware Institute (Formerly: National Builders Hardware Association) 14170 Newbrook Dr. Chantilly, VA 20151-2223 www.dhi.org	(703) 222-2010
DIPRA	Ductile Iron Pipe Research Association 245 Riverchase Pkwy East, Suite O Birmingham, AL 35244	(205) 988-9870
DLPA	Decorative Laminate Products Association (Dissolved in 1995 - Now part of KCMA.)	

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ECSA	Exchange Carriers Standards Association (See ATIS)	
EIA	Electronic Industries Association 2500 Wilson Blvd. Arlington, VA 22201	(703) 907-7500
EIMA	EIFS Industry Members Association 402 N. Fourth St., Suite 102 Yakima, WA 98901-2470 www.eifsfacts.com	(800) 294-3462 (509) 457-3500
EJMA	Expansion Joint Manufacturers Association 25 N. Broadway Tarrytown, NY 10591-3201	(914) 332-0040
ETL	ETL Testing Laboratories, Inc. (Now part of ITS)	
FCI	Fluid Controls Institute c/o Thomas Associates, Inc 1300 Sumner Ave. Cleveland, OH 44115-2851 www.taol.com/fci	(216) 241-7333
FCICA	Floor Covering Installation Contractors Association (Formerly: Floor Covering Installation Board) P.O. Box 948 Dalton, GA 30722-0948	(706) 226-5488
FGMA	Flat Glass Marketing Association (See GANA)	
FM	Factory Mutual System 1151 Boston-Providence Tnpk. P.O. Box 9102 Norwood, MA 02062-9102 www.factorymutual.com	(781) 762-4300
FTI	Facing Tile Institute c/o Stark Ceramics P.O. Box 8880 Canton, OH 44711	(330) 488-1211
GA	Gypsum Association 810 First St., NE, Suite 510 Washington, DC 20002 www.usg.com	(202) 289-5440
GANA	Glass Association of North America (Formerly: Flat Glass Marketing Association) 3310 SW Harrison St. Topeka, KS 66611-2279 www.glasswebsite.com/gana	(913) 266-7013

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GRI	Geosynthetic Research Institute 33rd and Lancaster Walk Rush Building, West Wing Philadelphia, PA 19104 www.gri-server.coe.drexel.edu	(215) 895-2343
HEI	Heat Exchange Institute c/o Thomas Associates, Inc. 1300 Sumner Ave. Cleveland, OH 44115-2851 www.taol.com/hei	(216) 241-7333
HI	Hydraulic Institute 9 Sylvan Way Parsippany, NJ 07054-3802	(201) 267-9700
HI	Hydronics Institute Division of Gas Appliance Manufacturers Association P.O. Box 218 35 Russo Pl. Berkeley Heights, NJ 07922 www.gamanet.org	(908) 464-8200
HMA	Hardwood Manufacturers Association (Formerly: Southern Hardwood Lumber Manufacturers Association) 400 Penn Center Blvd., Suite 530 Pittsburgh, PA 15235-5605 www.hardwood.org	(412) 829-0770
HPVA	Hardwood Plywood and Veneer Association 1825 Michael Farraday Dr. P.O. Box 2789 Reston, VA 22195-0789 www.hpva.org	(703) 435-2900
IAS	International Approval Services 8504 East Pleasant Valley Rd. Cleveland, OH 44131 www.iasapprovals.org	(216) 524-4990
IBD	Institute of Business Designers (Now part of IIDA)	
ICEA	Insulated Cable Engineers Association, Inc. P.O. Box 440 South Yarmouth, MA 02664	(508) 394-4424
IEC	International Electrotechnical Commission (Available from ANSI) 11 West 42nd St., 13th Floor New York, NY 10036-8002	(212) 642-4900
IEEE	Institute of Electrical and Electronics Engineers	(800) 678-4333 (212) 705-7900

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345 E. 47th St.
New York, NY 10017-2394
www.ieee.org

IESNA	illuminating Engineering Society of North America 120 Wall St., 17th Floor New York, NY 10005-4001 www.iesna.org	(212) 248-5000
IGCC	Insulating Glass Certification Council (Now part of ITS)	
IIDA	International Interior Design Association 341 Merchandise Mart Chicago, IL 60654-1104	(312) 467-1950
ILI	Indiana Limestone Institute of America Stone City Bank Building, Suite 400 Bedford, IN 47421	(812) 275-4426
IMSA	International Municipal Signal Association P.O. Box 539 165 E. Union St. Newark, NY 14513	(800) 723-4672 (315) 331-2182
INCE	Institute of Noise Control Engineering P.O. Box 3206, Arlington Branch Poughkeepsie, NY 12603	(914) 462-4006
IRI	Industrial Risk Insurers P.O. Box 5010 85 Woodland St. Hartford, CT 06102-5010	(860) 520-7300
ISA	ISA - International Society for Measurement and Control P.O. Box 12277 67 Alexander Dr. Research Triangle Park, NC 27709 www.isa.org	(919) 549-8411
ISS	Iron and Steel Society 410 Commonwealth Dr. Warrendale, PA 15086-7512 www.issource.org	(412) 776-1535
ISWA	Insect Screening Weavers Association P.O. Box 1018 Ossining, NY 10562	(914) 962-9052
ITS	Intertek Testing Services (Formerly: Inchcape Testing Services) P.O. Box 2040 3933 US Route 11 Cortland, NY 13045-7902	(800) 345-3851 (607) 753-6711

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www.itsglobal.com

KCMA	Kitchen Cabinet Manufacturers Association (Formerly: National Kitchen Cabinet Association) 1899 Preston White Dr. Reston, VA 22091-4326 www.kema.org	(703) 264-1690
LGSI	Light Gage Structural Institute c/o Loseke Technologies, Inc. P.O. Box 560746 The Colony, TX 75056	(972) 625-4560
LIA	Lead Industries Association, Inc. 295 Madison Ave. New York, NY 10017 www.leadinfo.com	(800) 422-5323 (212) 578-4750
LMA	Laminating Materials Association (Formerly: American Laminators Association) 116 Lawrence St. Hillsdale, NJ 07642-2730 www.lma.org	(201) 664-2700
LPI	Lightning Protection Institute 3335 N. Arlington Heights Rd., Suite E Arlington Heights, IL 60004-7700	(800) 488-6864 (847) 577-7200
MBMA	Metal Building Manufacturer's Association c/o Thomas Associates, Inc. 1300 Sumner Ave. Cleveland, OH 44115-2351 www.taol.com/mbma	(216) 241-7333
MCAA	Mechanical Contractors Association of America 1385 Piccard Dr. Rockville, MD 20850-4329	(301) 869-5800
MFMA	Maple Flooring Manufacturers Association 60 Revere Dr., Suite 500 Northbrook, IL 60062 www.maplefloor.com	(847) 480-9138
MFMA	Metal Framing Manufacturers Association (Formerly: Wood and Synthetic Flooring Institute) 401 N. Michigan Ave. Chicago, IL 60611	(312) 644-6610
MHI	Material Handling Institute (A Division of the Material Handling Industry) 8720 Red Oak Blvd., Suite 201 Charlotte, NC 28217-3992 www.mhi.org	(800) 345-1815 (704) 522-8644
MIA	Marble Institute of America	(614) 228-6194

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30 Eden Alley, Suite 301
Columbus, OH 43215
www.marble-institute.com

MIA	Masonry Institute of America 2550 Beverly Blvd. Los Angeles, CA 90057 www.masonryinstitute.org	(213) 388-0472
ML/SFA	Metal Lath/Steel Framing Association (A Division of the NAAMM) 8 South Michigan Ave., Suite 1000 Chicago, IL 60603	(312) 456-5590
MRCA	Midwest Roofing Contractors Association 4840 W. 15th St., Suite 1000 Lawrence, KS 66049	(800) 879-4448 (913) 843-4888
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry 127 Park St., NE Vienna, VA 22180-4602	(703) 281-6613
NAA	National Arborist Association P.O. Box 1094 Amherst, NH 03031-1094 www.natlarb.com	(800) 733-2622 (603) 673-3311
NAAMM	National Association of Engineerural Metal Manufacturers 8 South Michigan Ave., Suite 1000 Chicago, IL 60603 www.gss.net/naamm	(312) 456-5590
NAGDM	National Association of Garage Door Manufacturers (See DASMA)	
NAIMA	North American Insulation Manufacturers Association (Formerly: Thermal Insulation Manufacturers Association) 44 Canal Center Plaza, Suite 310 Alexandria, VA 22314 www.naima.org	(703) 684-0084
NAMI	National Accreditation & Management Institute, Inc. P.O. Box 366 207 S. Washington St. Berkeley Springs, WV 25411	(304) 258-5100
NAPA	National Asphalt Pavement Association NAPA Building 5100 Forbes Blvd. Lanham, MD 20706-4413	(301) 731-4748
NAPM	National Association of Photographic Manufacturers 550 Mamaroneck Ave.	(914) 698-7603

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NBHA	National Builders Hardware Association (See DHI)	
NCAC	National Council of Acoustical Consultants P.O. Box 359 66 Morris Ave., Suite 1A Springfield, NJ 07081	(201) 564-5859
NCCA	National Coil Coaters Association 401 N. Michigan Ave. Chicago, IL 60611	(312) 321-6894
NCMA	National Concrete Masonry Association 2302 Horse Pen Rd. Herndon, VA 20171-3499 www.ncma.org	(703) 713-1900
NCPI	National Clay Pipe Institute P.O. Box 759 253-80 Center St. Lake Geneva, WI 53147	(414) 248-9094
NCRPM	National Council on Radiation Protection and Measurements 7910 Woodmont Ave., Suite 800 Bethesda, MD 20814-3095 www.ncrp.com	(800) 229-2652 (301) 657-2652
NCSPA	National Corrugated Steel Pipe Association 1255 23rd St., NW, Suite 850 Washington, DC 20037 www.ncspa.org	(202) 452-1700
NEBB	Natural Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877-4121	(301) 977-3698
NECA	National Electrical Contractors Association 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814-5372	(301) 657-3110
NEI	National Elevator Industry 185 Bridge Plaza North, Suite 310 Fort Lee, NJ 07024	(201) 944-3211
NELMA	Northeastern Lumber Manufacturers Association 272 Tuttle Rd. P.O. Box 87A Cumberland Center, ME 04021	(207) 829-6901
NEMA	National Electrical Manufacturers Association 1300 N 17th St., Suite 1847 Rosslyn, VA 22209	(703) 841-3200

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www.nema.org

NETA	InterNational Electrical Testing Association P.O. Box 687 106 Stone St. Morrison, CO 80465-1526 www.electricnet.com/neta	(303) 697-8441
NFPA	National Fire Protection Association One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101 www.nfpa.org	(800) 344-3555 (617) 770-3000
NFPA	National Forest Products Association (See AFPA)	
NFRC	National Fenestration Rating Council Incorporated 1300 Spring St., Suite 120 Silver Spring, MD 20910 www.nfrc.org	(301) 589-NFRC
NHLA	National Hardwood Lumber Association P.O. Box 34518 Memphis, TN 38184-0518 www.natlhardwood.org	(901) 377-1818
NIA	National Insulation Association (Formerly: National Insulation and Abatement Contractors Association) 99 Canal Center Plaza, Suite 222 Alexandria, VA 22314 www.insulation.org	(703) 683-6422
NIAC	National Insulation and Abatement Contractors Association (See NIA)	
NKCA	National Kitchen Cabinet Association (See KCMA)	
NLGA	National Lumber Grades Authority #406-First Capital Pl., 960 Quayside Dr. New Westminster, BC V3M 6G2	(604) 524-2393
NOFMA	National Oak Flooring Manufacturers Association P.O. Box 3009 Memphis, TN 38173-0009	(901) 526-5016
NPA	National Particleboard Association 18928 Premiere Ct. Gaithersburg, MD 20879-1569 www.pbmdf.com	(301) 670-0604

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NPCA	National Paint and Coatings Association 1500 Rhode Island Ave., NW Washington, DC 20005-5597 www.paint.org	(202) 462-6272
NRCA	National Roofing Contractors Association O'Hare International Center 10255 W. Higgins Rd., Suite 600 Rosemont, IL 60018-5607 www.roofonline.org	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association 900 Spring St. Silver Spring, MD 20910 www.nrmca.org	(301) 587-1400
NSA	National Stone Association 1415 Elliot Pl., NW Washington, DC 20007 www.aggregates.org	(202) 342-1100
NSF	NSF International (Formerly: National Sanitation Foundation) P.O. Box 130140 Ann Arbor, MI 48113-0140 www.nsf.org	(313) 769-8010
NSSEA	National School Supply and Equipment Association 8300 Colesville Rd., Suite 250 Silver Spring, MD 20910	(800) 395-5550 (301) 495-0240
NTMA	National Terrazzo and Mosaic Association 3166 Des Plaines Ave., Suite 121 Des Plaines, IL 60018 www.ntma.com	(800) 323-9736 (847) 635-7744
NUSIG	National Uniform Seismic Installation Guidelines 12 Lahoma Ct. Alamo, CA 94526	(510) 946-0135
NWMA	National Woodwork Manufacturers Association (See NWWDA)	
NWWDA	National Wood Window and Door Association (Formerly: National Woodwork Manufacturers Association) 1400 E. Touhy Ave., G-54 Des Plaines, IL 60018 www.nwwda.org	(800) 223-2301 (847) 299-5200
PATMI	Power Actuated Tool Manufacturers' Institute, Inc.	(314) 947-6610

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	1603 Boonslick Rd. St. Charles, MO 63301-2244	
PCA	Portland Cement Association 5420 Old Orchard Rd. Skokie, IL 60077-1083 www.portcement.org	(847) 966-6200
PCI	Precast/Prestressed Concrete Institute 175 W. Jackson Blvd. Chicago, IL 60604 www.pci.org	(312) 786-0300
PDCA	Painting and Decorating Contractors of America 3913 Old Lee Hwy, Suite 33-B Fairfax, VA 22030 www.pdca.com	(800) 332-7322 (703) 359-0826
PDI	Plumbing and Drainage Institute 45 Bristol Dr., Suite 101 South Easton, MA 02375	(800) 589-8956 (508) 230-3516
PEI	Porcelain Enamel Institute 4004 Hillsboro Pike, Suite 224-B Nashville, TN 37215 www.porcelainenamel.com	(615) 385-5357
PGI	PVC Geomembrane Institute P.O. Box 4226 Traverse City, MI 49685 users.aol.com/forPVC1	(616) 933-6373
PPFA	Plastic Pipe and Fittings Association 800 Roosevelt Rd., Building C, Suite 20 Glen Ellyn, IL 60137-5833	(630) 858-6540
PPI	Plastic Pipe Institute (The Society of the Plastics Industry, Inc.) 1801 K St., NW, Suite 600L Washington, DC 20006 www.plasticpipe.org	(202) 974-5306
RCMA	Roof Coatings Manufacturers Association Center Park 4041 Powder Mill Rd., Suite 404 Calverton, MD 20705	(301) 230-2501
RCSC	Research Council on Structural Connections Sargent & Lundy 55 E. Monroe St. Chicago, IL 60603	(312) 269-2424
RFCI	Resilient Floor Covering Institute 966 Hungerford Dr., Suite 12-B	(301) 340-8580

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Rockville, MD 20850-1714

RMA	Rubber Manufacturers Association 1400 K St., NW, Suite 900 Washington, DC 20005 www.rma.org	(800) 220-7620 (202) 682-4800
SAE	SAE International 400 Commonwealth Dr. Warrendale, PA 15096-0001 For publications: Call (412) 776-4970	(412) 776-4841
SDI	Steel Deck Institute P.O. Box 25 Fox River Grove, IL 60021 www.sdi.org	(847) 462-1930
SDI	Steel Door Institute 30200 Detroit Rd. Cleveland, OH 44145-1967	(216) 889-0010
SEFA	Scientific Equipment and Furniture Association 1028 Duchess Dr. McLean, VA 22102-2010 www.sefalabfurn.com	(703) 790-8661
SEGD	Society for Environmental Graphic Design 401 F St., NW, Suite 333 Washington, DC 20001-2728	(202) 638-5555
SGCC	Safety Glazing Certification Council (Now part of ITS)	
SHLMA	Southern Hardwood Lumber Manufacturers Association (See HMA)	
SIGMA	Sealed Insulating Glass Manufacturers Association 401 N. Michigan Ave. Chicago, IL 60611-4267	(312) 644-6610
SJI	Steel Joist Institute 3127 10th Ave., North Ext. Myrtle Beach, SC 29577-6760	(803) 626-1995
SMA	Screen Manufacturers Association 2850 S. Ocean Blvd., Suite 114 Palm Beach, FL 33480-5535	(561) 533-0991
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association, Inc. 4201 Lafayette Center Dr. P.O. Box 221230 Chantilly, VA 20151-1209 www.smacna.org	(703) 803-2980

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SPI	Society of the Plastics Industry, Inc. Spray Polyurethane Division 1801 K St., NW, Suite 600K Washington, DC 20006 www.socplas.org	(800) 951-2001 (202) 974-5200
SPIB	Southern Pine Inspection Bureau 4709 Scenic Hwy Pensacola, FL 32504-9094	(904) 434-2611
SPRI	SPRI (Formerly: Single Ply Roofing Institute) 175 Highland Ave. Needham Heights, MA 02194-3034	(617) 444-0242
SSINA	Specialty Steel Industry of North America c/o Collier, Shannon Rill & Scott 3050 K St., NW, Suite 400 Washington, DC 20007 www.ssina.com	(800) 982-0355 (202) 342-8630
SSPC	Steel Structures Painting Council 40 24th St., 6th Floor Pittsburgh, PA 15222-4643	(412) 281-2331
SSPMA	Sump and Sewage Pump Manufacturers Association P.O. Box 647 Northbrook, IL 60065-0647	(847) 559-9233
STI	Steel Tank Institute 570 Oakwood Rd. Lake Zurich, IL 60047-1559	(847) 438-8265
SWI	Steel Window Institute c/o Thomas Associates, Inc. 1300 Sumner Ave. Cleveland, OH 44115-2851 www.taol.com/swi	(216) 241-7333
SWPA	Submersible Wastewater Pump Association 1806 Johns Dr. Glenview, IL 60025-1657	(847) 729-7972
SWRI	Sealant, Waterproofing and Restoration Institute 2841 Main Kansas City, MO 64108	(816) 472-7974
TCA	Tile Council of America 100 Clemson Research Blvd. Anderson, SC 29625	(864) 646-8453
TIMA	Thermal Insulation Manufacturers Association (See NAIMA)	

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TPI	Truss Plate Institute (Formerly: American Sod Producers Association) 583 D'Onofrio Dr., Suite 200 Madison, WI 53719	(608) 833-5900
TPI	Turfgrass Producers International (Formerly: American Sod Producers Association) 1855-A Hicks Rd. Rolling Meadows, IL 60008	(800) 405-8873 (847) 705-9898
UL	Underwriters Laboratories Inc. 333 Pfingsten Rd. Northbrook, IL 60062 www.ul.com	(800) 704-4050 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association 2655 Villa Creek Dr., Suite 155 Dallas, TX 75234 www.members.aol.com/unibell1	(972) 243-3902
USITT	USITT: The American Association of Design and Production Professionals in the Performing Arts 6443 Ridings Rd. Syracuse, NY 13206-1111	(800) 938-7488 (315) 463-6463
USP	U.S. Pharmacopeia (Formerly: U.S. Pharmacopoeial Convention) 12601 Twinbrook Pkwy Rockville, MD 20852-1790	(800) 227-8772 (301) 881-0666
WA	Wallcoverings Association 401 N. Michigan Ave. Chicago, IL 60611-4267	(312) 644-6610
WCLIB	West Coast Lumber Inspection Bureau P.O. Box 23145 Portland, OR 97281-3145	(503) 639-0651
WCMA	Window Covering Manufacturers Association (Formerly: American Window Covering Manufacturers Association) 355 Lexington Ave., 17th Floor New York, NY 10017-6603	(212) 661-4261
WEF	Water Environment Federation (Formerly: Water Pollution Control Federation) 601 Wythe St. Alexandria, VA 22314-1994	(703) 684-2400
WIC	Woodwork Institute of California P.O. Box 980247 West Sacramento, CA 95798-0247	(916) 372-9943

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WMMPA	Wood Moulding & Millwork Producers Association 507 First St. Woodland, CA 95695 www.wmmpa.com	(800) 550-7889 (916) 661-9591
WPCF	Water Pollution Control Federation (See WEF)	
WRI	Wire Reinforcement Institute 203 Loudoun St., SW Leesburg, VA 20175-2718	(703) 779-2339
WSC	Water Systems Council Building C, Suite 20 800 Roosevelt Rd. Glen Ellyn, IL 60137	(630) 545-1762
WSFI	Wood and Synthetic Flooring Institute (See MFMA)	
WWPA	Western Wood Products Association Yeon Building 522 SW 5th Ave. Portland, OR 97204-2122	(503) 224-3930

G. Federal Government Agencies: Names and titles of Federal Government standards- or specification-producing agencies are often abbreviated. The following abbreviations and acronyms referenced in the Contract Documents indicate names of standards- or specification-producing agencies of the Federal Government. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

CE	Corps of Engineers (U.S. Department of the Army) 20 Massachusetts Ave., NW Washington, DC 20314 CRD standards are available from: U.S. Army Corps of Engineers Waterways Experiment Station Technical Report Distribution Section Services Branch, TIC 3909 Halls Ferry Rd. Vicksburg, MS 39180-6199	(202) 761-0660 (601) 634-2696
CFR	Code of Federal Regulations (Available from the Government Printing Office) Washington, DC 20401 (Material is usually published first in the "Federal Register.") www.access.gpo.gov	(202) 512-0000
CPSC	Consumer Product Safety Commission East West Towers 4330 East-West Hwy Bethesda, MD 20814	(800) 638-2772

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CS	Commercial Standard (U.S. Department of Commerce) Government Printing Office Washington, DC 20402 For Commercial standards, contact: Ms. Brenda Umberger CS & PS Specialist c/o NIST Gaithersburg, MD 20899	(202) 512-1800 (301) 975-4036
DOC	Department of Commerce 14th St. and Constitution Ave., NW Washington, DC 20230	(202) 482-2000
DOT	Department of Transportation 400 Seventh St., SW Washington, DC 20590	(202) 366-4000
EPA	Environmental Protection Agency 401 M St., SW Washington, DC 20460	(202) 260-2090
FAA	Federal Aviation Administration (U.S. Department of Transportation) 800 Independence Ave., SW Washington, DC 20591	(202) 366-4000
FCC	Federal Communications Commission 1919 M St., NW Washington, DC 20554	(202) 418-0126
FDA	Food and Drug Administration 5600 Fishers Lane Rockville, MD 20857	(301) 443-1544
FHA	Federal Housing Administration (U.S. Department of Housing and Urban Development) 451 Seventh St., SW Washington, DC 20410	(202) 401-0388
FS	Federal Specification Unit (Available from GSA) 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407	(202) 619-8925
GSA	General Services Administration F St. and 18th St., NW Washington, DC 20405	(202) 708-5082
MIL	Military Standardization Documents (U.S. Department of Defense) Defense Printing Service 700 Robbins Ave., Building 4D Philadelphia, PA 19111	(215) 697-2179

NIST National Institute of Standards and Technology (301) 975-2000
(U.S. Department of Commerce)
Building 101, #A1134,
Rte. I-270 and Quince Orchard Rd.
Gaithersburg, MD 20899

OSHA Occupational Safety and Health Administration (202) 219-8148
(U.S. Department of Labor)
200 Constitution Ave., NW
Washington, DC 20210

PS Product Standard of NBS (202) 512-1800
(U.S. Department of Commerce)
Government Printing Office
Washington, DC 20402
For Product standards, contact:
Ms. Brenda Umberger (301) 975-4036
CS & PS Specialist
c/o NIST
Gaithersburg, MD 20899

RUS Rural Utilities Service (202) 720-9560
(Formerly: Rural Electrification Administration)
(U.S. Department of Agriculture)
14th St. and Independence Ave., SW
Washington, DC 20250

TRB Transportation Research Board, National Research Council (202) 334-2934
2101 Constitution Ave., NW
Washington, DC 20418

USDA U.S. Department of Agriculture (202) 720-8732
14th St. and Independence Ave., SW
Washington, DC 20250

USPS U.S. Postal Service (202) 268-2000
475 L'Enfant Plaza, SW
Washington, DC 20260-0010

H. State Government Agencies: The following state government agencies produce standards referenced in the Contract Documents:

California

CBHF State of California, Dept. of (800) 952-5210
Consumer Affairs (916) 574-2041
Bureau of Home Furnishings and Thermal Insulation Technical
Information
3485 Orange Grove Ave.
North Highland, CA 95660-5595

Texas

TFS Texas Forest Service (409) 639-8180

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Forest Products Laboratory
Highway 59 S., P.O. Box 310
Lufkin, TX 75902-0310

1.5 GOVERNING REGULATIONS AND AUTHORITIES

- A. Copies of Regulations: Obtain copies of the following regulations and retain at the Project site to be available for reference by parties who have a reasonable need:

1.6 SUBMITTALS

- A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01421

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Reference Standards and Definitions" specifies the applicability of industry standards to products specified.
 - 2. Division 1 Section "Submittals" specifies requirements for submitting the Contractor's Construction Schedule and the Submittal Schedule.

1.3 DEFINITIONS

- A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:
 - 1. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
 - 2. Revisions to the Contract Documents requested by the Owner or Engineer.
 - 3. Specified options of products and construction methods included in the Contract Documents.
 - 4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS

- A. Substitution Request Submittal: The Engineer will consider requests for substitution if received within 60 days after commencement of the Work. Requests received more than 60 days after commencement of the Work may be considered or rejected at the discretion of the Engineer.
1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for change-order proposals.
 2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.
 3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors, that will be necessary to accommodate the proposed substitution.
 - b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.
 - c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
 - d. Samples, where applicable or requested.
 - e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - g. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.
 - h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
 4. Engineer's Action: If necessary, the Engineer will request additional information or documentation for evaluation within one week of receipt of a request for substitution. The Engineer will notify the Contractor of acceptance or rejection of the substitution within 2 weeks of receipt of the request, or one week of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a change order.

- a. Use the product specified if the Engineer cannot make a decision on the use of a proposed substitute within the time allocated.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Conditions: The Engineer will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Engineer. If the following conditions are not satisfied, the Engineer will return the requests without action except to record noncompliance with these requirements.
 1. Extensive revisions to the Contract Documents are not required.
 2. Proposed changes are in keeping with the general intent of the Contract Documents.
 3. The request is timely, fully documented, and properly submitted.
 4. The specified product or method of construction cannot be provided within the Contract Time. The Engineer will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 5. The request is directly related to an "or-equal" clause or similar language in the Contract Documents.
 6. The requested substitution offers the Owner a substantial advantage, in cost, time, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Engineer for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.
 7. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
 9. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
 10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.
- B. The Contractor's submittal and the Engineer's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents

do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01631

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
1. Inspection procedures.
 2. Project record document submittal.
 3. Submittal of warranties.
 4. Final cleaning.
 5. Testing data.
- B. Closeout requirements for specific construction activities are included in the appropriate Sections in the Contract Documents.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.
 - a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
 2. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.

3. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 4. Submit record drawings, as-built drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
 5. Complete final clean-up requirements.
- B. Inspection Procedures: On receipt of a request for inspection, the Engineer will either proceed with inspection or advise the Contractor of unfilled requirements. The Engineer will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. The Engineer will repeat inspection when requested and assured that the Work is substantially complete.
 2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
 2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
 3. Submit a certified copy of the Engineer's final inspection list of items to be completed or corrected, endorsed and dated by the Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Engineer.
 4. Submit consent of surety to final payment.
 5. Submit a final liquidated damages settlement statement.
 6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 7. Submit certified statement of acknowledgement of warranties set forth in the General and Supplemental Conditions.
- B. Reinspection Procedure: The Engineer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Engineer.

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

1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Engineer's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
 2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
 3. Note related change-order numbers where applicable.
 4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.
 5. Submit utility as-builts, including hydrants, valves, all piping, storm sewer structures and sanitary sewer manholes in a digital format along with five hard copies.
 6. Provide survey/as-built by Surveyor registered in the State of Georgia.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.
 1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
 2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
 3. Note related record drawing information and Product Data.

4. Upon completion of the Work, submit record Specifications to the Engineer for the Owner's records.
5. Field survey is to be done by a Registered Surveyor in the State of Georgia.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: The General Conditions require general cleaning during construction. Regular site cleaning is included in Division 1 Section "Construction Facilities and Temporary Controls."
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning.
 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.
 - a. Clean the site, including R/W areas, of rubbish, litter, construction debris and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits.
- C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction if applicable.
- D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.
 1. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION 01700

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents.

- B. Project Record Documents required include the following:

1. Marked-up copies of Contract Drawings.
2. Marked-up copies of Shop Drawings.
3. Newly prepared drawings.
4. Marked-up copies of Specifications, addenda, and Change Orders.
5. Field records for variable and concealed conditions.
6. Final Property Survey.
7. Record Drawing Topographic Survey of Constructed Conditions.

- C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Submittals" specifies general requirements for preparing and submitting Project Record Documents.
2. Division 1 Section "Contract Closeout" specifies general closeout requirements.
3. Division 1 Section "Field Engineering" for specific data requirements for surveys.
4. Division 2 for specifying Project Record Document requirements for specific portions of the work.

- D. Maintenance of Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition. Make documents and Samples available at all times for the Engineer's inspections.

1.3 RECORD DRAWINGS

- A. Markup Procedure: During construction, maintain a set of blue- or black-line white prints of Contract Drawings and Shop Drawings for Project Record Document purposes.
1. Mark these Drawings to show the actual installation where the installation varies from the installation shown originally. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Items required to be marked include, but are not limited to, the following:
 - a. Dimensional changes to the Drawings.
 - b. Revisions to details shown on the Drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Changes made by change order or Construction Change Directive.
 - f. Changes made following the Engineer's written orders.
 - g. Details not on original Contract Drawings.
 2. Mark record prints of Contract Drawings showing actual physical conditions, completely and accurately.
 3. Mark record sets with red erasable colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 4. Mark important additional information that was either shown schematically or omitted from original Drawings.
 5. Note Construction Change Directive numbers, alternate numbers, change-order numbers, and similar identification.
- B. Responsibility for Markup: The individual or entity who obtained record data, whether the individual or entity is the Installer, subcontractor, or similar entity, shall prepare the markup on record drawings. In any case, Contractor shall be ultimately responsible for all record drawing information.
1. Accurately record information in an understandable drawing technique.
 2. Record data as soon as possible after obtaining it. Record and check the markup prior to enclosing concealed installations.
 3. At time of Substantial Completion, submit record drawings to the Engineer for the Owner's records. Organize into sets and bind and label sets for the Owner's continued use.
- C. Preparation of Final Marked Sets: Immediately prior to inspecting Certification of Substantial Completion, review completed marked-up record drawings with the Engineer. When authorized, prepare a full set of corrected blackline prints of Contract Drawings.
1. Incorporate changes and additional information previously marked on print sets. Erase, redraw, and add details and notations where applicable. Identify and date

- each drawing; include the printed designation "PROJECT RECORD DRAWINGS" in a prominent location on each drawing.
2. Refer instances of uncertainty to the Engineer for resolution.
 3. The Owner will furnish the Contractor one set of transparencies of original Contract Drawings for use in recording changes and additional information. Other printing as required is the Contractor's responsibility.
 4. The Contractor is responsible for printing original Contract Drawings and other drawings as required to produce transparencies. The Engineer will make original Contract Drawings available to the Contractor's print shop.
 5. Review of Transparencies: Before copying and distributing, submit corrected transparencies and the original marked-up prints to the Engineer for review. When acceptable, the Engineer will initial and date each transparency. Acceptance by the Engineer indicates acceptance of general scope of changes, additional information recorded, and of the quality of drafting.
 - a. The Engineer will return transparencies and the original marked-up prints to the Contractor for organizing into sets, printing, binding, and final submittal.
- D. Copies and Distribution: After completing the preparation of transparency record drawings, print 5 blue- or black-line prints of each drawing, whether or not changes and additional information were recorded. Organize the copies into manageable sets. Bind each set with durable-paper cover sheets. Include appropriate identification, including titles, dates, and other information on the cover sheets.
1. Organize and bind original marked-up set of prints that were maintained during the construction period in the same manner.
 2. Organize record transparencies into sets matching the print sets. Place these sets in durable tube-type drawing containers with end caps. Mark the end cap of each container with suitable identification.
 3. Submit the marked-up record set, transparencies, and 5 copy sets to the Engineer for the Owner's records; the Engineer will retain 1 copy set.
- E. Newly Prepared Record Drawings: Prepare new drawings in addition to the following procedures specified for preparing record drawings. New drawings may be required when a change order is issued as a result of accepting an alternate, substitution, or other modification.
1. Consult with the Engineer for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. When completed and accepted, integrate newly prepared Drawings with procedures specified for organizing, copying, binding and submitting record drawings.

1.4 RECORD SPECIFICATIONS

- A. During the construction period, maintain 5 copies of the Project Specifications, including addenda and modifications issued, for Project Record Document purposes.
1. Mark the Specifications to indicate the actual installation where the installation varies from that indicated in Specifications and modifications issued. Note related project record drawing information, where applicable.
 2. Upon completion of markup, submit record Specifications to the Engineer for the Owner's records.

1.5 MISCELLANEOUS RECORD SUBMITTALS

- A. Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Engineer for the Owner's records.
1. Categories of requirements resulting in miscellaneous records include, but are not limited to, the following:
 - a. Field records on excavations.
 - b. Field records on underground construction and similar work.
 - c. Survey showing locations and elevations of underground lines.
 - d. Invert elevations of drainage piping.
 - e. Authorized measurements utilizing unit prices or allowances.
 - f. Ambient and substrate condition tests.
 - g. Batch mixing and bulk delivery records.
 - h. Inspections and certifications by governing authorities.
 - i. Final inspection and correction procedures.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 RECORDING

- A. Post changes and modifications to the Documents as they occur. Do not wait until the end of the Project.

END OF SECTION 01720

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers standard warranties on products and special warranties.
1. Refer to the General Conditions for terms of the Contractor's period for correction of the Work.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 1 Section "Submittals" specifies procedures for submitting warranties.
 2. Division 1 Section "Contract Closeout" specifies contract closeout procedures.
 3. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.
 4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- D. Separate Prime Contracts: Each prime contractor is responsible for warranties related to its own contract.

1.3 DEFINITIONS

- A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.4 WARRANTY REQUIREMENTS

- A. **Related Damages and Losses:** When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
- B. **Reinstatement of Warranty:** When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. **Replacement Cost:** Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- D. **Owner's Recourse:** Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.
 - 1. **Rejection of Warranties:** The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- E. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.5 SUBMITTALS

- A. Submit written warranties to the Engineer prior to the date certified for Substantial Completion. If the Engineer's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Engineer.
1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Engineer within 15 days of completion of that designated portion of the Work.
- B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Engineer, for approval prior to final execution.
- C. Forms for special warranties are included at the end of this Section. Prepare a written document utilizing the appropriate form, ready for execution by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Submit a draft to the Owner, through the Engineer, for approval prior to final execution.
1. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- D. Form of Submittal: At Final Completion compile 2 copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- E. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.
 2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of the Contractor.
 3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 LIST OF WARRANTIES

A. Schedule: Provide warranties on products and installations as specified in the following Sections:

1. Asphalt Paving
2. Concrete Work
3. Storm Drain Piping & Structures
4. Water Line Piping, Valves & Hydrants
5. Sanitary Sewer Line Piping & Structures
6. Grassing & Matting
7. Earthwork Placement
8. Arch Foundations

END OF SECTION 01740

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

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 following:

1. Demolition and removal of existing structures - retaining walls.
2. Demolition and removal of selected site elements - sidewalks, curbs, storm pipes, etc.
3. Patching and repairs.
4. Demolition of roadway paving within the City of Griffin right-of-way.
5. Removal of Soil Excavation to foundation subgrade.

- B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Summary of Work" for use of the building and phasing requirements.
2. Division 1 Section "Contract Closeout" for record document requirements.
3. Division 2 Section "Site Clearing" for site clearing and removing above- and below-grade improvements.
4. Division 2 Section "Earthwork" for soil materials, excavating, backfilling, and site grading.

1.3 DEFINITIONS

- A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.
- B. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Engineer, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.4 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.
- B. Demolition utility items are to be turned over to the City of Griffin (hydrants, pipe, etc.).

1.5 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.
- B. Proposed dust-control measures.
- C. Proposed noise-control measures.
- D. Schedule of selective demolition activities indicating the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
 - 2. Interruption of utility services.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
- E. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by selective demolition operations.
- F. Record drawings at Project closeout according to Division 1 Section "Contract Closeout."
 - 1. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

1.6 SCHEDULING

- A. Arrange selective demolition schedule so as not to interfere with Owner's on-site operations.

- B. Notify City of Griffin Public Works three (3) business days before beginning construction in the GDOT right-of-way.

PART 2 - PRODUCTS (Not Applicable)

2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
 - 1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 2. Use materials whose installed performance equals or surpasses that of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. Perform inspections as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

- A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to governing authorities.

- a. Provide not less than 72 hours' notice to Owner if shutdown of service is required during changeover.

3.3 PREPARATION

- A. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.
- B. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

3.4 POLLUTION CONTROLS

- A. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.
 1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas. Do not allow material to enter the stream.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION 02070

SECTION 02260 - EXCAVATION SUPPORT AND 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 excavation support and protection systems
- B. Related Sections include the following:
 - 1. Division 2 Section "Earthwork" for excavating and backfilling.

1.3 PERFORMANCE REQUIREMENTS

- A. Design, provide, monitor, and maintain an anchored and braced excavation support and protection system capable of resisting soil and hydrostatic pressure and supporting sidewalls of excavations.
 - 1. Work includes removing excavation support and protection systems when no longer needed.
 - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 3. Install excavation support and protection systems without damaging existing buildings, pavements, and other improvements adjacent to excavation.

1.4 SUBMITTALS

- A. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer for excavation support and protection systems. System design and calculations must be acceptable to authorities having jurisdiction.
 - 1. Include Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.

- B. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by excavation support and protection systems.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer to assume engineering responsibility and perform work of this Section who has specialized in installing excavation support and protection systems similar to those required for this Project and with a record of successful in-service performance.

1.6 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by the Owner or others unless permitted in writing by the Engineer and then only after arranging to provide temporary utility services according to requirements indicated.
- B. Survey adjacent structures and improvements, employing a qualified professional engineer or surveyor; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
 - 1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Engineer if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials need not be new but must be in serviceable condition.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
 - 1. Shore, support, and protect utilities encountered.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- C. Locate excavation support and protection systems clear of permanent construction and to permit forming and finishing of concrete surfaces.
- D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure excavation support and protection systems remain stable.
- E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils and damaging structures, pavements, facilities, and utilities.
 - 1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlying construction and abandon remainder.
 - 2. Repair or replace, as approved by Engineer, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION 02260

SECTION 02270 – EROSION AND SEDIMENTATION CONTROL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This section consists of the furnishing and installing of silt fences, hay bales, check dams and other BMP's as shown on the drawings for the purpose of prohibiting sediment from escaping from the construction site. All BMP's must meet the requirements of the "Manual for Erosion and Sediment Control in Georgia", 5th Edition. Additional BMP's may be required for the project based on field inspection by the engineer.

1.3 DISTURBED SOIL

A. The disturbed area and the duration of exposure to erosive elements shall be kept to a practical minimum. Disturbed areas shall be mulched and seeded within 14 days of disturbance with a minimum of temp vegetation. Temporary vegetation or mulching shall be employed to protect exposed critical areas during construction. Permanent grassing and matting installation must be started within 14 days of completion and final grading of road sections. This will be required to minimize the total acreage disturbed at any time in the project to 50 acres or less.

PART 2 – STRUCTURES

2.1 EROSION CONTROL STRUCTURES

A. Structural erosion control measures must be installed before any land disturbing activities begin. At a minimum, BMP structures shall be installed as described on the Erosion Control Plans.

2.2 SURFACE RUN-OFF WATER

A. Sediment in run-off water must be trapped by the use of debris basins, sediment basins, silt traps, or similar measures as described on the drawings until the disturbed area is stabilized. Adequate provisions must be provided to minimize damage from surface water to the cut face of excavations or the sloping surfaces of fills.

A. The Contractor shall be responsible for maintaining all erosion and sediment control BMP's and structures during the construction period and until permanent vegetation is established on graded areas. This time period may extend past the time of Project Final Completion if grassing is not well established.

B. Silt fence and all other BMP's not deemed permanent are to be removed by the contractor at a time when permanent vegetation 80% established. This task will most likely occur after completion of the project and the Contractor is to return to the project site on instruction from the Engineer to remove the silt fence. A line item has been provided for this task and the contractor shall be paid for the linear footage of silt fence removed.

Removal of the silt fence shall include complete removal of the fencing, fine grading and mulching/grassing the disturbed area.

END OF SECTION 02270

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

SECTION 02300 - EARTHWORK

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 following:
 - 1. Backfilling arch culverts.
 - 2. Backfilling utility pipes.
 - 3. Spreading and placement of topsoil.
 - 4. Rock removal – excavation/blasting.

1.3 UNIT PRICES

- A. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the following:
 - 1. 6 inches (150 mm) beneath pipe in trenches, and the greater of 24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.
- B. Unit prices for rock excavation include replacement with approved materials and haul off/disposal of rock in an approved location offsite.
- D. The “TRENCH ROCK MOBILIZATION” bid item will be paid if trench rock is encountered by the Contractor during the project. The Owner will pay for additional mobilizations at the discretion of the Engineer and Owner if blasting is necessary in multiple areas.
- C. The “TRENCH ROCK MOBILIZATION” bid item will not be paid if the total dollar amount of the “TRENCH ROCK” bid item exceeds the “TRENCH ROCK MOBILIZATION” dollar amount.

1.4 DEFINITIONS

- A. Backfill: Soil materials used to fill an excavation.
1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Bedding Course: Layer placed over the subgrade in a trench before laying pipe.
- C. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
- D. Excavation: Removal of material encountered above subgrade elevations.
1. Common Excavation: Common excavation shall include the excavation of all material which meets the following criteria:
 - a. Condition 1: in its undisturbed condition may be classified as either cohesionless or cohesive materials in ASTM D 2487 (that is, cohesionless materials as GW, GP, SW, and SP; and cohesive materials as GC, SC, ML, CL, MH, and CH), of any gradation and consistency, and with a maximum particle size of 3 inches (76.2 mm); and
 - b. Condition 2: can be excavated by conventional tracked backhoe earth excavating equipment of a minimum size of a Caterpillar 235 or equivalent, medium stick or less, equipped with a narrow bucket and short bucket tip radius.
 2. Additional Excavation: Excavation below subgrade elevations as directed by Engineer. Additional excavation and replacement material will be paid for according to Contract provisions and unit rates for changes in the Work.
 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.
- E. Structural Fill: Engineered soil materials used to raise existing grades.
- F. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material in accordance with the conditions defined below regarding ripping and blasting:
1. Rip Rock Excavation: Rip rock shall be any material which meets all of the following criteria:

- a. Condition 1: does not meet the conditions for Common Excavations defined above and is of sufficient roughness, fractures, and bedding joints to allow penetration of a ripper tooth.
 - b. Condition 2: can be loosened using a Caterpillar Model D9N equipped with a single-shank No. 9 ripper or equivalent to the point that the material can be excavated.
 - c. Condition 3: has a seismic wave velocity less than 6,000 feet per second.
2. Blast Rock Excavation: Blast rock excavations shall be any material which meets the following criteria:
- a. Condition 1: does not meet the conditions for Common Excavations or Rip Rock Excavations as defined above and is of sufficient homogeneity to limit penetration of a ripper tooth.
 - b. Condition 2: material which is classified by the Geotechnical Engineer as solid, unweathered rock, including rock material that is in ledges, or is bedded.
 - c. Condition 3: does not meet the criteria for “rippable rock” as identified in the Caterpillar *Performance Handbook* (any addition).
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- H. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below base course, drainage fill, or topsoil materials.
- I. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.
- 1.5 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities homes/businesses in the construction area unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Engineer not less than two days (48 hours) in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without Engineer's written permission.
 3. Maintain water service to homes/businesses in the construction area.
 4. Contact utility-locator service for area where Project is located at least three business days (72 hours) before excavating.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with City of Griffin to shut off services if lines are active.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations. Materials must be pre-approved by Engineer prior to use on site.
- B. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, GM, GC, SW, SP, SM, SC, CL, ML, CH, and MH or a combination of these group symbols; free of rock or gravel larger than 3 inches (76.2 mm) and in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: ASTM D 2487 soil classification groups OL, OH, and PT, or a combination of these group symbols.
1. Unsatisfactory soils also include satisfactory soils not maintained within 3 percent of optimum moisture content at time of compaction testing by the Engineer.
- D. Backfill and Structural Fill: Satisfactory soil materials.
- E. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- F. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
- G. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
- H. Impervious Fill: Clayey sand mixtures capable of compacting to a dense state and which meets the approval of the Engineer.
- I. Topsoil: Topsoil from the site clearing activities will be stockpiled onsite for re-use on areas to be grassed.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. **Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and waterways.**

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding areas.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Install a dewatering system to keep subgrades and trench excavations dry and convey ground water away from excavations. Maintain until dewatering is no longer required.
 - 3. Pump groundwater infiltration, if required.

3.3 EXCAVATION, GENERAL

- A. Classified Excavation: Excavation to subgrade elevations classified as earth and rock. Rock excavation will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
 - 1. Earth (or Common) excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

- a. Intermittent drilling; ram hammering; or ripping of material not classified as rock excavation is earth (or common) excavation.
 2. Rock excavation includes removal and disposal of rock offsite in an approved location.
 - a. Do not excavate rock until it has been classified and cross-sectioned by Engineer.
 - C. Excavation (cut) slopes must be maintained at no less than 2-foot horizontal to 1-foot vertical (2H:1V) unless otherwise instructed by the Engineer.
- 3.4 EXCAVATION FOR UTILITY AND FOUNDATION TRENCHES
- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 1. Excavate trenches to allow installation of Contec Arch Culvert foundations as shown on plans.
 - B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.
 1. Clearance: As indicated on plans.
 - C. Trench Bottoms: Excavate trenches in accordance with the details set forth in the plans for bedding course. Hand excavate for bell of pipe.
 1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course, or as directed by the Engineer.
 2. Place stone as indicated on foundation plans for Contec Arch Culvert.
- 3.5 APPROVAL OF SUBGRADE
- A. Notify Engineer when excavations have reached required subgrade.
 - B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
 1. Additional excavation of unsatisfactory soil and replacement with satisfactory soil will be paid for according to Contract provisions for changes in the Work.

- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer.

3.6 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under utility trenches by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill or clean gravel may be used when approved by Engineer.
 - 1. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

3.7 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations in temporary construction easements.

3.8 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Surveying locations of underground utilities for record documents.
 - 2. Inspecting and testing underground utilities.
 - 3. Removing concrete formwork.
 - 4. Removing trash and debris.
 - 5. Removing temporary shoring and bracing, and sheeting.
 - 6. Installing permanent or temporary horizontal bracing on horizontally supported walls.
 - 7. Installing warning tape over piping.
 - 8. Installing detector wire.

3.9 UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

- B. Backfill trenches adjacent to footings with clean gravel (No. 57 stone) under the direction of the Engineer.
- C. Place and compact initial backfill of base course material, free of particles larger than 3/4 inch, to a height of 12 inches (300 mm) over the utility pipe or conduit.
 - 1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.
- D. Coordinate backfilling with utilities testing and compaction testing by the Engineer.
- E. Fill voids with approved backfill materials while shoring and bracing and as sheeting is removed.
- F. Place and compact final backfill of satisfactory soil material to final subgrade.
- G. Install warning tape with appropriate markings directly above utilities.

3.10 FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers, not exceeding 8 inches, to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use satisfactory soil material.
- C. All fill slopes must be maintained at no less than 2-foot horizontal to 1-foot vertical (2H:1V) unless otherwise instructed by the Engineer.

3.11 MOISTURE CONTROL

- 1. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 3 percent of optimum moisture content as determined by the applicable Proctor Test.
 - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF BACKFILLS AND FILLS

- A. Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
 1. Under walks, pavements and existing paved areas and roadways (including arch culvert), scarify and recompact top 12 inches (300 mm) of existing subgrade at 98 percent.
 2. Under lawn or areas not to receive any future paving, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 95 percent.
 3. Remainder of structural fill should be compacted to a minimum of 95 percent.

3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
 3. Replace soil over trenches to existing elevations.

3.14 FIELD QUALITY CONTROL

- A. Testing Agency: The Owner's testing agency (Soils Engineer) will perform quality control testing.
- B. Allow Soils Engineer to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work

comply with requirements. Coordinate with Soils Engineer at least 24 hours prior to testing needs.

- C. The Soils Engineer will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Arch Culvert: Two tests of backfill per side.
 - 2. Wall Backfill: At each compacted initial and final backfill layer, at least one test for each 25 feet or less of wall; otherwise no fewer than two tests.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained in accordance with Section 01400. Contractor will not be compensated for fill placement that does not meet compaction criteria. Contractor will not be paid for re-compaction of fill soils that do not meet compaction criteria. Refer to Section 01400, Subsection 1.3 B.1. for clarification.

3.15 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Transport surplus satisfactory soil to designated storage areas designated by Contractor and approved Engineer. Stockpile or spread soil as directed by Engineer.

1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property at no additional cost to Owner.

END OF SECTION 02300

NOT OFFICIAL BID DOCUMENTS - BIDDER MUST BE ON RECORD WITH ISSUING OFFICE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All of the Drawings and general provisions of the Contract, including Section AD-General Conditions, Section AE-Supplementary Conditions, Section AF-Special Conditions and Sections 01010 through 02930 apply to the Work of this Section.

1.2 SUMMARY

- A. This Section includes piping and specialties for combined municipal potable-water and fire-protection water service.

1.3 DEFINITIONS

- A. The following are industry abbreviations apply:

1. DIP: Ductile Iron Pipe
2. PVC: Polyvinyl Chloride Plastic

1.4 SYSTEM PERFORMANCE REQUIREMENTS

- A. Minimum Working Pressures: The following are minimum pressure requirements for piping and specialties, unless otherwise indicated:

1. Combined Potable-Water and Fire-Protection Water Service: 200 psig.

1.5 SUBMITTALS

- A. Product Data: For the following:

1. Pipe and fittings.
2. Valves.
3. Fire hydrants.
4. Vaults and hatches.
5. Pressure reducing valves.
6. Air release valve and box

- B. Record Drawings (As-Built Survey): At Project closeout a digital and printed copy of the completed work as-built prepared by a surveyor of the installed piping. Fittings marked by posts and above ground appurtenances (i.e. valve box, meter box, fire hydrants). Markers will be set by Contractor at bends and along line for reference.
- C. Test Reports: All testing as required by City of Griffin regulations.
- D. Purging and Disinfecting Reports: As specified in "Cleaning" Article in Part 3 and as required by City of Griffin regulations.
- E. Maintenance Data: For specialties to include in the maintenance manuals specified in Division 1. Include data for the following:
 - 1. Valves.
 - 2. Hydrants.
 - 3. Pressure reducing valves.

1.6 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of water-service piping specialties and are based on specific types and models indicated. Other manufacturers' products with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."
- B. Comply with standards of authorities having jurisdiction (the City of Griffin) for potable water-service piping. Include materials, installation, testing, and disinfection.
- C. Comply with NSF 61, "Drinking Water System Components--Health Effects," for materials for potable water.
- D. Comply with standards of authorities having jurisdiction for fire-protection water-service piping. Include materials, hose threads, installation, and testing.
- E. Provide listing/approval stamp, label, or other marking on piping and specialties made to specified standards.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:
 - 1. Ensure that valves are dry and internally protected against rust and corrosion.
 - 2. Protect valves against damage to threaded ends and flange faces.
 - 3. Set valves in best position for handling. Set valves closed to prevent rattling.

- B. During Storage: Use precautions for valves, including fire hydrants, according to the following:
 - 1. Do not remove end protectors, unless necessary for inspection; then reinstall for storage.
 - 2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Handling: Use sling to handle valves and fire hydrants whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use handwheels or stems as lifting or rigging points.
- D. Deliver piping with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.8 PROJECT CONDITIONS

- A. Perform site survey, research public utility records, and verify existing utility locations. Contact utility-locating service for area where Project is located.
- B. Perform utility pothole and probing as required to provide positive location.
- C. Verify existing water main materials where wet taps or other connections are being constructed.
- D. Perform site walk and document existing improvements and their conditions such as fencing, drives, mailboxes, trees, lawns (including grass species), etc.

PART 2 - PRODUCTS

2.1 PIPES AND TUBES

- A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.
- B. Ductile-Iron, Mechanical-Joint Pipe: DIP shall be designed in accordance with ANSI A21.50 (AWWA C150), latest revision and manufactured in accordance with ANSI A21.51 (AWWA C151), latest revision. 16" DIP shall be thickness class 52 unless specified otherwise. 8" DIP shall be Pressure Class 350, unless specified otherwise. The pipe shall have an outside asphaltic coating in accordance with ANSI A21.51 (AWWA C151), latest revision, and shall also have standard cement lining inside with asphaltic seal coat per ANSI A21.4 (AWWA C104), latest revision.
- C. Copper: Type K.
- D. Steel Encasement Pipe: 24" ASTM A252 with 0.375" wall thickness. Pipe to have bituminous asphaltic exterior coating. Encasement pipe must be straight 20' sections with no mid-weld joints.

2.2 PIPE AND TUBE FITTINGS

- A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.
- B. Ductile-Iron, Mechanical-Joint Fittings: AWWA C110, ductile-iron; or AWWA C153, ductile-iron, compact type. Include cement-mortar lining and seal coat according to AWWA C104 and glands, rubber gaskets, and bolts and nuts according to AWWA C111. Minimum working pressure to match pipe at 350 psi. Include mega lug or equal retainer glads (2) and bolts per fittings.
- C. Ductile-Iron, Deflection Fittings: Compound coupling fitting with sleeve and flexing sections, gaskets, and restrained-joint ends complying with AWWA C110 or AWWA C153. Include 350-psig minimum working-pressure rating; cement-mortar lining or epoxy, interior coating according to AWWA C550; deflection of at least 20 degrees; and glands, rubber gaskets, and bolts and nuts according to AWWA C111.

2.3 JOINING MATERIALS

- A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.
- B. Ductile-Iron Piping: The following materials apply:
 - 1. Mechanical Joints: AWWA C111 ductile-iron or gray-iron glands, high-strength steel bolts and nuts, and rubber gaskets.

2. Bends shall have MEGALUG joint restraints or approved equal.
- C. Pipe Couplings: Iron-body sleeve assembly, fabricated to match OD of pipes to be joined.
1. Sleeve: ASTM A 126, Class B, gray iron.
 2. Followers: ASTM A 47, malleable iron; or ASTM A 536, ductile iron.
 3. Gaskets: Rubber.
 4. Bolts and Nuts: AWWA C111.
 5. Finish: Enamel paint.
- D. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

2.4 VALVES

- A. Nonrising-Stem Gate Valves, 8-Inch NPS and Larger: UL 262, FM approved, iron body, bronze mounted with a compression resilient seat manufactured in accordance with AWWA STD C507, latest revision, bronze seating material, inside screw, 200-psig working pressure, and mechanical-joint ends and tabs for rod connections.
- B. Valve Boxes: Cast-iron box with top section and cover with lettering "WATER," bottom section with base of size to fit over valve and barrel approximately 5 inches in diameter, and adjustable cast-iron extension of length required for depth of bury of valve.
1. Provide steel tee-handle operating wrench with each valve box. Include tee handle with one pointed end, stem of length to operate valve, and socket-fitting valve-operating nut.
- C. Tapping Sleeve and Tapping Valve: Tapping Sleeves shall be Power Seal 3490 stainless or equal. Tapping Valves shall be Mueller, M.J. Type, 200.

2.5 ANCHORAGES

- A. Clamps, Straps, and Washers: ASTM A 506, stainless steel.
- B. Rods: ASTM A 575, steel.
- C. Rod Couplings: ASTM A 197, malleable iron.

- D. Bolts: ASTM A 307, steel.
- E. Cast-Iron Washers: ASTM A 126, gray iron.
- F. Concrete Reaction Backing: Portland cement concrete mix, 3000 psig.
 - 1. Cement: ASTM C 150, Type I.
 - 2. Fine Aggregate: ASTM C 33, sand.
 - 3. Coarse Aggregate: ASTM C 33, crushed gravel.
 - 4. Water: Potable.

2.6 IDENTIFICATION

- A. Refer to Division 2 Section "Earthwork" for underground warning tape materials.
- B. Arrange for detectable warning tapes made of solid blue film with metallic core and continuously printed black-letter caption "CAUTION--WATER LINE BURIED BELOW."
- C. Install temporary markers at bends for location during construction and to aid in the as-built drawing process. Location shall be surveyed and digital photos taken at time of installation.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Refer to Division 2 Section "Earthwork" for excavation, trenching, and backfilling.

3.2 PIPING APPLICATIONS

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications:
- B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.
- C. Do not use flanges or keyed couplings for underground piping.

1. Exception: Piping in boxes and structures, but not buried, may be joined with flanges or keyed couplings instead of joints indicated.
- D. Flanges, keyed couplings, and special fittings may be used on aboveground piping.
- E. Potable Water-Service Piping and Fire Protection Piping: Use the following:
 1. 8 to 16-Inch NPS: Ductile-iron, mechanical-joint pipe; ductile-iron, mechanical-joint fittings; and mechanical joints meeting City of Griffin specifications.

3.3 VALVE APPLICATIONS

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 1. Underground Valves, 6-Inch NPS and Larger: AWWA, gate valves, nonrising stem, with valve box meeting City of Griffin Specifications.

3.4 JOINT CONSTRUCTION

- A. Ductile-Iron Piping, Gasketed Joints: According to AWWA C600.
- B. Ductile-Iron Piping, Gasketed Joints for Fire-Service Piping: According to UL 194 and AWWA C600.
- C. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, OD, and system working pressure. Refer to "Piping Systems - Common Requirements" Article below for joining piping of dissimilar metals.
- D. Joints to have 'Mega Lug' type restraints as noted on plans.

3.5 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. General Locations and Arrangements: Drawings indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated, unless deviations to layout are approved on Coordination Drawings.
- B. Install locating wire on all non-ferrous piping.
- C. Install warning tape above all piping.

- D. Install components with pressure rating equal to or greater than system operating pressure and meeting City of Griffin specifications.
- E. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
- F. Install fittings for changes in direction and branch connections.

3.6 PIPING INSTALLATION

- A. Water-Main Connection: Tap water main with size and in location as indicated according to requirements of water utility IF REQUIRED.
- B. Make connections 8-inch and larger with tapping machine according to the following:
 - 1. Install tapping sleeve and tapping valve according to manufacturer's written instructions.
 - 2. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.
 - 3. Install gate valve onto tapping sleeve. Comply with AWWA C600. Install valve with stem pointing up and with cast-iron valve box.
 - 4. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove tapping machine and connect water-service piping.
- C. Comply with NFPA 24 for fire-protection water-service piping materials and installation.
- D. Install ductile-iron piping according to AWWA C600.
 - 1. Encase piping with PE film according to ASTM A 674 or AWWA C105.
- E. Bury piping with depth of cover over top at least 48 inches, with top at least 12 inches below level of maximum frost penetration.

3.7 ANCHORAGE INSTALLATION

- A. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
 - 1. Gasketed-Joint, Ductile-Iron, Potable-Water Piping: According to AWWA C600.
- B. Apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of installed ferrous anchorage devices.

- C. Install poly film over pipe at points of contact with concrete.

3.8 VALVE INSTALLATION

- A. General Application: Use mechanical-joint-end valves for 6 NPS and larger underground installation. Use threaded- and flanged-end valves for installation in pits and manholes. Use nonrising-stem UL/FM gate valves for installation with indicator posts. Use bronze corporation stops and valves, with ends compatible with piping, for 2-inch NPS and smaller installation.
- B. AWWA-Type Gate Valves: Comply with AWWA C600. Install underground valves with stem pointing up and with cast-iron valve box.

3.9 IDENTIFICATION INSTALLATION

- A. Install continuous plastic underground warning tape during back-filling of trench for underground water-service piping. Locate 16 inches below finished grade, directly over piping.
- B. Detectable warning tape shall be installed directly above waterlines 16'' below grade.

3.10 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests before joints are covered and after thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: Test at City of Griffin requirement of 200 psi for two (2) hours.
- C. Coordinate with the City of Griffin for any other required testing prior to approval.
- D. Prepare reports for testing activities.

3.11 CLEANING

- A. Clean and disinfect water distribution piping as follows:
 - 1. Purge new water distribution piping and parts of existing piping that have been altered, extended, or repaired before use.

2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities, use procedure described in NFPA 24 for flushing of piping. Flush piping system with clean, potable water until no dirty water appears at points of outlet.
 3. Use purging and disinfecting procedure meeting City of Griffin regulations. or use procedure described in AWWA C651 or as described below if more stringent than City of Griffin regulations:
 - a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
 - b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.
 - c. After allowed standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
 - d. Submit water samples in sterile bottles to authorities having jurisdiction and independent testing lab. Repeat procedure if biological examination shows evidence of contamination.
 4. Retest 48 hours after initial test.
- B. Prepare reports for purging and disinfecting activities.

END OF SECTION 02510

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All of the Drawings and general provisions of the Contract, including Section AD-General Conditions, Section AE-Supplementary Conditions, Section AF-Special Conditions and Sections 01010 through 01740 apply to the Work of this Section.

1.2 SUMMARY

- A. This Section includes sanitary sewerage outside the building.

1.3 DEFINITIONS

- A. PVC: Polyvinyl chloride plastic.
- B. DIP: Ductile Iron Pipe.

1.4 PERFORMANCE REQUIREMENTS

- A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.

1.5 SUBMITTALS

- A. Product Data: For the following:

1. Manhole cover inserts.
2. Pipe.

- B. Shop Drawings: Include plans, elevations, details, and attachments for the following:

1. Precast concrete manholes, including frames and covers.
2. Cast-in-place concrete manholes and other structures, including frames and covers.

- C. Design Mix Reports and Calculations: For each class of cast-in-place concrete.

- D. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic structures, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle precast concrete manholes and other structures according to manufacturer's written rigging instructions.

1.7 PROJECT CONDITIONS

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.
- B. Locate existing structures and piping to be closed and abandoned.
- C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Engineer not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer's written permission.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work.

2.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe and fitting materials.

2.3 PIPES AND FITTINGS

- A. Ductile-Iron Sewer Pipe: Pressure Class 350 - ASTM A 746, for push-on joints. All pipe and fittings must be per City of Griffin specifications.
1. Standard-Pattern, Ductile-Iron Fittings: AWWA C110, ductile or gray iron, for push-on joints.
 2. Compact-Pattern, Ductile-Iron Fittings: AWWA C153, for push-on joints.
 3. Gaskets: AWWA C111, rubber.
- B. PVC Sewer Pipe and Fittings: According to the following:
- ASTM D 3034, SDR 26, gasketed joints.
- a. Gaskets: ASTM F 477, elastomeric seals.

All pipe and fittings must be per City of Griffin specifications.

2.4 SPECIAL PIPE COUPLINGS AND FITTINGS

- A. Sleeve-Type Pipe Couplings: ASTM C1173, rubber or elastomeric sleeve and band assembly fabricated to mate with OD of pipes to be joined, for nonpressure joints.
1. Sleeve Material for Plastic Pipe: ASTM F 477, elastomeric seal.
 2. Sleeve Material for Dissimilar Pipe: Compatible with pipe materials being joined.

2.5 MANHOLES

- A. Normal-Traffic Precast Concrete Manholes: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints, and meeting City of Griffin Water and Wastewater Department Specifications.
1. Diameter: 48 inches minimum, unless otherwise indicated.
 2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
 3. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
 4. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
 5. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.

6. Gaskets: ASTM C 443, rubber.
 7. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch- diameter frame and cover.
 8. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
 9. Steps: ASTM C 478, individual steps or ladder. Omit steps for manholes less than 60 inches deep.
 10. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
- B. Heavy-Traffic Precast Concrete Manholes: ASTM C 913; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for rubber gasketed joints.
1. Ballast: Increase thickness of one or more precast concrete sections or add concrete to structure, as required to prevent flotation.
 2. Gaskets: Rubber.
 3. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch- diameter frame and cover.
 4. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
 5. Steps: Manufactured from deformed, 1/2-inch steel reinforcement rod complying with ASTM A 615/A 615M and encased in polypropylene complying with ASTM D 4101. Include pattern designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
 6. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
- C. Cast-in-Place Concrete Manholes: Construct of reinforced-concrete bottom, walls, and top; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, dimensions, and appurtenances indicated.
1. Ballast: Increase thickness of concrete, as required to prevent flotation.
 2. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch- diameter frame and cover.
 3. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.

4. Steps: Manufactured from deformed, 1/2-inch steel reinforcement rod complying with ASTM A 615/A 615M and encased in polypropylene complying with ASTM D 4101. Include pattern designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.

D. Manhole Frames and Covers: City of Griffin Standard (see detail) manufactured by East Jordan Iron Works, East Jordan, MI

1. Manholes in grassed areas and outfall lines must have bolt down tops.

2.6 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

C. Structure Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio. Include channels and benches in manholes.

1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
 - a. Invert Slope: minimum 0.20' through manhole with angles of 30° or greater; 0.10 straight to 30°.
2. Benches: Concrete, sloped to drain into channel.
 - a. Slope: 8 percent.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

2.7 CLEANOUTS

- A. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping (6" @ R/W. As Notes on plans.)
- B. DIP Cleanouts: DIP riser and bronze cap to be used when cleanouts are in pavement.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."

3.2 IDENTIFICATION

- A. Materials and their installation are specified in Division 2 Section "Earthwork." Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.
 1. Use detectable warning tape over all laterals and lines 6 inches or less.
 2. Wrap 6 inches or less pipe with detector wire.
 3. Wrap all laterals with detection wire.

3.3 PIPING APPLICATIONS

- A. General: Include watertight joints.
- B. Refer to Part 2 of this Section for detailed specifications for pipe and fitting products listed below. Use pipe, fittings, and joining methods according to applications indicated.
- C. Gravity-Flow Piping: Use the following:
 1. NPS 12: Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints as indicated on plans.
 2. NPS 6 - 12: PVC sewer pipe SDR26 and fittings, gaskets and gasketed joints.

3.4 SPECIAL PIPE COUPLING AND FITTING APPLICATIONS

- A. Special Pipe Couplings: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
 - 1. Use the following pipe couplings for nonpressure applications:
 - a. Sleeve type to join piping, of same size, or with small difference in OD.
 - b. Increaser/reducer-pattern, sleeve type to join piping of different sizes.
 - c. Bushing type to join piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

3.5 INSTALLATION, GENERAL

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.
- C. Use manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.
- D. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. Install gravity-flow piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.
 - 1. Install piping pitched down in direction of flow at slopes indicated.
- F. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by tunneling, jacking, or a combination of both.

3.6 PIPE JOINT CONSTRUCTION AND INSTALLATION

- A. General: Join and install pipe and fittings according to installations indicated.
- B. Ductile-Iron Sewer Pipe with Ductile-Iron Fittings: According to AWWA C600.
- C. PVC Sewer Pipe and Fittings: As follows:
 - 1. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
 - 2. Join profile sewer pipe fittings with gaskets according to ASTM D 2321 and manufacturer's written instructions.
 - 3. Install according to ASTM D 2321.
- D. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.
- E. Install with top surfaces of components, except piping, flush with finished surface.

3.7 MANHOLE INSTALLATION

- A. General: Install manholes, complete with appurtenances and accessories indicated.
- B. Form continuous concrete channels and benches between inlets and outlet.
- C. Set tops of frames and covers flush with finished surface of manholes that occur in pavements and walking paths. Set tops 12 inches above finished surface elsewhere, unless otherwise indicated.
- D. Install precast concrete manhole sections with gaskets according to ASTM C 891.

3.8 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318 and ACI 350R.

3.9 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extension from sewer pipe to cleanout at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

- B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 x 18 x 6" deep. Set with tops 1 inch above surrounding grade and grout between block and cleanout riser. Adjust cleanout so that cap is 1/2" below top of concrete pad.
- C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface at right-of-way.
- D. All cleanouts and laterals from main to right-of-way or limits of City of Griffin Public Sewer Easement to be 6 inches diameter.

3.10 TAP CONNECTIONS

- A. Make connections to existing piping and underground structures so finished Work complies as nearly as practical with requirements specified for new Work and meets the City of Griffin Water and Wastewater Department specifications.
- B. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
- C. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.11 FIELD QUALITY CONTROL

- A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
 - 1. Place plug in end of incomplete piping at end of day and when work stops.
 - 2. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.
- B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
 - 1. Submit separate reports for each system inspection.
 - 2. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.

- b. Deflection: Flexible piping (PVC) with deflection that prevents passage of a mandril of size not less than 92.5 percent of piping diameter or that meets the City of Griffin Water and Wastewater Department specifications.
 - c. Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Exfiltration: Water leakage from or around piping.
3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
 4. Reinspect and repeat procedure until results are satisfactory.
- C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.
 2. Test completed piping systems according to City of Griffin Water and Wastewater Department specifications.
 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
 4. Submit separate reports for each test.
 5. Perform tests as follows:
 - a. Sanitary Sewerage: Perform air test according to UNI-B-6.
 - b. Television system with water flowing in the pipe.
 - c. Perform mandril test on PVC pipe.
 - d. Perform any other tests as required by City of Griffin prior to approval.
 6. Manholes: Perform hydraulic test according to ASTM C 969.
 7. Leaks and loss in test pressure constitute defects that must be repaired.
 8. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

END OF SECTION 02530

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 exterior cement concrete pavement for the following:
 - 1. Curbs and gutters.
 - 2. Waterway/Flumes.
- B. Related Sections include the following:
 - 1. Division 2 Section "Earthwork" for subgrade preparation, grading, and subbase course.
 - 2. Division 2 Section "Pavement Joint Sealants" for joint sealants within concrete pavement and at isolation joints of concrete pavement with adjacent construction.
 - 3. Division 3 Section "Cast-in-Place Concrete" for general building applications of concrete.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, expansive hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.4 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixes: For each concrete pavement mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

- C. Samples: 10-lb sample of exposed aggregate.
- D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:
- E. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
 - 1. Cementitious materials and aggregates.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Fiber reinforcement.
 - 4. Admixtures.
 - 5. Curing compounds.
 - 6. Applied finish materials.
 - 7. Bonding agent or adhesive.
 - 8. Joint fillers.
- F. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed pavement work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
 - 1. Manufacturer must be certified according to the National Ready Mix Concrete Association's Plant Certification Program.
- C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.
- E. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by the requirements of the Contract Documents.
- F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixes.

- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
1. Before submitting design mixes, review concrete pavement mix design and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with concrete pavement to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixes.
 - c. Ready-mix concrete producer.
 - d. Concrete subcontractor.

PART 2 - PRODUCTS

2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
1. Use flexible or curved forms for curves of a radius 100 feet or less.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- B. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.
- C. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- D. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60 (Grade 420). Cut bars true to length with ends square and free of burrs.
- E. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

- F. Hook Bolts: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:
 - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

- A. General: Use the same brand and type of cementitious material from the same manufacturer throughout the Project.
- B. Portland Cement: ASTM C 150, Type I or II.
 - 1. Fly Ash: ASTM C 618, Class F or C.
 - 2. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- C. Blended Hydraulic Cement: ASTM C 595M, Type IS, portland blast-furnace slag cement.
- D. Blended Hydraulic Cement: ASTM C 595M, Type IP portland pozzolan cement.
- E. Blended Hydraulic Cement: ASTM C 595M, Type I (PM) pozzolan-modified portland cement.
- F. Blended Hydraulic Cement: ASTM C 595M, Type I (SM) slag-modified portland cement.
- G. Aggregate: ASTM C 33, uniformly graded, from a single source, with coarse aggregate as follows:
 - 1. Class: 4S.
 - 2. Class: 4M.
 - 3. Class: 1N.
 - 4. Maximum Aggregate Size: 1-1/2 inches nominal.
 - 5. Maximum Aggregate Size: 1 inch nominal.
 - 6. Maximum Aggregate Size: 3/4 inch nominal.

7. Do not use fine or coarse aggregates containing substances that cause spalling.
- H. Exposed Aggregate: Selected, hard, and durable; washed; free of material that reacts with cementitious material or causes staining; from a single source, with gap graded coarse aggregate as follows:
 1. Aggregate Sizes: 3/4 to 1 inch nominal.
 2. Aggregate Sizes: 1/2 to 3/4 inch nominal.
 3. Aggregate Sizes: 3/8 to 5/8 inch nominal.
- I. Water: ASTM C 94.

2.4 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures.
- B. Air-Entraining Admixture: ASTM C 260.
- C. Water-Reducing Admixture: ASTM C 494, Type A.
- D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
- E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
- F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.5 FIBER REINFORCEMENT

- A. Synthetic Fiber: Fibrillated polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III, 1/2 to 1 inch long.
- B. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III, 1/2 to 1 inch long.
- C. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- D. Products: Subject to compliance with requirements, provide one of the following:
 1. Fibrillated Fibers:

- a. Fibrasol F; Axim Concrete Technologies.
- b. Fibermesh; Fibermesh, Div. of Synthetic Technologies.
- c. Forta CR; Forta Corporation.
- d. Grace Fibers; W. R. Grace & Co., Construction Products Div.

2. Monofilament Fibers:

- a. Fibrasol IIP; Axim Concrete Technologies.
- b. Fiberstrand 100; Euclid Chemical Co.
- c. Fibermix Stealth; Fibermesh, Div. of Synthetic Industries.
- d. Forta Mono; Forta Corporation.
- e. Grace MicroFiber; W. R. Grace & Co., Construction Products Div.
- f. Polystrand 1000; Metalcrete Industries.

2.6 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- E. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- F. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- G. White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.
- H. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- I. Products: Subject to compliance with requirements, provide one of the following:
 1. Evaporation Retarder:

- a. Cimfilm; Axim Concrete Technologies.
 - b. Finishing Aid Concentrate; Burke Group, LLC (The).
 - c. Spray-Film; ChemMasters.
 - d. Aquafilm; Conspec Marketing & Manufacturing Co., Inc.
 - e. Sure Film; Dayton Superior Corporation.
 - f. Eucobar; Euclid Chemical Co.
 - g. Vapor Aid; Kaufman Products, Inc.
 - h. Lambco Skin; Lambert Corporation.
 - i. E-Con; L&M Construction Chemicals, Inc.
 - j. Confilm; Master Builders, Inc.
 - k. Waterhold; Metalcrete Industries.
 - l. Rich Film; Richmond Screw Anchor Co.
 - m. SikaFilm; Sika Corporation.
 - n. Finishing Aid; Symons Corporation.
 - o. Certi-Vex EnvioAssist; Vexcon Chemicals, Inc.
2. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound:
- a. AH Curing Compound #2 DR; Anti-Hydro International, Inc.
 - b. Res-X Cure All Resin; Burke Group, LLC (The).
 - c. RX Cure; Conspec Marketing & Manufacturing Co., Inc.
 - d. Day-Chem Rez Cure; Dayton Superior Corporation.
 - e. Kurez DR; Euclid Chemical Co.
 - f. Nitocure S; Fosroc.
 - g. #64 Resin Cure; Lambert Corporation.
 - h. L&M Cure DR; L&M Construction Chemicals, Inc.
 - i. 3100-Clear; W. R. Meadows, Inc.
 - j. Seal N Kure FDR; Metalcrete Industries.
 - k. Rich Cure; Richmond Screw Anchor Co.
 - l. Resi-Chem C309; Symons Corporation.
 - m. Hornocure 30; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.
 - n. Uni Res 150; Unitex.
 - o. Certi-Vex RC; Vexcon Chemicals, Inc.
3. Clear Waterborne Membrane-Forming Curing Compound:
- a. AH Curing Compound #2 DR WB; Anti-Hydro International, Inc.
 - b. Aqua Resin Cure; Burke Group, LLC (The).
 - c. Safe-Cure Clear; ChemMasters.
 - d. W.B. Resin Cure; Conspec Marketing & Manufacturing Co., Inc.
 - e. Day Chem Rez Cure (J-11-W); Dayton Superior Corporation.
 - f. Nitocure S; Fosroc.
 - g. Aqua Kure-Clear; Lambert Corporation.
 - h. L&M Cure R; L&M Construction Chemicals, Inc.

- i. 1100 Clear; W. R. Meadows, Inc.
 - j. Resin Cure E; Nox-Crete Products Group, Kinsman Corporation.
 - k. Rich Cure E; Richmond Screw Anchor Co.
 - l. Resi-Chem Clear Cure; Symons Corporation.
 - m. Horncure 100; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.
 - n. Hydro Cure; Unitex.
 - o. Certi-Vex Enviocure; Vexcon Chemicals, Inc.
4. White Waterborne Membrane-Forming Curing Compound:
- a. AH Curing Compound #2 WB WP; Anti-Hydro International, Inc.
 - b. Aqua Resin Cure; Burke Group, LLC (The).
 - c. W.B. Resin Cure; Conspec Marketing & Manufacturing Co., Inc.
 - d. Thinfilm 450; Kaufman Products, Inc.
 - e. Aqua Kure-White; Lambert Corporation.
 - f. L&M Cure R-2; L&M Construction Chemicals, Inc.
 - g. 1200-White; W. R. Meadows, Inc.
 - h. White Pigmented Resin Cure E; Nox-Crete Products Group, Kinsman Corporation.
 - i. Rich Cure White E; Richmond Screw Anchor Co.
 - j. Resi-Chem High Cure; Symons Corporation.
 - k. Horncure 200-W; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.
 - l. Hydro White 309; Unitex.

2.7 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Pavement-Marking Paint: Alkyd-resin type; ready mixed; complying with FS TT-P-115, Type I, or AASHTO M 248, Type N.
- C. Pavement-Marking Paint: Latex, water-base emulsion; ready mixed; complying with FS TT-P-1952.
 1. Color: As indicated.
 2. Color: Blue for handicapped requirements, white elsewhere.
 3. Color: Blue for handicapped requirements, yellow for fire lanes, white elsewhere.
- D. Glass Beads: AASHTO M 247.

- E. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

2.8 CONCRETE MIXES

- A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
- B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the trial batch method.
1. Do not use Owner's field quality-control testing agency as the independent testing agency.
- C. Proportion mixes to provide concrete with the following properties:
1. Compressive Strength (28 Days): 4000 psi.
 2. Compressive Strength (28 Days): 3500 psi.
 3. Compressive Strength (28 Days): 3000 psi.
 4. Maximum Water-Cementitious Materials Ratio: 0.45.
 5. Maximum Water-Cementitious Materials Ratio: 0.50.
 6. Slump Limit: 3 inches.
 7. Slump Limit: 4 inches.
 - a. Slump Limit for Concrete Containing High-Range Water-Reducing Admixture: Not more than 8 inches after adding admixture to plant- or site-verified, 2- to 3-inch slump.
- D. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements for concrete exposed to deicing chemicals.
- E. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash: 25 percent.
 2. Combined Fly Ash and Pozzolan: 25 percent.
 3. Ground Granulated Blast-Furnace Slag: 50 percent.
 4. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.

- F. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 2.5 to 4.5 percent.
- G. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus or minus 1.5 percent:
 - 1. Air Content: 5.5 percent for 1-1/2-inch maximum aggregate.
 - 2. Air Content: 6.0 percent for 1-inch maximum aggregate.
 - 3. Air Content: 6.0 percent for 3/4-inch maximum aggregate.
- H. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd.

2.9 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94.
- B. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94 and ASTM C 1116.
 - 1. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- C. Project-Site Mixing: Comply with requirements and measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.
 - 1. For mixers of 1 cu. yd. or smaller capacity, continue mixing at least one and one-half minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
 - 2. For mixers of capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
 - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. Proceed with pavement only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.

3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement and with recommendations in CRSI's "Placing Reinforcing Bars" for placing and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.

3.4 JOINTS

- A. General: Construct construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at isolation joints.
1. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
 2. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
 3. Provide tie bars at sides of pavement strips where indicated.
 4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 5. Use epoxy bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
1. Locate expansion joints at intervals of 50 feet, unless otherwise indicated.
 2. Extend joint fillers full width and depth of joint.
 3. Terminate joint filler less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.
- E. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to the following radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
 - a. Radius: 1/4 inch.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
- F. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to the following radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.
1. Radius: 1/4 inch.

3.5 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcement steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.
- D. Comply with requirements and with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery, at Project site, or during placement.
- F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- G. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete according to recommendations in ACI 309R.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.
- H. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.
1. Remove and replace portions of bottom layer of concrete that have been placed more than 15 minutes without being covered by top layer, or use bonding agent if approved by Engineer.
- I. Screed pavement surfaces with a straightedge and strike off. Commence initial floating using bull floats or darbies to form an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading dry-shake surface treatments.
- J. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.
- K. Slip-Form Pavers: When automatic machine placement is used for pavement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce pavement to required thickness, lines, grades, finish, and jointing as required for formed pavement.
1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of paver machine during operations.
- L. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.
- M. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.

2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

N. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover reinforcement steel with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, reinforcement steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.6 CONCRETE FINISHING

A. General: Wetting of concrete surfaces during screeding, initial floating, or finishing operations is prohibited.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
2. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

3.7 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and follow recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during

finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.8 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
 - 1. Elevation: 1/4 inch.
 - 2. Thickness: Plus 3/8 inch, minus 1/4 inch.
 - 3. Surface: Gap below 10-foot- long, unlevelled straightedge not to exceed 1/4 inch.
 - 4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.
 - 5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch.
 - 6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch.
 - 7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches.
 - 8. Joint Spacing: 3 inches.
 - 9. Contraction Joint Depth: Plus 1/4 inch, no minus.
 - 10. Joint Width: Plus 1/8 inch, no minus.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.
- B. Testing Agency: Owner will engage a qualified testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.
- C. Testing Services: Testing shall be performed according to the following requirements:
1. Sampling Fresh Concrete: Representative samples of fresh concrete shall be obtained according to ASTM C 172, except modified for slump to comply with ASTM C 94.
 2. Slump: ASTM C 143; one test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
 3. Air Content: ASTM C 231, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of air-entrained concrete.
 4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each set of compressive-strength specimens.
 5. Compression Test Specimens: ASTM C 31/C 31M; one set of four standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
 6. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. One specimen shall be tested at 7 days and two specimens at 28 days; one specimen shall be retained in reserve for later testing if required.
 7. When frequency of testing will provide fewer than five compressive-strength tests for a given class of concrete, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 8. When total quantity of a given class of concrete is less than 50 cu. yd., Engineer may waive compressive-strength testing if adequate evidence of satisfactory strength is provided.
 9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, current operations shall be evaluated and corrective procedures shall be provided for protecting and curing in-place concrete.
 10. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive compressive-strength test results equal or exceed specified

compressive strength and no individual compressive-strength test result falls below specified compressive strength by more than 500 psi.

- D. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing agency, concrete type and class, location of concrete batch in pavement, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as the sole basis for approval or rejection.
- F. Additional Tests: Testing agency shall make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Engineer. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

3.10 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.
- B. Drill test cores where directed by Engineer when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 02751

SECTION 02930 - LAWNS AND GRASSES

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 following:

1. Fine grading and preparing lawn areas.
2. Furnishing and applying new topsoil.
3. Furnishing and applying soil amendments.
4. Furnishing and applying fertilizers.
5. Seeding new lawns.
6. Replanting unsatisfactory or damaged lawns.
7. Watering during drought conditions.

- B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 2 Section "Earthwork" for excavation, filling, rough grading, and subsurface aggregate drainage and drainage backfill.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

- B. Product data for the following:

1. Fertilizers.
2. Seeds.

- C. Certification of grass seed from seed vendor for each grass-seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for sod, identifying sod source, including name and telephone number of supplier.
 - D. Certification by product manufacturer that the following products supplied comply with requirements:
 1. Limestone.
 2. Fertilizers.
 - E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of Engineers and owners, and other information specified.
 - F. Material test reports from qualified independent testing agency indicating and interpreting test results relative to compliance of the following materials with requirements indicated.
 1. Analysis of existing surface soil.
 - G. Planting schedule indicating anticipated dates and locations for each type of planting.
 - H. Maintenance instructions recommending procedures to be established by Owner for maintenance of landscaping during an entire year. Submit before expiration of required maintenance periods.
- 1.4 QUALITY ASSURANCE
- A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful grass establishment.
 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that grass planting is in progress.
 - B. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Engineer's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
 - C. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.6 COORDINATION AND SCHEDULING

- A. Planting Season: Sow lawn seed and install sod during normal planting seasons for type of lawn work required. Correlate planting with specified maintenance periods to provide required maintenance from date of Substantial Completion. Planting should follow schedule as shown on plans.
- B. Weather Limitations: Proceed with planting only when existing and forecast weather conditions are suitable for work.

1.7 MAINTENANCE

- A. Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
 - 1. Permanent Seeding: 14 days after date of Substantial Completion if season allows.
 - 2. Temporary Seeding: Immediately following completion of construction up to permanent seeding establishment.
 - a. **When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established at that time, continue maintenance during next planting season.**
- B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and mulch to produce a uniformly smooth lawn.
 - 1. Replant bare areas with same materials specified for lawns.
 - 2. Add new mulch in areas where mulch has been disturbed by wind or maintenance operations sufficiently to nullify its purpose. Anchor as required to prevent displacement.
- C. Watering of road slopes to enhance establishment of vegetation may have to be implemented and an allowance should be made for this task.

PART 2 - PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.
 - 1. Seed Mixture: Provide seed of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated on plans.

2.2 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 0.5 inch or larger in any dimension, and other extraneous materials harmful to plant growth.
 - 1. Topsoil Source: Reuse surface soil stockpiled on the site. Verify suitability of surface soil to produce topsoil meeting requirements and amend when necessary. Clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.

2.3 SOIL AMENDMENTS

- A. Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent, with a minimum 99 percent passing a No. 8 sieve and a minimum 75 percent passing a No. 60 sieve.
 - 1. Provide lime in the form of dolomitic limestone.
- B. Sand: Clean, washed, natural or manufactured sand, free of toxic materials.
- C. Peat Humus: Finely divided or granular texture, with a pH range of 6 to 7.5, composed of partially decomposed moss peat (other than sphagnum), peat humus, or reed-sedge peat.
- D. Sawdust or Ground-Bark Humus: Decomposed, nitrogen-treated, of uniform texture, free of chips, stones, sticks, soil, or toxic materials.
 - 1. When site treated, mix with at least 0.15 lb of ammonium nitrate or 0.25 lb of ammonium sulfate per cu. ft. of loose sawdust or ground bark.
- E. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

- F. Herbicides: EPA registered and approved, of type recommended by manufacturer.
- G. Water: Potable or from on-site lakes.

2.4 FERTILIZER

- A. Superphosphate: Commercial, phosphate mixture, soluble; minimum of 20 percent available phosphoric acid.
- B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:
 - 1. Composition: 1 lb per 1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- C. Slow-Release Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.5 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- B. Peat Mulch: Provide peat moss in natural, shredded, or granulated form, of fine texture, with a pH range of 4 to 6 and a water-absorbing capacity of 1100 to 2000 percent.
- C. Fiber Mulch: Biodegradable dyed-wood cellulose-fiber mulch, nontoxic, free of plant growth- or germination-inhibitors, with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
- D. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application, nontoxic and free of plant growth- or germination-inhibitors.

2.6 EROSION-CONTROL MATERIALS

- A. Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
- B. Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, 0.92 lb per sq. yd. minimum, with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect adjacent and adjoining areas from hydroseed overspraying.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 PLANTING SOIL PREPARATION

- A. Limit subgrade preparation to areas that will be planted in the immediate future.
- B. Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter.
- C. Mix soil amendments and fertilizers with topsoil at rates indicated. Delay mixing fertilizer if planting does not follow placing of planting soil within a few days. Either mix soil before spreading or apply soil amendments on surface of spread topsoil and mix thoroughly into top 4 inches of topsoil before planting.
 - 1. A "Planting Soil Amendments Schedule" is included at the end of this Section.
 - 2. Mix lime with dry soil prior to mixing fertilizer.

3. Apply superphosphate fertilizer directly to subgrade before tilling, at the rate indicated.
- D. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen.
1. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
 2. Allow for sod thickness in areas to be sodded.
- E. Preparation of Unchanged Grades: Where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:
1. Remove and dispose of existing grass, vegetation, and turf. Do not turn over into soil being prepared for lawns.
 2. Till surface soil to a depth of at least 6 inches. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
 3. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 4. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Owner's property.
- F. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1 inch in any dimension, and other objects that may interfere with planting or maintenance operations.
- G. Moisten prepared lawn areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- H. Restore prepared areas if eroded or otherwise disturbed after fine grading and before planting.

3.4 SEEDING BUILDING PADS

- A. Building pads are to be seeded with an agricultural type grain drill in lieu of broadcast planting.
1. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.

- B. Sow seed at the rates shown on the grassing schedules on the plans.
- C. Rake seed lightly into top 1/8 inch of topsoil, roll lightly, and water with fine spray.

3.5 HYDROSEEDING DISTURBED AREAS

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
 - 1. Mix slurry with nonasphaltic tackifier.
 - 2. Apply slurry uniformly to all areas to be seeded in a 1-step process. Apply mulch at the minimum rate of 1500 lb per acre dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.6 RECONDITIONING LAWNS

- A. Recondition existing lawn areas damaged by Contractor's operations, including storage of materials or equipment and movement of vehicles. Also recondition lawn areas where settlement or washouts occur or where minor regrading is required.
 - 1. Recondition other existing lawn areas.
- B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.
- C. Where substantial lawn remains, mow, dethatch, core aerate, and rake. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- D. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of it off the Owner's property.
- E. Till stripped, bare, and compacted areas thoroughly to a depth of 6 inches.
- F. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches of soil. Provide new planting soil as required to fill low spots and meet new finish grades.
- G. Apply seed and protect with straw mulch as required for new lawns.

- H. Apply sod as required for new lawns.
- I. Water newly planted areas and keep moist until new grass is established.

3.7 SATISFACTORY LAWN

- A. Seeded lawns will be satisfactory provided requirements, including maintenance, have been met and a healthy, uniform, close stand of grass is established, free of weeds, bare spots exceeding 5 by 5 inches, and surface irregularities.
- B. Replant lawns that do not meet requirements and continue maintenance until lawns are satisfactory.
- C. Grassing of road slopes may have to be watered to achieve timely establishment of vegetation.

3.8 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto surface of roads, walks, or other paved areas.
- B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period until lawn is established.

END OF SECTION 02930