STANDARD ADDENDUM
TO
EJCDC C-520 (2007 EDITION)
STANDARD FORM OF AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR
CONSTRUCTION CONTRACT (STIPULATED PRICE)
FOR THE
TOWN OF BLUFFTON

ARTICLE 3 – The phrase "act as Owner's representative," shall be deleted in Article 3.01.

ARTICLE 4 – The phrase "or other loss" shall be inserted after the phrase "financial loss" in the first sentence in Article 4.03(A).

ARTICLE 5 - In the last sentence of Article 5.01(B), the phrase "by Engineer" shall be deleted.

ARTICLE 6 - In Article 6.01(A), the phrase "by Engineer" shall be deleted. In Article 6.02(A)(1)(a), the phrase "If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, than as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and" shall be deleted. In Article 6.03, the phrase "as recommended by Engineer" shall be deleted.

ARTICLE 7 - Article 7.01 shall be deleted in its entirety.

ARTICLE 8 - Article 8.01(D) shall be deleted in its entirety. In Article 8.01(E), delete the phrase "the Site-related reports and drawings identified in the Contract Documents" and insert the phrase "any Site-related reports and drawings identified in the Contract Documents" in its place. In Article 8.01(H), insert the phrase "and Owner" after each instance of the word "Engineer" in this section.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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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:*

1. 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, expediters, 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.

SUPPLEMENTAL CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC C-700 (2007 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

SC-5.04 Add the following new paragraph immediately after Paragraph 5.04.B:

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

Workers' Compensation, and related coverages under Paragraphs 5.04.A.1 and A.2 of the General Conditions:

State:	Statutory
Applicable Federal (e.g., Longshoreman's):	Statutory
Employer's Liability:	Statutory

Contractor's General Liability under Paragraphs 5.04.A.3 through A.6 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Contractor:

General Aggregate	$1,000,000
Products – Completed Operations Aggregate	$1,000,000
Personal and Advertising Injury	$1,000,000
Each Occurrence (Bodily Injury and Property Damage)	$1,000,000

Property Damage liability insurance will provide Explosion, Collapse, and Under-ground coverages where applicable.

Excess or Umbrella Liability

General Aggregate	$2,000,000
Each Occurrence	$2,000,000

Automobile Liability under Paragraph 5.04.A.6 of the General Conditions:

Bodily Injury:	
Each person	$1,000,000
Each Accident	$1,000,000
Property Damage:	
Each Accident	$1,000,000
Combined Single Limit of	$1,000,000

SC 6.02 Add the following: Working hours on site may take place any time Monday through Saturday, 7:00 am through 7:00 pm, and Sunday noon to 7:00 pm.

SC 6.06 Add the following new paragraphs immediately after Paragraph 6.06.B:

1. Owner shall approve of all subcontractors and suppliers. No later than ten (10) days prior to the Notice to Proceed date Contractor shall submit in writing the following subcontractor and supplier information: entity full legal name and address, point of contact name and phone number, and if the subcontractor is unfamiliar to Owner, three references of companies with whom subcontractor has contracted within the last three (3) years on similar type construction work. Owner shall approve of all subcontractors on or before the Notice to Proceed date.

2. Contractor shall ensure subcontractors and suppliers are adequately insured to cover Contractor's liability for any claims under Article 5.

SC 6.14 Add the following: Contractor shall provide a project coordinator or a site superintendent who is able to communicate in English to Owner and/or emergency authorities at all times.

SC 8.01 Delete Section 8.01 in its entirety and insert the following in its place:

8.01 Contract Administration and Communication

A. Owner will provide contract administration duties for the duration of the construction contract. All communications will be directly between the Owner and Contractor.

SC 9.01 Delete Section 9.01 in its entirety and insert the following in its place:

9.01 Owner's Consultant

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

SC 14.02.C Delete Paragraph 14.02.C in its entirety and insert the following in its place:

C. Payment Becomes Due:

1. Thirty days upon receipt of an invoice for an approved Application for Payment by the Owner's Finance Department will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

2. The Contractor shall send invoices of an approved Application for Payment to:

   The Town of Bluffton
   Attn: Accounts Payable
   PO Box 386
   Bluffton, SC 29910

   An alternative electronic method for invoice submittals may be utilized by sending to: Invoice@townofbluffton.com, with a copy to the Project Manager.

END OF DIVISION I – GENERAL REQUIREMENTS

SPECIAL CONDITIONS
OF THE CONSTRUCTION CONTRACT

1. LOCATION

The work under this Contract will be located in Bluffton, South Carolina as shown on the Plans.

2. EXTENSION OF TIME AND FAILURE TO COMPLETE ON TIME

Any and all extensions of time shall be in accordance with the General Conditions.

3. SANITARY REGULATIONS

The Contractor shall provide adequate sanitary conveniences for use of those employed on the work and their use shall be strictly enforced. Such conveniences shall be made available when the first employees arrive on the site and shall be removed after the departure of the last employees from the job. The facilities shall be maintained at such points and in such manner as approved, and the Owner/Engineer shall have the right to inspect such facilities to determine whether or not sanitary requirements have been complied with.

4. ENVIRONMENTAL IMPACT

The Contractor shall conduct all his operations so as to minimize, to the greatest extent possible, adverse environmental impact.

a) Noise

All equipment and machinery shall be provided with exhaust mufflers maintained in good working order so as to reduce operating noise to minimum levels. In addition, operation of equipment and machinery shall be limited to daylight hours, except with the permission of the Engineer, based on critical need for the operation.

b) Dust/Smoke

All equipment movements shall be accompanied by a minimum of dust. Traveled surfaces and earthwork shall be maintained in a moist condition to avoid the generation of dust or the airborne movement of particulate matter under all prevailing atmospheric conditions.

Burning operations will not be allowed by the owner or appropriate regulatory agency.

c) Traffic

Trucks carrying spoil, fill, concrete or other material shall be routed over roads which will result in the least effect on traffic and nuisance to the public. All material shall be loaded in a manner which will preclude the loss of any portion of the load in transit, including covering, if necessary.

d) Siltation

All points of concentrated runoff from rainfall shall be visually monitored to determine that no eroded material from the construction site is leaving the Owner's property. Measures shall be taken to promptly eliminate such a deposition if occurring, including the installation of detention basins.

5. STORAGE OF MATERIALS

The Contractor shall arrange his plant and store his materials as compactly as practicable at points convenient for the Contractor and which do not damage the work or interfere with public activities or with work of other contractors or with free access to all parts of the site and to utility installations. Materials shall be so stored as to facilitate inspection and to insure preservation of their quality and fitness for use. They shall be placed on wooden platforms or other clean surfaces and not on the ground and shall be placed under cover. The Contractor shall provide the storage facilities subject to approval by the Owner (Town of Bluffton).

6. CONSTRUCTION STAKING

The Engineer will provide benchmarks and baselines of the drawings for horizontal and vertical control at the site of the work.

From the baselines and benchmarks established by the Engineer, the Contractor shall complete the layout of the work and shall be responsible for all measurements that may be required for the execution of the work prescribed in the specifications or on the Contract Plans, subject to such modifications as maybe required to meet changed conditions or as a result of necessary modifications to the contract work. The Contractor shall exercise proper and reasonable care in verifying figures shown on the Drawings before laying out the Work and will be responsible for any error resulting from his failure to exercise such care.

The Contractor shall furnish, at his own expense, all such stakes, spikes, steel pins, templates, platforms, equipment, instruments, tools and material and all labor including instrument, rodmen, chainmen, etc., as may be required in laying out any part of the work from the baselines and benchmarks established by the Engineer.

It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Engineer until authorized to remove them, and if such marks are destroyed by the Contractor or through his negligence prior to their authorized removal, they may be replaced by the Owner/Engineer at his discretion, and the expense of replacement will be deducted from any amounts due or to become due the Contractor.

All survey data shall be recorded in accordance with standard and approved methods. All field notes, sketches, records and computations made by the Contractor in laying out the work shall be available at all times during the progress of the work for the ready examination by the Owner/Engineer or his duly authorized representative.

The Owner/Engineer may make original and final surveys and make computations to determine the quantities of work performed or finally in place, if required. The Contractor shall make such surveys and computations as are necessary to determine the quantities of work performed or placed during each period for which a progress payment is to be made. All original field notes, computations and other records, or facsimile copies thereof, taken by the Contractor for the purpose of construction and for progress surveys, shall be furnished promptly to the representative of the Owner/Engineer for permanent records and for determining the proper amount of progress payments due to the Contractor. Unless waived in each specific case, quantity surveys made by the Contractor shall be made during the presence of a representative of the Engineer.

The Owner/Engineer may make checks as the work progresses to verify lines and grades established by the Contractor and to determine the conformance of the completed work as it progresses with the requirements of Contract Specifications and Plans. Such checking by the Owner/Engineer or his representative shall not relieve the Contractor of his responsibility to perform all work in accordance with the Contract Plans and Specifications and the lines and grades given therein. In the event that location marks as established by the Contractor are found to be inaccurate or inadequate, work shall be suspended until corrections have been made.

Contractor shall provide a final as-built survey in a digital format (GIS, CAD and Geo-referenced PDF) prior to final payment. As-builts must have coordinates in NAD83 and elevations in NAVD88. As-builts must conform to the Town of Bluffton Drainage As-Built Checklist.

No separate payment will be made for the costs involved in the survey work, layout work or staking performed by the Contractor. All such costs will be considered as incidental to the Contract.

7. UTILITIES

Utilities such as sewer, water, gas, phone, cable television, irrigation, and electric lines encountered in the work shall be protected from injury and maintained in service until moved or replaced as required under this Contract or by others as the case may be, or abandoned as may be necessary for the proper construction and use of the new work. The Contractor is responsible for all coordination with appropriate utility owners and replacement of any damaged utility at no additional cost to the Owner.

8. ADJUSTMENT OF DISCREPANCIES

In all cases of discrepancies between the various dimensions and details shown on drawings, or between the drawings and these specifications, the more expensive construction shall be estimated before construction is started; the matter shall be submitted to the Owner/Engineer for clarification. Without such a decision, discrepancies shall be adjusted by the Contractor at his own risk and in settlement of any complications arising from such adjustment; the Contractor shall bear all of the extra expense involved.

9. TESTING

Coordination of all tests/inspections shall be the responsibility of the Contractor. Testing shall be conducted as required in the various sections of these specifications, in accordance with the Engineer's technical specifications as attached. The cost for testing shall be paid by the Owner.

10. REFERENCE STANDARDS

Reference to the standards of any technical society, organization, or association, or to codes of local or state authorities, shall mean the latest standard, code, specification, or tentative standard adopted and published at the date of taking bids, unless specifically stated otherwise.

11. PROJECT MANAGEMENT

The Contractor shall schedule and coordinate the work of the Contractor and all subcontractors and others involved to maintain the accepted progress schedule. His duties shall also include the planning of the work, the scheduling of ordering and delivery of materials, and checking and control of all work under this Contract. Construction schedules shall be submitted to the Engineer for review prior to the start of any work. Schedules shall be verified or updated at the owner's request on a monthly basis.

The Contractor shall be responsible for complete supervision and control of his subcontractors as though they were his own forces. Notice to the Contractor shall be considered notice to all affected subcontractors.

The Contractor shall appoint a qualified representative to act as the Project Coordinator, or Superintendent, who shall be responsible for coordinating all work and providing liaison with the Engineer and the Owner. The Project Coordinator or Superintendent shall, in addition, plan the work, schedule the ordering and delivery of materials, and check and control the various phases of the construction of all work under this Contract. The Project Coordinator or Superintendent shall, in all matters, represent the Contractor at the sites of the work in the absence of a Corporate Officer or Principal of the firm.

The Project Coordinator or Superintendent shall not be changed without Owner's approval unless the project Coordinator or Superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ.

12. DIVISION OF WORK

Division of work as made by the Contract Plans and Specifications is for the purpose of specifying all work which is required. There is no attempt to make complete classification according to trade or any agreements which may exist between Contractors or groups of Contractors and trade union. Such division and classification of the work shall be the Contractor's responsibility.

13. RESTORATION

The Contractor shall conduct his operations so that restoration of roadways, driveways, curb and gutter, ditches and easements progresses along with the work. If the Owner/Engineer determines that inadequate progress is being made with the restoration, he may shut down the Contractor's operation until the restoration is caught up with the work. No open trenches will be left over night. All trenches will be backfilled before the end of the day's operation.

Reasonable care shall be taken during construction to avoid damage to vegetation. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Trees which receive damage to branches shall be trimmed to those branches to improve the appearance of the tree. Tree trunks receiving damage from equipment shall be treated with a tree dressing. Care shall be taken to correctly sever all roots necessary to complete work and consultation with the Town arborist shall be required before any impacts to vegetation is commenced. The Town of Bluffton Tree Ordinance shall be followed at all times.

14. EXISTING UTILITIES

All known utility facilities are shown schematically on the plans and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown on the plans will not relieve the Contractor of his responsibility under this requirement except as noted below. "Existing Utility Facilities" means any utility that exists on the project in its original, relocated or newly installed position.

The Contractor shall contact all owners of utilities including, but not limited to, water and sewer companies, gas companies, electric companies, telephone companies, cable television companies and governmental units prior to starting any excavation on the project and shall request that they locate and mark their respective facilities. BJWSA (Beaufort Jasper Water and Sewer Authority) maintains the water and sewer system and whose technical specifications are found online at http://www.bjwsa.org/technical-specs/ and shall be followed. Water meter boxes and sewer cleanouts require adjustment to meet final grade. These appurtenances, if within a proposed driveway shall be traffic rated. Existing non-traffic rated appurtenances can remain within the new sidewalk limits. BJWSA to make available to the contractor the replacement non-traffic rated materials if existing are damage or are otherwise unsuitable for placement in new sidewalk. BJWSA to provide new traffic rated materials for these appurtenances. The contractor shall provide all qualified labor associated with relocating, raising, lowering, or otherwise adjusting these appurtenances to be flush with the top of new sidewalk or driveway or adjacent finished grade.

Location and marking of all utilities in accordance with all state and local laws shall be performed.

15. MAINTENANCE DURING CONSTRUCTION

See SC DOT specs.

16. FAILURE TO MAINTAIN ROADWAYS AND STRUCTURES

If, at any time, the Contractor fails to properly maintain roadways and structures, and the Owner/Engineer observes such activity, the Owner/Engineer will immediately notify the Contractor of such non-compliance. If the Contractor fails to remedy the unsatisfactory maintenance within 24 hours after receipt of such notice, the Owner/Engineer may immediately arrange for maintenance of the work, and the entire cost of this maintenance will be deducted from monies due or to become due the Contractor under the Contract. As an alternative to the Owner's/Engineer's maintaining the work, all the items and quantities of work done, but not properly maintained, may be deducted from the current progress estimate, even if such items have been paid for in a previous estimate.

17. FLAGGING TRAFFIC

See SC DOT specs.

18. BARRICADES, DANGER, WARNING & DETOUR SIGNS

See SC DOT specs.

19. REFERENCED SPECIFICATIONS

Reference to the Department of Transportation Standard Specifications is to current South Carolina Department of Transportation Standard Specifications.

20. DRAWINGS

The work shall conform to the following drawings, all of which form a part of these specifications and are available in the office of project engineer.

21. PERMITS

The Owner has obtained the necessary permits to construct the project which is hereby incorporated into this contract, unless otherwise specified here within. The contractor shall comply with all terms, conditions and requirements of the permits.

22. RECORD DATA

Complete "record data" information shall be submitted by the Contractor to the Engineer and Owner along with the final pay request or sooner. "Record data" information shall include elevations of tops and inverts of all sanitary sewer structures and length, material and size of all pipes, location (and state plane coordinates) of all structures, fittings, valves, hydrants and service laterals. Final payment shall not be approved prior to the Engineer and Owner receiving the required "record data" information from the Contractor. "Record data" information shall meet the requirements of all applicable authorities.

23. TREES

The contractor shall adhere to all requirements mentioned herein as well as to the Town of Bluffton Unified Development Ordinance (incorporated by reference herein, www.townofbluffton.sc.gov/Documents/article5designstandards.pdf). If there is any conflict between this section and the Unified Development Ordinance, Article 5 of the Unified Development Ordinance shall govern.

a) When installing any utility line, irrigation line, etc. an air spade or boring must be used within the drip-line of any tree over 6 inches DBH, to avoid cutting roots.

b) Where pervious paving is to be placed under the drip-line of any tree over 6 inches DBH, the soil shall be compacted to a percentage acceptable for pedestrian traffic only. No roots over 2 inch caliper shall be cut to install paving. Sub-base layer for pervious paving shall be placed around preserved tree roots.

c) Where the cutting of tree roots less than 2 inch caliper cannot be avoided, the roots shall be cut flush by hand with a sharp blade or saw and immediately covered with a layer of moist soil or moist material such as burlap.

d) Grading machinery shall not be used within the drip-line of any tree over 6 inches DBH. If at all possible, grading within the drip-line shall be completed with hand tools only. No heavy equipment shall be used, parked or stored within the dripline of any tree unless absolutely necessary.

e) Where there is a slope easement that will affect any tree on private or public property, a permanent tree well shall be constructed to avoid placing any fill within the drip- line of any tree. No fill shall be stored within the dripline of any tree.

f) Trees to be planted shall not be planted so that the top of root-ball (root flare) is below top of surrounding grade nor planted more than 2 inches above grade.

g) No mulch shall be placed within 6 inches of trunk of a newly planted tree and mulch shall not be over three (3) inches deep.

h) Trees planted within sidewalk must have root barriers placed around them to deter future sidewalk damage. Trees outside sidewalk must have root barriers placed at the edge of sidewalk to deter future sidewalk damage. Where pervious paving is to be used, steel paving edging, with spikes for support, can be used to support paving as well as act as a root barrier. This steel edging must be placed so that it does not sever the roots of existing trees.

i) All containers, burlap, twine, straps, etc. shall be removed from root ball of trees at the immediate time and at the exact location where trees are to be planted. Tree

roots of trees to be planted shall not be uncovered until at the time of planting and shall not be moved from one location to another with roots exposed.

j) Planting holes shall be dug to a size roughly three (3) times the size of the root ball. Dig no deeper or slightly less deep than the height of the root ball. Do not cultivate the bottom of the hole, as it may cause settling of the root ball and the tree will be planted too deep. Use soil removed from hole to fill in around root ball. Tamp soil lightly, but do not compact soil. Newly planted trees shall be watered immediately after planting.

k) All trees / landscaping planted on site must meet or exceed the American Standard for Nursery Stock (ANSI Z60.1) standards. All trees / landscaping planted on site must also meet the requirements of the Bluffton DSO Section 4.14 and Section 14.15.

l) Erosion control that must be placed within the dripline or within 1.0 feet per inch of tree DBH, must be placed on natural grade. Erosion control cannot be trenched through the roots of existing trees. Erosion control shall be placed to prevent fill material from covering the roots of trees on site to the most extent possible. Any fill entering within the erosion control near a tree shall be immediately removed with hand tools only and that fill placed outside the dripline of the tree.

24. FRESHWATER WETLANDS

Freshwater wetlands are evident near the project site, and a Preliminary Jurisdictional Determination letter has been obtained indicating the extents of same. No work shall occur in any federally defined freshwater wetland by the selected contractor or any sub-contractor. To ensure the preservation of any federally defined freshwater wetlands, the contractor shall clearly stake/flag/demarcate any wetlands that are shown on the Plan.

TECHNICAL SPECIFICATIONS

Pathway Pedestrian Safety Improvements, Phase 2

Prepared for Town of Bluffton

Project No. R0001

Project Location: Bluffton, South Carolina

TABLE OF CONTENTS

These standard specifications, except for the Special Provisions (SP items), are taken from the South Carolina Department of Transportation (SCDOT) Standard Specifications for Highway Construction, Current Edition; current SCDOT supplemental Specifications, where the Town has been inserted as the Owner instead of the SCDOT and the Engineer has been inserted as the Resident Construction Engineer.

1050802 Construction Stakes, Lines and Grades

105.8.2 Construction Stakes, Lines, and Grades Provided by the Contractor

1. Provide all the layouts necessary to construct the elements of the project and accommodate all utility relocations. The Town will provide adequate reference points to the centerline of survey and benchmarks as shown on the Plans or as provided by the Engineer. Any additional control points set by the Town will be identified in the field and documented in writing to the Contractor. Keep the field notes in the Engineer's office.
2. Provide field personnel and set all additional stakes for the project, which are needed to establish offset stakes, reference points, and any other horizontal or vertical controls, including supplementary benchmarks necessary to secure a correct layout of the work. Make certain that project stakes have the station number clearly visible. The Contractor is not required to determine the property line between properties.
3. Ensure that all computations of survey work required in the execution of this project are performed by a Land Surveyor or Professional Engineer registered in South Carolina. Make certain that these computations are accompanied by the designated LS or PE seal and signature.
4. The Contractor is responsible for ensuring that the finished work substantially conforms to the lines, grades, elevations, and dimensions called for in the Plans or as provided by the Engineer. Any inspection or checking of the Contractor's layout by the Engineer and the acceptance of all or part of it does not relieve the Contractor of the responsibility to secure the proper dimensions, grades, and elevations of the several parts of the work. Exercise care in the preservation of stakes and benchmarks and have them reset at no additional expense when any are damaged, lost, displaced, or prematurely removed. Use competent personnel and suitable equipment for the layout work required. Do not engage the services of any person or persons in the employ of the Town for the performance of any work covered by this item.
5. The Engineer will make random checks of the Contractor's staking to determine if the work is in substantial conformance with the plans. Where the Contractor's work ties into work that is being done or will be done by others, checks will be made to determine if the work is in conformance with the proposed overall grade and horizontal alignment. For bridge projects, provide bridge deck grades to the Engineer for review before placing deck forms.
6. If during the course of staking or construction work unforeseen utilities and/or field conditions arise, which conflict with construction as shown in the Plans, notify the Engineer immediately. The Engineer will review the Contractor's findings and adjust the lines and grades accordingly or arrange for the utility to relocate its facilities. The resulting adjustments will be provided to the Contractor so that its survey crew can adjust the staking. Adjusted staking as described above is considered a normal consequence of construction. No additional compensation is due to the Contractor for this work or for any delays due to adjustments to the staking.
7. The quantity for the item Construction Stakes, Lines, and Grades is measured by each (EA) project site where the layout work is complete and accepted by the Engineer.
8. The payment for each portion of this item in the project is proportional to the amount of the relevant work completed. In no case will the sum of all payments for this item exceed the total bid amount for Construction Stakes, Lines, and Grades, which payment is full compensation for all material, labor, equipment, tools, supplies, transportation, and incidental work, including computations necessary to satisfactorily complete the work.
9. The payment includes all direct and indirect costs and expenses required to complete the work.
10. Pay items under this subsection include the following:

Item No.	Pay Item	Unit
105080X	Construction Stakes, Lines, and Grades	EA

1071000 Traffic Control

107.11 Traffic Control

1. The FHWA Manual on Uniform Traffic Control Devices (MUTCD) has been adopted as the official source for traffic control guidelines for SCDOT policies and procedures on installing and maintaining signs, markings, and signals in South Carolina. The MUTCD may be viewed online at the FHWA website at http://mutcd.fhwa.dot.gov. Execute the item Traffic Control as required by the Specifications, the Plans, and the current edition of the MUTCD adopted by the Town. Provide, erect, and maintain all necessary barricades, warning signs, lights, temporary signals, temporary striping, and other traffic control devices as required by the Specifications, the Plans, and the MUTCD. Perform this work without compensation unless bid items for such work are included in the Contract. The Contractor is not required to provide traffic control on any portion of the highway outside the scope of its work.
2. Contractor will provide, erect and maintain signs on detours or temporary routes. Maintain and relocate, where necessary, all regulatory, warning, and guide signs.
3. The work as defined in the Contract is considered to have begun with the placing of permanent construction signs by the Contractor. The work is considered completed when the Engineer authorizes the Contractor to remove the permanent construction signs, and the Contractor does so. The Engineer may permit the Contractor to omit permanent construction signs on low volume roads or streets where the work will be completed within the daylight hours of a single day. However, if the permanent construction signs are omitted, install temporary signs while the work is in progress.
4. Ensure that all barricades, signs, and traffic control devices conform to the requirements of the MUTCD. All signs in the MUTCD have been given an identification number, and a full-scale drawing of each sign is available for sign fabricators from the Director of Traffic Engineering.

107.12 Measurement and Payment for Traffic Control

1. The item Traffic Control is paid on a lump sum (LS) basis; and therefore, there is no specific measurement for this item. Payment is made on a per-complete basis as specified in Subsection 601.6.
2. The payment for Traffic Control does not include payment for permanent construction signs, temporary concrete barrier, portable terminal impact attenuators, changeable message signs, pavement markings, temporary pavement markers, or any item specified as a bid item with a contract unit bid price in the Contract.
3. The pay item for Traffic Control is as follows:

Item No.	Pay Item	Unit
1071000	Traffic Control	LS

2023000 Removal & Disposal of Existing Concrete Pavement

2024100 Removal & Disposal of Existing Curb and Gutter

SECTION 202 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

202.1 Description

1. This section contains specifications for the material, equipment, construction, measurement, and payment for the removal, wholly or in part, and satisfactory disposal of buildings, fences, guardrail, structures, old pavements, abandoned pipelines, underground storage tanks, and other obstructions that are not designated or permitted to remain, except for the obstructions removed and disposed of under other items in the Contract.
2. This subsection also contains specifications for the salvaging of all materials and backfilling of the trenches, holes, and pits.

202.2 Materials

1. None specified.

202.3 Equipment

1. Ensure that the equipment necessary for the proper construction of the work is on site, in acceptable working condition, and approved by the Engineer as to both type and condition before the start of work under this section. Provide sufficient equipment to enable prosecution of the work in accordance with the project schedule and completion of the work in the specified time.

202.4 Construction

202.4.1 General

1. Raze and dispose of all buildings, foundations, structures, guardrail, fences, and any other obstructions that are on the right-of-way and are not designated to remain. Include structures (buildings) to be cut off at the right-of-way line and structures (buildings) and appurtenances located entirely outside the right-of-way limits when such items are indicated on the Plans as items to be demolished.
2. Due to the possibility of encountering asbestos, secure a permit in accordance with SCDHEC regulations anytime a structure is to be razed. Inspect the facilities identified in the Contract as a Removal and Demolition item for the presence of asbestos before the submission of the bid. If asbestos is located, the provisions of Subsection 107.27 apply. Direct questions about the permit to the SCDHEC Bureau of Air Quality.
3. When structures (buildings) and obstructions are designated on the Plans to be cut off at a right-of-way line, produce a completed job of first class workmanship and remove and dispose of all debris and appurtenances, including utility connections from the portion of the structure within the right-of-way. Adequately support the portion of the structure remaining outside the right-of-way. Unless otherwise provided, re-facing is not required.
4. As directed by the Engineer, remove, cap, or seal utility service connections such as sewers, water lines, electrical connections, gas lines, etc. left in place after the removal of the structure (buildings) and obstructions, at the right-of-way line, the edge of the existing pavement, or at the

existing mains. Carefully store and protect utility materials unless the owner does not desire them. In this case, the material becomes the property of the Contractor.

5. When structures (buildings) and other obstructions are designated on the Plans to be cut off at the right-of-way or to be removed in their entirety, and unless otherwise provided, the structure (building) and all appurtenances and the material removed in performing this work becomes the property of the Contractor except utility materials as provided above. Take proper allowance for the value of the salvageable materials in the price bid for the item involved.
6. Destroy unusable perishable material. Unless otherwise permitted, dispose of non-perishable material outside the limits of view from the traveled roadway with written permission of the property owner on whose property the material is placed. Furnish copies of all agreements with property owners to the Engineer. Without cost to the Town, obtain disposal sites and secure any applicable federal, state, county, or municipal permits as required. Certify in writing to the Engineer that all permit requirements have been met before placing any material in a disposal area.
7. Remove unsuitable material from wells, cisterns, septic tanks, other tanks, basements, and cavities. Outside of construction limits, remove foundations left by structure removal to a depth of not less than 1 foot below natural ground. Within construction limits, remove foundations to a depth of not less than 2 feet below subgrade elevation. Break up basement floors to prevent them from holding water. Backfill basements or cavities left by structure removal as directed with material approved by the Engineer and compact in accordance with the provisions of Subsection 205.4.6 unless otherwise directed.
8. Where a structure or obstruction has been previously removed and the existing utility connections have not been terminated and capped, comply with the above provisions for utility service connections.
9. Comply with the requirements in the SCDOT Construction Manual including notifying the SCDOT Director of Communications before performing any blasting operations. Before blasting in any stream, river, or lake coordinate plans and operations with the local SCDNR District Fisheries Biologist and District Law Enforcement Captain.

202.4.5 Removal and Disposal of Pavements, Sidewalks, and Curbs

1. If so designated, remove and dispose of the following items unless such material is suitable for use in constructing embankments: existing Portland cement concrete, brick, or stone pavements with or without asphalt overlays, concrete, brick or stone sidewalks, concrete gutter or integral curb and gutter curb, asphalt concrete pavement, or asphalt curb. If suitable and approved by the Engineer, this material may be used to construct embankments.
2. As directed by the Engineer, sawcut pavement as necessary to produce a uniform line between the pavement to be retained and to be removed.
3. When the Plans indicate that concrete gutter is to be retained as a base and its integral curb removed, remove the curb to the top elevation of the gutter using methods approved by the ENGINEER that prevents damage to or displacement of the retained gutter.

202.5 Measurement

1. The quantity of material used to backfill areas that is excavated as directed and approved by the Engineer during the work for a removal item is measured by the cubic yard (CY) of Unclassified Excavation or Borrow Excavation as applicable in accordance with Subsection 203.5.
2. The quantity for the pay item Removal and Disposal of Existing Pavement is the actual horizontal surface area of the following material removed from the project and is measured by the square yard (SY) of the pavement before removal, complete, and accepted:
   - Existing brick pavement with or without asphalt overlay;
   - Brick sidewalk;
   - Cobblestone pavement with or without asphalt overlay;
   - Portland cement concrete pavement with or without asphalt overlay;
   - Portland cement concrete gutter;
   - Portland cement concrete integral curb and gutter; or
   - Portland cement stabilized base with asphalt concrete overlay.
3. The quantity for the pay item Removal and Disposal of Existing Asphalt Pavement is the actual horizontal surface area of asphalt concrete pavement with a total thickness of 2 inches or greater removed from the project, unless otherwise indicated, and is measured by the square yard (SY) of area before removal, complete, and accepted
4. Areas of asphalt pavement with a total thickness less than 2 inches or as otherwise indicated, such as aggregate bases, earth type bases, and other flexible pavement structure components are not included in the quantity for the pay item Removal and Disposal of Existing Asphalt Pavement because they are included in the quantity for the pay item Unclassified Excavation in accordance with Subsection 203.5.
5. The quantity for the pay item Removal and Disposal of Existing Curb is the length of existing stone, bituminous, or concrete curb removed from the project and is measured by the linear foot (LF) along the curb before removal, complete, and accepted.
6. When the Plans indicate that existing pavement or curb is to be removed, and the pay items Removal and Disposal of Existing Pavement, Removal of Existing Asphalt Pavement, or Removal and Disposal of Existing Curb are not included in the Contract, the removal and disposal of existing pavement or curb is included in quantity for the pay item Unclassified Excavation in accordance with Subsection 203.5.

202.6 Payment

1. Payment for the accepted quantity for each pay item, measured in accordance with Subsection 202.5, is determined using the contract unit bid price for the applicable item. Payment includes all direct and indirect costs and expenses necessary to complete the work.
2. Payment for lump sum pay item Removal of Structures and Obstructions is full compensation for removing and disposing of structures and obstructions as specified or directed and includes all materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to complete the work in accordance with the Plans, the Specifications, and other terms of the Contract.
3. Any backfill required under this section is paid for as Unclassified Excavation or Borrow Excavation as applicable in accordance with Section 203.
4. Payment for the accepted quantity for Removal and Disposal of Existing Pavement is full compensation for removing and disposing of the existing brick pavement (with or without asphalt

overlay), brick sidewalk, cobblestone pavement, Portland cement concrete pavement (with or without asphalt overlay), Portland cement concrete gutter, Portland cement concrete integral curb and gutter, and Portland cement stabilized base with asphalt concrete overlay as specified or directed and includes all materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to complete the work in accordance with the Plans, the Specifications, and other terms of the Contract.

5. Payment for the accepted quantity for Removal and Disposal of Existing Asphalt Pavement is full compensation for removing and disposing of existing asphalt pavements with thickness of 2 inches or greater as specified or directed and includes all materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to complete the work in accordance with the Plans, the Specifications, and other terms of the Contract.
6. Payment for the accepted quantity for Removal and Disposal of Existing Curb is full compensation for removing and disposing of existing concrete, asphalt, or stone curb as specified or directed and includes all materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to complete the work in accordance with the Plans, the Specifications, and other terms of the Contract.
7. Overhaul is paid in accordance with Section 207, except in conjunction with the following pay items:
   - Removal and Disposal of Existing Pavement,
   - Removal and Disposal of Existing Asphalt Pavement,
   - Removal & Disposal of Existing Curb, and
   - Removal & Disposal of Existing Asphalt Curb.
8. If the Contract contains the lump sum pay item Clearing & Grubbing within Right-of-Way, then in addition to the work requirements of Section 201, payment includes the cost of removing and disposing of items within the clearing and grubbing area in accordance with Section 202, except for those items setout specifically as separate pay items in the Contract or as otherwise noted.
9. Pay items under this section include the following:

Item No.	Pay Item	Unit
2023000	Removal & Disposal of Existing Pavement	SY
2024100	Removal & Disposal of Existing Curb	LF
2025000	Removal & Disposal of Existing Asphalt Pavement	SY

2031100 Organic Topsoil

810.4.6 Applying Organic Topsoil

1. At areas to be grassed where the existing seedbed has little or no topsoil, topsoil may be furnished and placed on the seedbed to ensure a good stand of grass.

810.5 Measurement

1. The quantity for Permanent Vegetation, Temporary Vegetation, Temporary Seeding, Seeding (Unmulched), or Seeding (Mulched) is the ground surface area with acceptable vegetation or stand of grass and is measured by the one-thousand square yard (MSY) unit, complete, and accepted.
2. The quantity of Interseeding is the ground surface area acceptably interseeded and is measured by the one-thousand square yard (MSY) unit, complete, and accepted.
3. The quantity of Fertilizer or Lime is the weight of fertilizer or lime applied, and is measured by the ton (TON), complete, and accepted. The quantity of Nitrogen is the actual weight of nitrogen applied and is measured by the pound (LB), complete, and accepted. Weights are determined by approved scales or by guaranteed weight of sacks shown on the manufacturer's tag. Furnish invoices of the above materials received on the project to the Engineer.
4. The quantity of Mowing is the area of ground surface area mowed at the direction of the Engineer and is measured by the one-thousand square yard (MSY) unit, complete, and accepted. Separate measurements will be made and added to the quantity for payment each time the area is mowed.
5. The quantity of Organic Topsoil is the volume of organic topsoil placed on site and is measured by the cubic yard (CY), complete, and accepted.

810.6 Payment

1. Payment for the accepted quantity for each pay item, measured in accordance with Subsection 810.5, is determined using the contract unit bid price for the applicable pay item, and the payment includes all direct and indirect costs and expenses necessary to complete the work.
2. Payment for Permanent Vegetation or Temporary Vegetation is full compensation for furnishing and placing vegetative materials (including fertilizer, lime, and nitrogen when called for) as specified or directed and includes all other materials, labor, equipment, tools, supplies transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
3. Payment for Temporary Seeding, Seeding (Unmulched), or Seeding (Mulched) is full compensation for furnishing and placing all seeding materials (excluding fertilizer, lime, nitrogen, and selected material for shoulders and slopes) as specified or directed and includes all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract. Payment will not exceed 90% of the contract unit bid price for these items until a satisfactory stand of grass meeting the requirements of Subsection 810.4.3 is established.
4. Payment for Interseeding is full compensation for inter-seeding an area as specified or directed and includes furnishing and placing seeds; aerating the existing turf; providing and applying herbicide and nonionic surfactant (if required with herbicide); and all other materials, labor,

equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.

5. Payment for Fertilizer, Lime, or Nitrogen is full compensation for furnishing and applying fertilizer, lime, or nitrogen as specified or directed and includes all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
6. Payment for Mowing is full compensation for mowing vegetation to an acceptable height in areas as specified or directed and includes all other materials, labor, equipment tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract. No adjustment in unit price will be made in case of overruns or underruns of this item.
7. Payment Organic Topsoil is full compensation for furnishing and placing organic topsoil as specified or directed and includes all other materials, labor, equipment, tools, supplies and transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
8. Payment for each item includes all direct and indirect costs and expenses necessary to complete the work.
9. Pay items for this section include the following:

Item No.	Pay Item	Unit
8100001	Permanent Vegetation	MSY
8101000	Seeding (Mulched)	MSY
8102100	Seeding (Unmulched)	MSY
8102700	Interseeding	MSY
8103000	Temporary Seeding	MSY
8103100	Temporary Vegetation	MSY
8104100	Fertilizer (10-10-10)	TON
8104200	Fertilizer (8-8-8)	TON
8104300	Fertilizer (16-4-8)	TON
8104400	Fertilizer (15-0-15)	TON
8104410	Fertilizer (15-15-15)	TON
8105000	Lime	TON
8106000	Nitrogen	LB
8109900	Mowing	MSY
8101100	Organic Topsoil	CY

6271015 8” White Solid Lines – Thermo. – 125 mil.
6271020 12” White Solid Lines – Thermo. – 125 mil.
6271025 24” White Solid Lines Thermo. – 125 mil.

SECTION 627 THERMOPLASTIC PAVEMENT MARKINGS

627.1 Description

1. This section contains specifications for the materials, equipment, construction, measurement, and payment for furnishing and applying permanent thermoplastic pavement markings within the limits of the project to delineate the travel lanes and channelize traffic.
2. This work includes protection of pavement markings during installation, determination of no passing zones for two-lane facilities in accordance with the MUTCD and providing the Town data used in establishing no passing zones on two-lane facilities.

627.2 Materials

627.2.1 General

1. Provide thermoplastic pavement marking material that is a reflectorized mixture of a thermoplastic binder and spherical glass beads upon which additional glass beads are applied by dropping immediately following application. Coat Portland concrete pavement surfaces, including bridge decks, with a primer-sealer material before application of the thermoplastic binder material. Coat other surfaces as well if recommended by the thermoplastic manufacturer.

627.2.2 Thermoplastic Binder Compound

627.2.2.1 General

1. Ensure that the thermoplastic binder compound meets all requirements of AASHTO M 249 as modified herein.
2. The material may be shipped in the granulated form or the block form. Use alkyd based thermoplastic pavement markings. Apply alkyd/maleic thermoplastic pavement markings by extrusion methods only. Extrusion may be accomplished using either conventional extrusion equipment or ribbon gun extrusion devices.
3. Ensure that the alkyd/maleic binder consists of a mixture of synthetic resins containing high boiling point plasticizers and at least one synthetic resin that is solid at room temperature. Use a binder with at least one-half of its composition consisting of 100% maleic-modified glycerol of resin and not less than 15% by weight of the entire material formulation. Make certain that the binder does not contain petroleum hydrocarbon resins. Ensure that resins/rosins used are maleic-modified glycerol esters.
4. Ensure that the thermoplastic material dissolves immediately in diacetone alcohol. Slow dissolution is evidence of the presence of hydrocarbon binder components, which are not allowed.

627.2.2.2 Yellow Thermoplastic

1. Use a yellow thermoplastic that is lead-free (L/F). Ensure that it does not contain more than 3ppm of lead by weight in a cured state and not more than 100ppm of total Heavy Metals as defined by Resource Conservation and Recovery Act (RCRA) including lead and hexavalent chromium when tested in accordance with Environmental Protection Agency (EPA) Methods 3050 and 6010. Ensure that the yellow thermoplastic contains proper amounts of pigment to produce a material that is weather-fast, heat stable, and meets the Yellow Color, Reflectance, Color Stability (Accelerated Weathering), and Retroreflectivity requirements specified herein. Make certain that the lead-free yellow thermoplastic material appears yellow during both daytime and nighttime conditions when applied with drop-on beads. Ensure that the thermoplastic does not contain any hazardous materials at levels that would cause the thermoplastic to be classified as a hazardous waste as defined by RCRA Subarticle C rules and Table 1 of 40 CFR 261.24 Toxicity Characteristic.
2. Ensure that the yellow color of unbeaded material matches Federal Standard Designation No. 595b, color No. 33538 and is within the following chromaticity limits (color box) defined by plotting the following four (x, y) pairs on a C.I.E. 1931 Chromaticity diagram:

   (x1, y1) (.5300, .4560)
   (x2, y2) (.5100, .4850)
   (x3, y3) (.4550, .4440)
   (x4, y4) (.4720, .4000)
   Reflectance (Y) between 45 and 55
   Measurement conditions = 2 degrees observer/illuminant D65
   Instrument: BYK – Gardner “Color-Guide” Spectrophotometer

627.2.2.3 Accelerated Color Stability

1. Ensure that the accelerated weathering of white and yellow (L/F) thermoplastic meets the requirements of ASTM G 155, Table X3.1, Cycle I for 1500 hours total exposure time. Prepare sample by dipping a sheet aluminum panel into the molten thermoplastic and removing it to obtain a 1.5 to 3.0 mm coating thickness of thermoplastic on the panel. Place the panel in the weathering apparatus for 1500 hrs.
2. After accelerated weathering, measure the Yellow Color or Yellowness Index of the unbeaded material as stated in AASHTO M 249, Section 4.3.1 or 4.3.7. Material must meet the color stability requirements below after this exposure:
   - White – ASTM E 313 – Yellowness Index, max. 20
   - Yellow – Measured chromaticity coordinates falls within a “color box” defined by the following four (x, y) pairs on a C.I.E. 1931 Chromaticity diagram:

   (x1, y1) (.5300, .4560)
   (x2, y2) (.5100, .4850)
   (x3, y3) (.4350, .4290)
   (x4, y4) (.4490, .3770)

627.2.2.4 Color Stability of In-Service White and Yellow Thermoplastic

1. The daytime color of the applied white and yellow thermoplastic pavement marking material (with drop-on beads) must meet the color requirements shown in Subsection 627.2.2.3 (Accelerated Color Stability). The color may be measured within 60 days of application using a portable BYK-Gardner "Color-Guide" Spectrophotometer (see Subsections 627.2.2.2 and 627.2.2.3) and must remain within the "color-box" as noted in Subsection 627.2.2.3.

627.2.2.5 Hardness and Indentation Resistance

1. Measure the hardness according to ASTM D 2240, except condition the sample for 2 hours in a 115ºF water bath, before measuring the hardness. Condition the Durometer at 115ºF in a force d air oven. Remove the sample from the water bath and quickly place the Durometer on the sample while starting a stopwatch. Record the hardness after 15 seconds. Ensure that the total weight of the Durometer is 2000 grams. Make certain the hardness is a minimum of 40 and a maximum of 70.

627.2.2.6 Flash Point

1. Ensure that the flash point of the thermoplastic pavement marking is a minimum of 475ºF (245ºC) when tested in accordance with ASTM D 92.

627.2.3 Glass Beads

1. Ensure that Type 1, Type 3, and Type 4 glass beads meet the requirements of AASHTO M 247 with the following exceptions:
   Glass beads are a minimum of 80% true spheres when tested according to ASTM D 1155 and meet the following gradation requirements when tested in accordance with ASTM D 1214:

Sieve Size	Percent by Mass Passing Designated Sieve (ASTM D 1214)		
	Grading Designation		
	Type 1 (AASHTO)	Type 3 (FP 96)	Type 4 (FP 96)
No. 8	---	---	---
No. 10	---	---	100
No. 12	---	100	95 - 100
No. 14	---	95 - 100	80 - 95
No. 16	100	80 - 95	10 - 40
No. 18	---	10 - 40	0 - 5
No. 20	95 – 100	0 - 5	0 - 2
No. 25	---	0 - 2	---
No. 30	75 – 95	---	---
No. 40	---	---	---
No. 50	15 – 35	---	---

No. 80	---	---	---
No.100	0 – 5	---	---

2. Ensure that the intermixed glass beads meet the requirements for Type I with the following exception:

   The intermixed glass beads are incorporated into the thermoplastic binder at a minimum of 35% and a maximum of 40% by mass weight.

627.2.4 Primer-Sealer

1. Use a two-part epoxy primer-sealer recommended by the manufacturer of the thermoplastic pavement marking material on Portland cement pavement surfaces and bridge surfaces that have not been overlaid with asphalt. Use the primer-sealer on any type of pavement before the placing of any pavement symbols. Use the primer-sealer on asphalt concrete pavement surfaces if recommended by the manufacturer of the thermoplastic pavement marking material. Ensure that the primer-sealer forms a continuous film that will mechanically adhere to the pavement and neither discolor nor cause any noticeable change in the pavement outside of the finished pavement markings. Apply the primer-sealer in accordance with the manufacturer's recommendations.

627.2.5 Quality Assurance Provisions And Certification

1. Obtain actual laboratory test results from the manufacturer of the thermoplastic binder indicating compliance with all requirements of AASHTO M 249 for each batch or lot of material furnished, along with a final certification that the material furnished meets the requirements of the Town's specifications. Also, obtain from the manufacturer of the drop-on glass beads a certification stating that the material furnished meets all the requirements of the Contract specifications. Furnish copies of the above-described affidavits to the Engineer.

627.3 Equipment

627.3.1 Application Equipment

1. Use equipment that enables the installation of thermoplastic pavement markings by methods in accordance with AASHTO M 249 with the addition of the following requirements.
2. Applicators may be either a truck-mounted liner or a portable unit. A truck-mounted unit is defined as a self-propelled vehicle with six or more wheels and an enclosed cab for housing a driver. Make certain that the operator has controls that allow override of pre-set automatic cycles in order to extend a line or to begin a new cycle at any selected point.
3. Prepare material with an insulated batching machine recommended or furnished by the manufacturer and consists of a special kettle for melting and heating the composition. Ensure that heating of kettles and melters is done by controlled heat transfer systems that are oil jacketed or indirect flame air jacketed. Do not use direct flame heating equipment. Make certain that all kettles and melters are equipped with an automatic thermostatic control device and proper thermometers to control the temperature of the material at the manufacturer's recommended application temperature range. Ensure that all mixing and conveying parts up to

the final dispensing nozzle/shaping die maintain the material at the appropriate temperature. Ensure that the applicator and kettle are equipped and arranged to satisfy the requirements of all state and local requirements.

4. Ensure that the batching machine provides continuous mixing and agitation of the material. Make certain that all parts of the equipment that come in contact with the material are easily accessed and exposed for cleaning and maintenance and are designed to prevent accumulation and clogging.
5. Apply thermoplastic pavement markings by extrusion methods. Extrusion may be accomplished either with a conventional extrusion equipment, wherein one side of the shaping die is the pavement surface, and the other three sides are contained by, or are part of, suitable equipment for heating and controlling the flow of material, or with ribbon gun extrusion devices. Make certain that the applicators have a means for cleanly cutting off square ends.
6. Ensure that the applicators are capable of producing the various widths of traffic markings required in the MUTCD and/or on the Plans. Make certain that the applicators are mobile and maneuverable so that it can follow straight lines and make normal curves in a true arc. Use a truck-mounted liner with a method of automatically applying "skip" or solid longitudinal lines, including right and left edge lines, or any combination of single or double line configurations (color and pattern) as illustrated in the MUTCD. Adjust application equipment to prevent nozzle/shaping die overruns without the use of pans, aprons, or other devices.
7. Apply glass beads to the surface of the completed marking with an automatic bead dispenser attached to the applicator so that the beads are dispensed almost instantly following application of the marking material.

627.3.2 Equipment on Site

1. Ensure that the equipment necessary for the proper construction of the work is on site, in acceptable working condition, and approved by the ENGINEER as to both type and condition before the start of work under this section. Provide sufficient equipment to enable prosecution of the work in accordance with the project schedule and completion of the work in the specified time.

627.4 Construction

627.4.1 Use and Coordination of Traffic Control

1. It is the Contractor's responsibility to use and coordinate the proper traffic control indicated in the Specification, on the Plans and the SCDOT Standard Drawings, in the MUTCD, or as directed by the ENGINEER to allow for the safe removal of existing pavement markings if required, surface preparation, and installation of new pavement markings.

627.4.2 Surface Preparation

1. Ensure that the pavement is dry and free of glaze, oil, dirt, grease, or other foreign contaminants. Where directed by the ENGINEER, remove any existing markings that conflict with the Pavement Marking Plans by an approved method before the application of thermoplastic material. Use approved removal methods, which are shot blast, sand blast, or grinding.

2. In cases where the existing symbol markings (i.e. arrows, ONLY, etc.) differ from or are in conflict with the Plans, the MUTCD, or the SCDOT Standard Drawings the ENGINEER will determine which governs. For symbol marking relocation or replacement, remove 95% of the conflicting markings by buffing, water blasting, sand blasting, or otherwise ensuring that the pavement surface is in proper condition for adequate bonding of the new thermoplastic markings. Include the cost of removal in the bid prices for placement of the new symbol markings.
3. On Portland cement concrete surfaces including bridge decks, remove at least 95% of any existing markings by an approved method to provide for adequate bonding of the thermoplastic material. Make the width of the removal 2 inches wider than the line to be applied. Apply a primer sealer, recommended by the thermoplastic manufacturer, to the prepared surface before the application of the thermoplastic material.
4. When removing existing markings from the pavement surface, provide a positive means to control dust and accumulation of debris resulting from the removal operation. Capture the removed material utilizing a separate vacuum equipped vehicle or other approved system, to prevent its dispersal, and to properly dispose of this material. Do not allow visible marking material debris to remain on the pavement shoulders. Ensure that the clean-up operations include removal and disposal of the excess or waste materials away from the project site.
5. Ensure that the removal or dust and debris collection operations do not damage the existing pavement surfaces (concrete or asphalt) or damage the pavement joint materials. Repair any significant damage occurring from the removal operations to the satisfaction of the ENGINEER and at no expense to the Town.
6. Immediately before application of the new marking material, clean all surfaces to be marked with a jet of compressed air. At the time of marking application, ensure that the pavement surface is free of dust, dirt, oil, grease, and any remaining loose or flaking existing marking material.

627.4.3 Application of Primer-Sealer

1. Where required, spray the primer-sealer on the pavement surface where the lines are to be applied. Follow the recommendations of the manufacturer of the primer sealer and/or thermoplastic material for the application thickness and curing time before application of the thermoplastic material.

627.4.4 Application of the Thermoplastic Pavement Marking Material

1. Except when directed or approved by the ENGINEER, place all longitudinal markings with a truck-mounted applicator in conformance with the requirements of Subsection 627.3. Such an exception may occur where the length of a particular marking is too short or the curvature too great to permit efficient use of the truck-mounted liner. Transverse markings may be applied with a portable unit.
2. Ensure that the markings are straight or uniform in curvature and conform uniformly to tangents, curves, and transitions. Make certain that symbols are of the dimensions shown in the SCDOT Standard Drawings. Ensure that markings are of the dimensions and are placed as shown on the Pavement Marking Plans or as directed by the ENGINEER. Provide sufficient control points to serve as guides for the application of markings at no additional expense to the Town.
3. Ensure that the finished line pavement markings are free from waviness and lateral deviation does not exceed 2 inches in 15 feet. Any greater deviation is sufficient cause for removal and

correction of such markings at no additional expense to the Town. Remove and correct symbol pavement markings not meeting the dimensional requirements shown in the SCDOT Standard Drawings. Protect the pavement markings until dry by placing guarding or warning devices as necessary. If a vehicle crosses the wet marking, remove the pavement marking and any tracking lines made by the moving vehicle and apply new markings at no additional expense to the Town.

4. Place pavement markings only when the pavement is dry as determined by visual inspection or other approved method and the pavement temperature is a 55ºF or greater and the air temperature is 50ºF or greater. No work is allowed when any moisture is visible on the pavement surface or pavement is wet. Provide each work crew with a hand-held infrared non-contact thermometer with a temperature range of 0ºF to 1000ºF to verify the minimum surface temperature and a pocket thermometer capable of accurately measuring air temperature. Measure air temperature away from heat generating equipment.
5. Do not apply thermoplastic pavement markings between December 15 and March 15, inclusive. Additionally, the Engineer may disallow application on any days when the weather is cold and/or rainy and there is some question as to whether the surface temperature will be above 55ºF for a period adequate to obtain quality pavement markings. Application may also be disallowed on any day when, in the opinion of the Engineer, moisture conditions are not satisfactory for obtaining quality pavement markings.
6. Ensure that new asphalt concrete surfaces are in place a minimum of 7 days before application of thermoplastic pavement markings. Remove the curing compound on new Portland cement concrete surfaces before application of pavement markings.
7. Have on hand an adequate number of personnel experienced in the handling and application of this type of material to ensure that the work is done properly. Run the marking machine only in the direction of normal traffic flow during marking operations.
8. Perform work only during daylight hours unless specified otherwise. Ensure that all markings are sufficiently dry before sunset to permit crossing by traffic. Remove all protective devices before sunset to allow free movement of traffic at night.
9. Apply the thermoplastic pavement marking material at a temperature between 390ºF and 420ºF that provides the best adhesion to the pavement as recommended by the manufacturer. Heat the material uniformly throughout and ensure that it has a uniform disbursement of binder, pigment, and glass beads when applied to the surface of the pavement.
10. Apply extruded lines 12 inches or less in width with a die that equals the width of the line. Extruded lines greater than 12 inches may be applied with two dies whose combined width is equal to the width of the line.

627.4.5 Rate of Application of Thermoplastic Material

1. Apply the thermoplastic material at the specified widths and at the rate of new dry material thickness as specified as follows.
   - 90 mils for edge lines and median lines including:
     4-inch solid white lines,
     4-inch solid yellow lines,
     4-inch broken yellow lines,
     6-inch solid white lines,and
     6-inch solid yellow lines.
   - 90 mils for lane lines including:

4-inch broken white lines and
6 inch broken white lines.

- 90 mils for center lines on two-lane roads including:
  4-inch broken yellow lines and
  4-inch solid yellow lines.
- 125 mils for all symbols, words, or other lines not listed above.

627.4.6 Application of Glass Beads

627.4.6.1 General

1. Mechanically apply drop-on glass beads to the surface of the pavement marking material immediately after the material is applied to the pavement surface while the pavement marking material is still molten. Ensure that the beads are held by, and mechanically embedded in, the surface of the material. Make certain that the beads are uniformly distributed over the entire surface of the marking utilizing the single-drop or double-drop method specified below.
2. Uniformly apply drop-on glass beads to the surface of the molten thermoplastic material using either Single-Drop or Double-Drop method as required. Make certain that beads are embedded at 60% of their diameter and at a rate of 8 to 10 lbs per 100 square feet. Ensure that Type I glass spheres used for Single-Drop applications have a dual coating for adhesion promotion and moisture resistance.

627.4.6.1 Double Drop Method

1. Use the double-drop method of applying glass beads for all Interstate highways and for other roadways when specified or required by the plans.
2. Use small glass beads meeting the gradation for Type 1 required in Subsection 627.2.3.
3. Use large glass beads meeting the gradation for Type 3 or 4 required in Subsection 627.2.3 and are a minimum of 80% true spheres.
4. Apply large beads uniformly to the surface of the thermoplastic material so that they are embedded at 60% of their diameter at a rate of 8 to 10 lbs. per 100 square feet of material. Immediately follow the application of the large beads with application of the smaller spheres at a rate of 8 to 10 lbs. per 100 square feet of material.
5. Ensure that the beads are properly embedded and adhered to the thermoplastic line; if not, cease all marking operations until corrections are made.
6. Make certain that the marking is uniformly retroreflectorized upon cooling.

627.4.7 Reflectance Requirements

1. Ensure that the markings have the minimum retroreflectance values shown in the following table at the time of installation as obtained with a LTL 2000 Retroreflectometer. Make certain these values are maintained for a minimum of 30 days from the time the markings are placed. Make certain that each marking is uniformly retroreflectorized upon cooling.

Retroreflectivity (mcd/lux/m²)		
	White	**Yellow**
Single-Drop	375	250

Double-Drop	450	350

627.4.8 Inspection and Sampling

1. In addition to initial acceptance, thermoplastic material may be required to be sampled, tested, and approved by the OMR or their designated representative before shipment.
2. At the discretion of the Town, additional sampling and testing at the job site may be performed. Submit to the Engineer a certification from the manufacturer for each shipment, certifying through actual laboratory test results that the thermoplastic meets the requirements of AASHTO M 249 as amended herein for each type of thermoplastic material. No thermoplastic material may be used or be paid for until the thermoplastic certification is received and accepted by the Engineer. The Town reserves the right to sample and test any thermoplastic material supplied for any SCDOT project at any time.
3. A lot consists of a batch, or consecutive batches of thermoplastic manufactured on the same day using the same formulation. A lot must be more than 2000 lbs and less than 44,000 lbs of thermoplastic material. A batch is that amount of thermoplastic that was manufactured and packaged in a single operation. Make certain thermoplastic material from the same lot is palletized, stretch-wrapped, labeled with the manufacturer's lot and batch numbers (on each pallet) and batch number (on each bag) and stored in a common area to facilitate random sampling of the entire lot by the Town's Inspector.
4. Ensure that the following information is included on the manufacturer's certification:
   - State Specification No.,
   - Manufacturer's Product No.,
   - Color (White or Lead-Free Yellow),
   - Weight of the sample,
   - Identification numbers of batches comprising the lot and lot number,
   - Date of Manufacture,
   - Form (block or granular),
   - Binder Type – Alkyd,
   - Sampling Method (splitting, thieving, quartering, random bag, etc.), and
   - SC File No. or Contract No.
5. Submit to the OMR or their designee a manufacturer's test report showing actual laboratory test results on each lot of thermoplastic material. Include the following information in the manufacturer's test report:
   - Binder Content,
   - Pigment Content,
   - Glass Bead Content,
   - Daylight Luminous Reflectance,
   - 4 Hour Daylight Luminous Reflectance after 4 hrs at 425ºF,
   - Yellow Color – Chromaticity Coordinates (for yellow only),
   - Yellowness Index (for white only),
   - Ring and Ball Softening Point,
   - Hardness,

- Flowability,
- Extended Flowability, and
- Flash Point.

6. The Town reserves the right to retest any batch/lot of thermoplastic material after delivery. Results from such retesting will prevail over all other tests and failure will be the basis of rejection. Remove material not meeting the specification from the project and replaced at no expense to the Town, including all costs for handling, retesting and shipping.

627.4.9 Testing

1. Perform tests according to the specified test methods. Qualitative and quantitative analysis may also be performed by other methods of analysis at the option of the Town. Ensure that the manufacturer maintains a laboratory sufficiently staffed and equipped to maintain the quality of the product called for in these specifications.
2. The Town may require the manufacturer to fully disclose details of the systems and processes in its QA/QC Program.

627.4.10 Inspection and Acceptance of Work

1. All thermoplastic pavement markings will be inspected for proper line thickness and width, adhesion, and cycle length. The markings will also be observed in both daytime and nighttime conditions to determine whether all requirements of the Contract have been met. Remove and replace markings that fail to have a satisfactory appearance during either daytime or nighttime conditions at no additional expense to the Town.
2. The final acceptance of the thermoplastic pavement markings will be delayed for a period of 90 days after the last date of marking on the project to permit observation of performance. The Contractor is responsible for the maintenance and performance of pavement markings during the 90-day observation period. The markings are guaranteed under the payment and performance bond. Traffic must be operating on the facility during the entire 180-day observation period unless otherwise directed.
3. Replace markings or markers that, in the opinion of the Engineer, have not performed satisfactorily during this 90-day period due to defective materials and/or workmanship.
4. Ensure that the pavement marking material provided shows no signs of failure due to blistering, excessive cracking, chipping, bleeding, staining, discoloration, oil content of the pavement materials, smearing or spreading under heat, deterioration due to contact with grease deposits, oil, or gasoline drippings, spilling, poor adhesion to the pavement materials, loss of retroreflectivity, and normal wear.
5. Ensure that the thermoplastic marking maintains minimum retroreflectance values shown in the following table throughout the observation period. These measurements will be taken within 30 days before the end of the observation period. The retroreflectance values will be taken using a LTL 2000 Retroreflectometer.

180-Day Retroreflectivity (mcd/lux/m²)		
	White	Yellow
Single-Drop	325	200

Double-Drop	400	300

627.5 Measurement

1. The quantities for thermoplastic pavement markings for lines are measured by the linear foot (LF) along the center of the pavement marking lines for each type of line, width, color, and dry thickness of pavement marking line in-place, complete and accepted. Measurement is made of the pavement marking only and excludes the spaces between broken lines.
2. The quantities for thermoplastic pavement marking symbols (arrows, words, and railroad crossing symbols) are measured by each (EA) arrow (straight, right, left or combination), word or words, and railroad crossing symbol in-place, complete and accepted. A railroad-crossing symbol consists of "X RR".
3. Traffic control utilized during the performance of thermoplastic pavement marking work is not measured under items covered by this section but is included in the item Traffic Control in accordance with Subsections 107.12 and 601.5.
4. Unless included in other pay items in the Contract, the work required to remove existing pavement markings is considered incidental work for the thermoplastic pavement marking items and is not measured separately.
5. Unless included in other pay items in the Contract, the work required to determine the no passing zones for two-lane facilities and to provide the Town with the data used in establishing the zones is considered incidental to the work under this section and is not measured for payment.

627.6 Payment

1. Payment for the accepted quantity for each type of thermoplastic pavement markings measured in accordance with Subsection 627.5 is determined with the contract unit bid price for the applicable item. Payment is full compensation for applying thermoplastic pavement markings as specified or directed and includes preparing the pavement surface; removing unacceptable pavement markings; and all other materials, labor, equipment, supplies, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
2. Removal of existing pavement markings is considered incidental to the other items of work and no separate payment is made for this work unless separate pay items are included in the Contract.
3. Unless otherwise included in the Contract, traffic control for application and/or removal of pavement markings is included in the pay item Traffic Control in accordance with Subsections 107.12 and 601.6.
4. Determination of the no passing zones for two-lane facilities and providing the Town with the data is considered incidental to the other various items of work, and no separate payment is made for this work.
5. Payment for each item includes all direct and indirect costs and expenses required to complete the work.
6. Pay items under this section include the following:

Item No.	Pay Item	Unit
6271015	8" White Solid Lines Thermoplastic - 125 Mil.	LF
6271020	12" White Solid Lines (Stop Lines) - Thermoplastic -125 mil.	LF
6271025	24" White Solid Lines (Stop/Diagonal Lines) – Thermoplastic - 125 mil.	LF
6271078	8" Yellow Solid Lines (Pavement Edge Lines) Thermoplastic - 90 mil.	LF
6271080	24" Yellow Solid Lines - Thermoplastic - 125 mil.	LF

6319505 Removal of Existing Pavement Markings

SECTION 631 REMOVAL OF EXISTING PAVEMENT MARKINGS

631.1 Description

1. This section contains specifications for the materials, equipment, construction, measurement, and payment for removal of existing pavement markings before installation of new markings when specified. This work includes removal of existing markings, capture of removed material by an approved means and disposal of the captured material.

631.2 Materials

1. None specified.

631.3 Equipment

1. Ensure that the equipment necessary for the proper construction of the work is on site, in acceptable working condition, and approved by the Engineer as to both type and condition before the start of work under this section. Provide sufficient equipment to enable prosecution of the work in accordance with the project schedule and completion of the work in the specified time.

631.4 Construction

1. Remove the existing long lines (edge lines, lane lines and gore markings) on the Interstate highway mainline and ramps by water blasting, sandblasting, grinding, or other method approved by the Engineer. Do not use chemicals for removal of existing markings. Upon completion of the removal, make certain that the pavement surface is in proper condition for bonding of the new marking material.
2. On smooth surfaces, remove at least 95% of the existing lines. On open-graded asphalt or grooved concrete surfaces, remove the existing lines in a manner such that none of the marking material remains above the pavement surface (i.e. the existing marking is planed even with the pavement surface). Residual material may remain in the grooves or voids on such surfaces.
3. When removing existing markings from the pavement surface, provide a positive means to control dust and accumulation of debris resulting from the removal operation. Capture the removed material utilizing a separate vacuum equipped vehicle or other approved system, to prevent its dispersal, and properly dispose of this material. No visible marking material debris may remain on the pavement shoulders. Ensure that the recovery system is within a maximum of 75 feet behind the removal operation. If the recovery system fails, cease the removal operations until the recovery system is operating properly. Clean up, remove, and dispose of excess or waste materials from the project site.
4. Ensure that the removal operation and the dust and debris collection operation does not damage existing pavement surfaces (concrete or asphalt) or damage pavement joint materials. Repair any significant damage occurring because of removal operations to the satisfaction of the Engineer.

5. In cases where the existing symbol markings (arrows, words, etc.) differ from or are in conflict with the Plans or the SCDOT Standard Drawings, the Engineer will determine which to follow. For symbol marking relocation or replacement, remove 95% of the conflicting markings by buffing, water blasting, sand blasting or otherwise assuring that the pavement surface is in proper condition for adequate bonding of the new thermoplastic markings.
6. Replace all mainline and ramp edge lines (white and yellow) and entrance and exit gore markings within 3-calendar days of removal. Replace all mainline lane lines the same day that the existing lines are removed. Immediately before application of the new marking material, clean all surfaces to be marked with a jet of compressed air. At the time of marking application, ensure that the pavement surface is free of dust, dirt, oil, grease, and any remaining loose or flaking marking material.

631.5 Measurement

1. The quantity for the pay item Removal of Pavement Markings is the length of existing pavement markings removed and is measured by the linear foot (LF) of a 6-inch width of pavement marking measured along the center of existing edge lines, lane lines, and gore markings removed excluding spaces between broken lines, complete and accepted.
2. For each lane line removed, the quantity is a minimum of 10 feet, regardless of the actual line length removed. The length of 12-inch gore markings is multiplied by a factor of 2 (i.e. 300 feet of 12 inch line = 600 LF of removal).
3. Removal of arrows, words, and symbols is considered incidental work for the replacement items and no separate measurement is made for this work.

631.6 Payment

1. Payment for the accepted quantity for Removal of Pavement Markings, measured in accordance with Subsection 631.5, is full compensation for the removal and disposal of existing pavement markings as specified or directed and includes dust control, debris removal, and all other materials, labor, equipment, tools, supplies, transportation and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
2. No payment is made for the removal of arrows, words, and symbols. This work is incidental to the in the unit bid price for placement of the new symbol markings.
3. Traffic control for removal of existing pavement markings is included in the pay item Traffic Control in accordance with Subsections 107.12 and 601.6
4. Payment for each item includes all direct and indirect costs and expenses required to complete the work.
5. Pay items under this section include the following:

Item No.	**Pay Item**	**Unit**
6319505	Removal of Pavement Markings	LF

7203120 Concrete Curb and Gutter (1'-6")
7204100 Concrete Sidewalk (4" Uniform)

SECTION 720 CONCRETE CURB, GUTTER, CURB AND GUTTER, SIDEWALK, DRIVEWAY, AND MEDIAN

720.1 Description

1. This section contains specifications for the materials, construction, equipment, measurement, and payment for the construction of Portland cement concrete curb, Portland cement concrete gutter, Portland cement concrete curb and gutter, Portland cement concrete sidewalk, Portland cement concrete driveway, and Portland cement concrete median in one course on a prepared subgrade in accordance with these specifications, conforming to the dimensions, typical cross-section, and notes shown on the Plans, and to the lines and grades shown on the Plans or established by the Engineer.
2. This work includes the placing of reinforcing steel in the concrete when indicated on the Plans.

720.2 Materials

720.2.1 Portland Cement Concrete

1. Provide Class 2500 Portland cement concrete conforming to the applicable requirements of Section 701.

720.2.2 Expansion Joint Material

1. Provide expansion joint materials meeting the requirements of Subsection 702.2.2.1.

720.2.3 Reinforcing Steel

1. Provide reinforcing steel conforming to the requirements of ASTM A 706, Grade 60, and meeting the applicable requirements of Section 703.

720.3 Equipment

1. Ensure that the equipment necessary for the proper construction of the work is on site, in acceptable working condition, and approved by the Engineer as to both type and condition before the start of work under this section. Provide sufficient equipment to enable prosecution of the work in accordance with the project schedule and completion of the work in the specified time.

720.4 Construction

720.4.1 Subgrade

1. Thoroughly compact the subgrade and finish to a smooth, firmly compacted surface, which is moist at the time the concrete is placed. In areas where it is impractical to use standard type rollers, accomplish compaction by vibratory hand compactors. Remove and replace concrete

that settles and/or cracks after placement as directed by the Engineer without additional compensation.

720.4.2 Forms

1. Use wood or metal forms of a depth equal to the thickness of the concrete course. Make certain they are free from warp and are of sufficient strength when staked, to hold the alignment during the concrete placing and finishing operations. Before concrete is placed against them, clean and oil the forms. Use flexible or curved forms on curves as necessary in order to prevent a chord effect in the alignment of the finished work.

720.4.3 Existing Sidewalks and Driveways

1. Where a portion of an existing sidewalk or driveway is reconstructed, cut the existing section to a minimum depth of 2 inches with a suitable saw at the location designated by the ENGINEER and remove the entire section to be reconstructed. Join the new sidewalk or driveway with the old work at this line.

720.4.4 Mixing and Placing Concrete

1. Batch and mix the concrete in accordance with the applicable requirements of Section 701.
2. Unless otherwise indicated on the Plans, construct concrete curbs, concrete gutters, and concrete curb and gutters in uniform 10-foot sections, except where shorter sections are necessary for closures; but ensure that no section is less than 4 feet in length. Separate the sections by sheet steel templates or dividing plates set normal to the face and top of the curb. Carefully set the plates during the placing of the concrete and keep in place until the concrete has set sufficiently to hold its shape. Remove the plates while the forms are still in place.
3. Deposit concrete in the forms so that the forms do not displace out of grade or alignment. During the placing operations, spade or vibrate the concrete throughout the entire mass and especially against the forms and joints. Tamp, float, trowel, broom, edge, and finish the surface of the concrete to the typical section, lines, and grades as soon as practicable after the placing of the concrete. Leave the forms in place until the concrete has set sufficiently and their removal does not injure the concrete.

720.4.5 Extruded or Slip-Formed Curb or Curb and Gutter Construction

1. Unless otherwise specified and except on structures, concrete curb may be placed by an extrusion machine acceptable to the Engineer. An accepted slip-form machine may be used to construct concrete curb or curb and gutter if satisfactory results are obtained. When, in the opinion of the Engineer, satisfactory results are not being obtained, discontinue the extrusion or slip-form work and use the stationary form type of construction with no adjustment in compensation. Remove and replace unsatisfactory work without any additional compensation.
2. Construct expansion and weakened joints at the same locations as required when form construction is being used. Make weakened joints, spaced at 10 foot intervals, by cutting the plastic concrete with a trowel or by other acceptable methods. Ensure that the manner of

construction of joints meets the approval of the Engineer and has a workmanlike finish after edging.

720.4.6 Joints

720.4.6.1 Expansion Joints

1. Ensure that preformed expansion joints are ¾ inch thick and extend the full depth of the concrete. Construct joints at the locations indicated on the Plans and at the following locations:
   - Wherever a sidewalk is constructed between an adjoining substantial structure on one side and curbing on the other side, form an expansion joint adjacent to the curbing.
   - Place an expansion joint between the sidewalk and the radius curbing at street intersections.
   - Where concrete sidewalks or medians are constructed adjacent to existing or new concrete pavement or structures, place a transverse expansion joints in the sidewalk or median opposite such joints in the concrete pavement or structure.
   - Where existing structures such as light standards, poles, fire hydrants, etc., are within the limits of the sidewalk or median area, surround them with an expansion joint.
   - Place transverse expansion joints at intervals of not more than 100 feet in all concrete shapes.

720.4.6.2 Contraction Joints

1. Divide the concrete slabs in sidewalks between expansion joints into blocks 10 feet in length, by scoring transversely after floating operations are completed. Where the sidewalk slabs are more than 10 feet in width, score them longitudinally in the center. Extend transverse and longitudinal scoring for a depth of 1 inch and not less than ¼ inch or more than ½ inch in width. Edge and finish joints smooth and true to line.
2. In concrete medians, locate transverse contraction joints, formed as described above, at intervals of not more than 25 feet and extend not less than a quarter of the median depth.

720.4.7 Final Finish

720.4.7.1 Curbs and Curb and Gutters

1. As soon as the concrete has set sufficiently, remove the forms from the exposed surfaces. Float and trowel the concrete on the curb face and top as necessary to provide a smooth uniform finish. Leave joint templates in place a minimal length of time to prevent bonding or distortion at the joint.
2. After the surface of the gutter has been properly shaped and prepared and the water sheen has disappeared, produce the final finish by brooming. Apply brooming transverse to the line of traffic. Ensure that joints are in a vertical plane perpendicular to the curb face. Make certain that joints are clean and corners well rounded. Edge corners and conform to the typical cross-section. Eliminate all tool marks in final finish.

720.4.7.2 Sidewalks, Gutters, Medians, and Driveways

1. Apply the final finish for sidewalks, gutters, medians, and driveways by brooming as specified in Subsection 720.4.7.1, unless otherwise directed. As soon as the forms are removed from concrete median, rub down the sides to a smooth and uniform finish. Remove mortar or aggregate particles that spill onto the pavement.

720.4.7.3 Repair of Defects

1. As soon as the forms are removed from all concrete shapes, fill honeycombed places and other minor defects with a mortar composed of one part Portland cement and two parts sand. Plastering is not allowed. Replace sections with visible cracks at no expense to the Town.

720.4.8 Protection and Curing

1. Protect the concrete as specified in Subsection 702.4.6 and cure with liquid membrane-forming compounds meeting the requirements of Subsection 702.2.2.11. Ensure that methods and rates of application of curing compounds are in accordance with Subsection 702.4.4.2.

720.4.9 Backfilling

1. After the concrete has set sufficiently and the forms have been removed, backfill the spaces on both sides to the required elevation with suitable material that is firmly compacted and neatly graded. Backfill concrete gutter so that the earth materials are a minimum of 1 inch above the concrete. Maintain an earth roll on each side as necessary to prevent undermining of curb and gutter.

720.5 Measurement

1. The quantity for the pay item Concrete Curb, Concrete Gutter, or Concrete Curb and Gutter (of the type and size specified) is the length of the cast-in-place curb and/or gutter and is measured by the linear foot (LF), complete, and accepted. Concrete Curb and Gutter is measured along the roadway face of the curb at the gutter line. Concrete Curb and Concrete Gutter are both measured along the roadway at the finished grade elevation.
2. The quantity for the pay items Concrete Sidewalk, Concrete Driveway, and Concrete Median is the finished surface area of the top of the cast-in-place sidewalk, driveway, or median and is measured by the square yard (SY), complete, and accepted. Deductions for drainage structures such as catch basins, drop inlets, etc., are in accordance with the Plans, the Specifications, and SCDOT Standard Drawings.
3. Excavation, when applicable and approved, is measured in accordance with Subsection 203.5.

720.6 Payment

1. Payment for the accepted quantity, measured in accordance with Subsection 720.5, is determined using the contract unit bid price for the applicable pay item. Payment is full compensation for constructing curb and/or gutter as specified or directed and includes fine grading; compacting the subgrade; formwork; concrete, reinforcing steel; joint templates; joint materials; curing concrete; backfilling; and all other materials, labor, equipment, tools, supplies,

transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.

2. Excavation, when applicable and approved, is paid for in accordance with Subsection 203.6.
3. Payment for each item includes all direct and indirect costs and expenses necessary to complete the work.
4. Pay items under this section include the following:

Item No.	Pay Item	Unit
7201100	Concrete Transition Curb	LF
72020X0	Concrete Gutter Type *(X)*	LF
7203110	Concrete Curb and Gutter (1'-6")	LF
7203210	Concrete Curb and Gutter (2'-0")	LF
7204100	Concrete Sidewalk (4” Uniform)	SY
7205000	Concrete Driveway (6" Uniform)	SY

7209000 PEDESTRIAN RAMP CONSTRUCTION

72049000 DETECTABLE WARNING MATERIALS

1.00 GENERAL

1.01 Construct pedestrian ramps conforming to these standard drawings. Submit ramp design drawings to the Engineer for review when non-standard ramps are used.

1.02 Use materials and workmanship in accordance with the SCDOT standard specifications for highway construction (latest edition), SCDOT qualified product list 61 and detectable warning manufacturer's installation instructions.

1.03 Provide a skid-resistant broom finish on concrete within the designated pedestrian access route. Construct designated pedestrian access routes located on asphalt pavements as level as practical and remove loose or uncompacted asphalt through the entire access route

1.04 Coordinate the ramp and the pedestrian crosswalk markings so that detectable warnings for ramps and refuge islands are entirely within pedestrian crosswalk markings.

1.05 See standard drawing 626-305-00 for crosswalk marking styles.

1.06 Construct sidewalk, parallel ramp, and landing cross slopes at 100h: 1v [no steeper than 50h: 1v] toward the roadway. construct cross slope of perpendicular ramps to match roadway grade.

1.07 Construct running slope of new curb ramps at a 12h:1v or 8.337 or flatter when measured along the direction of pedestrian travel up the ramp and relative to a level grade unless field conditions require a ramp greater than 15' long.

1.08 Use at least 18" curb radius at all edges of new concrete islands and at least 6" curb radius at all curb returns. Do not saw cut edges through islands or at ramps for new construction.

1.09 Do not construct standard ramp partitions or curb returns taller than 12". In locations where grade separation between sidewalk and adjacent property exceeds 12", slope adjacent grade as directed by the engineer or property owner (2:1 or flatter). Where regrading of adjacent property is not practical, provide a retaining wall as shown in the plans, special provisions, or as directed by the Engineer.

1.10 Remove and dispose of all waste and excess material from completed ramp.

1.11 In locations where architectural treatments (imprinted asphalt architectural pavers stamped concrete etc.) are included in the plans do not place the architectural treatments within the pedestrian ramp or landing however dyed or stained concrete may be used in these areas if indicated in the plans or special provisions

1.12 where practical locate architectural treatments along the boundary of the pedestrian access route rather than directly within the pedestrian access route.

5.00 REFUGE ISLANDS/RAISED MEDIANS

5.01 In refuge islands, provide a minimum of 2' -0" separation between detectable warnings on either side of the refuge to delineate where island begins and ends.

5.02 Use detectable warnings in raised islands 6' - 0" wide or wider in general direction of pedestrian travel through the ramp.

5.03 Use island straight crossing adjacent to intersections through any island less than 12' wide.

5.04 When a mid-block crossing is required, consider mid-block staggered crossing (720- 055-41) to encourage eye contact between the pedestrian and the oncoming traffic. always angle the stagger so the pedestrian travels through the refuge facing the oncoming traffic.

15.00 DRAINAGE

15.01 Where practical, locate drainage structures outside and uphill of designated pedestrian access routes.

15.02 When drainage structure must be located inside of a pedestrian access route use only ADA compliant drainage structures. Use ADA rated grate and covers when inside pedestrian access routes including sidewalks, ramps, landings, crosswalks, and islands. see standard drawings for catch basins (719-0xx-xx), drop inlets (719-1xx-xx), and trench drains (719-2xx-xx) for available options.

15.03 Do not eliminate drainage structure without the consent of the hydraulic engineer.

15.04 Provide ramp partitions as needed to contain roadway drainage or if needed to maintain grading on adjacent property. when ramp partition is used, grade adjacent soil within 1 /2" of the top of the ramp partition and flat for at least 1' behind the ramp partition

20.00 DETECTABLE WARNINGS

20.01 For standard installations, use at least a 2' -0" x 5' - 0" detectable warning at all interfaces between pedestrian access route or refuge island and adjacent traffic. Always supply enough detectable warning material to cover landing or refuge boundary as specified in these standard drawings. Retrofit ramps that do not have sufficient room to accommodate standard ramps may use smaller detectable warnings is specified in the plans or special provisions.

20.02 Unless specified otherwise in the plans or special provisions, install safety yellow federal number 33530 detectable warnings. See qualified product list 61 for available colors and use only colors that provide contrast between the adjacent materials.

20.03 follow detectable warning manufacturer's installation procedures and use only materials (primer, grout, adhesives, etc.) and methods (contact preparation, placement, field cuts, etc.), that are specified by the detectable warning manufacturer as compatible with the selected warning product.

20.04 Select detectable warning product based on the following conditions:

A. Wet inset with fasteners or replaceable	Any new location with new concrete
B. Wet inset without fasteners	Any new location with new concrete
C. Paver	Only when specified in plans or special provisions
D. Asphalt applied	Only on asphalt surfaces
E. Dry bonded	Only when new concrete will not be placed in ramp

20.05 For radius installations, field cut detectable warning material to fit back of curb radius as shown or order custom fabricated pieces to match curb radius. Edge of detectable warning must be within 3" of back of curb at any measured location for curved installations. Cover entire back of curb radius boundary to within 2 inches of both sides of the lower landing. Where practical, minimize the number of field cut pieces in radius installations.

20.06 Do not install detectable warnings in at-grade medians or in median locations where a raised median terminates on one side of a crosswalk. No refuge island is available in these cases, so pedestrian crosswalk signal should be timed to allow the pedestrian to cross to the next available refuge location.

20.07 Place all style detectable warning materials flush with top of sidewalk (flush +/- 1/8").

20.08 Locate entire warning behind curb line to minimize vehicles riding over this feature. Locate one edge of detectable warning within 3 inches of the face of curb on median islands and 0 to 2 inches behind back of curb and gutter.

20.09 Align truncated dome pattern in line with direction pedestrian travel across the detectable warning.

20.10 Groove a ¼" x ¼" joint in the concrete pad directly around the perimeter of the detectable warning material for all wet inset and grouted paver styles.

20.11 Apply sealant around the perimeter and all joints of the detectable warning for all grouted paver asphalt applied and dry bonded surface applied style detectable warnings.

25.00 RETROFIT INSTALLATIONS

25.01 When retrofitting pedestrian ramps on sidewalks, retrofit existing concrete islands at the same time.

25.02 For retrofit ramps, regardless of existing sidewalk width; construct full size ramps as shown in these standard drawings, unless right of way limits do not accommodate standard ramps or shown otherwise in the plans or special provisions.

25.03 Use dry bonded surface applied detectable warnings only in locations where existing geometry conforms to requirements for a retrofit ramp and no new concrete will be placed in the ramp or landing. Provide a copy of the latest version of the manufacturer's installation instructions to the Engineer before installation of surface applied detectable warnings.

25.04 For retrofit ramps, if new concrete is placed in the ramp, use only wet inset or paver style detectable warning systems.

25.05 For island retrofits, saw cut edges are acceptable on at grade pass throughs. The ramps are constructed to direct pedestrians to the top of the raised island provide side flare edges on the ramp to minimize trip hazard. Do not use saw cut or vertical edges on retrofit ramps in sidewalk.

25.06 Place factory edges of the dry bonded surface applied detectable warning transverse to the direction of pedestrian travel across the detectable warning. Field cut edges may only be placed against curbs, ramp edges, and adjacent detectable warnings seal perimeter and all edges of dry bonded surface applied detectable warnings.

30.00 MEASUREMENT

30.01 For curb ramps, measure pedestrian ramp construction 7209000 in square yards based on the actual area of ramps, tapered and dropped curbs, ramp partitions, curb returns, flares, and gutters shown shaded in these standard drawings.

30.01 A measure detectable warning material 7204900 on new pedestrian ramps in square feet based on the actual installed area of the detectable warning used.

30.02 For locations in raised medians where at-grade pass-through is constructed, measure concrete median 7206000, in square yards, by the area inside the perimeter of the raised median if the pass-through was not present.

30.03 For locations in raised medians and on existing ramps where only the application of surface applied detectable warning is required, measure surface applied detectable warning 7209100 in square feet based on the actual applied area of detectable warning.

30.04 For locations where existing sidewalk is to be removed, measure removal and disposal of existing pavement 2023000, in square yards, by the area of sidewalk, curb, and gutter removed from the existing infrastructure.

40.00 PAYMENT

40.01 Pay for pedestrian ramp construction 7209000 in square yards as shown in these drawings. payment includes all materials and labor to construct pedestrian ramp as shown. No additional payment will be made for components used to complete the ramp construction.

40.02 Pay for concrete median 7206000 in square yards as shown on standard drawings 720-105-xx. Payment includes all materials and labor to construct pedestrian pass through across median islands.

40.02.a. Pay for detectable warning material 7204900 in square feet as shown in these drawings when new concrete is placed. Include in this quantity the materials and labor to install the warning material of the color and style specified in the plans or special provisions or provide a safety yellow wet inset style product when the style is not specified.

40.03 Pay for surface applied detectable warning 7209100 in square feet as shown in these drawings. When installing surface applied detectable warnings on asphalt or when retrofitting existing ramps. Payment includes all materials and labor to install the surface applied detectable warning as shown.

40.04 Pay for removal and disposal of existing pavement 2023000 in square yards.

Item No.	Pay Item	Unit
7204900	Detectable Warning Material (RED BRICK)	SF
7204900	Detectable Warning Material (GRAY TILE)	SF
7204900	Detectable Warning Material (YELLOW TILE)	SF
7209000	Pedestrian Ramp Construction	SY

8131000 Sodding (Match Existing)

SECTION 813 SODDING

813.1 Description

1. This section contains specifications for the materials, equipment, construction, measurement, and payment for sodding, which consists of furnishing and laying sod of perennial turf-forming grasses on slopes and shoulders and other areas in conformity with the Plans and the Specifications or as directed by the Engineer.

813.2 Materials

813.2.1 Sod

1. Provide sod that consists of living, well-established growth, predominantly of the grass specified in the Special Provisions. Provide vigorous, well-rooted, healthy turf, free from disease, insect pests, weeds, other grasses, stones, and any other harmful or detrimental materials.

813.2.2 Fertilizer

1. Provide fertilizer conforming to the requirements of Subsection 810.2.5.

813.2.3 Lime

1. Provide lime conforming to the requirements of Subsection 810.2.6.

813.3 Equipment

1. Ensure that the equipment necessary for the proper construction of the work is on site, in acceptable working condition, and approved by the Engineer as to both type and condition before the start of work under this section. Provide sufficient equipment to enable prosecution of the work in accordance with the project schedule and completion of the work in the specified time.

813.4 Construction

813.4.1 Advance Preparations

1. Perform the advance soil preparations specified in Subsection 810.4.5. Provide machine stripped sod with a uniform soil thickness of approximately 1 inch. The minimum acceptable soil thickness is ¾ inch. The measurement for thickness excludes top growth and thatch. Roll or fold sod before lifting. Handle sod in a manner that prevents tearing, breaking, drying, or any other damage.

813.4.2 Lime and Fertilizer

1. Apply lime and fertilizer as specified in Subsection 810.4.7 or according to soil tests. Do not apply lime and fertilizer until one month after installation of sod.

813.4.3 Furnishing and Placing Topsoil

1. To ensure a good stand of grass in areas where the existing soil bed has little or no topsoil, furnish and place topsoil on the soil bed. Furnish the amount of topsoil as directed by the ENGINEER.

813.4.4 Laying Sod

1. Lay sod on the prepared sod bed within 24 hours after cutting, except that sod may be stored in stacks or piles, grass to grass and roots to roots for not more than 5 days. Protect sod against drying from sun or wind and from freezing if necessary. Perform moving and laying of sod when weather conditions and soil moisture are favorable.
2. Lay the sod when the soil is moist. If necessary, moisten dry sod beds before sod is laid. Lay sections of solid sod edge to edge with staggered joints. Plug openings with sod or fill with acceptable loamy topsoil. Fill openings in joints with loamy topsoil. After laying sod and filling joints, roll or tamp with approved equipment to eliminate air pockets and provide an even surface.

813.4.5 Maintenance

1. Water the sod immediately after laying and keep the sod moist until final acceptance of the Contract. Perform all maintenance including watering, repairing washes, additional sodding, and fertilizing where a satisfactory stand of grass has not been achieved until the work is accepted. Do not fertilize centipede between August 1 and April 1.

813.4.6 Acceptance

1. When requested, the Engineer will inspect sodded areas for acceptance. Engineer acceptance is contingent on establishing a satisfactory stand of perennial grass. Sodded areas are acceptable when all requirements including maintenance are met and a healthy, evenly colored, viable stand of grass is established. A satisfactory stand of grass must have a root system that is sufficient to survive dry periods and winter weather and is capable of re-establishing in the spring.

813.5 Measurement

1. The quantity for Sodding is the surface area of the acceptable stand of grass and is measured by the o square yard (SY) unit, complete, and accepted.
2. Fertilizer, lime, and other nutrients are considered as incidental items for the sodding work and are not measured for separate payment.
3. Topsoil furnished and applied is measured and paid for as Organic Topsoil in accordance with Subsection 810.5 and 810.6.

813.6 Payment

1. Payment for the accepted quantity for the pay item Sodding, measured in accordance with Subsection 813.5, is determined using the contract unit bid price for the item. The payment is full compensation for laying and establishing grass sod as specified or direct and includes furnishing viable grass sod (including fertilizer, lime, and selected material for shoulders or slopes), labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract, except for organic top soil, which is a separate pay item.
2. Payment includes all direct and indirect costs and expenses necessary to complete the work.
3. Pay items under this section include the following:

Item No.	Pay Item	Unit
8131000	Sodding	SY

8150100 Erosion Control

SECTION 815 EROSION CONTROL

815.1 Description

1. This section contains specifications for the materials, equipment, construction, measurement, and payment for the placement of temporary erosion control measures to prevent erosion and water pollution through the use of best management practices including the use of berms, silt basins, silt ditches, sediment dams, fiber roving, rolled erosion control products, silt fences, floating turbidity barriers, brush barriers, sediment tubes, inlet filters, bonded fiber matrix, flexible growth matrix, temporary flexible pipe slope drains, temporary seeding, and stabilized construction entrances in conformity with the Plans the Specifications, SCDOT Standard Drawings, or as directed by the ENGINEER.

815.1.1 Erosion Control Device Applications

815.1.1.1 Rolled Erosion Control Products (RECP) 815.1.1.1.1 Temporary Erosion Control Blankets

1. Erosion control blanket will be designated on the Plans or by the Engineer. The following criteria will be followed to select the type of blanket utilized:
   - Install Type A temporary erosion control blankets on slopes 2H:1V or flatter only. For slopes greater than 2H:1V, use turf reinforcement matting (TRM).
   - Install Type B temporary erosion control blankets on channels or concentrated flow areas with a maximum calculated design sheer stress less than or equal to 1.75 lbs/ft^2. For channels and concentrated flow areas with design shear stresses greater than 1.75 lbs/ft^2, use TRM.
   - Install Type C temporary erosion control blankets on areas where the establishment of temporary erosion control is critical and seeding needs additional reinforcement. Use temporary blankets for anionic polyacrylamide applications on slopes 2H:1V or flatter.

815.1.1.1.2 Turf reinforcement Matting (TRM)

1. Turf reinforcement matting will be designated on the Plans or by the Engineer. The following criteria will be followed to select the type of TRM utilized:
   - Install a Type 1 TRM on slopes 2H:1V or flatter or in channels where the calculated design shear stress is 4.0 lbs/ft^2 or less and the design flow velocity reaches a value up to 10-ft/sec.
   - Install a Type 2 TRM on slopes 1.5H:1V or flatter or in channels where the calculated design shear stress is 6.0 lbs/ft^2 or less and a design flow velocity reaches a value up to 15-ft/sec.
   - Install a Type 3 TRM on slopes 1H:1V or flatter or in channels where the calculated design shear stress is 8.0 lbs/ft^2 or less and the design flow velocity reaches a value up to 20-ft/sec.
   - Install a Type 4 TRM on slopes 1H:1V or greater or in channels where the calculated design shear stress is up to 12 lbs/ft2 and the design flow velocity reaches a value up to 25-ft/sec, and when field conditions exist with high loading and/or high survivability

requirements.

815.1.1.2 Sediment Tubes

1. Sediment tubes are temporary erosion control devices installed along contours, in drainage conveyance swales, and around drainage inlets to reduce the effects of soil erosion and to retain sediment. Locations for installation will be designated on the Plans or by the ENGINEER.

815.1.1.3 Inlet Structure Filters

1. Inlet structure filters are temporary erosion control devices installed around pipe inlet structures to trap sediment and keep silt, sediment, and construction debris from entering pipe systems through open inlet structures. Additionally, inlet structure filters are used to prevent the silting-in of inlets, storm drainage systems, and receiving channels. Locations for installation will be designated on the Plans or by the ENGINEER.
2. The criteria for the use of Inlet Structure Filter Types A, B, D, E, and F are identified in Subsections 815.1.1.3.1 through 815.1.1.3.5.

815.1.1.3.1 Type A Low Flow Inlet Filters

1. Install a Type A low flow inlet filter for inlets with a peak flow rate less than 1 ft3/sec, the inlet drain area grade is less than 5%, and the immediate drainage area (5-foot radius around the inlet) grade is less than 1%. Do not use for areas receiving concentrated flow.

815.1.1.3.2 Type B Medium Flow, Low Velocity Inlet Filters

1. Install a Type B medium flow, low velocity inlet filter for inlets with a peak flow rate less than 3 ft3/sec, the inlet drain area grade is less than 5%, and the flow velocity to the inlet does not exceed 3 ft/sec. Use this type of filter where an overflow capacity is not required to prevent excessive ponding around the structure.

815.1.1.3.3 Type D High Flow, High Velocity Inlet Filters

1. Install a Type D high flow, high velocity inlet filter for a drainage area up to 2 acres with peak flow rates greater than 3 ft3/sec, the inlet drain area grade is greater than 5%, and the flow velocity to the inlet may exceed 3 ft/sec. Use Type D1 filters for median applications. Use Type D2 for sump applications. Use Type D1 or D2 filters where an overflow capacity is required to prevent excessive ponding around the structure and to protect inlet structures not associated with curb inlets. Use to protect structure inlets such as Catch Basin Type 9, yard inlets, Drop Inlet 24 inches by 24 inches, Drop Inlet 24 inches by 36 inches, and manholes.

815.1.1.3.4 Type E Surface Course Curb Inlet Filters

1. Install a Type E surface course curb inlet filter to protect Catch Basin Types 1, 16, 17, and 18 after the road surface course is placed.

815.1.1.3.5 Type F Inlet Tubes

1. Type F inlet tubes are classified into two categories: weighted and non-weighted. Install a weighted Type F inlet tube to protect Catch Basin Types 1, 9, 12, 14, 15, 16, 17, and 18, Drop Inlet 24 inches by 24 inches, Drop Inlet 24 inches and 36 inches, manholes, and trench drains where drainage areas are less than 1 acre. Place the weighted inlet tube on gravel, concrete, asphalt, or other hard surfaces around drainage inlet. Install a weighted Type F inlet tube where construction traffic may occur around the inlet. All weighted Type F inlet structure filters are applicable as Type E inlet structure filters.
2. Use non-weighted Type F inlet tubes as inlet filters for Catch Basins Type 1, 16, 17, and 18 with drainage areas less than 1 acre. Place non-weighted Type F inlet tubes on subgrade and are applicable until the road base course is placed.

3. Use both weighted and non-weighted Type F inlet tubes as weep hole inlet filters. Use non-weighted Type F inlet tubes only where stakes can be driven into the ground or subgrade to secure the tube.

815.1.1.4 Stabilized Construction Entrance

1. Locate a stabilized construction entrance, which is a temporary stone-stabilized pad with a non-woven geotextile fabric underlining, at defined points of vehicular ingress and egress on construction sites to reduce the amount of mud, dirt, and rocks transported onto public roads by motor vehicles, equipment, and runoff. Taper the edges of the entrance out towards the road to prevent tracking of mud at the edge of the entrance, and so that long vehicles do not leave the stabilized area when turning onto or off the paved roadway.

815.1.1.5 Bonded Fiber Matrix (BFM)

1. Use a bonded fiber matrix (BFM) as an allowable substitution for mulch or in temporary seeding applications and seeding applications as outlined in Section 810.
2. Install BFMs in the following situations:
    - Enhancement of temporary seeding operations to reduce erosion and expedite seed germination.
    - A high-performance mulch is required for permanent seeding.
    - Seeding application takes place on highly erodible soil or slopes.
    - Slopes up to 1H:1V.
    - The required functional longevity of soil protection is 6 months or less.
    - The soil is dry and rain is not expected within 48 hours after application.
    - There is a high degree of certainty that heavy rains will not follow application.
3. Do not use a BFM as Type A temporary erosion control blanket, channel liners, or in areas receiving concentrated flow.

815.1.1.6 Flexible Growth Matrix (FGM)

1. Install a flexible growth matrix (FGM) in the following situations:
    - As a Type A temporary erosion control blanket,
    - On slopes up to 2H:1V.
    - As an infill for a TRM on slopes greater than 2H:1V.
    - Environmentally sensitive wetlands and other wildlife areas not compatible for products containing netting.
    - The site requires strong mechanical and chemical bonds to withstand greater surface flow and/or severe slopes.
    - The required functional longevity of soil protection is up to 1-year.
    - The site requires immediate erosion protection and there is a risk of impending weather.
    - Fast vegetation establishment is required.
    - A high factor of design safety is required.
3. Do not use an FGM as a channel liner or for areas receiving concentrated flow.

815.2 Materials

815.2.1 Rolled Erosion Control Products (RECP)

815.2.1.1 Temporary Erosion Control Blankets

1. When not used with polyacrylamide slope applications, provide temporary erosion control blankets with a core composed primarily of biologically, photochemically or otherwise degradable constituents such as wheat straw, coconut fiber, straw-coconut blends, or aged curled excelsior wood fiber with longevity of approximately 1 to 3 years.
2. Ensure that the core is enclosed in double netted matting (i.e., matting with netting on both sides of the blanket) composed of non-organic, photodegradable, or biodegradable polypropylene netting. Ensure that the top netting consists of degradable polypropylene with a maximum mesh opening of 0.75 inch by 0.75 inch, and the bottom netting consists of degradable polypropylene with a maximum mesh opening of 0.50 inch by 0.50 inch. Ensure that netting is stitched together at not more than 2 inches on center. For blankets composed of aged, curled excelsior wood fiber, ensure that both the top and bottom netting consist of degradable polypropylene with a maximum mesh opening of 1.0 inch by 1.0 inch and that it consists of aged, curled excelsior wood interlocking fibers with 80% of the fibers a minimum of 6 inches long. Ensure that the netting is stitched together at not more than 2 inches on center. Do not use jute netting.
3. Provide Class A and Class B temporary erosion control blankets with physical properties derived from quality control testing performed by a laboratory accredited by the Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) and conforming to the following Minimum Average Roll Values (MARV) shown in the following table.

Temporary Erosion Control Blankets	
Physical Properties	**MARV**
Minimum mass per unit area (ASTM D 6475)	6 oz/yd^2
Minimum thickness (ASTM D 6525)	0.25 inch
Minimum initial grab tensile strength (ASTM D 6818)	75 x 75 lbs/ft
Minimum roll width	48 inches
Note: For Class B channel applications, a minimum unvegetated shear stress of 1.0 lbs/ft^2 based on short-term peak flow duration of 0.5 hour is required.	

815.2.1.2 Temporary Erosion Control Blankets for Polyacrylamide Slope Applications

1. Provide a Class C temporary erosion control blanket for anionic polyacrylamide slope application that is a uniform organic temporary erosion control blanket composed of jute netting or curled excelsior wood fiber or coconut fiber blankets. Do not use blankets containing straw or straw/coconut blends. Ensure that slopes are 2H:1V or flatter for this application.
2. For a polyacrylamide slope application, provide a Type C temporary erosion control blanket with physical properties derived from quality control testing performed by a GAI-LAP accredited laboratory and conforming to the following Minimum Average Roll Values (MARV) shown in the following tables.

Jute Netting
Uniform, open, plain weave netting using un-dyed and unbleached loosely twisted construction yarn that does not vary in thickness by more than 0.5 its normal diameter.

Minimum roll width	48-inches
Minimum thickness (ASTM D 1777)	0.25 inch
Yarn Warp Count (ASTM D 3775)	19.5 minimum per 1 foot of width
Yarn Weft Count (ASTM D 3775)	14.0 minimum per 1 foot of width
Minimum mass per unit area (ASTM D 3776)	6 oz/yd^2
Minimum dry grab tensile strength (ASTM D 4632)	300 x 175 lbs/ft
Minimum wet grab tensile strength (ASTM D 4632)	125 x 65 lbs/ft
Minimum open area	50%
Minimum openings	Approx. 0.5 to 1.0 inch in width and length

Excelsior Blankets	
Double-netted blanket consisting of curled excelsior wood interlocking fibers with 80% of the fibers a minimum of 6-inches long forming a degradable netting with a maximum mesh opening of 1.0 inch by 1.0 inch.	
Minimum roll width	48 inches
Minimum thickness (ASTM D 6525)	0.25 inches
Minimum mass per unit area (ASTM D 6475)	6 oz/yd^2
MD-Tensile strength (ASTM D 5035)	120 lbs/ft
TD-Tensile strength (ASTM D 5035)	70 lbs/ft
Maximum MD-Elongation (ASTM D 5035)	30%
Maximum TD-Elongation (ASTM D 5035)	20%

Coconut Blankets	
Double-netted blanket consisting of 100% coconut fiber forming degradable netting with a maximum mesh opening of 0.75 inch by 0.75 inch.	
Minimum roll width	48 inches
Minimum thickness (ASTM D 6525)	0.25 inches
Minimum mass per unit area (ASTM D 6475)	6 oz/yd^2
MD-Tensile strength (ASTM D 4595)	190 lbs/ft
TD-Tensile strength (ASTM D 4595)	190 lbs/ft
Maximum MD-Elongation (ASTM D 4595)	20%
Maximum TD-Elongation (ASTM D 4595)	20%

815.2.1.3 Turf reinforcement Matting (TRM)

815.2.1.3.1 Type 1

1. Provide a Type 1 TRM consisting of a web of mechanically or melt bonded polymer netting, monofilaments or fibers entangled to form a strong three-dimensional stable net structure utilizing bonding methods including polymer welding, thermal or polymer fusion or the placement of fibers between two high-strength biaxial oriented nets mechanically bound by parallel stitching with polyolefin thread. The Engineer may allow a degradable fiber matrix to be used to provide immediate coverage for bare soil.

815.2.1.3.2 Type 2

1. Provide a Type 2 TRM consisting of a web of mechanically or melt bonded polymer netting, monofilaments or fibers that are entangled to form a strong three-dimensional stable net structure utilizing bonding methods including polymer welding, thermal or polymer fusion or the placement of fibers between two high-strength biaxial oriented nets mechanically bound by parallel stitching with polyolefin thread. The Engineer may allow a degradable fiber matrix to provide immediate coverage for bare soil.

815.2.1.3.3 Type 3

1. Provide a Type 3 TRM consisting of a web of mechanically or melt bonded polymer netting, monofilaments or fibers that are entangled to form a strong three-dimensional stable net structure utilizing bonding methods including polymer welding, thermal or polymer fusion or the placement of fibers between two high-strength biaxial oriented nets mechanically bound by parallel stitching with polyolefin thread. Do not use a TRM manufactured from discontinuous or glued netting in this category. Ensure that the material is 100% synthetic and resistant to biological, chemical, and ultraviolet degradation.

815.2.1.3.4 Type 4 (High Survivability)

1. Provide a Type 4 TRM consisting of a geosynthetic matrix that exhibits a very high interlock and reinforcement capacities with both soil and root systems, demonstrates a high tensile modulus, and is specially designed for erosion control applications on steepened slopes and vegetated waterways. Do not use a TRM manufactured from discontinuous netting, netting loosely held together by stitches or glue, or composites. Ensure that the material is 100% synthetic and resistant to biological, chemical, and ultraviolet degradation. Furnish a Type 4 TRM with high loading and/or high survivability capabilities for field conditions such as long term maintenance, structural backfills protecting critical structures, utility cuts, and traffic areas with the potential for high abrasion, higher required factors of safety, and/or general durability concerns.

815.2.1.3.5 Physical Properties

1. Ensure that TRM materials have Minimum Average Roll Values (MARV) derived from quality control testing performed by a GAI-LAP accredited laboratory and conforming to the values shown in the following table.

Turf Reinforcement Matting

Property	Test Method	MARV for Type 1	MARV for Type 2	MARV for Type 3	MARV for Type 4[5]
Mass per Unit Area	ASTM D 6475	6-8 oz/yd^2	8-10 oz/yd^2	10-12 oz/yd^2	12-14 oz/yd^2
Thickness	ASTM D 6525	0.25 inches	0.35 inches	0.40 inches	0.40 inches
Grab Tensile Strength[1]	ASTM D 6818	145 x 110 lbs/ft	170 x 130 lbs/ft	400 x 300 lbs/ft	3100 x 1500 lbs/ft
Tensile Elongation[1]	ASTM D 6818	50% (max)	50% (max)	50% (max)	55% (max)
UV Resistance[2]	ASTM D 4355	80 % @ 1000 hrs	80 % @ 1000 hrs	80% @ 1000 hrs	90 % @ 1000 hrs
Ground Cover Factor[3]	Light Projection Analysis	60%	70%	70%	75%
Slopes	--	2H:1V or Flatter	1.5H:1V or Flatter	1H:1V or Flatter	1H:1V or Greater
Short-term Vegetated Velocity[4]	--	< 10 ft/sec	10 to 15 ft/sec	15 to 20 ft/sec	20 to 25 ft/sec
Shear Stress[4]	--	0 – 4 lbs/ft^2	4 – 6 lbs/ft^2	6 – 8 lbs/ft^2	8 – 12 lbs/ft^2

Notes:

1. Values of both machine and cross machine directions, respectively, under dry or saturated conditions.
2. Tensile strength retained of structural components after exposure.
3. Ground cover factor represents "% shade" from lumite light projection test.
4. Maximum permissible design values based on short-term (0.5-hr), vegetated data obtained at SCDOT-approved independent hydraulics testing facility on an erodible soil bed and/or by Colorado state university hydraulics laboratory or the Texas DOT's Texas Transportation Institute (TTI) hydraulics and erosion control laboratory for "flexible channel liner applications."
5. High factor of safety and high survivability required.

815.2.1.4 Quality Assurance Sampling, Testing, and Acceptance

1. Ensure that the RECP meets the requirements of the standards given in this specification or the approved industry equivalent.
2. Sample and test the RECP to verify conformance with this specification. Sample in accordance with ASTM D 4354.
3. Acceptance of the RECP is granted in accordance with ASTM D 4759 based on testing performed by GAI-LAP accredited laboratory of either conformance samples obtained using Procedure A of ASTM D 4354 or based on the manufacturer's certification and testing of quality control samples obtained using Procedure B of ASTM D 4354.

4. Quality Assurance sampling and testing is waived for products manufactured at an ISO 9002 certified manufacturing facility. Provide documentation of ISO 9002 certification upon request.
5. Provide an RECP from the list in the most recent edition of SCDOT Qualified Product Lists 55 and 56 in the appropriate category.

815.2.1.5 Manufacturing Quality Control

1. For TRM Types 1, 2, 3 and 4, perform the Manufacturing Quality Control (MQC) testing at a GAI-LAP accredited laboratory at the frequency in ASTM D 4354 with the exceptions indicated by the following minimum acceptable testing frequency in the following table.

Testing Requirements for TRM Type 1, 2, 3, and 4		
Property	**Test Method**	**Test Frequency** tests/m^2 (tests/yd^2) of production
Mass Per Unit Area	ASTM D 6475	1/20,000 (1/24,000)
Tensile Strength	ASTM D 6818	1/20,000 (1/24,000)
Tensile Elongation	ASTM D 6818	1/20,000 (1/24,000)
Ground Cover Factor	Light Projection Analysis	1/20,000 (1/24,000)

2. Obtain and furnish to the Engineer a certification signed by a responsible representative of the manufacturer within 24 hours of each truckload or shipment of material delivered to the construction site.

815.2.2 Fiber Roving

815.2.2.1 Type A Fiberglass Roving

1. Provide fiberglass roving consisting of fiberglass material formed from continuous fibers drawn from molten glass, coated with a chrome-complex sizing compound, collected into strands, and lightly bound together into a roving without the use of a binding agent or other deleterious substances. Ensure that the roving is wound into a package such that the material can be continuously withdrawn using a compressed air ejector to expand the fiber roving into a mat on the soil surface.
2. Furnish an electrical grade fiberglass roving material meeting the requirements indicated in the following table.

Requirements for Type A Fiberglass Roving		
Physical Property	**Limits**	**Test Methods**
Strands / Rove	50 - 70	End Count
Fiber Diameter, inches (Nominal)	0.00035 - 0.00045	ASTM D 578
Yards/lb. of Rove	170 - 300	ASTM D 578

815.2.2.2 Type B Polymer Roving

1. Provide material formed from continuous strands of fibrillated polymer yarns, collected into a roving without the use of a binding agent or other deleterious substances. Fibrillation is defined as a net-like physical structure of the yarn created by splitting the yarn in a precise pattern during the manufacturing process. Provide roving that is packaged so that it can be continuously withdrawn using a compressed air ejector to expand the roving into a mat of polymer fibers on the soil surface.
2. Furnish Type B polymer roving that meets the physical property requirements indicated in the following table.

Requirements for Type B Polymer Roving		
Physical Property	**Limits**	**Test Methods**
Strands/Rove	20 - 30	End Count
Yards/lbs of Rove	170 - 520	ASTM D 1907
Organic Content % Max.	1.0	ASTM D 1907
UV Stability	70% Strength Retained	ASTM D 4355

815.2.3 Sediment Tubes

815.2.3.1 Sediment Tubes for Ditch Checks

1. Provide a sediment tube for ditch checks produced by a manufacturer experienced in sediment tube manufacturing. Ensure that the sediment tube is composed of compacted geotextile, curled excelsior wood fiber, natural coconut fiber, hardwood mulch, or a mixture of these materials enclosed by a flexible netting material and utilize an outer netting that consists of seamless, high-density polyethylene, photodegradable material treated with ultraviolet stabilizers or a seamless, high-density polyethylene, non-degradable material.
2. Do not use straw, straw fiber, straw bales, pine needles and/or leaf mulch.
3. Do not use curled excelsior wood fiber or natural coconut fiber rolled erosion control products (RECP) rolled up to create a sediment tube device.
4. Furnish steel posts minimum of 48 inches long and meeting the minimum physical requirements specified in Subsection 815.2.12.
5. Provide sediment tubes for ditch check applications that meet the following minimum performance requirements indicated in the following table.

Minimum Performance Requirements for Sediment Tubes		
Property	**Test Method**	**Value**
Diameter	Field Measured	18.0 inch minimum 24.0 inch maximum
Mass per Unit Length	Field Measured	3.0 lbs/ft ± 10% for 18-inch diameter or 4.0 lbs/ft ± 10% for 24-inch diameter
Fiber Length	Field Measured	80% of the fiber materials at least 4 inches in length

Length per Tube	Field Measured	10 foot minimum*
Netting Unit Weight	Certified	0.35 oz/ft minimum
*Select a length to minimize the number of sediment tubes needed. If the ditch check length (perpendicular to the water flow) is 15 feet, then one 15-foot sediment tube is preferred over two overlapped 10-foot sediment tubes.		

815.2.3.2 Quality Assurance

1. Before installation of sediment tubes, provide the following information from the manufacturer:
   - Written Quality Control program conforming to the requirements of Subsection 815.2.3.3**.**
   - Documentation of field and/or laboratory testing that quantifies the erosion control and sediment retention performance of the products conforming to the requirements of **Subsection 815.2.3.3**.
   - Guarantee that the products perform to the minimum performance standards under the specific conditions stated in this specification.
2. Ensure that each sediment tube bears complete identification including, but not limited to, the following:
   - Manufacturer's name and location,
   - Manufacturer's telephone number and fax number,
   - Manufacturer's e-mail address and web address, and
   - Sediment tube name, model, and/or serial number.
3. Furnish sediment tubes from the most recent edition of SCDOT Qualified Product List 57.

815.2.3.3 Quality Control

1. Before installation of sediment tubes, provide the following information from the manufacturer:
   - Written description of the manufacturer's Quality Control program of field and/or laboratory testing that quantifies the performance of the product. Performance testing must take place at a laboratory accredited to perform tests required for the product tested.
   - Instructions on the proper installation and maintenance of the sediment tube.
   - Certification of the testing requirements upon request.
2. Provide verification of conformance with manufacturer's published specifications, the certification, which at a minimum, identifies the following:
   - Independent qualified test facility,
   - Manufacturer,
   - Product ID,
   - Test ID, and
   - Test date.

815.2.4 Inlet Filters

815.2.4.1 Type A Low Flow Inlet Filters

815.2.4.1.1 Filter Fabric Inlet Protection

1. Provide filter fabric from the most recent edition of SCDOT Qualified Product List 34.
2. Furnish steel posts a minimum of 60 inches long and meeting the minimum physical requirements specified in Subsection 815.2.12.
3. Provide heavy-duty plastic ties to attach the fabric to posts.

815.2.4.1.2 Sediment Tubes

1. Refer to the Subsection 815.2.3 for sediment tube material and performance requirements. Provide sediment tubes from the most recent edition of SCDOT Qualified Product List 57.

815.2.4.2 Type B Medium Flow, Low Velocity Inlet Filters

815.2.4.2.1 Hardware Fabric and Stone Inlet Protection

1. Provide hardware fabric or comparable wire mesh with maximum openings of 0.5 inch x 0.5 inch as the supporting material.
2. Furnish steel posts a minimum of 36 inches long and meeting the minimum physical requirements for steel post specified in Subsection 815.2.12.
3. Provide heavy-duty plastic ties to attach the wire mesh material to posts. Place aggregate No. 5 washed stone against the hardware fabric on all sides.

815.2.4.3 Type D High Flow, High Velocity Inlet Filters

1. Provide a Type D high flow, high velocity inlet filter composed of a geotextile fabric connected to a rigid structure that completely surrounds the inlet, where the geotextile fabric is non-biodegradable and resistant to degradation by ultraviolet exposure and to contaminants commonly encountered in storm water. Ensure that the rigid structure is composed of high molecular weight, high-density polyethylene copolymer with a UV inhibitor. Provide a rigid structure that is reusable and recyclable.
2. Provide an inlet filter using filter fabric constructed of 100% continuous polyester non-woven engineering fabric and conforms to the guidelines in ASTM D 1117. Ensure that the filter fabric is fabricated to provide a direct fit adjacent to the associated rigid structure and is capable of reducing effluent sediment concentrations by not less than 80% under typical sediment migration conditions.
3. Provide a Type D high flow, high velocity inlet filter that has a two-stage design. Ensure that the first stage conveys normal flows at a minimum clean water flow rate of 100 gallons per minute per square foot, and the second stage conveys high flow rates with a minimum apparent opening of 0.5 inch per square inch (No. 12 standard sieve opening). Ensure that the Type D1 inlet structure filter has a first stage with a minimum height of 9 inches and a maximum height of 12 inches in order to allow greater overflow capacity and to prevent ponding in the median.
4. Provide a filter fabric with the following Minimum Average Roll Values (MARV) properties as shown in the following table.

Type D Inlet Filters			
Property	**Test Method**	**Units**	**MARV**

Weight	ASTM D 3776	oz/yd^2	3.0
Grab Tensile Strength	ASTM D 4632	lbs	80
Grab Tensile Elongation	ASTM D 4632	%	50
Puncture Strength	ASTM D 4833	lbs	40
Mullen Burst Strength	ASTM D 3786	psi	150
Trapezoid Tear Strength	ASTM D 4533	lbs	30
Fabric Opening Size	ASTM D 4751	US Std Sieve (max)	50
Permittivity	ASTM D 4491	sec^{-1}	1.5
Water Flow Rate	ASTM D 4491	gal/min/ft^2	100
Ultraviolet Resistance	ASTM D 4355 (500 hrs)	%	70

5. Provide a high-flow, high-velocity inlet filter that has lifting devices or structures to assist in the installation and to allow inspection of the storm water system.

815.2.4.4 Type E Surface Course Inlet Filters

1. Furnish a Type E surface course inlet filter that has a minimum height or diameter of 9 inches and a minimum length 2 feet longer than the length of the curb opening. Do not completely block the inlet opening with surface course inlet filters.
2. Provide a Type E surface course inlet filter constructed with a synthetic material that allows storm water to freely flow through while trapping sediment and debris. Ensure that the geotextile is non-biodegradable, resistant to degradation by ultraviolet exposure, and resistant to contaminants commonly encountered in storm water. Do not use straw, straw fiber, straw bales, pine needles, or leaf mulch as filter materials.
3. Provide a Type E surface course inlet filter with aggregate compartments for stone, sand, or other weighted materials or mechanisms to hold the unit in place.
4. Ensure that the filter fabric of the curb inlet filter is capable of reducing effluent sediment concentrations by no less than 80% under typical sediment migration conditions and has the following Minimum Average Roll Values (MARV) for physical properties shown in the following table.

Filter Fabric Properties for Curb Inlet Filters			
Property	**Test Method**	**Units**	**MARV**
Weight	ASTM D 3776	oz/yd^2	3.0
Grab Tensile Strength	ASTM D 4632	lbs	80

Grab Tensile Elongation	ASTM D 4632	%	50
Puncture Strength	ASTM D 4833	lbs	40
Mullen Burst Strength	ASTM D 3786	psi	150
Trapezoid Tear Strength	ASTM D 4533	lbs	30
Apparent Open-ing Size	ASTM D 4751	US Std Sieve (max)	50
Permittivity	ASTM D 4491	$second^{-1}$	1.5
Water Flow Rate	ASTM D 4491	$gal/min/ft^2$	100
Ultraviolet Resistance	ASTM D 4355 (500 hrs)	%	70

815.2.4.5 Type F Inlet Tubes

815.2.4.5.1 Weighted Inlet Tubes

1. Provide a Type F weighted inlet tube produced by a manufacturer experienced in sediment tube manufacturing. Provide an inlet tube composed of compacted geotextile, age curled excelsior wood fiber, natural coconut fiber, hardwood mulch, or a mix of these materials, and enclosed by a flexible netting material. Do not use straw, straw fiber, straw bales, pine needles, or leaf mulch.
2. Ensure that the outer netting consists of seamless, high-density polyethylene, photodegradable material treated with ultraviolet stabilizers or seamless, high-density polyethylene, non-degradable material.
3. Do not use a curled wood excelsior fiber or a natural coconut fiber rolled erosion control product (RECP) rolled up to create an inlet tube device.
4. Provide a Type F weighted inlet tube that is a sediment tube capable of staying in place without external stabilization measures and has a weighted inner core or other weighting mechanism to keep it in place. Provide a weighted inlet tube that meets the minimum requirements shown in the following table.

Minimum Requirements for Weighted Inlet Tubes		
Property	**Test Method**	**Value**
Diameter	Field Measured	6.0 inch to 12.0 inch
Mass per Unit Length	Field Measured	6 inch = 6 lbs/ft min. 12 inch = 12 lbs/ft min.
Fiber Length	Field Measured	80% of the fiber materials at least 4-inches in length
Length per Tube	Field Measured	6 foot minimum
Netting Unit Weight	Certified	0.35 oz/ft minimum

815.2.4.5.2 Non-Weighted Inlet Tubes

1. Provide a Type F non-weighted inlet tube that is produced by a manufacturer experienced in sediment tube manufacturing, composed of compacted geotextile, curled excelsior wood fiber, natural coconut fiber, hardwood mulch, or a mixture of these materials, and enclosed by a flexible netting material. Do not use straw, straw fiber, straw bales, pine needles, or leaf mulch.
2. Provide a non-weighted inlet tube with outer netting that consists of seamless, high-density polyethylene, photodegradable material treated with ultraviolet stabilizers or seamless, high-density polyethylene, non-degradable material.
3. Do not use curled wood excelsior fiber or natural coconut fiber rolled erosion control products (i.e., RECP) rolled up to create an inlet tube device.
4. Provide stakes or other means to stabilize non-weighted inlet tubes to keep them safely in place. Secure non-weighted inlet tubes with wooden stakes (1 inch x 1 inch) or steel posts (1.25 lbs/linear ft) a minimum of 3 feet in length placed on 2-foot centers. Provide Type F non-weighted inlet tubes that meet the minimum requirements shown in the following table.

Minimum Requirements for Non-weighted Inlet Tubes		
Property	**Test Method**	**Value**
Diameter	Field Measured	6.0 inch to 12.0 inch
Mass per Unit Length	Field Measured	6.0 inch = 1.0 lbs/ft minimum 12.0 inch = 2.0 lbs/ft minimum
Fiber Length	Field Measured	80% of the fiber materials at least 4 inches in length
Length per Tube	Field Measured	6 feet minimum
Netting Unit Weight	Certified	0.35 oz/ft minimum

815.2.4.6 Quality Assurance

1. Before installation of inlet structure filters, provide the ENGINEER with the following information from the manufacturer:
   - Written Quality Control program conforming to the requirements of Subsection 815.2.4.7**.**
   - Documentation of field and/or laboratory testing that quantifies the erosion control and sediment retention performance of the product conforming to the requirements of **Subsection 815.2.4.7.**
   - Guarantee that the product performs to the minimum performance standards under the specific conditions as stated in thisspecification.
2. Ensure that each inlet structure filter bears complete identification including, but not limited to, the following:
   - Manufacturer's name and location,
   - Manufacturer's telephone number and fax number,
   - Manufacturer's e-mail address and web address, and
   - Inlet structure filter, BMP, or Sediment Tube name, model, and/or serial number.

3. Provide an inlet structure filter from a manufacturer with a minimum of 3 years experience at manufacturing inlet structure filters for use as sediment control equipment and experienced in the installation of equivalent applications. Provide a list of at least 20 references of installations if requested by the Engineer.
4. Provide inlet structure filters from the most recent edition of SCDOT Qualified Product List 58 in the appropriate category.

815.2.4.7 Quality Control

1. Before installation of sediment tubes, provide the Engineer with the following information from the manufacturer:
   - Written description of the manufacturer's Quality Control program of field and/or laboratory testing that quantifies the performance of the product. Performance testing must be at a laboratory accredited to perform such tests required for the product tested.
   - Instructions on the proper installation and maintenance of the inlet structure filter.
   - Certification of the testing requirements upon request.
2. Provide certification of the product's conformance with the required performance specifications, which at a minimum, identifies the following:
   - Independent qualified test facility,
   - Manufacturer,
   - Product ID,
   - Test ID, and
   - Test date.

815.2.5 Silt Fences

1. Provide material for silt fence complying with the requirements specified herein, on the Plan details, or as approved by the Engineer.

815.2.5.1 Posts

1. Furnish steel posts a minimum of 60 inches long and meeting the minimum physical requirements specified in Subsection 815.2.12.
2. When heavy clay soils are present on site, use the steel posts specified above with the addition of a metal plate welded near the bottom so that when the post is driven to the proper depth, the plate is below the ground level for added stability. In areas where conditions warrant, larger posts or reduced post spacing may be required to provide an adequate fence to handle the stress from sediment loading.

815.2.5.2 Filter Fabric

1. Provide a filter fabric from the most recent edition of SCDOT Qualified Product List 34. Ensure that the filter fabric is composed of fibers consisting of long chain, synthetic polymers composed of at least 85% by weight of polyolefins, polyesters, or polyamides. Ensure that the fibers are formed into a network so that the filaments or yarns retain dimensional stability relative to each other. Do not treat or coat the filter fabric, which might adversely alter its physical properties

after installation. Do not use fabric with defects or flaws that significantly affect its physical and/or filtering properties. Provide a filter fabric with a minimum width of 36 inches.

2. Protect the filter fabric with a suitable wrapping for protection against moisture and extended ultraviolet exposure before placement.
3. Provide filter fabric meeting the following minimum physical requirements in the following table.

Minimum Requirements for Filter Fabric		
Physical Property*	**Test Method**	**Required Value**
Tensile Strength	ASTM D 4632	90 lbs.
Elongation	ASTM D 4632	<50% - fabric self-supporting
Maximum Apparent Opening Size (AOS)	ASTM D 4751	0.60 mm maximum
Permittivity	ASTM D 4491	0.05 per second
Ultraviolet Stability (retained strength after 500 hrs of ultraviolet exposure)	ASTM D 4355	70%
* Unless otherwise indicated, numerical values represent the MARV.		

815.2.6 Floating Turbidity Barriers

1. Provide floating turbidity barrier for sediment protection for fill placed in water or areas affected by tidal flow. Provide floating turbidity barrier meeting the requirements in the following table.

Minimum Requirements for Floating Turbidity Barriers			
	Light Duty	**Medium Duty**	**Heavy Duty**
Fabric – Polyester Reinforced Vinyl (oz/yd^2)	18	22	22
Flotation(1) (lbs/ft)	13	22	22
Top Load Cable	---	---	10,000 lbs ($^5/_{16}$ inch, galvanized)
Stress Plates	---	---	⅝ inch Polypropylene
Rope Retainer	⅝ inch Polypropylene	⅝ inch Polypropylene	⅝ inch Polypropylene
Grommets	#4 Brass	#4 Brass	#4 Brass
Seams Heat Welded	Yes	Yes	Yes
Bottom Load Chain	0.63 lbs/ft (min) (¼ inch, galvanized)	0.95 lbs/ft (min) ($^5/_{16}$ inch, galvanized)	0.95 lbs/ft (min) ($^5/_{16}$ inch, galvanized)

Connecting Hardware	Galvanized Steel	Galvanized Steel	Galvanized Steel
Standard Depth	5 ft.	5 ft.	5 ft.
Standard Length(2)	50 & 100 ft.	50 & 100 ft.	50 & 100 ft.

Notes:

(1) Flotation for barriers of depths greater than 10 feet is to be 60 pounds per foot. Flotation must be sufficient to maintain the top of the barrier at an elevation 3 inches above the water.

(2) The maximum length for barriers of depth greater than 10 feet is 50 feet.

2. If specified, provide buoys complying with the South Carolina Town of Natural Resources Marine Law Enforcement Buoy Specifications in conjunction with the floating turbidity barrier.

815.2.7 Corrugated Metal Pipe for Sediment Dams

1. Provide corrugated metal pipe complying with the applicable requirements of Section 714.

815.2.8 Temporary Seeding

1. Provide materials conforming to the applicable requirements of Section 810.

815.2.9 Stabilized Construction Entrance

1. Provide a stabilized construction entrance composed of the following materials:
   - Non-woven geotextile fabric.
   - No. 1 aggregate (see ASTM C 33) with the gradation in the following table.

Gradation Table for Stabilized Construction Entrance Material	
Nominal Size (Sieves With Square Openings)	**Percent Passing**
4 inch	100
3½ inch	90 to 100
2½ inch	25 to 60
1½ inch	0 to 15
¾ inch	0 to 5

2. Provide a non-woven geotextile fabric that meets the requirements of Subsection 804.2.11.

815.2.10 Bonded Fiber Matrix (BFM)

1. Provide a bonded fiber matrix (BFM) from the most recent edition of SCDOT Qualified Product List 65 and is composed of long non-toxic, degradable, strand fibers held together by cross-linked hydrocolloid bonding agents that upon drying become insoluble and non-dispersible to eliminate direct raindrop impact on soil. Use a BFM that does not form a water-insensitive crust that can inhibit plant growth. Provide a BFM that is completely photodegrade or biodegrade. Do

not use materials listed or used for hydro-mulching applications, or organic and mineral bonding agents such as dry polyacrylamide, starch, guar, and plantago mixed with fibers. Seed, lime, and fertilizer may be added to the BFM mixture according to the requirements of Section 810.

2. Provide a BFM meeting the following requirements:
   - Passed a free liquid quality control test when mixed as liquid slurry (liquids separate from fibrous solids no greater than 1-inch per minute as measured on a standard test board).
   - Does not dissolve or disperse upon re-wetting.
   - Has no holes greater than 1 mm in size.
   - Has no gaps between the BFM and the soil.
   - Has minimum water holding capacity of 1000g per 100g (1000%).
   - Has no germination or growth inhibiting factors and does not form a water-resistant crust.
3. Furnish BFM components pre-packaged by the manufacturer to assure material performance and compliance with the following typical values in the following tables when applied at a rate of 3500 pounds per acre.

BFM Properties	
Property	**Required Value**
Wood Fiber by Weight	85% ± 5%
Bonding Agent/Crosslinked Hydro-Colloid Polymer Tackifiers	10% ± 1%
Moisture Content	12% ± 3%
Organic Matter	95% minimum
pH Range	4.8 ± 2
Color	Colored to contrast application area, does not stain concrete or painted surfaces

BFM Properties and Test Methods		
Property	**Test Method**	**Required Value**
Mass Per Unit Area	ASTM D 6566	11.5 oz/yd^2
Thickness	ASTM D 6525	0.10 inch minimum
Ground Cover	ASTM D 6567	99%
Water Holding Capacity	Proposed ASTM	1000%
Functional Longevity	Observed	Up to 6 months
Cover Factor (6 in/hr event)	ECTC Test Method #2	0.10 maximum
% Effectiveness	ECTC Test Method #2	90% minimum

Cure Time	ECTC Test Method #2	98% effective 48 hours after application
Vegetation Establishment	ECTC Test Method #4	350% minimum

4. Provide BFM from manufacturer listed on the most recent edition of SCDOT Qualified Product List 65 and provide documentation of testing at an approved independent laboratory demonstrating performance based on reduced water runoff, reduced soil loss, and enhanced plant germination.

815.2.11 Flexible Growth Matrix (FGM)

1. Provide a flexible growth matrix (FGM) that combines both chemical and mechanical bonding techniques to lock the engineered matrix in place. Provide a FGM that is hydraulically applied and is a flexible erosion control matrix composed of long strands of thermally processed wood fibers, crimped man-made and organic interlocking fibers, and performance enhancing additives that forms a lofty, interlocking matrix, which creates air space and water-absorbing cavities that improves seed germination, reduces the impact of raindrop energy, and minimizes soil loss.
2. Furnish a FGM that requires no curing period and, when applied, uses water insoluble tackifiers and flocculants to form an intimate bond with the soil surface to create a continuous erosion resistant matrix that allows rapid germination and accelerated plant growth. Do not use materials listed or used for hydro-mulching applications. Do not use organic and mineral bonding agents such as dry polyacrylamides, starch, guar, and plantago mixed with fiber.
3. Seed, lime, and fertilizer may be added to the FGM mixture according to Section 810. Furnished FGM components pre-packaged by the manufacturer to assure material performance and compliance with the following typical values when applied at a rate of 3500 pounds per acre.
4. Ensure that the FGM provided meets the requirements in the following tables.

Flexible Growth Matrix	
Property	**Value**
Wood Fiber by Weight	85% ± 3%
Cross-linked Hydro-Colloid Polymer Tackifiers	10% ± 1%
Crimped Inter-Locking Fibers	5% ± 1%
Moisture Content	12% ± 3%
Color	Colored to contrast application area, does not stain concrete or painted surfaces

Flexible Growth Matrix Properties and Test Methods		
Property	**Test Method**	**Value**
Mass Per Unit Area	ASTM D 6566	11.5 oz/yd^2
Thickness	ASTM D 6525	0.15 inch minimum

Ground Cover	ASTM D 6567	99%
Water Holding Capacity	Proposed ASTM	1500%
Flexural Rigidity (wet)	ASTM D 6575	5 oz-yd maximum
Functional Longevity	Observed	Up to 1 year
Cover Factor (6 in/hr event)	ECTC Test Method #2	0.01 maximum
% Effectiveness	ECTC Test Method #2	99% minimum
Cure Time	ECTC Test Method #2	98% effective 2 hours after application
Shear Stress	ECTC Test Method #3	0.75 lbs/ft^2 minimum
Vegetation Establishment	ECTC Test Method #4	500% minimum

5. Provide a FGM from a manufacturer listed on the most recent edition of SCDOT Qualified Product List 66 and provide documentation of testing at an approved independent laboratory demonstrating performance based on reduced water runoff, reduced soil loss, and enhanced plant germination.

815.2.12 Steel Posts

1. Provide steel posts for use with inlet structure filters, sediment tubes, and silt fences meeting the following minimum physical requirements:
   - Composed of high strength steel with minimum yield strength of 50,000 psi.
   - Standard "T" cross-section with a nominal face width of 1.38 inches and nominal "T" length of 1.48 inches.
   - Weighs 1.25 pounds per foot (± 8%)
   - Painted with water based baked enamel paint.

815.2.13 Temporary Pipe Slope Drains

1. Ensure that pipe for slope drains conforms to the requirements of Subsection 803.2.

815.3 Equipment

1. Ensure that the equipment necessary for the proper construction of the work is on site, in acceptable working condition, and approved by the ENGINEER as to both type and condition before the start of work under this section. Provide sufficient equipment to enable prosecution of the work in accordance with the project schedule and completion of the work in the specified time.
2. Use the following equipment for applying fiber roving and asphalt:
   - Pneumatic ejector capable of applying fiber roving at the rate of 2 pounds per minute (approximately 8 square yards per minute),
   - Air compressor capable of applying 40 cubic feet per minute at 80 to 100 psi and acceptable air base for supplying air to areas inaccessible to compressor, and
   - Asphalt distributor with hoses and hand spray bar for areas inaccessible to

distributor.

815.4 Construction

815.4.1 General

1. Promptly install temporary erosion control measures when problem conditions exist or when potential problems are anticipated in certain areas in order to minimize soil erosion and siltation. Properly maintain the temporary erosion control measures until permanent erosion control features are functioning properly.
2. Coordinate the temporary erosion control provisions with the permanent erosion control features provided elsewhere in these specifications to the extent practical to assure economical, effective, and continuous erosion control during construction. Permanent seeding, sodding, riprap, concrete gutter, asphalt gutter, slope drains, and concrete slope protection are considered permanent erosion control items and are covered in other sections of these specifications.
3. Coordinate erosion control measures with the grading operations throughout the duration of the project in accordance with Subsection 107.26.
4. Use temporary erosion control measures to correct conditions where problems are anticipated or to correct conditions that develop during construction.
5. Remove temporary erosion control items if no longer needed in an area after establishment of permanent vegetation and completion and proper functioning of other permanent erosion control items as directed by the Engineer. Restore these areas to a condition similar to the surrounding areas after removal.

815.4.2 Rolled Erosion Control Products (RECP)

815.4.2.1 Site Preparation

1. Grade areas to be treated with RECP and compact as indicated or as directed by the Engineer or the manufacturer's representative.
2. Remove large rocks, soil clods, vegetation, and other sharp objects that could keep the RECP from intimate contact with subgrade.
3. Prepare seedbed by loosening the top 2 to 3 inches of soil above final grade.
4. Select and apply soil amendments, lime, fertilizer, and seed required by the seeding plan or by the Engineer or the manufacturer's representative to a scarified soil surface prior to the installation of the RECP.

815.4.2.2 Installation of RECP 815.4.2.2.1 General

1. Follow the manufacturer's installation procedures included with each RECP. If requested by the Engineer, arrange for a manufacturer's representative to be on-site to oversee and approve the initial installation. Provide a letter from the manufacturer approving the installation when requested by the Engineer.
2. Install the RECP at the elevation and the alignment indicated on the Plans.
3. Use stakes, pins, or staples with a minimum length of 6 inches to secure temporary erosion control blankets. Use 12-inch anchors for specific erosion control blankets in sandy, loose, or wet soils or as directed by the Engineer or the manufacturer's representative.

4. Use stakes, pins, or staples with a minimum length of 12 inches to secure permanent TRM. Use longer anchors for specific permanent TRM in sandy, loose, or wet soils or as directed by the Engineer or the manufacturer's representative.
5. Use the following table to determine the minimum anchoring frequency.

TRM Anchoring Requirements	
Slope Grade	**Anchoring Frequency**
Up to 3H:1V	1 anchor/square yard
3H:1V to 2H:1V	1.5 anchors/square yard
2H:1V to 1H:1V	2 anchors/square yard
Steeper than 1H:1V and Channel Bottoms	2.5 anchors/square yard

6. Obtain Engineer and manufacturer's representative approval before execution of alternate installation methods to those specified herein.

815.4.2.2.2 Slope Installation

1. At the top of the slope, construct a 6-inch (deep) x 12-inch (wide) anchor trench to inhibit undermining from stray surface water. Extend the upslope terminal end of the RECP 30 inches past the anchor trench.
2. Use stakes or staples to fasten the RECP material into the upslope anchor trench on 12-inch centers. Backfill the trench with soil and compact. Apply seed to the backfill soil surface and cover this area with the remaining 12 inches of the RECP terminal end. Stake or staple the terminal end down slope of the anchor trench on 12-inch centers.
3. Securely fasten all RECP materials to the soil by installing stakes or staples at a minimum rate of 1.5 stakes per square yard. Select anchors that have sufficient ground penetration to resist pullout. Increase the anchoring frequency if the Engineer or the manufacturer's representative deems it necessary due to site conditions (i.e., loose or wet soils).
4. Unroll the RECP parallel to the primary direction of water flow and place in direct contact with the soil surface. Do not stretch or allow the material to bridge over surface inconsistencies. Overlap the edges of adjacent (vertically down the slope) RECP a minimum of 3 inches with the upslope roll overlapping on top of the down slope roll in shingle style.
5. Overlap the edges of parallel (horizontal across the slope) blankets 3 to 6 inches depending on the type of RECP used.

815.4.2.2.3 Channel Installation

1. Excavate anchor trenches and/or staple check slots perpendicular to the flow direction across the entire width of the channel at 25-foot intervals and at the terminal end of the channel reach.
2. Construct a 6-inch (deep) x 12-inch (wide) beginning anchor trench. Extend the downstream end of the RECP 30 inches past the anchor trench and use the slack RECP material to cover the backfilled soil. Fasten the RECP material into the anchor trench on 12-inch centers.
3. Excavate 6 inch x 6 inch check slots every 25 feet along the length of the channel.

4. If directed by the Engineer, replace excavated check slots with a double row of staples or stakes. For staple or stake check slots, place the two rows of stakes or staples 4 inches apart and install each row of staples or stakes on 12-inch centers. Drive all stakes and staples flush with the soil surface.
5. Beginning at the downstream end in the center of the channel, place the initial end of the first RECP in the anchor trench, and secure it with ground anchor devices at 12-inch intervals.
6. Position adjacent rolls in the anchor trench in the same manner, overlapping the proceeding roll a minimum 3 inches. Secure the RECP at 12-inch intervals along the anchor trench, backfill and compact with specified soil or as directed by the Engineer or the manufacturer's representative.
7. Unroll center strip of RECP upstream over compacted trench. Stop at next check slot or terminal anchor trench. Unroll adjacent rolls of RECP upstream in similar fashion, maintaining a 3-inch overlap.
8. Fold and secure the RECP snugly into transverse check slots. Lay material in bottom of the slot, then fold the material back against itself. Anchor through both layers of RECP at 12-inch intervals. Backfill with soil and compact. Continue unrolling the RECP widths upstream over compacted slot to next check slot or terminal anchor trench.
9. Secure RECP to channel bottom with ground anchoring devices at a frequency of 2.5 anchors per square yard. Select anchors that have sufficient ground penetration to resist pullout. Increase the anchoring frequency if the Engineer or the manufacturer's representative deems it necessary due site conditions (i.e., loose or wet soils).
10. Cut longitudinal anchor slots 4 inches x 4 inches at the top of each slope. Fasten the RECP material into the longitudinal anchor slots on 12-inch centers.

815.4.2.3 Delivery, Storage, and Handling

1. Follow the requirements of ASTM D 4873 for RECP labeling, shipment and storage. Ensure that product labels clearly show the manufacturer or supplier name, style name, and roll number. Include with each shipping document a notation certifying that the material is in accordance with the manufacturer's certificate.
2. Wrap each RECP roll with a material that protects the geotextile from damage due to shipment, water, sunlight, and contaminants. Maintain the protective wrapping during shipment and storage.
3. During storage, elevate the RECP rolls off the ground and adequately cover to protect them from the following: site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, strong acids or strong bases, flames including welding sparks, temperatures in excess of 160ºF, and other environmental conditions that can damage the physical properties of RECP.

815.4.2.4 Inspection and Maintenance of RECP

1. Check areas protected by RECP for dislocation or failure every 7-calendar days.
2. Ensure that the pinning or stapling pattern is consistent with that shown on the manufacturer's installation sheet. If there is evidence that the RECP is not securely fastened to the soil, install extra pins or staples to inhibit the RECP from becoming dislodged.
3. Inspect regularly until grass or vegetation is firmly established.

4. Repair damaged areas immediately by restoring the soil on slopes or channels to its finished grade, re-applying fertilizer and seed, and replacing the appropriate RECP material as needed.

815.4.2.5 Acceptance

1. Obtain Engineer acceptance and approval for RECP installations.

815.4.3 Brush Barriers

1. Install brush barriers as shown on the Plans or as directed by the ENGINEER. Construct brush barriers from selected materials from the clearing and grubbing operation.
2. Construct brush barriers for erosion control measures as soon as brush is readily available from the clearing operation. Do not use the barriers in residential or commercial areas, or in areas where development is anticipated within the next few years. Construct brush barriers parallel to the toes of slopes of embankments constructed of erodible material to heights of 15 feet or more. Use brush barriers when natural ground is level or sloping away from project. Leave the brush barriers in place. Do not construct barriers at any site that has high visibility and detracts from the appearance of either the adjacent property or the completed highway.
3. Form the brush barriers by placing brush, limbs, small trees, and other vegetative growth in a small continuous ridge or piles as close as practicable not more than 15 feet outside of and generally parallel to the toe of the proposed embankment. Place some of the heavier material on top to secure the barrier. Intermingle the brush logs and tree limbs to prevent the formation of a solid dam and allow water to filter through it. If a gutter is proposed as a permanent erosion control measure along the toe of an embankment, place the brush barrier outside the construction limits of the gutter. Construct the barrier with mechanical equipment and "walk down" with a bulldozer to produce a barrier that is dense with relatively uniform height between 3 to 5 feet and width between 5 to 10 feet.

815.4.4 Fiber Roving

1. Place the fiber roving within 24 hours after performing seeding operations in accordance with Section 810, except do not apply mulch to the area where fiber roving is being placed.
2. Spread Type A fiberglass roving uniformly over the designated areas at a minimum rate of 0.30 pounds per square yard. Spread Type B polymer roving uniformly over the designated areas at a minimum rate of 0.15 pounds per square yard.
3. Immediately after placing the roving, anchor it to the ground with the same type asphalt material used in the seeding operation and meeting the requirements of Section 810. Apply the asphalt uniformly over the specified fibers at a rate of 0.25 to 0.35 gallons per square yard. At the upgrade and downgrade ends, bury the roving to a depth of 1 foot to ensure that water does not pass under the roving.

815.4.5 Sediment Tubes

815.4.5.1 Site Preparation

1. Remove all rocks, clods, vegetation, or other obstructions that would prevent the installed sediment tube from having direct contact with the underlying soil or surface.

815.4.5.2 Installation

1. If requested by the Engineer, provide a manufacturer's representative on-site to oversee and approve the initial installation of sediment tubes. Provide a letter from the manufacturer approving the installation if requested by the Engineer.
2. Install the sediment tube by laying it flat on the ground. Construct a small trench to a depth that is 20% of the sediment tube diameter. Lay the sediment tube in the trench and compact the upstream sediment tube-soil interface. Do not completely bury the sediment tube during installation. Review all project specifications for special installation requirements. Install sediment tubes ensuring that no gaps exist between the soil and the bottom of the sediment tube. Lap the ends of adjacent sediment tubes a minimum of 6 inches to prevent flow and sediment from passing through the field joint. Never stack sediment tubes on top of one another.
3. Avoid damage to the sediment tube during installation. If a sediment tube becomes damaged during installation, place a stake on both sides of the damaged area, terminating the tube segment, and install a new tube segment. Perform field monitoring to verify that installation procedures do not damage sediment tubes. Replace sediment tubes damaged during installation as directed by the Engineer or the manufacturer's representative at no expense to the Town.
4. Install sediment tubes in swales or drainage ditches perpendicular to the flow of water and extend them up the side of the slopes a minimum of 1-foot above the design flow depth. Space sediment tubes according to the following table.

Sediment Tube Spacing	
Slope	**Maximum Sediment Tube Spacing**
Less than 2%	150 feet
2%	100 feet
3%	75 feet
4%	50 feet
5%	40 feet
6%	30 feet
Greater than 6%	20 feet

5. Install sediment tubes using wooden stakes (1-inch x 1-inch) or steel posts specified in Subsection 815.2.3.1. Space posts or stakes 2-foot centers and drive them into the ground to a minimum depth of 2.0 feet leaving less than 1-foot of stake above the exposed sediment tube.
6. Intertwine the posts or stakes with the outer mesh on the downstream side
7. An acceptable alternative installation is driving stakes on 2-foot centers on each side of the sediment tube and connecting them with natural fiber twine or steel wire to inhibit the sediment tube from moving vertically. Sediment tubes can also be secured by installing the stakes on 2-foot centers in a crossing manner ensuring direct soil contact at all times.
8. Select the sediment tube length to minimize the number of sediment tubes needed to span the width of the drainage conveyance. If the required ditch check length (perpendicular to the water

flow) is 15 feet, then one 15-foot sediment tube is preferred compared to two overlapping 10-foot sediment tubes.

9. Install sediment tubes for ditch checks over bare soil, mulched areas or erosion control blankets. Keep sediment tubes for ditch checks in place until fully established vegetation and root systems have completely developed and can survive on their own.

815.4.5.3 Delivery, Storage, and Handling

1. Follow the manufacturer's written storage and handling procedures for sediment tube labeling, shipment, and storage. Clearly show the manufacturer or supplier name, sediment tube diameter and length on product labels.
2. Store and cover sediment tubes off the ground and cover adequately to protect them from the following: construction damage, precipitation, extended exposure to ultraviolet radiation including sunlight, on-site chemicals, flames including welding sparks, excessive temperatures, and other environmental conditions that can damage the physical properties of sediment tubes.

815.4.5.4 Inspection and Maintenance of Sediment tubes

1. Inspect sediment tubes after installation to ensure that no gaps exist under the sediment tubes or between the joints of adjacent ends of the sediment tubes. Inspect sediment tubes every 7 days. Repair rills, gullies, and undercutting near the sediment tubes.
2. Remove sediment deposits that impair the filtration capability of a sediment tube when the sediment reaches one-third of the height of the exposed sediment tubes. Remove and/or replace installed sediment tubes as required to adapt to changing construction site conditions.
3. When the functional longevity of the sediment tubes is exceeded as determined by the ENGINEER or the manufacturer's representative, remove them from the site. Gather and dispose of them in regular means as non-hazardous, inert material. Before final stabilization, backfill all trenches, depressions or all other ground disturbances caused by the removal of sediment tubes.

815.4.5.5 Acceptance

1. Obtain Engineer acceptance and approval of sediment tube installations. When requested by the Engineer, ensure that a manufacturer's representative is on site to oversee and approve the initial installation of sediment tubes. Obtain a letter from the manufacturer approving the installation when requested by the Engineer.

815.4.6 Silt Fences

1. Construct the silt fence in accordance with Plans or SCDOT Standard Drawings or as approved by the Engineer. Place silt fences before the major construction in an area is started.
2. Maintain the silt fence until its capacity has been reached or erosion activity in the area has stabilized. Remove sediment accumulated along the fence when it reaches approximately one-third of the height of the fence, especially if heavy rains are expected. Remove trapped sediment or stabilize on site.
3. Inspect the silt fence every 7 days. Immediately correct any deficiencies. Remove filter fabric and replace whenever it has deteriorated to such extent that it reduces the effectiveness of the silt fence. In addition, review daily the location of silt fences in areas where construction activities

have changed the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Install additional silt fences as directed by the Engineer where deficiencies exist.

4. If a silt fence or portion of a fence is located in an area where removing the sediment is not possible, then install a second silt fence, if necessary, at the discretion of the Engineeer. In this case, payment for both silt fences and portions involved is made at the unit price for silt fence.
5. Remove silt fence within 30 days after final stabilization is achieved or after temporary Best Management Practices (BMP) are no longer needed. Permanently stabilize disturbed areas resulting from fence removal. The fence materials remains the property of the Contractor and may be used at other locations provided the materials meet the appropriate requirements contained in this specification and/or on the Plans.

815.4.7 Floating Turbidity Barriers

1. Place floating turbidity barrier at the location shown on the Plans and in accordance with the manufacturer's recommendations. Anchor the ends on the undisturbed shoreline with sufficient support to secure the barrier in place during turbulent conditions. Place vertical supports and/or anchors along the barrier as necessary to prevent the barrier from drifting. Maintain the floating turbidity barrier until all disturbed areas have stabilized sufficiently to control erosion.

815.4.8 Silt Basins

1. Construct silt basins by excavating in berm ditches, parallel roadway ditches, at culvert inlets and outlets, and other locations as directed by the ENGINEER. Construct in accordance with the Plans and the SCDOT Standard Drawings. Remove sediment as necessary to ensure that the basin functions properly.

815.4.9 Silt Ditches

1. Construct temporary silt ditches in accordance with the Plans and the SCDOT Standard Drawings at locations shown on the Plans or as directed by the Engineer. Silt ditches are generally constructed adjacent and parallel to the toe of the slope in relatively rolling areas where there is a possibility of property damage from sheet-type erosion. This type ditch is not intended to carry large volumes of water, but to catch sediment from runoff.

815.4.10 Sediment Dams

1. Construct temporary sediment dams in accordance with the Plans and the SCDOT Standard Drawings at locations shown on the Plans or as directed by the Engineer .

815.4.11 Inlet Structure Filters

815.4.11.1 Site Preparation

1. Remove all rocks, clods, vegetation, or other obstructions so that the installed pre-fabricated inlet protection BMP has direct contact with the underlying surface.

815.4.11.2 Installation

815.4.11.2.1 General

1. Install inlet structure filters in accordance with the manufacturer's written installation instructions, in compliance with these specifications and with all OSHA, local, state, and federal codes and regulations.

815.4.11.2.2 Type A - Low Flow Inlet Filters

815.4.11.2.2.1 Filter Fabric Inlet Protection

1. Excavate a trench 6 inches deep around the outside perimeter of the inlet unless the fabric is pneumatically installed. Extend the filter fabric a minimum of 12 inches into the trench. Backfill the trench with soil or crushed stone and compact over the filter fabric unless the fabric is pneumatically installed.
2. Install steel posts specified in Subsection 815.2.4.1.1. Space the posts around the perimeter of the inlet a maximum of 3 feet apart and drive them into the ground a minimum of 24 inches.
3. Install the filter fabric to a minimum height of 24 inches above grade. Cut the filter fabric from a continuous roll to the length of the protected area to avoid the use of joints. When joints are necessary, wrap filter fabric together only at a support post with both ends securely fastened to the post, with a minimum 6-inch overlap. Attach fabric to the posts with heavy-duty plastic ties. Attach four evenly spaced ties in a manner to prevent sagging or tearing of the fabric. In all cases, affix ties in not less than four places.

815.4.11.2.2.2 Sediment Tubes

1. Install sediment tubes in accordance with Subsection 815.4.5.2.

815.4.11.2.3 Type B - Medium Flow, Low Velocity Inlet Filters

815.4.11.2.3.1 Hardware, Fabric, and Stone Inlet Protection

1. Excavate a trench 6 inches deep around the outside perimeter of the inlet. Use hardware fabric or comparable wire mesh with maximum openings 0.5 inch x 0.5 inch as the supporting material. Extended the fabric a minimum of 6 inches into the ground. Backfill the trench with soil or crushed stone and compact over the fabric.
2. Install steel posts specified in Subsection 815.2.4.2.1. Space the posts a maximum of 3 feet apart around the perimeter of the inlet and drive them into the ground a minimum of 18 inches.
3. Install the wire mesh fabric above grade a minimum of 18 inches without exceeding 24 inches. Use heavy-duty wire ties spaced a maximum of 6 inches apart to attach the wire mesh material to the steel posts. Place Aggregate No. 5 washed stone to a minimum height of 12 inches and a maximum height of 24 inches against the hardware fabric on all sides.

815.4.11.2.4 Type D - High Flow, High Velocity Inlet Filters

815.4.11.2.4.1 Rigid Inlet Filters

1. Install rigid inlet filters in accordance with the manufacturer's written installation instructions. Properly install rigid inlet protection so that the inlet is completely enclosed.

815.4.11.2.5 Type E - Surface Course Curb Inlet Filters

1. Use surface course inlet filters in conjunction with Catch Basin Types 1, 16, 17, and 18 after the placement of the road surface course. Place surface course inlet filters where sediment may spill over sidewalks and curbs.
2. Install surface course inlet filters in front of curb inlet openings. Ensure that the filter has a minimum height or diameter of 9 inches and a minimum length 2 feet longer than the length of the curb opening to allow sufficient length to cover the inlet with at least 1-foot of clearance beyond the inlet on both ends. Do not completely block the inlet opening with surface course inlet filters. Install surface course inlet filters in a manner to allow overflows to enter the catch basin. Fill the aggregate compartment to a level (at least half full) that keeps the surface course inlet filter in place and creates a seal between the surface course inlet filter and the road surface.

815.4.11.2.6 Type F - Inlet Tubes

815.4.11.2.6.1 Weighted Inlet Tubes

1. Weighted inlet tubes do not require posts or additional techniques to keep them in place. Install weighted inlet tubes lying flat on the ground with no gaps between the soil or underlying surface and the inlet tube. Never stack weighted inlet tubes on top of one another. Do not completely block inlets with weighted inlet tubes. Install weighted inlet tubes so that all overflow or overtopping water has the ability to enter the inlet unobstructed. To avoid possible flooding, two or three concrete blocks may be placed between the weighted inlet tubes and the inlet.

815.4.11.2.6.2 Non-Weighted Inlet Tubes

1. Install non-weighted inlet tubes immediately after grading and construction of Catch Basin Types 1, 16, 17, and 18 boxes. Maintain non-weighted inlet tubes during subgrade and base preparation until the base course is placed. Review all project specifications for special installation requirements. Install non-weighted inlet tubes using 1-inch x 1-inch wooden stakes or 1.25 lb./linear ft. steel posts a minimum of 36 inches in length, placed on 2-foot centers. Intertwine the stakes with the outer mesh on the downstream side of the inlet tube. Drive stakes in the ground to a minimum depth of 12 inches, leaving less than 12 inches of stake exposed above the non-weighted inlet tube.
2. An acceptable alternative installation is driving stakes on 2-foot centers on each side of the non-weighted inlet tubes and connecting them with a natural fiber twine or steel wire to inhibit the non-weighted sediment tube from moving vertically. Another acceptable alternative installation for non-weighted inlet tubes is installing stakes on 2-foot centers in a crossing manner maintaining direct soil contact at all times. Install non-weighted inlet tubes so that the top is below the top of the installed curb line to ensure that all overflow or overtopping water has the ability to enter the inlet unobstructed.

815.4.11.3 Delivery, Storage, and Handling

1. Follow the manufacturer's written procedures for inlet structure filter labeling, shipment, and storage. Ensure that the manufacturer or supplier name, the structure size, shape, and weight clearly show on product labels.
2. Store inlet structure filters off the ground and cover adequately to protect them from the following: construction damage, precipitation, extended exposure to ultraviolet radiation

including sunlight, on-site chemicals, flames, including welding sparks, excessive temperatures, and other environmental conditions that can damage the physical properties of the inlet filters.

815.4.11.4 Inspection and Maintenance of Inlet Structure Filters

815.4.11.4.1 General

1. Inspect inlet structure filters after installation for gaps that may permit sediment to enter the storm drainage system. Inspect inlet filters every 7 days. Immediately handle all damage or necessary repairs. Remove all accumulated sediment and debris from the surface and vicinity of inlet filters after each rainfall event or as directed by the Engineer or the manufacturer's representative. Remove sediment when it reaches approximately one-third of the height of the inlet filter. If a sump is used, remove sediment when it fills approximately one-third of the depth of the hole. Maintain the pool area, always providing adequate sediment storage volume for the next storm event.
2. Remove, move, and/or replace inlet filters as required to adapt to changing construction site conditions. Remove inlet structure filters from the site when the functional longevity is exceeded as determined by the Engineer or the manufacturer's representative. Dispose of inlet filters no longer in use at an appropriate recycling or solid waste facility. Before final stabilization backfill and repair trenches, depressions, and all other ground disturbances caused by the removal of inlet filters. Remove all construction material and sediment and dispose of them properly. Grade the disturbed areas to the elevation of the inlet structure crest. Stabilize all bare areas immediately.

815.4.11.4.2 Type A - Low Flow Inlet Filters

815.4.11.4.2.1 Filter Fabric Inlet Protection

1. Replace the fabric if it becomes clogged, or as directed by the Engineer. Take care not to damage or undercut the fabric when removing the sediment.

815.4.11.4.2.2 Sediment Tubes

1. Inspect sediment tubes after installation for gaps under the sediment tubes and for gaps between the joints of adjacent ends of sediment tubes. Repair rills, gullies, and all undercutting near sediment tubes. Remove and/or replace installed sediment tubes as required to adapt to changing construction site conditions. Remove all sediment tubes from the site when the functional longevity is exceeded as determined by the Engineer or the manufacturer's representative. Dispose of sediment tubes as non-hazardous, inert material.

815.4.11.4.3 Type B - Medium Flow Low Velocity Inlet Filters

815.4.11.4.3.1 Hardware, Fabric, and Stone Inlet Protection

1. If the stone becomes clogged with sediment, pull the stones away from the inlet and clean or replace them. Because cleaning gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.

815.4.11.4.4 Type D - High Flow, High Velocity Inlet Filters

815.4.11.4.4.1 Rigid Inlet Protection Device

1. Inspect Type D inlet filters after installation to ensure that no gaps exist that may permit sediment to enter the storm drain system. Remove and/or replace rigid inlet filters to adapt to changing construction site conditions. Clean the rigid inlet protection filter material when it becomes covered or clogged with deposited sediment. Replace the rigid inlet protection filter material as directed by the Engineer.

815.4.11.4.5 Type E - Surface Course Curb Inlet Filters

1. Because ponding is likely if sediment is not removed regularly, inspect surface course curb inlet filters on a regular basis and immediately after major rain events. Clean the surface course curb inlet filter if a visual inspection shows silt and debris build up around the filter.

815.4.11.4.6 Type F - Inlet Tubes

815.4.11.4.6.1 Weighted Inlet Tubes

1. Weighted inlet tubes may be temporarily moved during construction as needed. Replace weighted inlet tubes damaged during installation as directed by the Engineer or the manufacturer's representative at no expense to the Town.

815.4.11.4.6.2 Non-Weighted Inlet Tubes

1. Non-weighted inlet tubes may be temporarily moved during construction as needed. Replace non-weighted inlet tubes damaged during installation as directed by the Engineer or the manufacturers' representative at no expense to the Town.

815.4.11.5 Acceptance Criteria

1. Obtain Engineer approval of inlet structure filter installations. When requested by the ENGINEER, ensure that a manufacturer's representative is on-site to oversee and approve the initial installation of inlet structure filters. Obtain a letter from the manufacturer approving the installation when requested by the Engineer.

815.4.12 Temporary Pipe Slope Drains

1. Construct optional temporary pipe slope drains as required or as directed by the Engineer. Ensure that the flexible pipe is of sufficient size to carry the anticipated volume of water, but in no case less than 8 inches in diameter. Ensure that pipe conforms to the requirements of Section 803.
2. Install temporary slope drains as a part of the grading operation where applicable and adjust as directed by the Engineer.
3. Construct an earth berm at the top of cut or fill sections to channel the water into the slope drain and to prevent collected water from spilling over the edge of the slope.
4. When the temporary slope drains are removed, dress and seed the area in accordance with Section 810. The removed pipe drain becomes property of the Contractor, and it may be used again at other temporary locations if the pipe is in a condition acceptable to the Engineer.

815.4.13 Temporary Seeding

1. Perform Temporary Seeding in accordance with Section 810 as applicable.

815.4.14 Stabilized Construction Entrance

815.4.14.1 Application

1. Install a stabilized construction entrance at all defined points where traffic enters or leaves a construction site and moves directly off or onto a public road. Use construction entrances in conjunction with the stabilization of construction roads to reduce the amount of mud picked up by vehicles.
2. Ensure that the stabilized construction entrance is a minimum of 24 feet wide by 100 feet long and modify as necessary to accommodate site constraints. Taper the edges of the entrance out towards the road to prevent tracking of mud at the edge of the entrance.
3. If washing is used, make provisions to intercept the wash water and trap the sediment before it is carried offsite. Require washdown facilities as needed. In general, establish washdown facilities with crushed stone and drain into a sediment trap or sediment basin.
4. Remove all vegetation and any objectionable material from the foundation area. Divert all surface runoff and drainage from the stones to a sediment trap or basin. Install a non-woven geotextile fabric before placing any stone. If necessary, install a culvert pipe across the entrance to provide positive drainage. Place the aggregate at a minimum depth of 6 inches uniform on top of the geotextile fabric.

815.4.14.2 Inspection and Maintenance of Stabilized Construction Entrances

1. Inspect stabilized construction entrances every 7 days. Check for mud and sediment build-up and pad integrity. Wash, replace, or add stone whenever the entrance fails to perform effectively or as directed by the Engineer. Wash or replace the stone in the entrance whenever the entrance fails to reduce the amount of mud being carried offsite by vehicle tires. Wash frequently to extend the useful life of the stone.
2. Re-shape stone pad as needed for drainage and runoff control. Brush or sweep up soil that has been tracked offsite immediately and properly dispose of it. Use flushing only when the water can be discharged to a sediment trap or basin. Maintain the stabilized construction entrance until the remainder of the construction site has been fully stabilized. Repair any broken pavement immediately.
3. For sites with wash racks at each site entrance, construct and maintain sediment traps for the life of the project.
4. If the aggregate material is being tracked offsite, limit larger vehicles from the construction site or use a larger diameter stone. If excessive sediment is being tracked onto the roadway, increase the length of the stabilized construction entrance.

815.4.14.3 Acceptance Criteria

1. Obtain Engineer acceptance and approval for stabilized construction entrance installations and for the replacement of stone.

815.4.15 Bonded Fiber Matrix (BFM)

815.4.15.1 Application

1. Use BFM with all components pre-packaged by the manufacturer to assure material performance. Do not field mix materials, additives, or components.
2. Examine substrates and conditions before applying materials. Do not proceed with installation until unsatisfactory conditions are corrected. Apply BFM to geotechnically stable slopes that are constructed to divert runoff water away from the face of the slope eliminating damage to the slope face caused by the surface flow from above the slope.
3. Use personnel or subcontractors certified and trained by the manufacturer in the proper procedures for mixing and applying the BFM. Strictly comply with the manufacturer's mixing recommendations and installation instructions. Use approved hydraulic seeding/mulching machines with fan-type nozzle (50-degree tip) for BFM applications. Apply BFM from opposing directions to the soil surface in successive layers, reducing the "shadow effect" to achieve maximum coverage of all exposed soil. Do not apply the BFM immediately before, during, or after rainfall. Allow the BFM a minimum of 24 hours to dry after installation.
4. Do not exceed maximum slope length of 100 feet when slope gradients are steeper than 4H:1V. Install BFMs at a general application rate of 3500 pounds per acre.

815.4.15.2 Delivery, Storage, and Handling

1. Have BFM components delivered in factory labeled packages. Store and handle in strict compliance with the manufacturer's instructions and recommendations. Ensure that packaging is composed of UV resistant bags with a UV resistant pallet cover. Protect stored BFM from damage caused by weather, excessive temperatures, and construction operations. Clean all spills promptly.

815.4.15.3 Maintenance

1. Prepare a maintenance plan that includes the following:
   - Reapplication of BFM as directed by the Engineer to disturbed areas that require continued erosion control.
   - Maintenance of equipment to provide uniform application rates.
   - Rinsing of all BFM mixing and application equipment thoroughly with water to avoid formation of residues and appropriate discharge of all rinse water.
2. Degradation of BFM can be expected to occur as a result of mechanical degradation, chemical, and biological hydrolysis, sunlight, salt, and temperature. Where necessary, reapply BFM in accordance with manufacturer's instructions. Reapplication is not required unless BFM treated soils are disturbed or turbidity or water quality shows the need for an additional application. If BFM-treated soils are left undisturbed, the necessity of reapplication will be determined by the Engineer.

815.4.15.4 Acceptance Criteria

1. Obtain Engineer acceptance and approval of BFM installations. When requested by the Engineer, ensure that a manufacturer's representative is on-site to oversee and approve the initial installation of BFM. Obtain a letter from the manufacturer approving the installation when requested by the Engineer.

815.4.16 Flexible Growth Matrix (FGM)

815.4.16.1 Application

1. Use flexible growth matrix (FGM) with components pre-packaged by the manufacturer to assure material performance. Do not field mix materials, additives, or components.
2. Examine substrates and conditions before materials are applied. Apply FGM to geotechnically stable slopes that constructed to divert runoff away from the face of the slope. Do not proceed with installation until satisfactory conditions are established.
3. Use personnel or subcontractor certified and trained by the manufacturer in the proper procedures for mixing and application of the FGM. Strictly comply with the manufacturer's mixing recommendations and installation instructions. Use approved hydraulic seeding/mulching machines with fan-type nozzles (50-degree tip) for FGM applications. Apply FGM from opposing directions to the soil surface in successive layers, reducing the "shadow effect" to achieve maximum coverage of all exposed soil. FGM does not require a cure time and is effective immediately; therefore, FGM may be applied before, during or after a rainfall event. Install FGM materials at the general application rates in the following table.

Flexible Growth Matrix Application Rates	
Condition	**Application Rate**
Slope Applications	3500 pounds per acre
Below TRM	1500 pounds per acre

815.4.16.2 Delivery, Storage, Handling

1. Use FGM with components pre-packaged by the manufacturer to assure material performance. Have materials and products delivered in UV and weather resistant factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage from weather, excessive temperatures, and construction operations. Clean all spills promptly.

815.4.16.3 Maintenance

1. Prepare a maintenance plan that includes the following:
   - Reapplication of FGM as directed by the ENGINEER to disturbed areas that require continued erosion control.
   - Maintenance of equipment to provide uniform application rate.
   - Rinsing all FGM mixing and application equipment thoroughly with water to avoid formation of residues and appropriate discharge of rinse water.
   2. Degradation of FGM can be expected to occur because of mechanical and chemical degradation and biological hydrolysis, sunlight, salt, and temperature. Reapply FGM in accordance with the manufacturer's instructions. Reapplication is not required unless FGM treated soils are disturbed or turbidity or water quality shows the need for an additional application. If FGM-treated soils are left undisturbed, the necessity of reapplication will be determined by the Engineer.

815.4.16.4 Acceptance Criteria

1. Obtain Engineer acceptance and approval of FGM installations. When requested by the Engineer, ensure that a manufacturer's representative is on-site to oversee and approve the initial installation of the FGM. Obtain a letter from the manufacturer approving the installation when requested by the Engineer.

815.5 Measurement

1. The quantity of the pay item Fiber Roving Type (A or B) is the surface area covered by the roving including in anchor trenches and is measured by the square yard (SY) of fiber roving in-place, complete, and accepted.
2. The quantity of the pay item Turf Reinforcement Matting (TRM) Type (1, 2, 3, or 4) or Temporary Erosion Control Blanket (ECB) Class (A, B, or C) is the surface area covered by the rolled erosion control product, including seams, overlaps, anchor trenches, and wastage and is measured by the one-thousand square yard (MSY) unit of material in-place, complete, and accepted. Products damaged by the Contractor's operations are not included in the measurement.
3. The quantity for the pay item Sediment Tube is the length of sediment tube installed, including overlaps and wastage and is measured by the linear foot (LF) of sediment tube in-place, complete, and accepted. Sediment tubes damaged by the Contractor's operations are not included in the measurement. The installation of the sediment tubes may require written acceptance by the manufacturer's representative before the quantity is accepted.
4. The quantity for the pay item Silt Fence is the length of silt fence installed and maintained and is measured by the linear foot (LF) of silt fence in-place, complete, and accepted.
5. The quantity for the pay item Removal of Silt Retained by Silt Fence is the length of silt fence in front of which silt deposit was removed as ordered by the Engineer and is measured by the linear foot (LF) along the line of the silt fence, complete, and accepted.
6. The quantity for Replace/Repair of Silt Fence is the length of silt fence repaired or replaced because of failure of the silt fence not the fault of the Contractor and is measured by the linear foot (LF) along the line of the silt fence, complete, and accepted.
7. The quantity for the item Floating Turbidity Barrier (Light, Medium, or Heavy Duty) is the length of floating turbidity barrier if the depth is specified in the Contract, or if the depth is not specified, then by the surface area of the floating turbidity barrier furnished, installed, maintained and is measured by either the linear foot (LF) or the square foot (SF) as applicable for type of barrier in-place, complete, and accepted. Measurement of accumulated material removed and disposed of each time the device is cleaned out is included in the quantity for Cleaning Silt Basins.
8. The quantity for the pay item Silt Basins is the volume of material excavated for the construction and backfilling of silt basins and is measured by the cubic yard (CY) of material moved during each operation, complete, and accepted. Each operation is measured separately.
9. The quantity for the pay item Cleaning Silt Basins is the volume of sediment deposits removed from silt ditches and silt basins as directed by the ENGINEER, measured by the cubic yard (CY) of material removed, complete, and accepted. The quantity also includes sediment deposits removed from erosion control devices as directed and approved by the Engineer, except from in front of silt fences. Measurements will be taken each time sediment is removed. Proper disposal of the sediment removed is considered incidental work in this item and is not measured for payment.

10. The quantity for the pay item Silt Ditches is of material excavated for the construction and backfilling of silt ditches and is measured by the cubic yard (CY) of material moved, complete, and accepted. Each operation is measured separately.
11. The quantity for the pay item Inlet Structure Filter Type (B, D1, D2, E CBT-1, E CBT-16, E CBT-17, or E CBT-18) is measured by the each (EA) filter furnished and installed, complete, and accepted. The quantity for Inlet Structure Filter Type A, F (Weighted), or F (Non-weighted) is the length of inlet structure filter furnished and installed, including overlaps and wastage and is measured by the linear foot (LF) of filter in-place, complete, and accepted. Inlet structure filters damaged by the Contractor's operations are not included in the quantity. The proper removal and disposal of deposited sediment around inlet structure filters is included in the quantity for Cleaning Silt Basins.
12. The quantity for the pay item Filter Material for Inlet Structure Filter Type D1 or Filter Material for Inlet Structure Filter Type D2 is measured by each (EA) inlet structure filter around which the filter fabric is replaced not due to the fault of the Contractor's operations, complete, and accepted. This measurement only includes replacement filter fabric, not the replacement of the frame for the Type D1 or Type D2 inlet structure filters.
13. The quantity for the pay item Temporary Flexible Pipe Slope Drains - (diameter in inches) is the length of the flexible pipe drains furnished and installed, measured by the linear foot (LF) along of pipe in-place, complete, and accepted. This item includes any excavation necessary for the installation of the pipe drains; and therefore, no measurement is made for the excavation work.
14. The quantity for the pay item Stabilized Construction Entrance is the surface area of the stabilized construction entrance in-place and is measured by the square yard (SY), complete, and accepted. When replacement stone is authorized by the ENGINEER, the area of replacement stone in the stabilized construction entrance is measured and added to the quantity for this item.
15. The quantity for the pay item Bonded Fiber Matrix (BFM) is the surface area covered by the bonded fiber matrix applied at the recommended rate and is measured by the one-thousand square yard (MSY) units of matrix in-place, complete, and accepted. The installation of the BFM may require written acceptance by the manufacturer's representative before acceptance for payment.
16. The quantity for the pay item Flexible Growth Matrix (FGM) is the surface area covered by the flexible growth matrix applied at the recommended rate and is measured by the one-thousand square yard (MSY) units of matrix in-place, complete, and accepted. The installation of the FGM may require written acceptance by the manufacturer's representative before acceptance for payment.
17. Brush barriers are not measured for payment. The material and labor to construct brush barriers are considered incidental to the clearing and grubbing operations.
18. The quantity for Temporary Seeding is measured in accordance with Subsection 810.5.
19. Temporary pipe slope drains installed are considered incidental to work of the erosion control items; and therefore, they are not measured for payment.

815.6 Payment

1. Unless otherwise noted, payment for the accepted quantity for each pay item, measured in accordance with Subsection 815.5, is determined using the contract unit bid price for the applicable item, and the payment includes all direct and indirect costs and expenses required to complete the work.

2. Payment for Fiber Roving Type (A or B) is full compensation for installing fiber roving as specified or directed and includes furnishing, spreading and maintaining fiber roving; application of asphalt tackifier; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
3. Payment for Turf Reinforcement Matting (TRM) Type (1, 2, 3, or 4) or Temporary Erosion Control Blanket (ECB) Class (A, B, or C) is full compensation for installing TRM or ECB as specified or as directed and includes furnishing, placing, and maintaining the erosion control matting or blankets; providing anchor devices and trenches; quality control testing; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
4. Payment for Sediment Tubes is full compensation for installing the sediment tubes as specified or directed and includes furnishing, placing, maintaining, inspecting, removing, and disposing of the sediment tubes; providing wooden stakes, steel posts, proper storage facilities, documentation of Quality Control and Quality Assurance programs; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
5. Payment for Silt Fence is full compensation for installing silt fence as specified or directed and includes furnishing, placing, maintaining, inspecting, removing, and disposing of silt fences; providing filter fabric, posts, and ties; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
6. Payment for Replace/Repair of Silt Fence is full compensation for repairing or replacing damaged or malfunction silt fences as specified or directed and includes furnishing or repairing filter fabric, posts, and ties, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
7. Payment for Floating Turbidity Barrier (Light, Medium, or Heavy Duty) is full compensation for installing floating turbidity barriers as specified or directed and includes furnishing, installing, maintaining, removing and disposing of the floating turbidity barriers; providing attachments to the shore, anchors, vertical supports, anchor buoys, buoyed warning signs, and lighted buoys; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
8. Payment for Silt Basins is full compensation for constructing silt basins as specified or directed and includes excavating, grading, and backfilling of silt basins; disposing of surplus material; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
9. Payment for Cleaning Silt Basins is full compensation for removing and disposing of sediment deposits accumulated in silt basins as well as other sediment retention devices as specified or directed and includes all materials, labor, equipment, tools, supplies, transportation, and

incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.

10. Payment for Silt Ditches is full compensation for constructing silt ditches as specified or directed and includes excavating, grading, and backfilling of silt ditches; disposing of surplus material; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
11. Payment for Inlet Structure Filter (of the type required) is full compensation for installing the inlet structure filters as specified or directed and includes furnishing, installing, maintaining, inspecting, removing and disposing of the inlet structure filters; providing posts, fabric, ties, anchor trenches, proper storage facilities, and documentation of Quality Control and Quality Assurance programs; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
12. Payment for Stabilized Construction Entrance is full compensation for constructing stabilized construction entrances as specified or directed and includes furnishing, installing, inspecting, maintaining, reshaping, removing, and disposing of the stabilized construction entrance (and exit); providing washdown facilities, drainage, and geotextile under the aggregate; sweeping adjacent roadway as necessary or directed; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
13. Payment for Bonded Fiber Matrix (BFM) or Flexible Growth Matrix (FGM) is full compensation for installing BFM or FGM as specified or directed and includes furnishing, applying, and maintaining the erosion control matrix including testing and documentation of Quality Control and Quality Assurance programs and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.
14. Brush barriers are not paid for directly but are considered incidental to the clearing and grubbing operation. The cost for brush barriers is included in the contract lump sum bid price for Clearing and Grubbing.
15. The payment for Temporary Seeding is made in accordance with the applicable provisions of Subsection 810.6.
16. Pay items under this section include the following:

Item No.	Pay Item	Unit
8151000	Fiber Roving	SY
8151010	Bonded Fiber Matrix (BFM)	MSY
8151020	Flexible Growth Matrix (FGM)	MSY
8151101	Turf Reinforcement Matting (TRM) Type 1	MSY
8151102	Turf Reinforcement Matting (TRM) Type 2	MSY
8151103	Turf Reinforcement Matting (TRM) Type 3	MSY
8151104	Turf Reinforcement Matting (TRM) Type 4	MSY

8151111	Temporary Erosion Control Blanket (Class A)	MSY
8151112	Temporary Erosion Control Blanket (Class B)	MSY
8151113	Temporary Erosion Control Blanket (Class C)	MSY
8152004	Inlet Structure Filter - Type F (Weighted)	LF
8152006	Inlet Structure Filter - Type F (Non-Weighted)	LF
8152007	Sediment Tube	LF
8153000	Silt Fence	LF
8153090	Replace/Repair Silt Fence	LF
8153100	Floating Turbidity Barrier - Light Duty	SF
81531XX	Floating Turbidity Barrier - Light Duty ((X)' Deep)	LF
8153200	Floating Turbidity Barrier -Medium Duty	SF
81532XX	Floating Turbidity Barrier - Medium Duty ((X)' Deep)	LF
8153300	Floating Turbidity Barrier - Heavy Duty	SF
81533XX	Floating Turbidity Barrier - Heavy Duty ((X)' Deep)	LF
8154000	Silt Basins	CY
8154010	Cleaning Silt Basins	CY
8154050	Removal of Silt Retained by Silt Fence	LF
8155000	Silt Ditches	CY
8156205	Inlet Structure Filter - Type D1	EA
8156207	Filter Material for Inlet Structure Filter - Type D1	EA
8156210	Inlet Structure Filter - Type B	EA
8156211	Inlet Structure Filter - Type E (Catch Basin Type 1)	EA
8156212	Inlet Structure Filter - Type E (Catch Basin Type 16)	EA

SP-1 Oyster Shell Finish Concrete Sidewalk

General Requirements

1. **Scope**: Provide a concrete sidewalk with an oyster shell finish to achieve a tabby look. This specification is intended to provide a durable and aesthetically pleasing oyster shell finish on the concrete sidewalk.

Materials

1. **Concrete**:
    - Strength: Minimum 3000 psi.
    - Mix Design: As per SCDOT standards.
2. **Oyster Shells**:
    - Size: 3/4 inch to 1 1/2 inch.
    - Washed and rinsed clean and free from impurities.

Surface Preparation

1. **Subgrade**: Compact and level the subgrade to the required grade.
2. **Formwork**: Secure forms to the required line and grade.

Placement

1. **Concrete Placement**:
    - Place and spread concrete evenly in accordance with SCDOT specification (Item 72041000)
2. **Oyster Shell Application**:
    - Broadcast oyster shells evenly over the wet concrete surface at a rate of 10 pounds per square yard.
    - Press shells lightly into the surface to ensure they are embedded and adhere to the wet concrete.

Finishing

1. **Floating and Troweling**:
    - Float and trowel the surface to embed the shells and achieve the desired finish.
    - Ensure the surface is smooth and even and shells are adequately embedded without sharp edges protruding.

- As concrete surface begins to dry, lightly spray the surface with clean water to wash the cement from the surface shells and provide the tops of the surface shells clean and exposed.

2. **Curing**:
    - Apply a curing compound or cover with wet burlap/plastic sheeting to retain moisture.
    - Cure for a minimum of 7 days.

Quality Control

1. **Inspection**: Inspect the finished surface to ensure uniform distribution of shells and consistent finish.
2. **Testing**: Perform compressive strength tests on concrete samples as per SCDOT concrete sidewalk specifications and standard procedures.

Protection

1. **Protection**: Protect the finished surface from traffic and environmental damage until fully cured.

Item No.	Pay Item	Unit
7204900	Detectable Warning Material (RED BRICK)	SF
7204900	Detectable Warning Material (GRAY TILE)	SF
7204900	Detectable Warning Material (YELLOW TILE)	SF
7209000	Pedestrian Ramp Construction	SY

SP-2 Remove and Reset Mortarless Block Pavers to comply with ADA standards

General Requirements

1. **Description:** This specification ensures the proper removal and reinstallation of mortarless block pavers on a curb ramp, aligning with ADA standards and regulations for accessibility.
2. **Scope**: Remove existing mortarless block pavers from a non-compliant curb ramp area to the extents as necessary and reinstall them to meet current at the correct slope and dimensions to comply with ADA standards and regulations.

Materials

1. **Pavers**: Reuse existing mortarless block pavers.
2. **Base Material**: Crushed stone or gravel, as specified.
3. **Bedding Sand**: Washed concrete sand.
4. **Edge Restraints**: Utilize existing pavers as the edge restraints.
5. **Joint Sand**: Fine, washed sand.

Removal

1. **Preparation**:
    - Mark the area of pavers to be removed.
    - Ensure safety measures are in place, including traffic control to prevent pedestrians entering the work area.
2. **Paver Removal**:
    - Carefully remove pavers to avoid damage.
    - Clean pavers to remove any debris or old bedding material.
3. **Base Removal**:
    - Remove existing base material to the depth as required to meet ADA slope and dimension requirements.
    - Dispose of old, excess base material as per local regulations.

Reinstallation

1. **Base Preparation**:
    - Excavate and Grade the subgrade to the required depth, slopes and dimensions.
    - Compact the subgrade to achieve a stable and uniform base.

- Install a new base layer of crushed stone or gravel, compacted in 2-inch lifts to a minimum thickness of 4 inches.

2. **Bedding Layer**:
    - Spread a 1-inch thick layer of washed concrete sand over the compacted base.
    - Screed the sand to ensure a uniform surface at the proper slopes and dimensions.
3. **Paver Installation**:
    - Reinstall the cleaned pavers in the original pattern or as specified.
    - Ensure pavers are level and have proper spacing for joint sand.
4. **Edge Restraints**:
    - The existing pavers along the perimeter of the work area shall be used to prevent movement.
5. **Joint Sand**:
    - Sweep fine, washed sand into the joints between the pavers.
    - Compact the pavers and reapply sand as necessary to fill the joints completely.

ADA Compliance

1. **Slopes and Dimensions**:
    - Ensure the reinstalled pavers meet basic ADA requirements for curb ramps, including:
        - A maximum longitudinal slope of 1:12 (8.33%).
        - A cross slope not exceeding 1:48 (2%).
        - A minimum clear width of 36 inches.
    - Ensure smooth transitions at the bottom and top of the curb ramp to the adjoining surfaces.

Quality Control

1. **Inspection**:
    - Inspect the installed pavers for proper alignment, slope, and compliance with ADA standards.
    - Verify that all joints are filled and the surface is stable.
2. **Testing**:
    - Perform a tactile inspection to ensure the surface is free of trip hazards and meets ADA standards.

Cleanup

1. **Site Cleanup**:
    - Remove all debris and excess materials from the site.
    - Restore any disturbed areas to their original condition.

Protection

1. **Temporary Protection**:
    - Protect the reinstalled paver area from traffic and other disturbances until the joint sand has set and the pavers are stable.
    - Restore any disturbed areas to their original condition.

Measurement

- This item shall be measured as a single Lump Sum for all necessary work, materials and labor to reconstruct the curb ramp at Site 91 to ADA compliant slopes and dimensions.

Payment

- Pay for the total reconstruction of the curb ramp at Site 91 as a Lump Sum item, to include the removal and resetting of existing block pavers, excavating and grading and amended as necessary, the base materials to reset the pavers to comply with ADA standards and regulations as shown in the drawings and specifications. Payment includes all materials and labor to reconstruct the pedestrian ramp. No additional payment will be made for components used to complete the ramp construction.

Item No.	Pay Item	Unit
SP-2	Remove and Reinstall Brick Pavers To Correct Slope and Dimensions (SITE 91)	LS

SP-3 Permanent Relocation of Regulatory Traffic Signs

General Requirements

1. **Description**: This specification provides guidelines for the safe and effective relocation of regulatory traffic signs as part of a sidewalk project, ensuring compliance with visibility and placement standards.
2. **Scope**: Relocate existing regulatory traffic signs (stop, speed limit, etc.) as specified in the plans for the project.

Materials

1. **Posts**:
    - Existing steel U-channel posts, galvanized.
    - Length: Existing and as suitable for the specified mounting height.
2. **Signs**:
    - Existing regulatory traffic signs (STOP).
3. **Hardware**:
    - Galvanized bolts, nuts, and washers.

Removal and Relocation

1. **Existing Sign Removal**:
    - Carefully remove the existing signs from posts without damaging the signs.
    - Remove posts from the ground by loosening and pulling. If the post is embedded in a concrete footer, the post may be cut at the top of the footer as long as it is at least 6 inches below finish grade, or the footer may be pulled with the sign post and re-used at the new location.
2. **Site Preparation**:
    - Determine the new location for each sign based on the project's plans.
    - Ensure the new location is free from obstructions and conforms to visibility requirements.
3. **Installation**:
    - **Post Installation**:
        - Install new or existing U-channel posts at the designated locations.

- Embed posts a minimum of 24 inches into the ground and ensure they are plumb.
- Set posts firmly in the ground to the required line and grade. Ensure that the posts are truly vertical and are aligned accurately when signs are attached. Ensure that the top of posts are level with the top of the supported sign.
- Use concrete footer (12-inch diameter and 24-inch deep) if necessary for stability in loose or sandy soil.

- **Sign Mounting**:
  - Mount signs at the appropriate height (typically 7 feet from the bottom of the sign to the ground for urban applications, 5 feet for rural applications).
  - Ensure signs are oriented correctly and securely fastened to the posts with galvanized hardware.

Quality Control

1. **Inspection**:
   - Verify that all signs are installed at the correct locations and heights.
   - Ensure that the signs are properly oriented and visible to oncoming traffic.
2. **Testing**:
   - Perform pull tests on a sample of posts to ensure they meet stability requirements.

Protection

1. **Temporary Protection**:
   - Protect relocated signs from damage during the remainder of the construction project.
   - Use temporary signage if necessary until the permanent signs are in place.

Measurement

- The quantity for the pay item of Relocation of Existing Post-Mounted Sign (STOP) is measured by the actual number of signs, as designated on the plans, which have been relocated.

  The unit price shall include all direct and indirect costs such as labor, equipment, materials, transportation and all other related costs necessary to successfully complete the task.

Payment

- The quantity of Relocated Signs, measured as provided above shall be paid for at the contract unit price per **Each** for " Relocation of Existing Post-Mounted Sign (STOP)".

Payment will be made under:

Item No.	Pay Item	Unit
SP-3	Relocation of Existing Post-Mounted Sign (STOP)	EA

SP-4 Selective Tree Removal

General Requirements

1. **Description**: This specification provides guidelines for the safe and effective removal of trees as designated on the plans.

2. **Scope**: Work covered by this item includes the removal and disposal of selected trees as directed by the Owner and in accordance with the provisions of these specifications. This shall be all equipment, resources and labor required to complete the work including but not limited to, climbing, tying-off, cutting and lowering limbs, grinding brush and stumps, backfilling and restoring stump pits, and removing from the site and properly disposing of all waste as directed by the Owner. Removal of trees with diameters larger than 36 inches will be paid for based on negotiated time and materials. Where the Owner deems that the removal of a selected tree(s) poses a special hazard to property or man-made features such as buildings, utilities, or roadways, the tree removal will be paid for based on negotiated time and materials.

Removal Methods

1. **Trees and Stumps**

    - Tree removal shall be accomplished by current industry standard methods. Stumps shall be removed to a minimum depth of 2 feet below the natural ground surface, unless otherwise directed by the Owner. When only a stump is removed, it will be measured across the top and paid at 50% of the price for that size tree. The area of the removed stump shall be backfilled with suitable soils, free of debris, unless otherwise specified by the Owner.

2. **Disposal**

    - All trees and stumps removed shall be properly disposed of in accordance with the applicable requirements of the General Conditions and applicable local and state laws.

Preventing Ancillary Damage

- The Contractor shall be responsible for and must take special care to prevent damage to any surrounding property, infrastructure, building, utilities, or other vegetation to remain. If vegetation to remain is damaged, broken branches shall be removed and rough edges of scarred edges shall be shaped and made smooth in accordance with the "Landscape Construction Standards". Any vegetation to remain that is damaged to such an extent that it is dangerous, unsightly or likely to die, shall be removed, disposed of, and shall be replaced

by the Contractor at no additional cost to the Town. Any grass or ground cover that is damaged shall be seeded and mulched by the Contractor at no additional cost to the Town.

Measurement

- The quantity for the pay item of selective tree removal is measured by be the actual number of trees, as designated on the plans, which have been removed and disposed of. The tree size will be determined by Diameter at Breast Height (DBH), measuring the circumference of the tree at forty-two (42) inches above the above adjacent average ground level.

  The unit price shall include all direct and indirect costs such as labor, equipment, fuel, materials, transportation and all other related costs necessary to successfully complete the task.

Payment

- The quantity of Selective Tree Removal, measured as provided above shall be paid for at the contract unit price per **Each** for "Selective Tree Removal, _____ inch to _____ inch diameter".

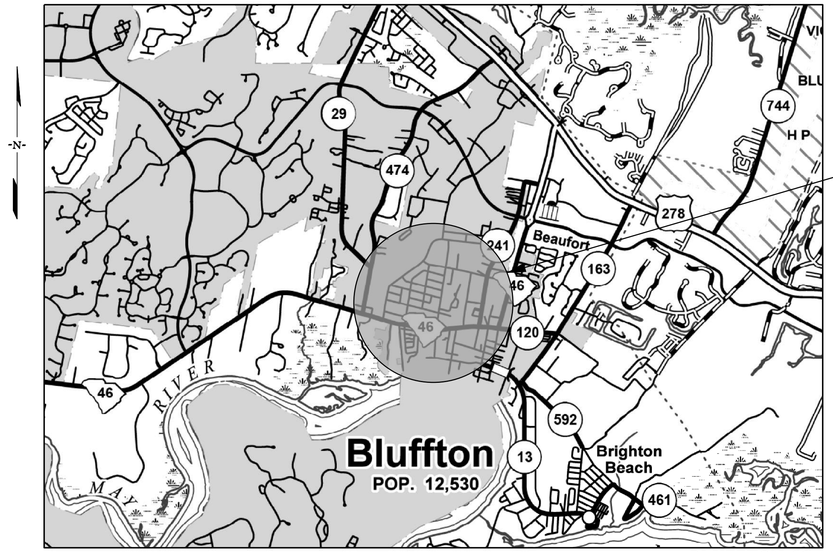
  Payment will be made under:

Item No.	Pay Item	Unit
SP-4	Selective Tree Removal, 6 inch to 12 inch diameter	EA
SP-4	Selective Tree Removal, 12.1 inch to 24 inch diameter	EA
SP-4	Selective Tree Removal, 24.1 inch to 36 inch diameter	EA

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	1

SHEET INDEX

TOWN OF BLUFFTON
PATHWAY PEDESTRIAN
SAFETY IMPROVEMENTS



LAYOUT
N.T.S.

BLUFFTON, SC

Design Reference for these plans is the:

2021

SCDOT Roadway Design Manual

ENVIRONMENTAL PERMIT INFORMATION			
USACE PERMIT	___YES	_X_NO	
NEPA DOCUMENT	___YES	_X_NO	
401 CERTIFICATION	___YES	_X_NO	
OCRM CAP	___YES	_X_NO	
NAVIGABLE WATERS	___SC	___USCG	___USACE _X_N/A

3 DAYS BEFORE DIGGING IN
SOUTH CAROLINA

CALL 811

SOUTH CAROLINA 811 (SC811)
WWW.SC811.COM
ALL UTILITIES MAY NOT BE A MEMBER OF SC811

RAILROAD INVOLVEMENT?
YES / (NO)

SCDOT REVIEW	RIGHT–OF–WAY INITIAL	RIGHT–OF–WAY DATE	CONSTRUCTION INITIAL	CONSTRUCTION DATE
PRECONSTRUCTION SUPPORT – ROAD				
PRECONSTRUCTION SUPPORT – STRUCTURES				
RPG – DESIGN MANAGER				
RPG – PROGRAM MANAGER				

THE INITIALS ABOVE DO NOT RELIEVE THE ENGINEER OF RECORD OF THE RESPONSIBILITY TO DESIGN THIS PROJECT IN ACCORDANCE WITH ALL APPLICABLE CRITERIA.

For Right Of Way Acquisition:

_____ _____
Consultant Engineer of Record Date

CONSULTING ENGINEERING FIRM

INFRASTRUCTURE CONSULTING & ENGINEERING

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS: ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF LETTING.

CONTACT INFORMATION

INFRASTRUCTURE CONSULTING & ENGINEERING

CLARKE HINSON, PE
PROJECT MANAGER
225 SEVEN FARMS DR, STE 200
CHARLESTON, SC 29492

TOWN OF BLUFFTON

CONSTANCE S. CLARKSON, CEPSCI
PROJECT MANAGER
20 BRIDGE STREET
PO BOX 386
BLUFFTON, SC 29910

ENGINEER OF RECORD

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 34113 BRANDON W. PRINE

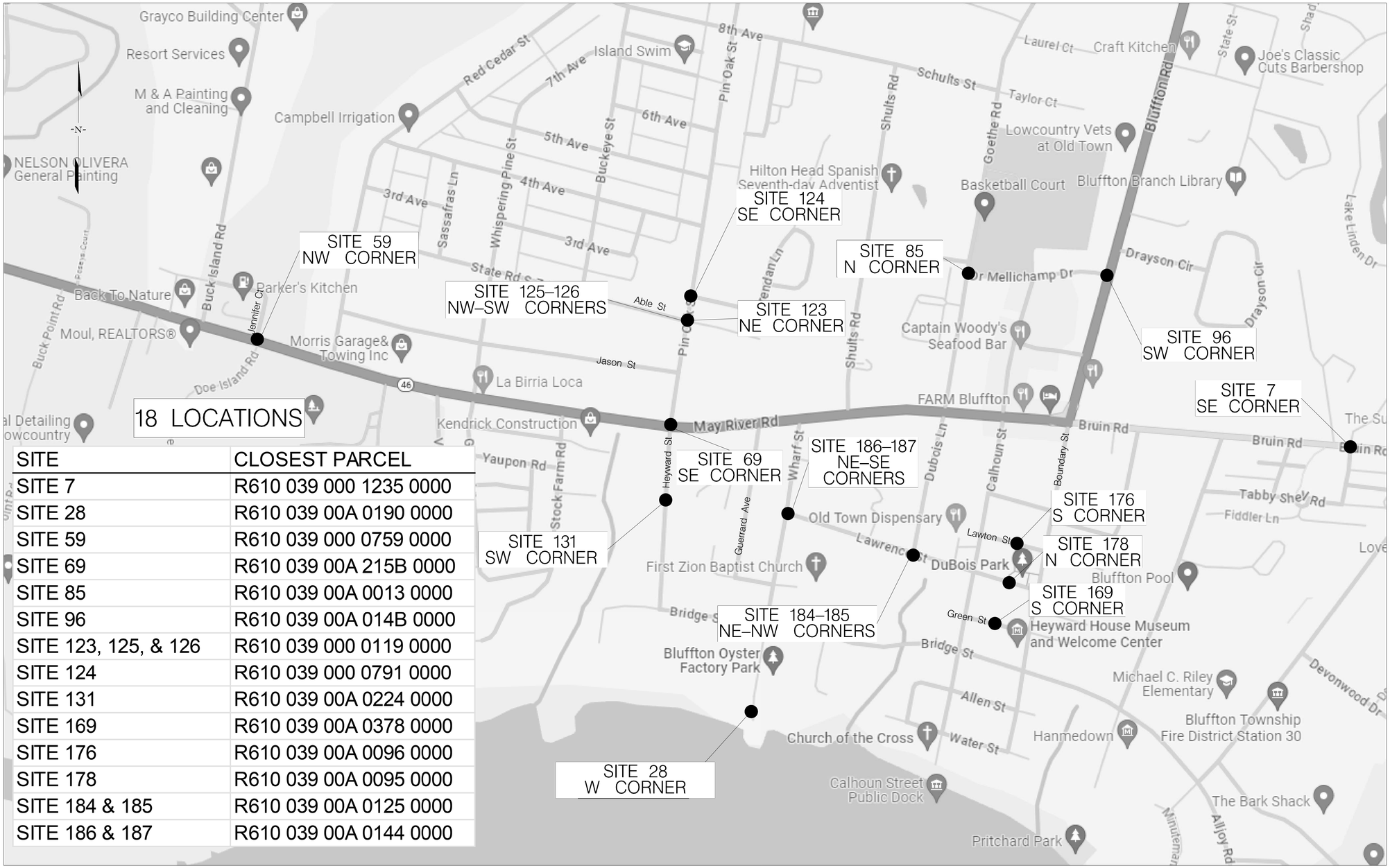
SOUTH CAROLINA INFRASTRUCTURE CONSULTING & ENGINEERING, LLC No. 4470 CERTIFICATE OF AUTHORIZATION

FOR CONSTRUCTION DATE

G:\PROJECTS\23-143 Bluffton ADA Improvements_D-DESIGN\Roadway\Dgn\Plan_Sheets\SHT_01_Title.dgn
9/18/2024

09/19/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	1A



SITE	CLOSEST PARCEL
SITE 7	R610 039 000 1235 0000
SITE 28	R610 039 00A 0190 0000
SITE 59	R610 039 000 0759 0000
SITE 69	R610 039 00A 215B 0000
SITE 85	R610 039 00A 0013 0000
SITE 96	R610 039 00A 014B 0000
SITE 123, 125, & 126	R610 039 000 0119 0000
SITE 124	R610 039 000 0791 0000
SITE 131	R610 039 00A 0224 0000
SITE 169	R610 039 00A 0378 0000
SITE 176	R610 039 00A 0096 0000
SITE 178	R610 039 00A 0095 0000
SITE 184 & 185	R610 039 00A 0125 0000
SITE 186 & 187	R610 039 00A 0144 0000

INFRASTRUCTURE CONSULTING & ENGINEERING

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 34113 BRANDON W. PAINE

SOUTH CAROLINA INFRASTRUCTURE CONSULTING & ENGINEERING, LLC CERTIFICATE OF AUTHORIZATION No. 4470

REV.NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

DESIGNED BY: RNT DATE 02/23/2024
DRAWN BY: RNT DATE 02/23/2024
CHECKED BY: JCH DATE 02/23/2024

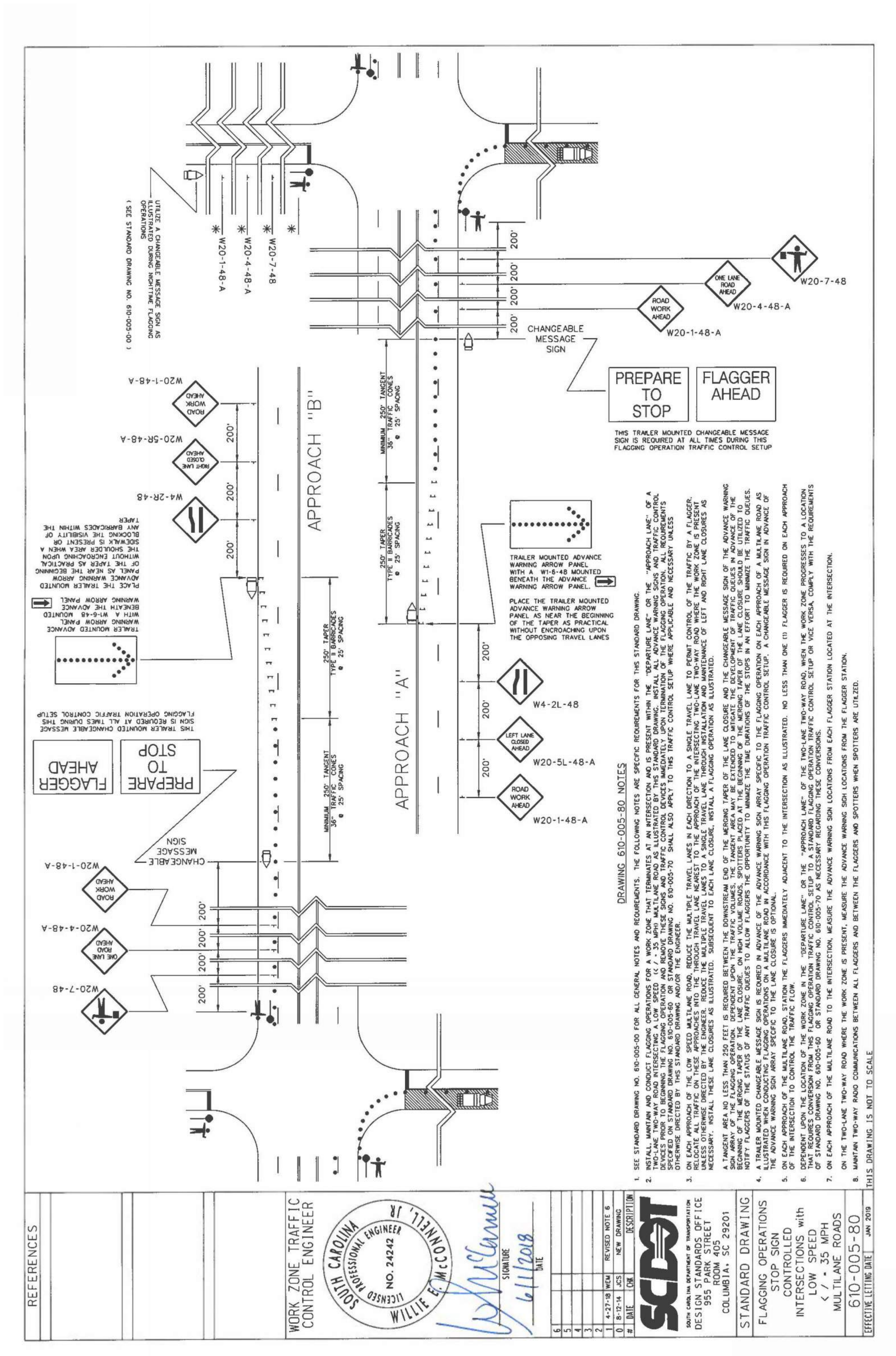
TOWN OF BLUFFTON

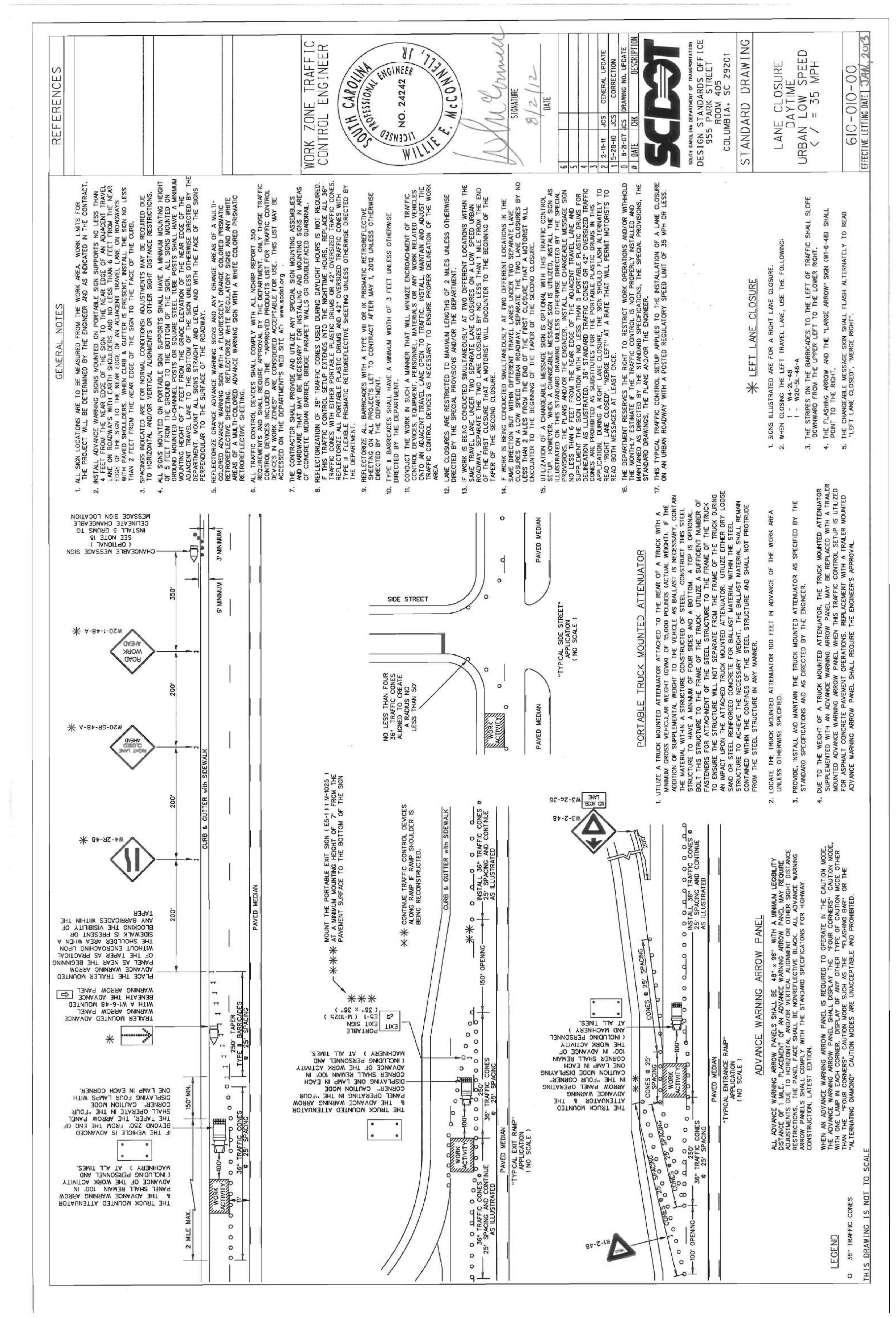
PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITE LOCATION MAP

SCALE: NTS

G:\PROJECTS\23-143 Bluffton ADA Improvements_D-DESIGN\Roadway\Dgn\Plan_Sheets\SHT_01A_Layout.dgn
9/18/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	3





G:\PROJECTS\23-143 Bluffton ADA Improvements_D-DESIGN\Roadway\Dgn\Plan_Sheets\SHT_03_Details.dgn
9/18/2024

INFRASTRUCTURE CONSULTING & ENGINEERING

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 34113 BRANDON W. PAYNE

SOUTH CAROLINA INFRASTRUCTURE CONSULTING & ENGINEERING, LLC No. 4470 CERTIFICATE OF AUTHORIZATION

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

DESIGNED BY:	RNT	DATE	02/23/2024
DRAWN BY:	RNT	DATE	02/23/2024
CHECKED BY:	JCH	DATE	02/23/2024

TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
DETAIL SHEET

SCALE: NTS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	2

SUMMARY OF ESTIMATED QUANTITIES

PAY ITEM	DESCRIPTION	QUANTITY	UNIT
1031000	MOBILIZATION	1	LS
1032010	BONDS AND INSURANCE	1	LS
1050800	CONSTRUCTION STAKES, LINES & GRADES	1	EA
1071000	TRAFFIC CONTROL	1	LS
1090200	AS-BUILT CONSTRUCTION PLANS	1	LS
2023000	REMOVAL & DISPOSAL OF EXISTING CONCRETE PAVEMENT	107	SY
2024100	REMOVAL & DISPOSAL OF EXISTING CURB AND GUTTER	99	LF
6271015	8" WHITE SOLID LINES - THERMO. - 125 MIL.	253	LF
6271020	12" WHITE SOLID LINES - THERMO. - 125 MIL.	60	LF
6271025	24" WHITE SOLID LINES - THERMO. - 125 MIL.	42	LF
6319505	REMOVAL OF PAVEMENT MARKINGS	398	LF
7203110	CONCRETE CURB AND GUTTER (1'-6")	62	LF
7204100	CONCRETE SIDEWALK(4" UNIFORM)	40	SY
7204900	DETECTABLE WARNING MATERIAL (RED BRICK)	132	SF
7204900	DETECTABLE WARNING MATERIAL (GRAY TILE)	5	SF
7204900	DETECTABLE WARNING MATERIAL (YELLOW TILE)	72	SF
7209000	PEDESTRIAN RAMP CONSTRUCTION	105	SY
8150100	EROSION CONTROL	1	LS
SP-1	OYSTER SHELL CONCRETE SIDEWALK (4" UNIFORM)	198	SF
SP-2	REMOVE AND REINSTALL BRICK PAVERS TO CORRECT SLOPE (SITE 91)	1	LS
SP-3	RELOCATION OF POST-MOUNTED SIGN (STOP)	3	EA
SP-4	TREE REMOVAL (SITE 36, 6" CEDAR)	1	EA

INFRASTRUCTURE CONSULTING & ENGINEERING

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 34113 BRANDON W. PAYNE

SOUTH CAROLINA INFRASTRUCTURE CONSULTING & ENGINEERING, LLC No. 4470 CERTIFICATE OF AUTHORIZATION

REV.NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

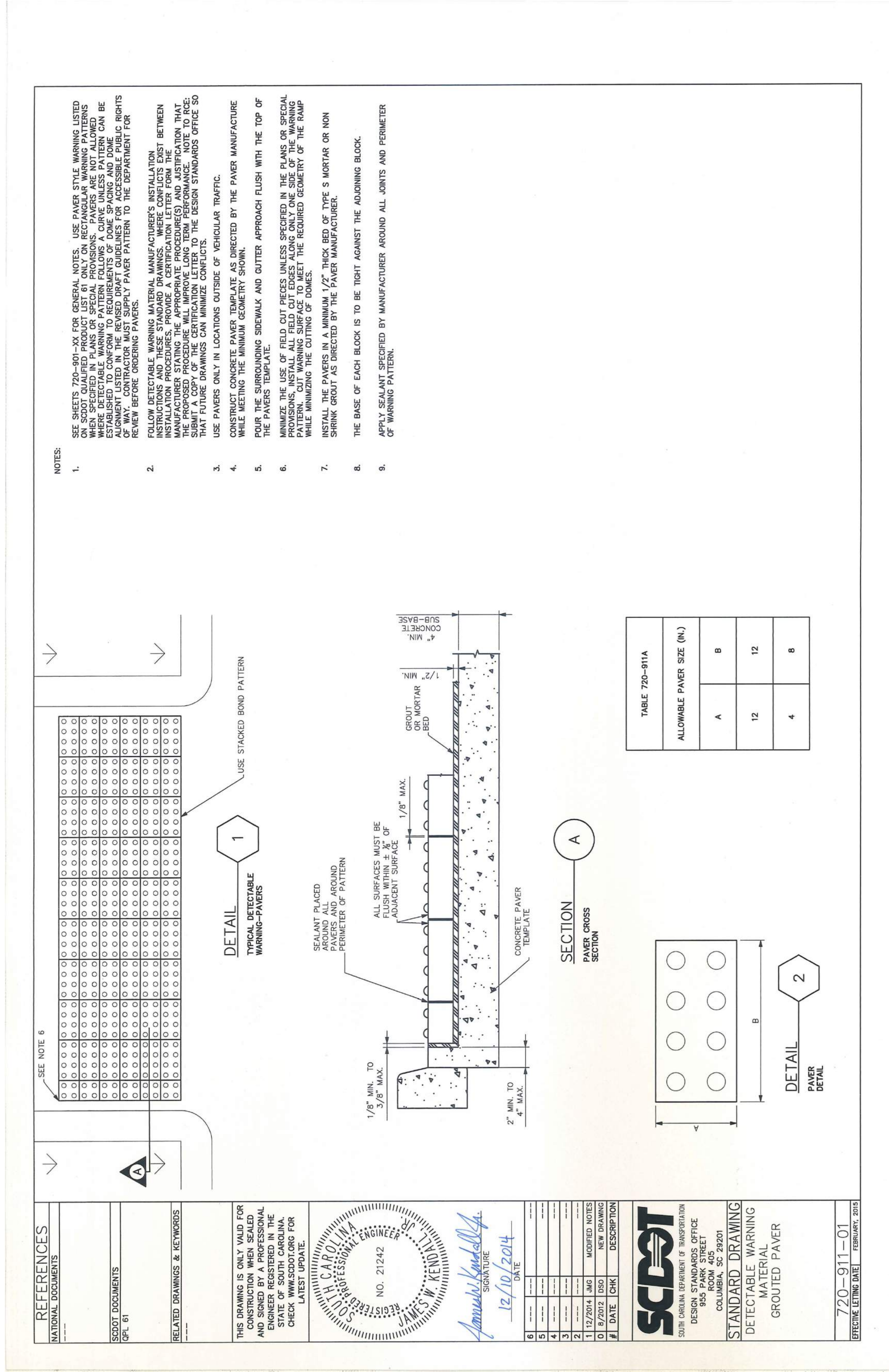
DESIGNED BY: ACP DATE 02/23/2024
DRAWN BY: ACP DATE 02/23/2024
CHECKED BY: JCH DATE 02/23/2024

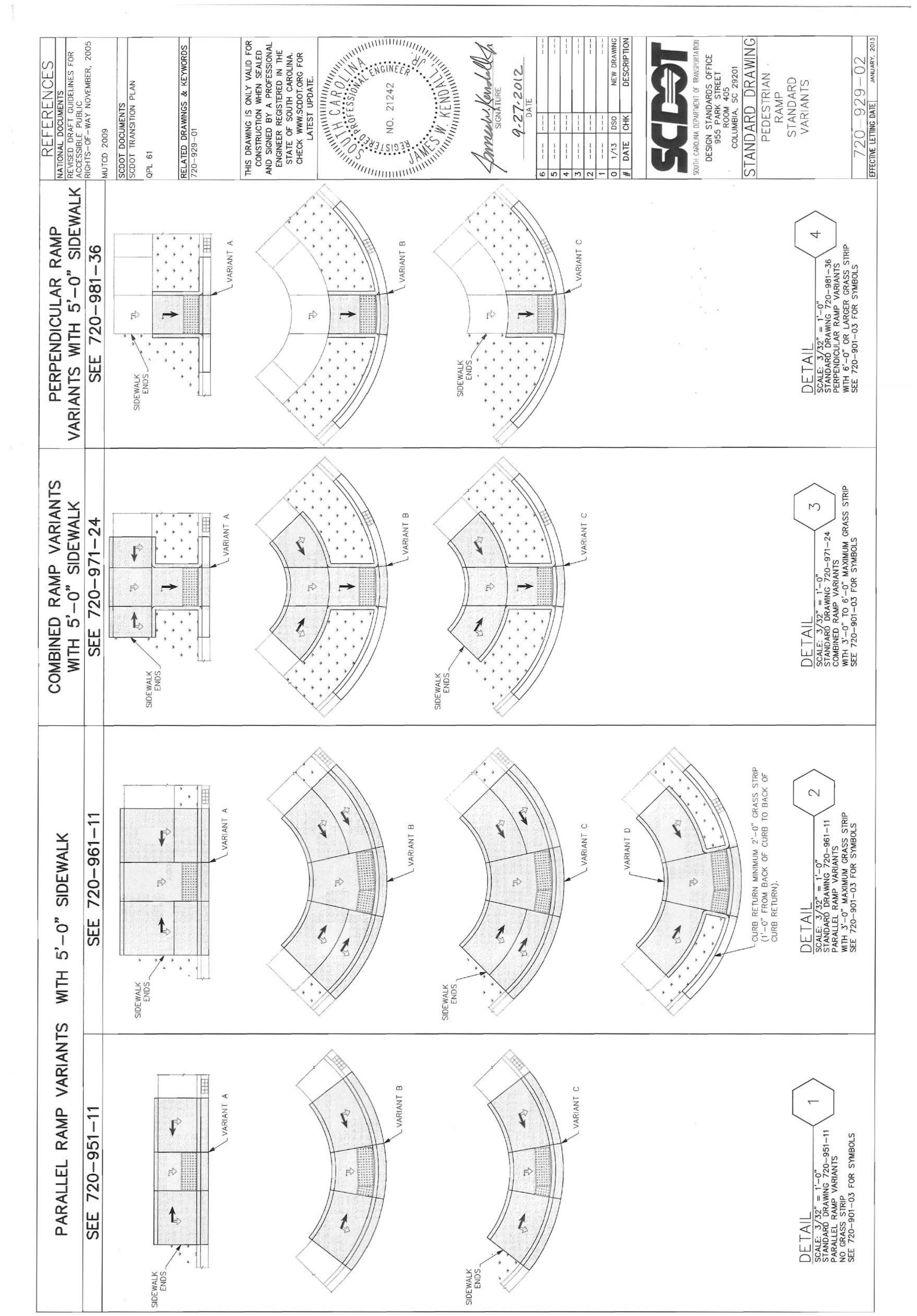
TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SUMMARY OF ESTIMATED QUANTITIES

SCALE: NTS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	3A





INFRASTRUCTURE CONSULTING & ENGINEERING

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 34113 BRANDON W. PAYNE

SOUTH CAROLINA INFRASTRUCTURE CONSULTING & ENGINEERING, LLC No. 4470 CERTIFICATE OF AUTHORIZATION

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

DESIGNED BY:	RNT	DATE	02/23/2024
DRAWN BY:	RNT	DATE	02/23/2024
CHECKED BY:	JCH	DATE	02/23/2024

TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
DETAIL SHEET

SCALE: NTS

G:\PROJECTS\23-143 Bluffton ADA Improvements_D-DESIGN\Roadway\Dgn\Plan_Sheets\SHT_03A_Details.dgn
9/18/2024

09/19/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	3B

NOTES:
1. SEE STANDARD DRAWINGS 720-901-XX FOR GENERAL NOTES.
2. SEE STANDARD DRAWINGS 720-91X-XX FOR INSTALLATION PROCEDURES FOR DETECTABLE WARNING SURFACE MATERIALS.
3. SEE STANDARD DRAWINGS 720-929-XX FOR VARIANTS TO THIS STANDARD.
4. CONSTRUCT RAMP PARTITION AT ALL LOCATIONS WHERE ROADWAY DRAINAGE COULD DISCHARGE ONTO ADJACENT PROPERTY. CONSTRUCT RAMP PARTITION IF NEEDED TO RETAIN EXISTING GROUND ELEVATION ON ADJACENT PROPERTY.

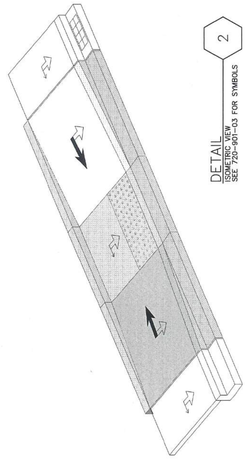


TABLE: 720-951-11 (SEE 720-929-01, X=10')		
ROAD SLOPE, S (%)	ELEVATION, [N]	L (UPHILL SIDE RAMP), [FT]
S ≤ 1%	[B-A] ≤ 7%	7'-0"
1% < S ≤ 3%	[B-A] ≤ 9%	10'-0"
S > 3%	[B-A] ≤ 9%	15'-0"

REFERENCES	
NATIONAL DOCUMENTS	
REVISED DRAFT GUIDELINES FOR ACCESSIBLE PUBLIC RIGHTS-OF-WAY NOVEMBER, 2005.	
MUTCD 2009	
SCDOT DOCUMENTS	
SCDOT TRANSITION PLAN	
QPL 61	
RELATED DRAWINGS & KEYWORDS	
720-929-01 720-929-02	

THIS DRAWING IS ONLY VALID FOR CONSTRUCTION WHEN SEALED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF SOUTH CAROLINA. CHECK WWW.SCDOT.ORG FOR LATEST UPDATE.

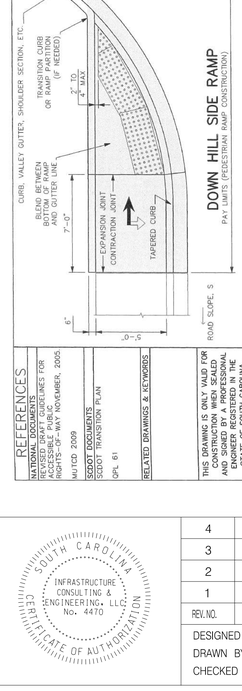
SOUTH CAROLINA PROFESSIONAL ENGINEER No. 21242 JAMES W. KENDRICK
12/3/2014 DATE

#	DATE	CHK	DESCRIPTION
6	----	---	---
5	----	---	---
4	----	---	---
3	----	---	---
2	----	---	---
1	10/14	JMG	REMOVED PAY ITEMS
0	1/13	DSG	NEW DRAWING

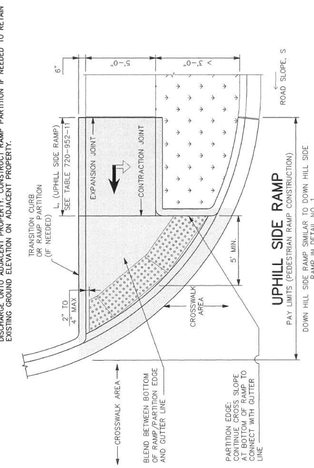
SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 420
COLUMBIA, SC 29201

STANDARD DRAWING
PEDESTRIAN RAMP
NO GRASS
(PARALLEL RAMP)

720-951-11
EFFECTIVE LETTING DATE: FEBRUARY, 2015



NOTES:
1. SEE STANDARD DRAWINGS 720-901-XX FOR GENERAL NOTES AND 720-901-03 FOR SYMBOLS.
2. SEE STANDARD DRAWINGS 720-91X-XX FOR INSTALLATION PROCEDURES FOR DETECTABLE WARNING SURFACE MATERIALS.
3. SEE STANDARD DRAWINGS 720-929-XX FOR VARIANTS TO THIS STANDARD.
4. QUANTITIES IN TABLE 720-952-11 ASSUME THAT DOWN HILL SIDE RAMP IS ALWAYS AT GRADE.
5. CONSTRUCT RAMP PARTITION AT ALL LOCATIONS WHERE ROADWAY DRAINAGE COULD DISCHARGE ONTO ADJACENT PROPERTY. CONSTRUCT RAMP PARTITION IF NEEDED TO RETAIN EXISTING GROUND ELEVATION ON ADJACENT PROPERTY.



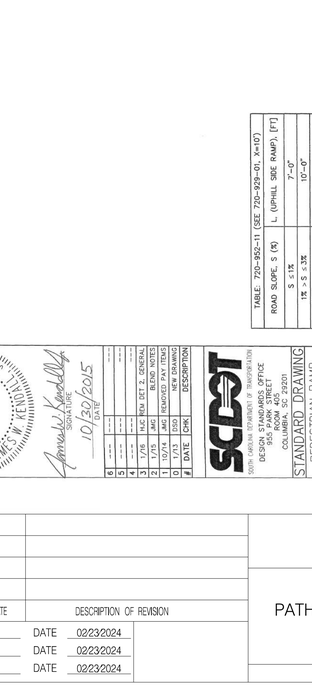


TABLE: 720-952-11 (SEE 720-929-01, X=10')	
ROAD SLOPE, S (%)	L (UPHILL SIDE RAMP), [FT]
S ≤ 1%	7'-0"
1% < S ≤ 3%	10'-0"
S > 3%	15'-0"

REFERENCES	
NATIONAL DOCUMENTS	
REVISED DRAFT GUIDELINES FOR ACCESSIBLE PUBLIC RIGHTS-OF-WAY NOVEMBER, 2005.	
MUTCD 2009	
SCDOT DOCUMENTS	
SCDOT TRANSITION PLAN	
QPL 61	
RELATED DRAWINGS & KEYWORDS	

THIS DRAWING IS ONLY VALID FOR CONSTRUCTION WHEN SEALED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF SOUTH CAROLINA. CHECK WWW.SCDOT.ORG FOR LATEST UPDATE.

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 21242 JAMES W. KENDRICK
10/30/2015 DATE

#	DATE	CHK	DESCRIPTION
6	----	---	---
5	----	---	---
4	----	---	---
3	7/16	MJC	REV DET 2, GENERAL
2	1/15	JMG	BLEND NOTES
1	10/14	JMG	REMOVED PAYITEMS
0	1/13	DSG	NEW DRAWING
#	DATE	CHK	DESCRIPTION

SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 420
COLUMBIA, SC 29201

STANDARD DRAWING
PEDESTRIAN RAMP
CONDENSED
TERMINAL
(PARALLEL RAMP)

720-952-11
EFFECTIVE LETTING DATE: JANUARY 2016

INFRASTRUCTURE CONSULTING & ENGINEERING

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 34113 BRANDON W. PAYNE

SOUTH CAROLINA INFRASTRUCTURE CONSULTING & ENGINEERING, LLC CERTIFICATE OF AUTHORIZATION No. 4470

REV.NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

DESIGNED BY: RNT DATE 02/23/2024
DRAWN BY: RNT DATE 02/23/2024
CHECKED BY: JCH DATE 02/23/2024

TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
DETAIL SHEET

SCALE: NTS

G:\PROJECTS\23-143 Bluffton ADA Improvements_D-DESIGN\Roadway\Dgn\Plan_Sheets\SHT_03B_Details.dgn
9/18/2024

09/19/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	3C

NOTES:
1. SEE STANDARD DRAWINGS 720-901-XX FOR GENERAL NOTES.
2. SEE STANDARD DRAWINGS 720-91X-XX FOR INSTALLATION PROCEDURES FOR DETECTABLE WARNING SURFACE MATERIALS.
3. SEE STANDARD DRAWINGS 720-929-XX FOR VARIANTS TO THIS STANDARD.

REFERENCES
NATIONAL DOCUMENTS
REVISED DRAFT GUIDELINES FOR ACCESSIBLE PUBLIC RIGHTS-OF-WAY, NOVEMBER, 2005
MUTCD 2009
SCDOT DOCUMENTS
SCDOT TRANSITION PLAN
QPL 61
RELATED DRAWINGS & KEYWORDS
720-929-02

THIS DRAWING IS ONLY VALID FOR CONSTRUCTION WHEN SEALED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF SOUTH CAROLINA. CHECK WWW.SCDOT.ORG FOR LATEST UPDATE.

SOUTH CAROLINA PROFESSIONAL ENGINEER JAMES W. KENDALL NO. 21242 REGISTERED

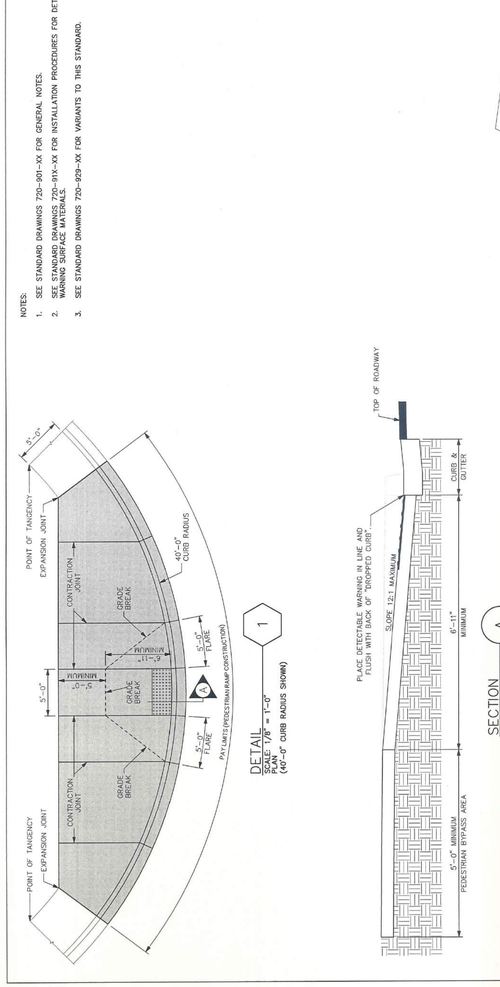
SIGNATURE
12/8/2014 DATE

#	DATE	CHK	DESCRIPTION
6	----	----	----
5	----	----	----
4	----	----	----
3	----	----	----
2	----	----	----
1	10/14	JMG	REMOVED PAY ITEMS
0	1/13	DSO	NEW DRAWING

SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING
PEDESTRIAN RAMP
PEDESTRIAN BYPASS
ON RADIUS
(PERPENDICULAR RAMP)
CURB RADIUS > 20'-0"

720-952-36
EFFECTIVE LETTING DATE: FEBRUARY, 2015



DETAIL
SCALE: 1/16" = 1'-0"
PLAN
(40'-0" CURB RADIUS SHOWN)

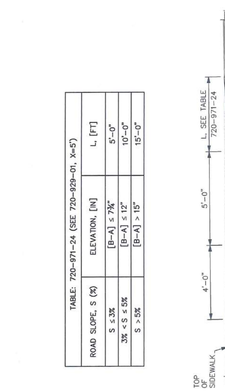
SECTION
SCALE: 1/2" = 1'-0"
ELEVATION AT RAMP

DETAIL
ISOMETRIC VIEW
20'-0" CURB RADIUS SHOWN
SEE 720-901-03 FOR SYMBOLS

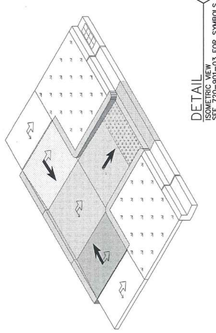
NOTES:
1. SEE STANDARD DRAWINGS 720-901-XX FOR GENERAL NOTES.
2. SEE STANDARD DRAWINGS 720-91X-XX FOR INSTALLATION PROCEDURES FOR DETECTABLE WARNING SURFACE MATERIALS.
3. SEE STANDARD DRAWINGS 720-929-XX FOR VARIANTS TO THIS STANDARD.
4. THE VALUES LISTED IN TABLE 720-971-24 ARE BASED ON A RAMP WITH A 3" DROP DUE TO THE USE OF A COMBINED RAMP.
5. CONSTRUCT RAMP PARTITION AT ALL LOCATIONS WHERE ROADWAY DRAINAGE COULD POTENTIALLY FLOW ONTO ADJACENT PROPERTY. RAMP PARTITION IS NEEDED TO RETAIN EXISTING GROUND ELEVATION ON ADJACENT PROPERTY.

TABLE: 720-971-24 (SEE 720-929-01, X=5')

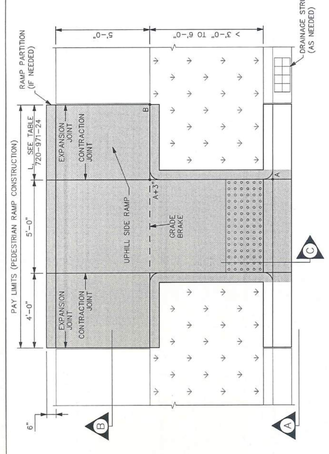
ROAD SLOPE, S (%)	ELEVATION, [H]	L [FT]
S ≤ 3%	[B-A] ≤ 3¾"	5'-0"
3% < S ≤ 5%	[B-A] ≤ 12"	10'-0"
S > 5%	[B-A] > 15"	15'-0"



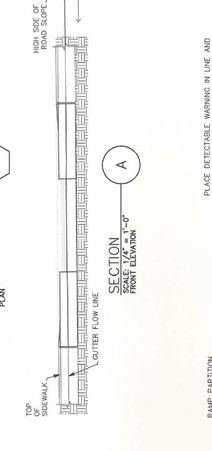
SECTION
SCALE: 1/4" = 1'-0"
RAMP & CURB SECTION



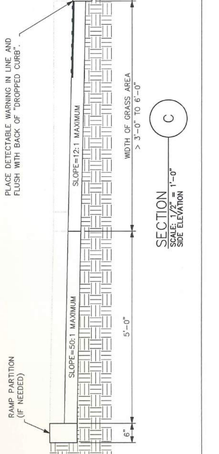
DETAIL
ISOMETRIC VIEW
SEE 720-901-03 FOR SYMBOLS



DETAIL
SCALE: 1/4" = 1'-0"
PLAN



SECTION
SCALE: 1/4" = 1'-0"
FRONT ELEVATION



SECTION
SCALE: 1/4" = 1'-0"
SIDE ELEVATION

REFERENCES
NATIONAL DOCUMENTS
REVISED DRAFT GUIDELINES FOR ACCESSIBLE PUBLIC RIGHTS-OF-WAY, NOVEMBER, 2005
MUTCD 2009
SCDOT DOCUMENTS
SCDOT TRANSITION PLAN
QPL 61
RELATED DRAWINGS & KEYWORDS
720-929-02

THIS DRAWING IS ONLY VALID FOR CONSTRUCTION WHEN SEALED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF SOUTH CAROLINA. CHECK WWW.SCDOT.ORG FOR LATEST UPDATE.

SOUTH CAROLINA PROFESSIONAL ENGINEER JAMES W. KENDALL NO. 21242 REGISTERED

SIGNATURE
12/8/2014 DATE

#	DATE	CHK	DESCRIPTION
5	----	----	----
4	----	----	----
3	----	----	----
2	----	----	----
1	10/14	JMG	ELEV. TO DETAIL "A"
0	1/13	DSO	REMOVED PAY ITEMS
			NEW DRAWING

SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING
PEDESTRIAN RAMP
3'-0" TO 6'-0"
GRASS STRIP
(COMBINED RAMP)

720-971-24
EFFECTIVE LETTING DATE: FEBRUARY, 2015

INFRASTRUCTURE CONSULTING & ENGINEERING

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 34113 BRANDON W. PAYNE

SOUTH CAROLINA INFRASTRUCTURE CONSULTING & ENGINEERING, LLC CERTIFICATE OF AUTHORIZATION No. 4470

REV.NO.	BY	DATE	DESCRIPTION OF REVISION
4			
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DESIGNED BY: RNT DATE 02/23/2024
DRAWN BY: RNT DATE 02/23/2024
CHECKED BY: JCH DATE 02/23/2024

TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
DETAIL SHEET

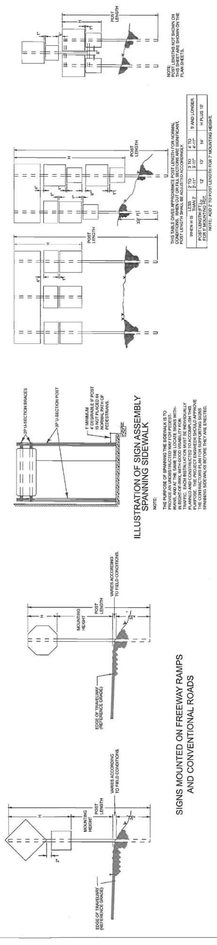
SCALE: NTS

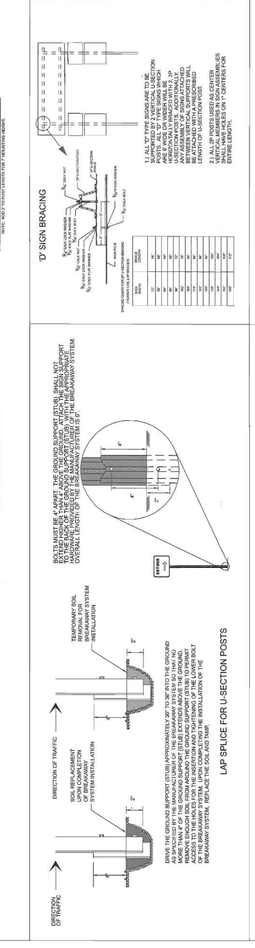
G:\PROJECTS\23-143 Bluffton ADA Improvements_D-DESIGN\Roadway\Dgn\Plan_Sheets\SHT_03C_Details.dgn
9/18/2024

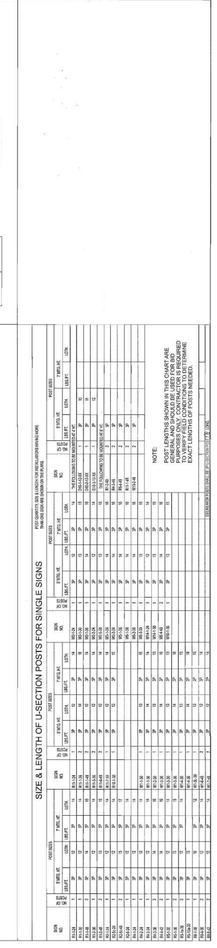
09/19/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	3D

FLAT SHEET SIGN MOUNTING DETAILS







REFERENCES

SIGNING AND MARKING ENGINEER
SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER 23845 MARK H. KNOTTINGHAM
SIGNATURE
2-11-08
DATE

#	DATE	DR.	DESCRIPTION
6			
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SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN MANUAL BUREAU OF TRAFFIC
955 PARK STREET
COLUMBIA, SC 29201

STANDARD DRAWING

FLAT SHEET MOUNTING DETAILS

651-110-00
EFFECTIVE (STD.) DATE: MAY 2008

INFRASTRUCTURE CONSULTING & ENGINEERING

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 34113 BRANDON W. PAYNE

SOUTH CAROLINA INFRASTRUCTURE CONSULTING & ENGINEERING, LLC No. 4470 CERTIFICATE OF AUTHORIZATION

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TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
DETAIL SHEET

SCALE: NTS

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9/18/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	4

GENERAL NOTES

1. PROJECT DESCRIPTION
CONSTRUCTION OF 19 SITES IN THE TOWN OF BLUFFTON TO IMPROVE EXISTING CONDITIONS OF PEDESTRIAN SIDEWALKS AND RAMPS.

2. UTILITIES
WATER VALVES AND SEWER MANHOLES SHALL BE ADJUSTED (RAISED OR LOWERED) TO MATCH THE SIDEWALK PROFILE AND SHALL NOT BE PARTIALLY LOCATED WITHIN THE SIDEWALK. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COORDINATION WITH UTILITY OWNERS TO PERFORM THE REQUIRED WORK. NO ADDITIONAL PAYMENT WILL BE MADE FOR ADJUSTING WATER VALVES OR SEWER MANHOLES. THIS WORK SHALL BE CONSIDERED INCIDENTAL AND INCLUDED IN THE UNIT COST OF CLEARING AND GRUBBING AND SHALL INCLUDE ALL WORKMANSHIP AND MATERIALS NECESSARY TO COMPLETE THIS ITEM.

THE LOCATIONS OF EXISTING UTILITIES SHOWN ON THE PLANS HAVE BEEN DETERMINED FROM AVAILABLE INFORMATION AND ARE PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE UTILITIES INFORMATION SHOWN ON THE DRAWINGS. IT IS THEREFORE THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM THAT THE PROPER COORDINATION WITH THE VARIOUS UTILITY OWNERS HAS BEEN PERFORMED.

THE CONTRACTOR SHALL COOPERATE WITH THE UTILITY OWNERS DURING RELOCATION OPERATIONS. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING AN UNDERGROUND UTILITY WHETHER SHOWN ON THE DRAWINGS OR LOCATED BY THE UTILITY COMPANY. COST OF DAMAGES TO ANY UTILITIES AS A RESULT OF CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

3. CLEARING & GRUBBING WITHIN ROADWAY
CLEARING & GRUBBING OPERATIONS WILL BE PERFORMED ONLY IN THE IMMEDIATE AREA NECESSARY FOR THE CONSTRUCTION OF THE SIDEWALK AND ALL WORK ASSOCIATED WITH THE PROJECT.

4. SIGNS
ALL EXISTING ROAD SIGNS AFFECTED BY CONSTRUCTION ACTIVITIES SHALL BE RETAINED, RELOCATED, OR REMOVED AS DIRECTED BY ENGINEER. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE LUMP SUM COST FOR CLEARING AND GRUBBING.

ALL NEW SIGNS SHALL BE 7 FEET IN HEIGHT FOR SIDEWALKS AND PLACED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND SCDOT STANDARD DRAWINGS. NEW 2P & 3P SIGN SUPPORTS REQUIRED FOR RELOCATED SIGNS WILL BE PAID PER LINEAR FOOT INSTALLED AND ACCEPTED.

5. TRAFFIC CONTROL
THE CONTRACTOR SHALL SUBMIT THE TRAFFIC CONTROL PLAN TO THE TOWN AND THE ENGINEER FOR APPROVAL BEFORE BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL FURNISH, INSTALL, AND MAINTAIN ALL NECESSARY PROVISIONS FOR TRAFFIC CONTROL FOR THE DURATION OF THE PROJECT. THESE PROVISIONS, AS IN EACH CASE IS APPLICABLE, WILL CONFORM TO THE REQUIREMENTS CONTAINED IN THE SCDOT STANDARD SPECIFICATIONS, STANDARD DRAWINGS, SUPPLEMENTAL SPECIFICATIONS, SPECIAL PROVISIONS, THE FEDERAL HIGHWAY ADMINISTRATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, AND AS DIRECTED BY THE ENGINEER. THE LUMP SUM COST FOR TRAFFIC CONTROL SHALL INCLUDE ALL WORK AS DIRECTED ABOVE. THIS LUMP SUM COST SHALL INCLUDE TEMPORARY CONSTRUCTION SIGNS, BARRICADES, DRUMS, CONES, LIGHTS, AND OTHER ITEMS AS REQUIRED TO COMPLETE THIS WORK.

SIDEWALK CLOSURES – WHERE SIDEWALKS ARE TO BE CLOSED, PROVIDE TYPE 2 BARRICADES AND "SIDEWALK CLOSED" SIGNS AT THE WORK ZONE AND TYPE 2 BARRICADES AND "SIDEWALK CLOSED AHEAD" SIGNS AT THE NEAREST INTERSECTIONS. FOR NIGHTTIME CLOSURES, TYPE A FLASHING WARNING LIGHTS SHALL BE USED ON BARRICADES THAT CLOSE SIDEWALKS.

6. PERMANENT CONSTRUCTION SIGNS
CONTRACTOR SHALL REFER TO SCDOT STD. DWG. 605-010-02 FOR PLACEMENT OF PERMANENT CONSTRUCTION SIGNS. ROAD SIGNS SHALL BE PAID FOR PER SQUARE FOOT INSTALLED AND ACCEPTED UNDER THE BID ITEM FOR PERMANENT CONSTRUCTION SIGNS.

CONTRACTOR SHALL REFER TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND SCDOT STANDARD DRAWINGS FOR PLACEMENT OF TEMPORARY TRAFFIC CONTROL SIGNS. THIS PROJECT REQUIRES THREE (3) R9-9 SIGNS. ALL SIGNS SHALL BE 7 FEET IN HEIGHT FOR SIDEWALKS. NEW 2P & 3P SIGN SUPPORTS REQUIRED FOR TEMPORARY SIGNS WILL BE PAID PER LINEAR FOOT INSTALLED AND ACCEPTED.

7. MAILBOXES
ALL EXISTING MAILBOXES SHALL REMAIN ACCESSIBLE FOR DELIVERY DURING CONSTRUCTION. IF RELOCATION IS NECESSARY, EITHER TEMPORARILY DURING CONSTRUCTION OR PERMANENTLY, THE TEMPORARY OR NEW PERMANENT LOCATION SHALL BE APPROVED BY THE ENGINEER AND THE U.S. POSTAL SERVICE. THIS WORK SHALL BE PAID FOR AS "RELOCATE MAILBOX" AND SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND INCIDENTALS NECESSARY TO RELOCATE EACH MAILBOX TO ITS FINAL LOCATION DURING OR AFTER CONSTRUCTION.

8. ALL WORKMANSHIP AND MATERIALS USED ON THIS PROJECT SHALL CONFORM TO THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2007 EDITION), SCDOT 2007 SUPPLEMENTAL SPECIFICATIONS, SCDOT SUPPLEMENTAL TECHNICAL SPECIFICATIONS AND SCDOT STANDARD DRAWINGS IN EFFECT AT THE TIME OF LETTING EXCEPT WHERE OTHERWISE NOTED THE PLANS.

9. ANY FIELD CHANGES WITHIN SCDOT RIGHT-OF-WAY OR CHANGES THAT WOULD IMPACT SCDOT RIGHT-OF-WAY WILL REQUIRE SCDOT APPROVAL PRIOR TO CHANGES BEING IMPLEMENTED IN THE FIELD.

10. SEDIMENT & EROSION CONTROL
IF NECESSARY, SLOPES, WHICH EXCEED EIGHT (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO HYDROSEEDING. IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.

STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED, EXCEPT AS STATED BELOW.

A) WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICAL.
B) WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH-DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 14 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.

ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED ONCE EVERY CALENDAR WEEK AND WITHIN 24-HOURS OF A STORM EVENT OF 0.5" OR GREATER. IF PERIODIC INSPECTION OR OTHER INFORMATION INDICATES THAT A BMP HAS BEEN INAPPROPRIATELY OR INCORRECTLY INSTALLED, THE PERMITTEE MUST ADDRESS THE NECESSARY REPLACEMENT OR MODIFICATION TO CORRECT THE BMP WITHIN 48 HOURS OF IDENTIFICATION.

PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED, AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION. FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.

ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED. ONLY SEDIMENT CONTROL DEVICES APPROVED BY SCDHEC AND THE TOWN OF BLUFFTON WILL BE ACCEPTABLE, SPECIFICALLY GRATED CATCH BASIN AND DROP INLETS SHALL NOT BE PROTECTED BY SIMPLY WRAPPING THE GRATE WITH FILTER FABRIC.

THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE THE TRACKING OF MUD ONTO PAVED ROADWAY(S) FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.

INDIVIDUAL PROPERTY OWNERS SHALL FOLLOW THESE PLANS DURING CONSTRUCTION OR OBTAIN APPROVAL OF AN INDIVIDUAL PLAN IN ACCORDANCE WITH S.C REG. 72-300 ET SEQ. AND SCR100000.

TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR TO DIVERT SEDIMENT-LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.

ALL WATERS OF THE STATE (WOS), INCLUDING WETLANDS, ARE TO BE FLAGGED OR OTHERWISE CLEARLY MARKED IN THE FIELD. A DOUBLE ROW OF SILT FENCE IS TO BE INSTALLED IN ALL AREAS WHERE A 50-FOOT BUFFER CANNOT BE MAINTAINED BETWEEN THE DISTURBED AREA AND ALL WOS. A 10-FOOT BUFFER SHOULD BE MAINTAINED BETWEEN THE LAST ROW OF SILT FENCE AND ALL WOS.

LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.

A COPY OF THE SWPPP, INSPECTION RECORDS, AND RAINFALL DATA MUST BE RETAINED AT THE CONSTRUCTION SITE OR A NEARBY LOCATION EASILY ACCESSIBLE DURING NORMAL BUSINESS HOURS, FROM THE DATE OF COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO THE DATE THAT FINAL STABILIZATION IS REACHED.

INITIATE STABILIZATION MEASURES ON ANY EXPOSED STEEP SLOPE (3H:1V OR GREATER) WHERE LAND-DISTURBING ACTIVITIES HAVE PERMANENTLY OR TEMPORARILY CEASED, AND WILL NOT RESUME FOR A PERIOD OF 7 CALENDAR DAYS.

MINIMIZE SOIL COMPACTION AND UNLESS INFEASIBLE, PRESERVE TOPSOIL.

MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER, AND OTHER WASH WATERS. WASH WATERS MUST BE TREATED IN A SEDIMENT BASIN OR ALTERNATIVE CONTROL THAT PROVIDES EQUIVALENT OR BETTER TREATMENT PRIOR TO DISCHARGE.

THE FOLLOWING DISCHARGES FROM SITES ARE PROHIBITED:
- WASTEWATER FROM WASHOUT OF CONCRETE, UNLESS MANAGED BY AN APPROPRIATE CONTROL;
- WASTEWATER FROM WASHOUT AND CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS;
- FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE; AND
- SOAPS OR SOLVENTS USED IN VEHICLE AND EQUIPMENT WASHING.

AFTER CONSTRUCTION ACTIVITIES BEGIN, INSPECTION MUST BE CONDUCTED AT A MINIMUM OF AT LEAST ONCE EVERY CALENDAR WEEK AND MUST BE CONDUCTED UNTIL FINAL STABILIZATION IS REACHED ON ALL AREAS OF THE CONSTRUCTION SITE.

IF EXISTING BMPS NEED TO BE MODIFIED OR IF ADDITIONAL BMPS ARE NECESSARY TO COMPLY WITH THE REQUIREMENTS OF THIS PERMIT AND/OR SC'S WATER QUALITY STANDARDS, IMPLEMENTATION MUST BE COMPLETED BEFORE THE NEXT STORM WATER EVENT WHENEVER PRACTICABLE. THE SITUATION MUST BE DOCUMENTED IN THE SWPPP AND ALTERNATIVE BMPS MUST BE IMPLEMENTED AS SOON AS REASONABLY POSSIBLE.

A PRE-CONSTRUCTION CONFERENCE MUST BE HELD FOR EACH CONSTRUCTION SITE WITH AN APPROVED ON-SITE SWPPP PRIOR TO THE IMPLEMENTATION OF CONSTRUCTION ACTIVITIES. FOR NON-LINEAR PROJECTS THAT DISTURB 10 ACRES OR MORE THIS CONFERENCE MUST BE HELD ON-SITE UNLESS THE DEPARTMENT HAS APPROVED OTHERWISE.

THE CONTRACTOR IS REQUIRED TO IDENTIFY AND MAINTAIN AN ON-SITE CONCRETE WASHDOWN AREA THAT MEETS ALL REQUIREMENTS / BMPS OF SCDHEC. APPROVED WASHOUT AREAS MAY INCLUDE SECTIONS OF SIDEWALK THAT HAVE BEEN FORMED AND THAT ARE LOCATED AHEAD OF THE CURRENT CONCRETE POUR. THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVAL OF CONCRETE REMNANTS AND PREPARING THE SUBGRADE IN THESE AREAS PRIOR TO PLACEMENT OF THE NEXT DAYS CONCRETE POUR.

SEQUENCE OF CONSTRUCTION

1. RECEIVE NPDES COVERAGE FROM DHEC
2. NOTIFY SCDHEC REGIONAL OFFICE, SCDOT AND BEAUFORT COUNTY 48 HOURS PRIOR TO ANY LAND DISTURBING ACTIVITIES.
3. CLEARING & GRUBBING ONLY AS NECESSARY FOR INSTALLATION OF PERIMETER CONTROLS (E.G. SILT FENCE).
4. INSTALLATION OF PERIMETER CONTROLS (E.G. SILT FENCE).
5. CLEARING AND GRUBBING OF SITE (SEDIMENT & EROSION CONTROL MEASURES FOR THESE AREAS MUST ALREADY BE INSTALLED).
6. STRIP TOP SOIL AND STOCKPILE FOR LATER USE ON SHOULDERS AND SLOPES PER SECTION 209 OF THE STANDARD SPECIFICATIONS. "ALL DISTURBED AREA [ANY AREA OF LAND THAT WILL BE DISTURBED DURING CONSTRUCTION, THAT INCLUDES CLEARING, GRUBBING, STOCK PILING, AND INSTALLATION OF ANY BMPS (SILT FENCE, SWALES, CHECK DAMS, ETC] MUST BE INCLUDED WITHIN THE LIMITS OF DISTURBANCE."
7. ROUGH GRADING
8. PERMANENT STABILIZATION
9. CONSTRUCT SIDEWALK
10. FINISH GRADING AND FINAL GRASSING AND LANDSCAPING
11. MAINTAIN ALL SEDIMENT AND EROSION CONTROL DEVICES FOR THE EXTENT OF THE PROJECT
12. REMOVAL OF SEDIMENT CONTROLS AFTER SITE HAS BEEN STABILIZED
13. FILE NOTICE OF TERMINATION

INFRASTRUCTURE CONSULTING & ENGINEERING

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 34113 BRANDON W. PAYNE

SOUTH CAROLINA INFRASTRUCTURE CONSULTING & ENGINEERING, LLC CERTIFICATE OF AUTHORIZATION No. 4470

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DESIGNED BY: RNT DATE 02/23/2024
DRAWN BY: RNT DATE 02/23/2024
CHECKED BY: JCH DATE 02/23/2024

TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
GENERAL NOTES

SCALE: NTS

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9/18/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	5

N

PLACE 1'x6' 2' OC WHITE 125 MIL THERMO CROSS WALK
REMOVE EXIST.CROSSWALK

SAWCUT & REMOVE 12 LF OF 6' RAMP PARTITION
REPLACE WITH 3' RADIUS 6' RAMP PARTITION
FILL GAPS WITH 4" CONC. SIDEWALK AS NECESSARY.
ADD 5-SQFT OF DETECTABLE WARNING SURFACE MATERIALS TO MATCH EXIST. PER SCDOT STD.DWGs.720-95I-II & 720-9II-0I

S-120 (BRUIN ROAD) (SCDOT)

PRESENT 25' R/W SCDOT Dkt. 7.426 Sheet 8

PRESENT 25' R/W SCDOT Dkt. 7.426 Sheet 8

10

15' UTILITY E'SMT. (SEE P.B./PG.: 112/133)

15' UTILITY E'SMT. (SEE P.B./PG.: 112/133)

EASEMENT EASEMENT EASEMENT EASEMENT EASEMENT EASEMENT EASEMENT EASEMENT EASEMENT EASEMENT EASEMENT EASEMENT EASEMENT

16" OAK

7" OAK

CRAPE MYRTLE CLUSTER

15" PINE

PLACE 11 LF of 24" WHITE THERMO (125 MIL) STOP BAR
REMOVE 11 LF EXIST. STOP BAR

WILD SPARTINA STREET (LOCAL)

DEDICATED 25' R/W PLAT BOOK 112 PAGE 133

DEDICATED 25' R/WPLAT BOOK 112 PAGE 133

4RBR W/ORANGE CAP

4RBR W/ORANGE CAP

DEDICATED 25' R/W
PLAT BOOK 112 PAGE 133

BLUE CRAB STREET (LOCAL)

j.bragg Consulting, Inc.
18 Daffodil Farm Way | Bluffton | SC 29910
(803) 513-3777

SOUTH CAROLINA J. BRAGG CONSULTING, INC. No. 5768 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 23872 SCOTT DAVID HILDEBRAND

9/18/2024

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DESIGNED BY: SDH DATE 2/7/2024
DRAWN BY: SDH DATE 2/7/2024
CHECKED BY: CH DATE XXXXXXXX

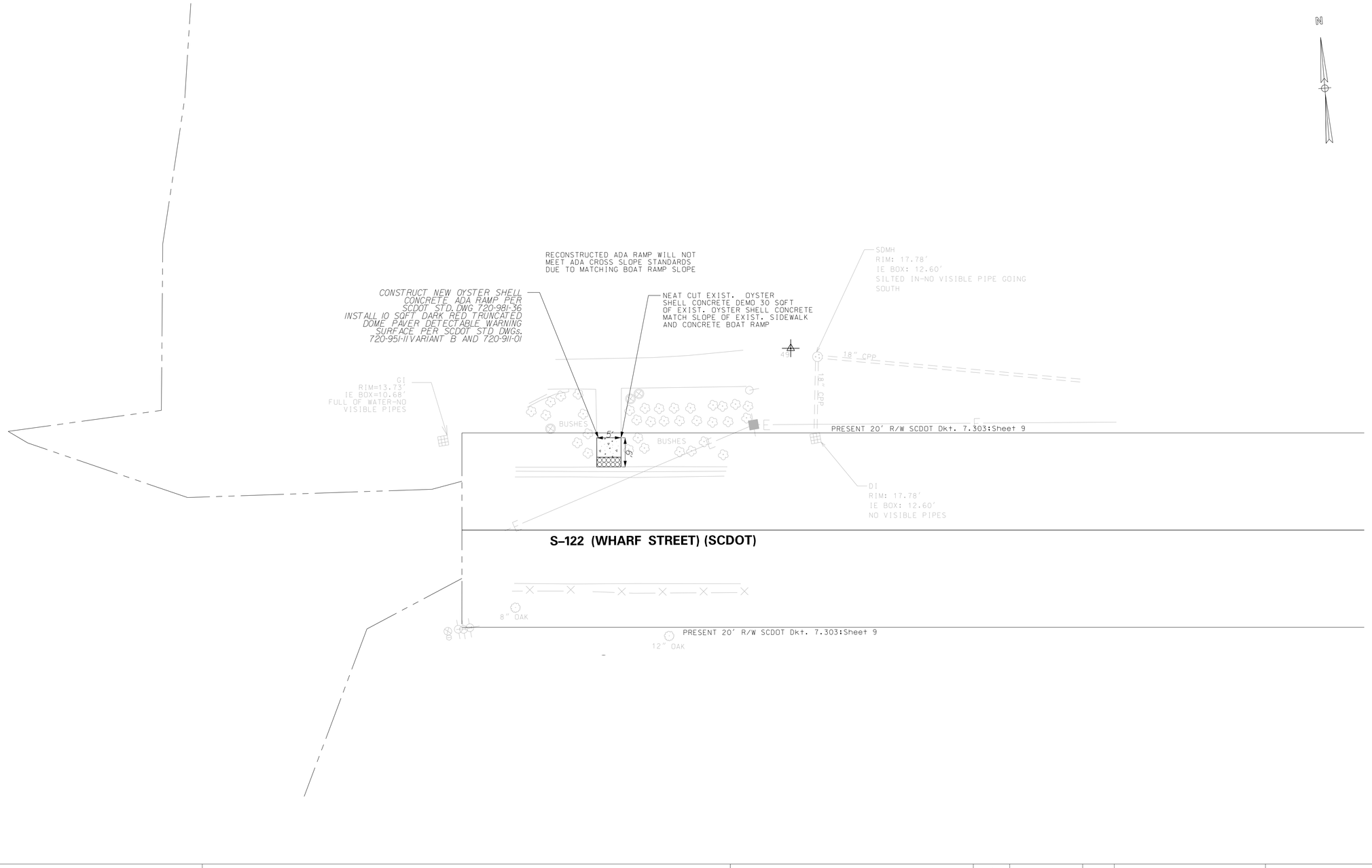
TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITE 7 SE CORNER OF
BRUIN RD AT WILD SPARTINA ST

SCALE: 1" = 10'

$$$$$$pathS$$$$$$$$filename$$$$$$$$
$$$$date$$$$

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	6



j.bragg Consulting, Inc.
18 Daffodil Farm Way | Bluffton | SC 29910
(803) 513-3777

SOUTH CAROLINA J. BRAGG CONSULTING, INC. No. 5768 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 23872 DAVID H. CEBERIO

9/18/2024

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TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITE 28
WARF STREET BOAT RAMP

SCALE: 1" = 10'

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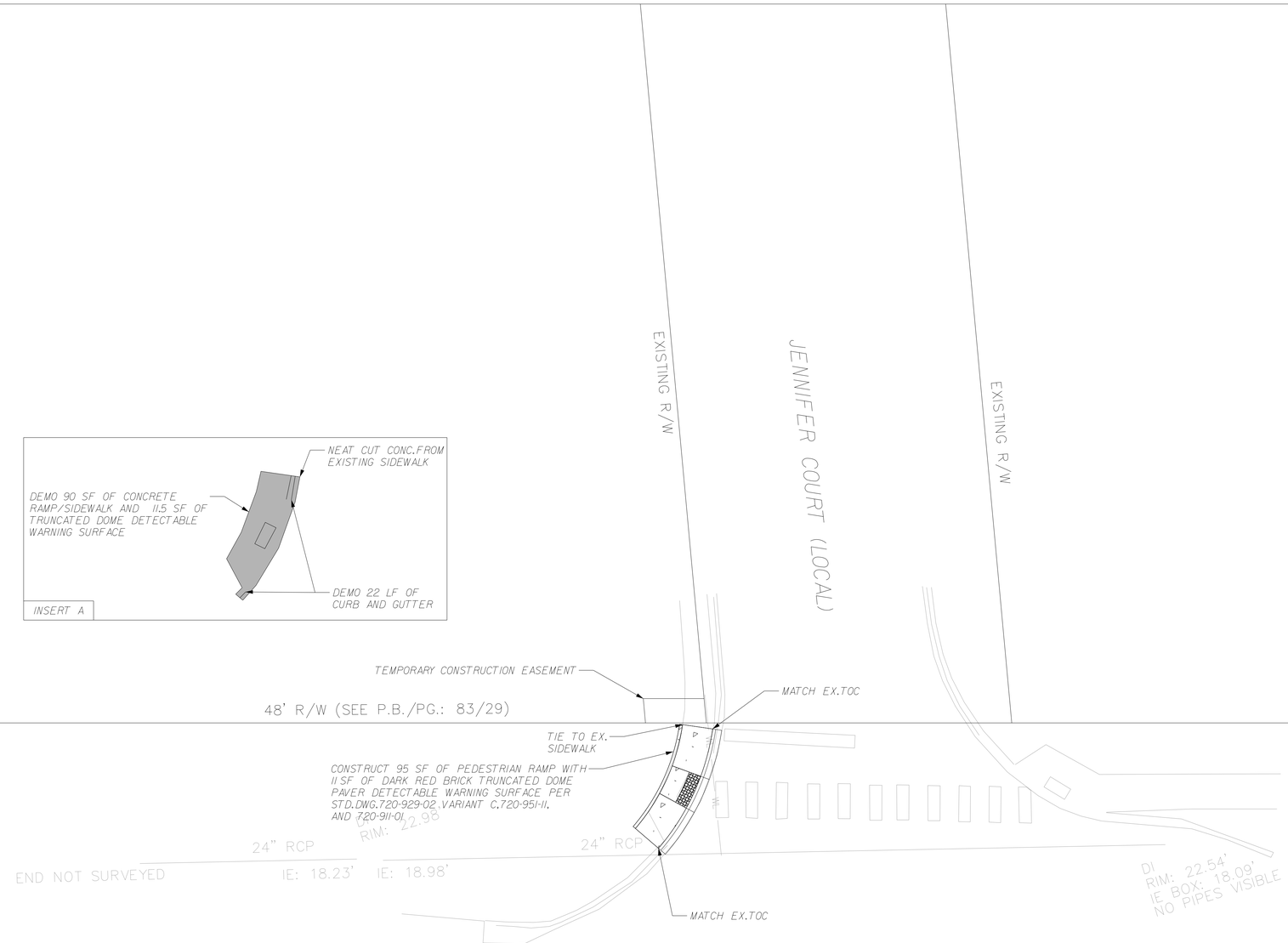
$$$date$$$$

09/19/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	7



INFRASTRUCTURE CONSULTING & ENGINEERING

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TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITE – 59 NW CORNER OF
MAY RIVER RD (SC 46) AND JENNIFER CT

SCALE: 1" = 10'

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9/18/2024

09/19/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	8

EXISTING R/W

EXISTING R/W

MAY RIVER ROAD (SC 46)(SCDOT)

EXISTING R/W

EXISTING R/W

THOMAS HEYWARD STREET (LOCAL)

EXISTING R/W

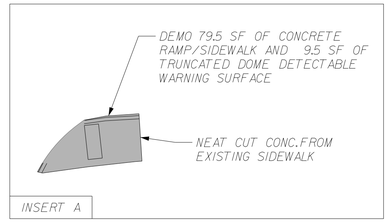
EXISTING R/W

-N-

MATCH EX.TOC

TIE TO EX. SIDEWALK

CONSTRUCT 80 SF OF PEDESTRIAN RAMP WITH 15 SF OF DARK RED BRICK TRUNCATED DOME PAVER DETECTABLE WARNING SURFACE PER STD.DWG.720-952-11 AND 720-911-01



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9/18/2024

INFRASTRUCTURE CONSULTING & ENGINEERING

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 34113 BRANDON W. PAYNE

SOUTH CAROLINA INFRASTRUCTURE CONSULTING & ENGINEERING, LLC CERTIFICATE OF AUTHORIZATION No. 4470

REV.NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

DESIGNED BY: RNT DATE 02/23/2024
DRAWN BY: RNT DATE 02/23/2024
CHECKED BY: JCH DATE 02/23/2024

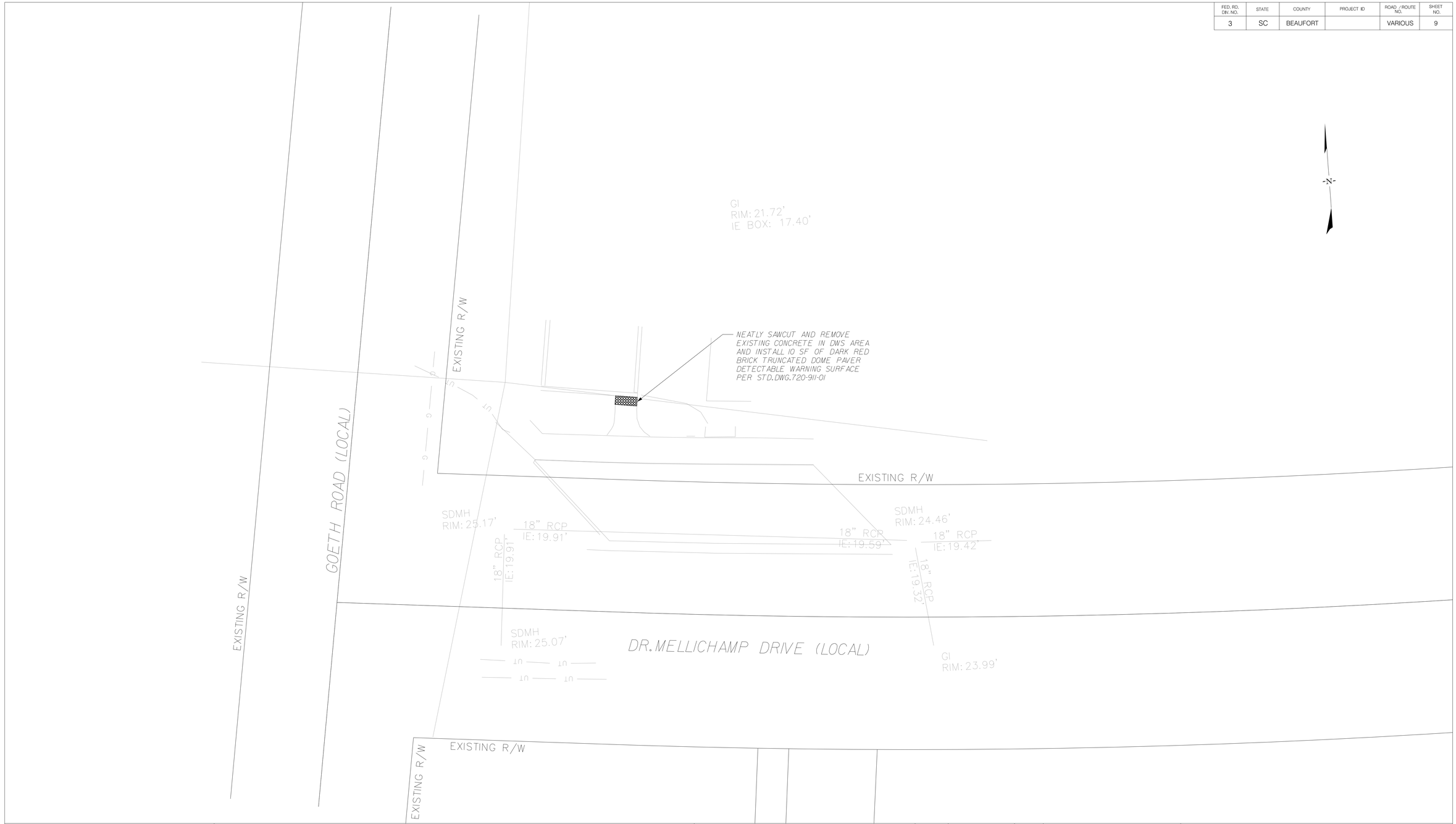
TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITE 69 – SE CORNER OF
MAY RIVER RD (SC 46) AND THOMAS HEYWARD ST

SCALE: 1" = 10'

09/19/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	9



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TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITE 85
DR. MELLICHAMP DR AT MC RILEY PARK PARKING

SCALE: 1" = 10'

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9/18/2024

09/19/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	10

CONTROL POINT 1
#5 RBR w/ALUM CSE CAP
SCSP COORDINATES
NORTHING: 147,951.52
EASTING: 2,043,124.29
ELEV: 24.43' NAVD 88

DR. MELLICHAMP DRIVE (LOCAL)

EXISTING R/W

EXISTING R/W

EXISTING R/W

BLUFFTON ROAD (SC 46)

EXISTING R/W

EXISTING R/W

MATCH EX.TOC

MATCH EX.TOC

CONSTRUCT 85 SF OF OYSTER SHELL PEDESTRIAN RAMP WITH 16 SF OF DARK RED BRICK TRUNCATED DOME PAVER DETECTABLE WARNING SURFACE PER STD.DWG.720-929-02 VARIANT C. 720-951-11. AND 720-911-01

DEMO 85 SF OF OYSTER SHELL RAMP/SIDEWALK AND 7.5 SF OF TRUNCATED DOME DETECTABLE WARNING SURFACE

NEAT CUT CONC. FROM EXISTING SIDEWALK

INSERT A

G:\PROJECTS\23-143 Bluffton ADA Improvements_D-DESIGN\Roadway\Dgn\Plan_Sheets\Site 96.dgn
9/18/2024

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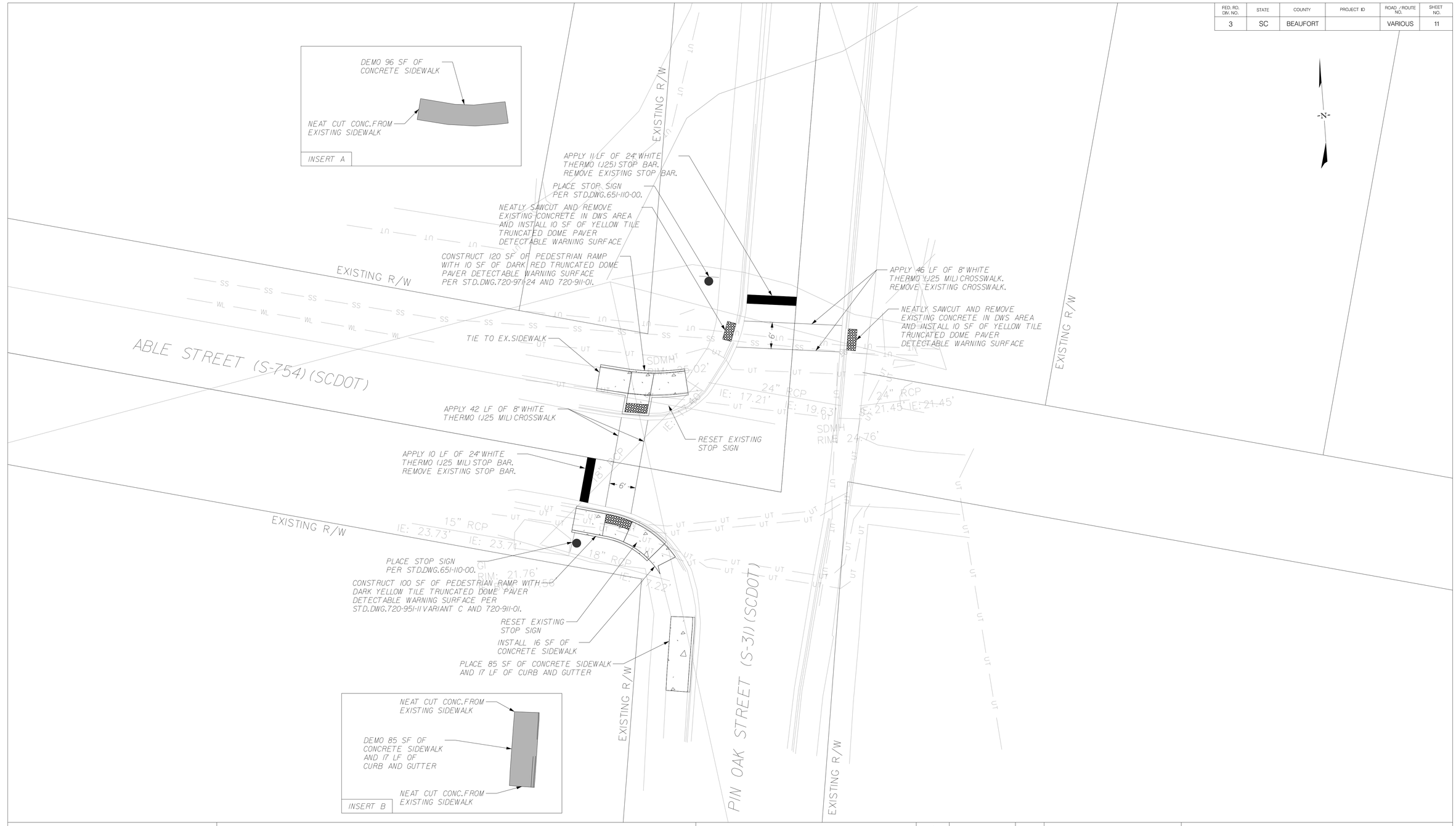
TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITE 96 – SW CORNER OF
DR. MELLICHAMP DR AND BLUFFTON RD

SCALE: 1" = 10'

09/19/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	11



G:\PROJECTS\23-143 Bluffton ADA Improvements_D-DESIGN\Roadway\Dgn\Plan_Sheets\Site 123,125,126.dgn
9/18/2024

INFRASTRUCTURE CONSULTING & ENGINEERING

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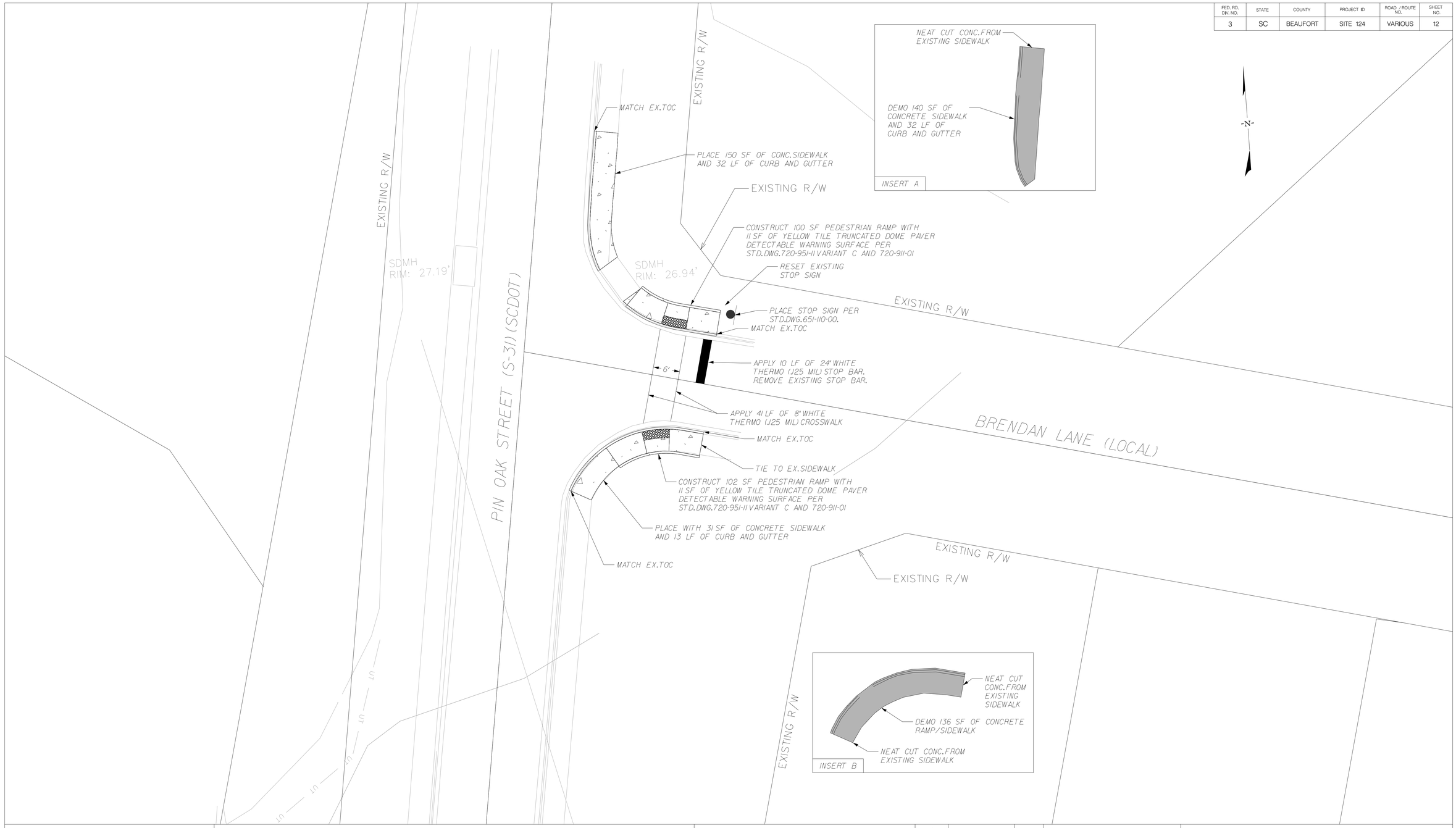
TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITES 123, 125, AND 126
PIN OAK ST (S-31) AT ABLE ST (S-754)

SCALE: 1" = 10'

09/19/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT	SITE 124	VARIOUS	12



INFRASTRUCTURE CONSULTING & ENGINEERING

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 34113 BRANDON W. PAINE

SOUTH CAROLINA INFRASTRUCTURE CONSULTING & ENGINEERING, LLC CERTIFICATE OF AUTHORIZATION No. 4470

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DESIGNED BY: RNT DATE 02232024
DRAWN BY: RNT DATE 02232024
CHECKED BY: JCH DATE 02232024

TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITE 124 – SE CORNER OF
PIN OAK ST (S-31) AND BRENDAN LN

SCALE: 1" = 10'

C:\PROJECTS\23-143 Bluffton ADA Improvements_D-DESIGN\Roadway\Dgn\Plan_Sheets\Site 124.dgn
9/18/2024

09/19/2024

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	13

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9/18/2024

INFRASTRUCTURE CONSULTING & ENGINEERING

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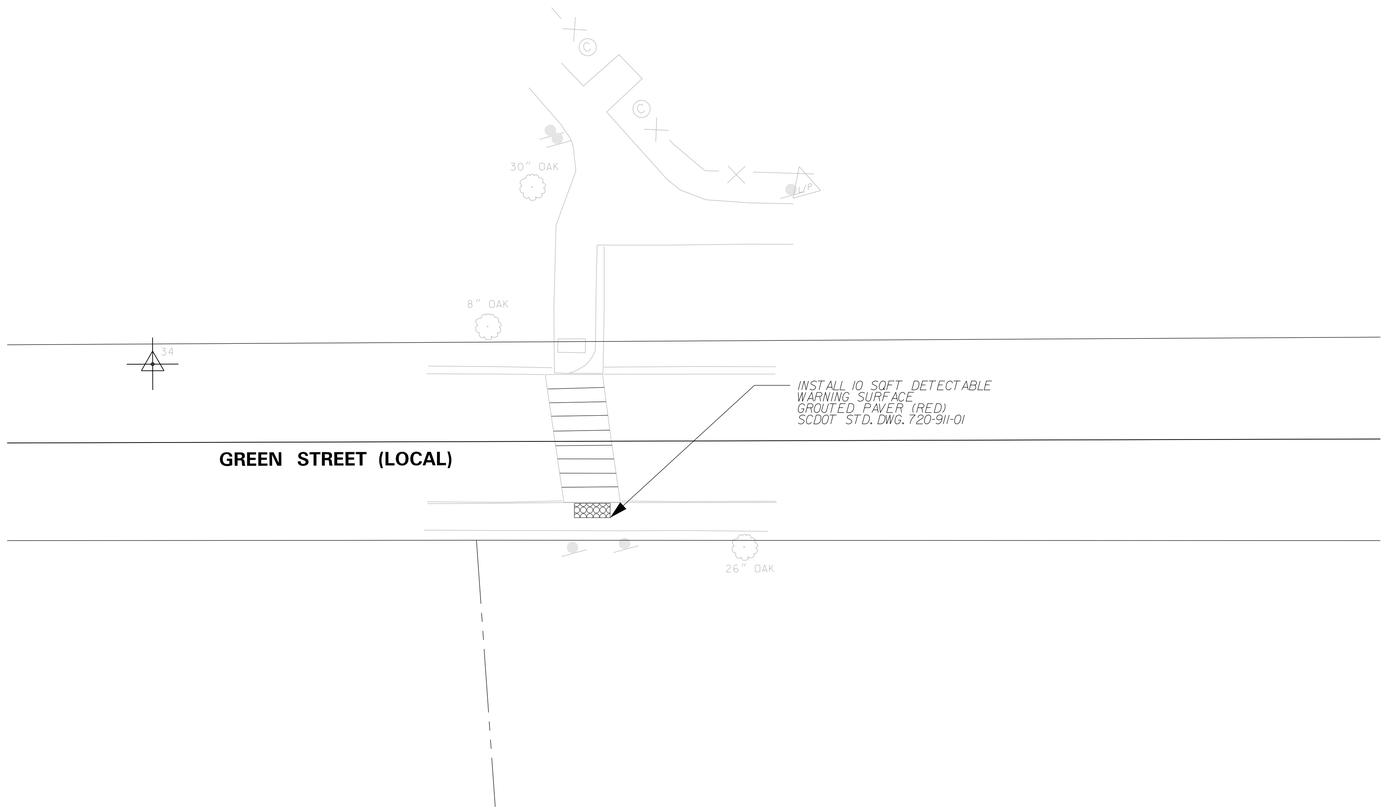
TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITE 131 – SW CORNER OF
THOMAS HEYWARD ST AND MERIWETHER CT

SCALE: 1" = 10'

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	14



j.bragg Consulting, Inc.
18 Daffodil Farm Way | Bluffton | SC 29910
(803) 513-3777

SOUTH CAROLINA J. BRAGG CONSULTING, INC. No. 5768 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 23872 SCOTT DAVID HILDEBRAND

9/18/2024

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DESIGNED BY: SDH DATE 2/7/2024
DRAWN BY: SDH DATE 2/7/2024
CHECKED BY: CH DATE XXXXXXXX

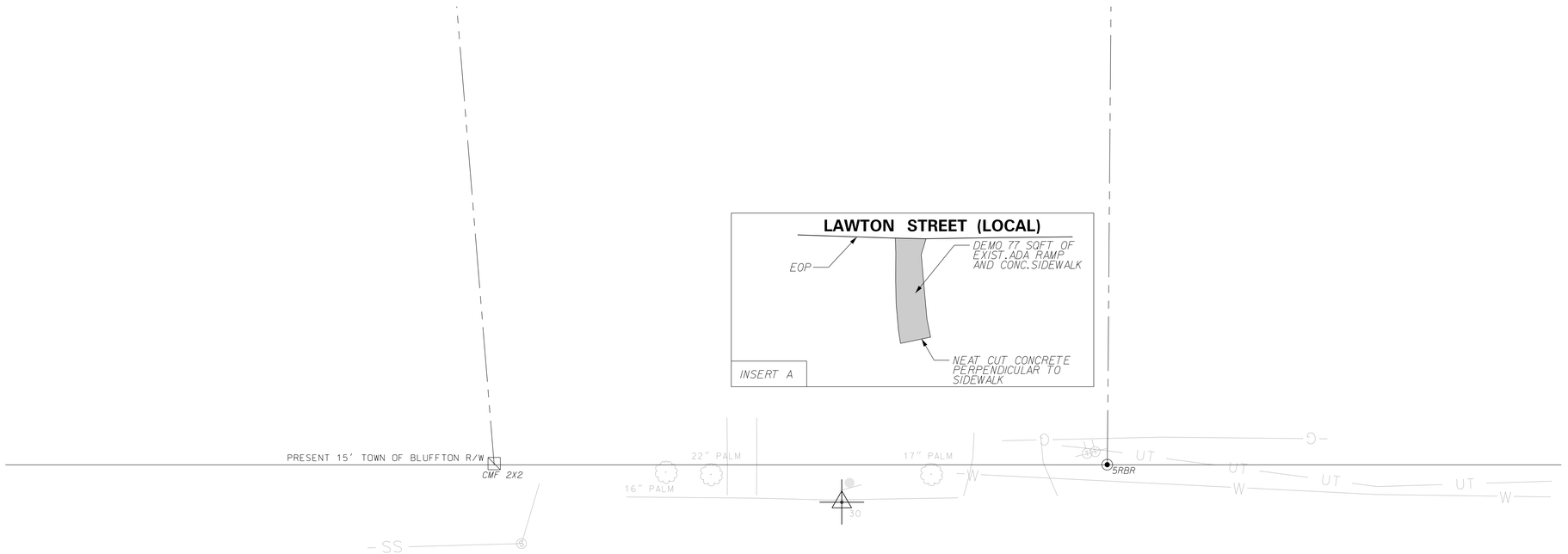
TOWN OF BLUFFTON

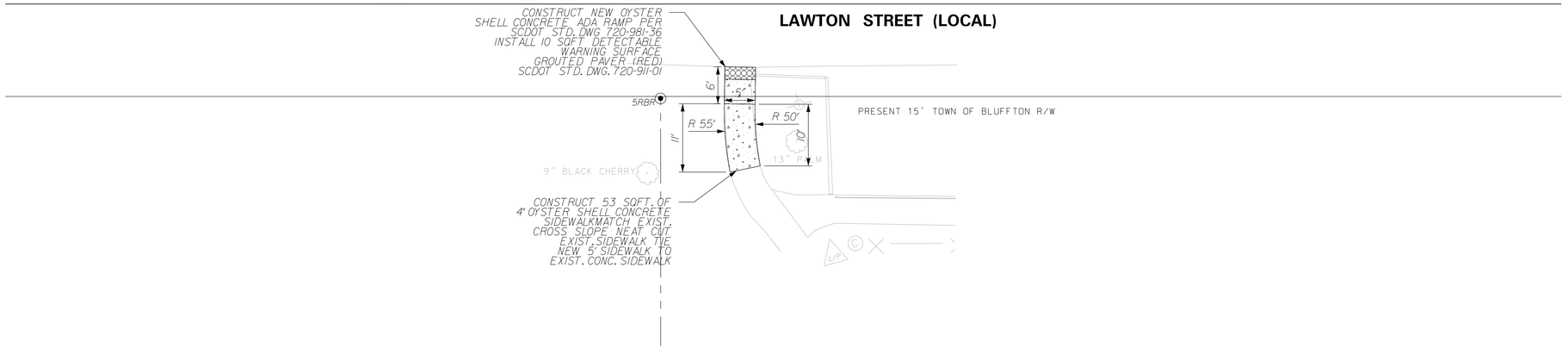
PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITE 169 SOUTH SIDE OF
GREEN ST AT MID BLOCK DUBOIS PARK

SCALE: 1" = 10'

$$$$$$$path$$$$$$$filename$$$$$$$
$$$$date$$$$

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	15





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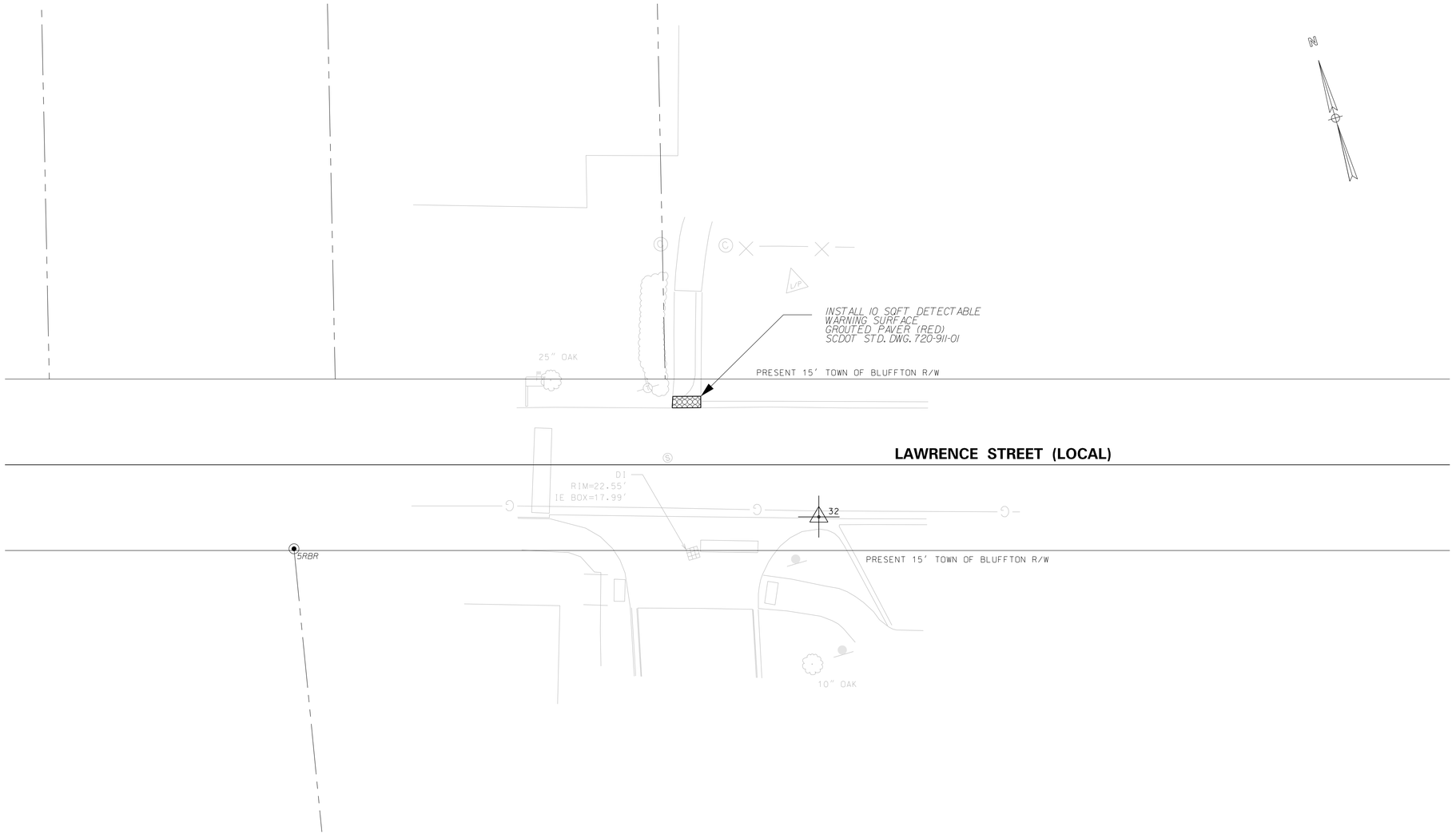
BEAUFORT COUNTY

ADA IMPROVEMENTS
SITE 176 SOUTH SIDE OF
LAWTON ST AT MID BLOCK DUBOIS PARK

SCALE: 1" = 10'

$$$$$$path$$$$$$$$filename$$$$$$$$
$$$$date$$$$

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	16



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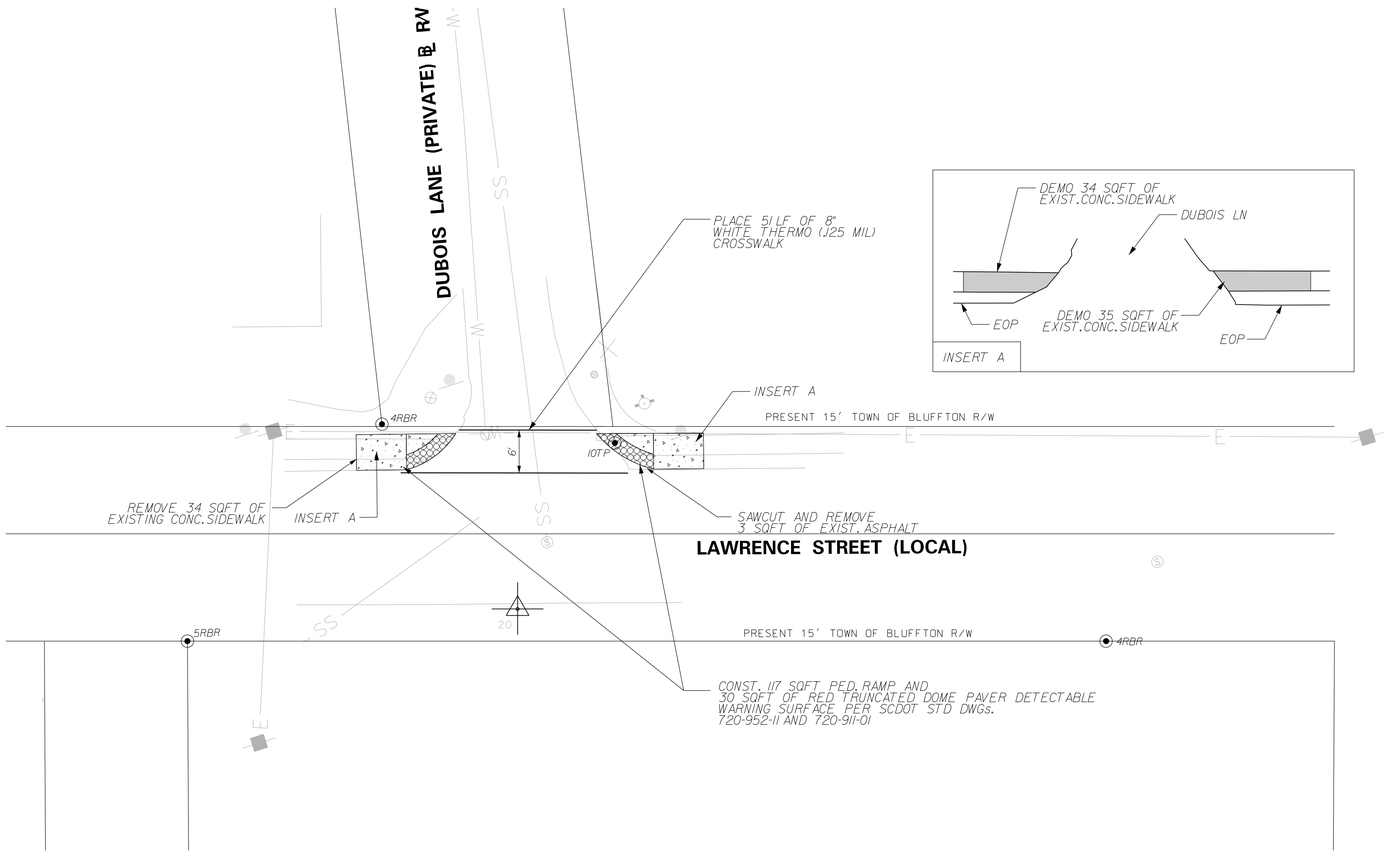
TOWN OF BLUFFTON

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITE 178 N SIDE OF
LAWRENCE ST AT MID BLOCK DUBOIS PARK

SCALE: 1" = 10'

$$$$$$$path$$$$$$$$filename$$$$$$$$
$$$$date$$$$

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	17



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CHECKED BY: CH DATE XXXXXXXX

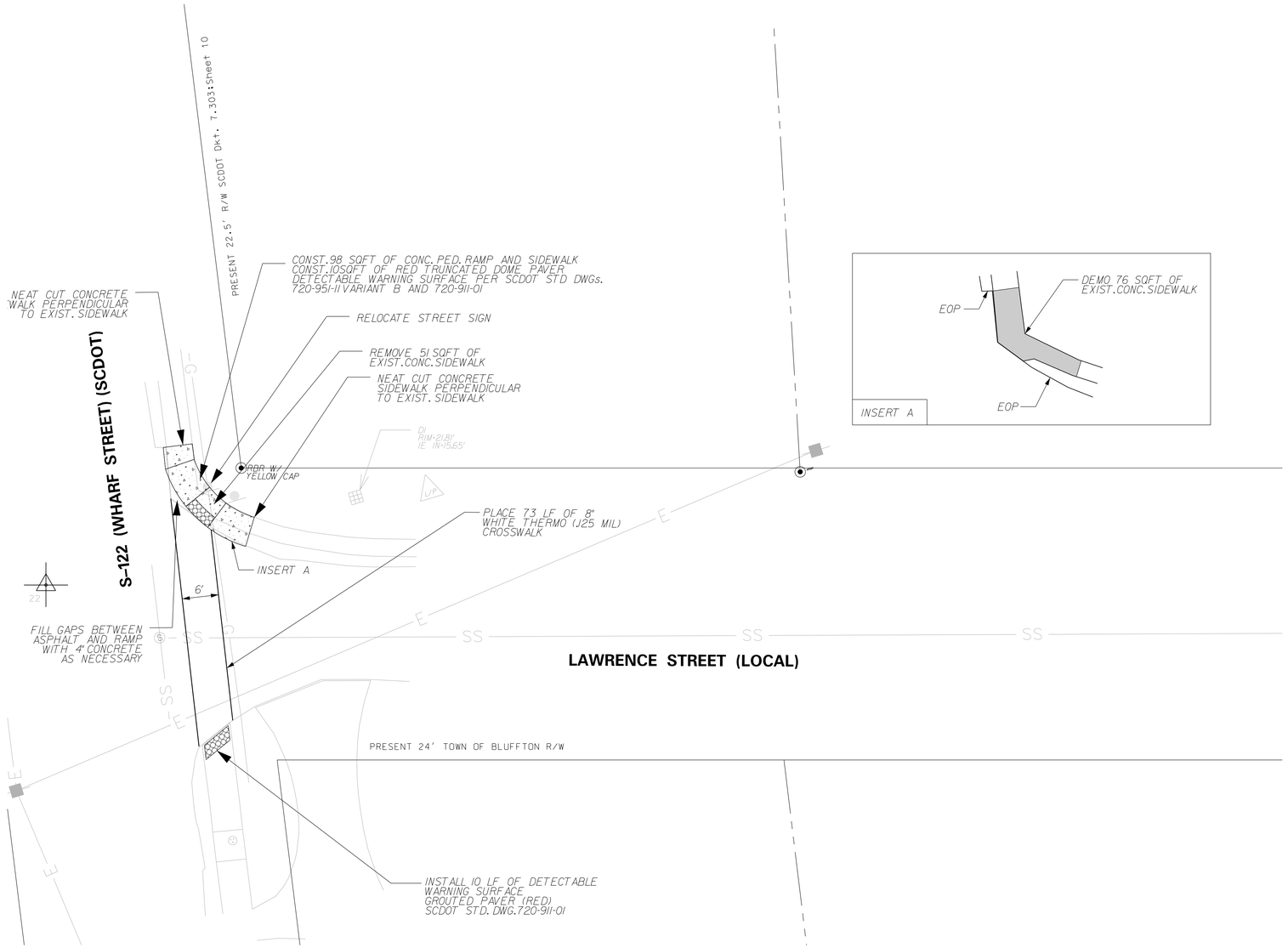
BEAUFORT COUNTY

PATHWAY PEDESTRIAN SAFETY IMPROVEMENTS
SITES 184 & 185 NE AND NW CORNER OF
LAWRENCE ST AT DUBOIS LN

SCALE: 1" = 10'

$$$$$$path$$$$$$$$filename$$$$$$$$
$$$$date$$$$

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD. / ROUTE NO.	SHEET NO.
3	SC	BEAUFORT		VARIOUS	18



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TOWN OF BLUFFTON

ADA IMPROVEMENTS
SITES 186 & 187 NE AND SE CORNER OF WHARF ST AT LAWRENCE ST

SCALE: 1" = 10'

$$$$$$$path$$$$$$$filename$$$$$$$
$$$$date$$$$