

**BIDDING DOCUMENTS,  
CONTRACT DOCUMENTS  
& SPECIFICATIONS**

**LOCAL DRAINAGE IMPROVEMENTS: LEE AVENUE, REED  
DRIVE, & CEDAR STREET**

**TOWN OF EMERALD ISLE, NORTH CAROLINA**

October 2022

Prepared for:  
**TOWN OF EMERALD ISLE**



Prepared by:  
**Moffatt & Nichol Engineers**



4700 Falls of Neuse Road, Suite 300  
Raleigh, NC 27609

**TABLE OF CONTENTS**

Title Page  
Table of Contents

**BIDDING DOCUMENTS**

00100 Notice to Bidders  
00200 Instructions to Bidders  
00410 Bid Form  
00430 Bid Bond  
00440 Non-collusion Affidavit  
00450 List of Subcontractors  
00470 Identification of Minority Business Participation  
00471 State of North Carolina Affidavit A – Listing of Good Faith Efforts  
00472 State of North Carolina Affidavit B – Intent to Perform Contract with Own  
Workforce  
00473 State of North Carolina Affidavit C – Portion of Work to Be Performed By  
Minority Firms  
00474 State of North Carolina Affidavit D – Good Faith Efforts  
00480 Sheet for Attaching Insurance Certificates  
00490 Certificate of Town of Emerald Isle Attorney  
00500 Federal Funding Provisions

**CONTRACT DOCUMENTS**

00520 Sample Standard Form of Agreement Between Owner and Contractor  
00610 Sample Performance Bond Form  
00615 Sample Payment Bond Form  
00700 General Conditions

**TECHNICAL SPECIFICATIONS**

# NOTICE TO BIDDERS

Sealed proposals will be received by the Town of Emerald Isle (Owner), at the Town of Emerald Isle Administration Building Conference Room located at 7509 Emerald Drive, Emerald Isle, NC 28594, until **3:00** pm, local time **November 2, 2022** and immediately thereafter publicly opened and read for the furnishing of labor, material and equipment entering into the construction of the:

## Local Drainage Improvements: Lee Avenue, Reed Drive, & Cedar Street

Bids will be received for single prime only. All proposals shall be lump sum. Per North Carolina law, if less than three bids are received the project will be advertised for one additional week until bids are opened.

### \*\*\*Pre-Bid Meeting\*\*\*

An open non-mandatory pre-bid meeting will be held for all interested bidders and vendors at **2:00 pm** local time on **October 24, 2022** at the **Town of Emerald Isle Administration Building Conference Room** located at 7500 Emerald Drive, Emerald Isle, NC. The meeting will address project specific questions, issues and bidding procedures. A call-in number for this pre-bid meeting will be provided to those who request it from the Engineer. Concerns and or questions should be related in writing to the Engineer no later than **5:00 pm EDT** on **October 26, 2022**.

*Project description:* The Work includes the provision of labor, materials, equipment, and services required to complete the Local Drainage Improvements: Lee Avenue, Reed Drive, and Cedar Street as described in the Bidding Documents, Contract Documents, plans and specifications. The work generally consists of the following:

1. Replacement of existing 43"x64" arch culvert on Lee Avenue including installing new headwalls and pavement repairs
2. Installation of French drain system, storm drain pipe, pump lift station, and forcemain on Reed Drive
3. Completion of three minor drainage projects on Cedar Street including a driveway berm, bioretention cell, and overflow pipe
4. Notice of Award is expected to be issued on or before November 9, 2022, and a Notice to Proceed is expected to be issued by November 30, 2022
5. Substantial Completion of all projects is to be completed by March 30, 2023

The project Engineer is Moffatt & Nichol, Raleigh, North Carolina. Complete plans, specifications and contract documents may be obtained from Moffatt & Nichol, 4700 Falls of Neuse Road, Suite 300, Raleigh, NC 27609 for a nonrefundable fee of \$100. The documents will also be available for inspection at the following locations:

- In the Engineer's office at 4700 Falls of Neuse Road, Suite 300, Raleigh, NC 27609;
- in the Emerald Isle Administration Building at 7509 Emerald Drive, Emerald Isle, NC 28594;

In addition to above, the Engineer will provide a secure FTP Site with the documents available for download to those bidders which supply the Engineer with an email address.

With request for Bidding Documents, please supply the following information:

- Company name and contact person

- Street address and mailing address for the bidding office, if different
- Phone and fax numbers for the bidding office
- Email Address for Contact Person

Each proposal shall be accompanied by a cash deposit or a certified check drawn on some bank or trust company, insured by the Federal Deposit Insurance Corporation, of an amount equal to or not less than five percent (5%) of the proposal, or in lieu thereof a bidder may offer a bid bond of five percent (5%) of the bid executed by a surety company licensed under the laws of North Carolina to execute the contract in accordance with the bid bond. Said deposit shall be retained by the owner as liquidated damages in event of failure of the successful bidder to execute the contract within 15 days after the award or to give satisfactory surety as required by law.

All Bidders are hereby notified that they must have proper North Carolina license as required under the state laws governing their respective trades. Bidders will be required to show evidence that they are licensed to perform the work as required by North Carolina General Statutes, Chapter 87, and by the Instructions to Bidders, or covenant to obtain such qualifications prior to award of the contract.

Bidders are encouraged to examine the project sites prior to bidding. Engineer will transmit to Bidding Document holders of record such Addenda and explanations as Engineer considers necessary in response to written questions. Oral statements may not be relied upon and will not be binding or legally effective.

The Town is an Equal Opportunity Employer and does not discriminate. Small, minority, and woman-owned business and labor-surplus-area firms are encouraged to submit bids.

This bid is subject to Federal Funding requirements.

The Town reserves the right to reject any or all bids and to award a contract to the bidder they deem to be in the best interest of the Town. The bidder to whom the contract may be awarded must comply with the requirements of the N.C. General Statutes, Section 143-129 as amended.

A performance bond and a payment bond will be required for one hundred percent (100%) of the contract price.

Bids may be held by the Town for a period not to exceed thirty (30) days from the date of bid opening.

Engineer: Moffatt & Nichol  
4700 Falls of Neuse Road  
Suite 300  
Raleigh, NC 27609  
(919) 781-4626

Owner: Town of Emerald Isle  
7509 Emerald Drive  
Emerald Isle, NC 28594-2917  
(252) 354-3424

# INSTRUCTIONS TO BIDDERS

## TABLE OF CONTENTS

	<b>Page</b>
Article 1 – Defined Terms.....	1
Article 2 – Copies of Bidding Documents.....	1
Article 3 – Qualifications of Bidders .....	1
Article 4 – Examination of Bidding Documents, Other Related Data, and Site .....	2
Article 5 – Pre-Bid Conference.....	4
Article 6 – Site and Other Areas .....	4
Article 7 – Interpretations and Addenda.....	5
Article 8 – Bid Security .....	5
Article 9 – Contract Times .....	5
Article 10 – Liquidated Damages .....	5
Article 11 – Substitute and “Or-Equal” Items .....	5
Article 12 – Subcontractors, Suppliers and Others.....	6
Article 13 – Preparation of Bid .....	6
Article 14 – Basis of Bid; Comparison of Bids .....	7
Article 15 – Submittal of Bid.....	8
Article 16 – Modification and Withdrawal of Bid .....	8
Article 17 – Opening of Bids .....	9
Article 18 – Bids to Remain Subject to Acceptance .....	9
Article 19 – Evaluation of Bids and Award of Contract .....	10
Article 20 – Contract Security and Insurance.....	10
Article 21 – Signing of Agreement.....	10

## **ARTICLE 1 – DEFINED TERMS**

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Owner* – Owner is defined as the Town of Emerald Isle, a North Carolina municipality.
  - B. *Engineer* – Engineer is Moffatt & Nichol, Inc., of Raleigh, North Carolina.
  - C. *Bidder* – The individual or entity who submits a Bid directly to Owner.
  - D. *Successful Bidder* – The lowest responsible Bidder submitting a responsive Bid to whom Owner (on the basis of Owner’s evaluation as hereinafter provided) makes an award.
  - E. *Issuing Office* – The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

## **ARTICLE 2 – COPIES OF BIDDING DOCUMENTS**

- 2.01 Complete sets of the Bidding Documents in the number and for the purchase sum, if any, stated in the advertisement or invitation to bid may be obtained from the Issuing Office.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

## **ARTICLE 3 – QUALIFICATIONS OF BIDDERS**

- 3.01 To demonstrate Bidder’s qualifications to perform the Work, within five (5) days of Owner’s request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for below.
- A. Each bid must contain evidence of Bidder’s qualifications to do business in the state of North Carolina or covenant to obtain such qualifications prior to award of the contract.
- 3.02 Contractors or Subcontractors performing work or providing services under this contract shall comply with all current applicable standards of the North Carolina Department of Labor, Division of Occupational Safety and Health. Bidder must be prepared to submit within five (5) days of Engineer’s request, documentation related to the Bidder’s compliance with the current standards promulgated by the North Carolina Department of Labor, Division of Occupational Safety and Health that are applicable to the Work. At the request of the Engineer, Bidder shall submit the following:
- A. OSHA 200 Log results for the past five years;

- B. OSHA Citations, if any, for the past five years;
- C. Experience Modifications Factors (Worker's Compensation) for the past three years;
- D. Written Safety Program, including documentation of training;
- E. Contractor's written drug use and alcohol misuse prevention program; and
- F. Current Coast Guard ocean certification of each dredge listed in the Equipment List.

3.03 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

#### **ARTICLE 4 – EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE**

##### 4.01 *Subsurface and Physical Conditions*

- A. The Supplementary Conditions identify:
  - 1. Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Bidding Documents.
  - 2. Those drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that Engineer has used in preparing the Bidding Documents.
- B. Copies of reports and drawings referenced in Paragraph 4.01.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.02 of the General Conditions has been identified and established in Paragraph 4.02 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

##### 4.02 *Underground Facilities*

- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

##### 4.03 *Hazardous Environmental Condition*

- A. Owner is not aware of any Hazardous Environmental Conditions. However, no surveys have been performed to search for such conditions.

- 4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 4.06 of the General Conditions.
- 4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.
- 4.06 Reference is made to Article 7 of the General Conditions for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of contract documents (other than portions thereof related to price) for such other work.
- 4.07 Paragraph 6.13.C of the General Conditions indicates that if an Owner safety program exists, it will be noted in the Supplementary Conditions.
- 4.08 It is the responsibility of each Bidder before submitting a Bid to:
- A. examine and carefully study the Bidding Documents, including any Addenda and the other related data identified in the Bidding Documents;
  - B. become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
  - C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;
  - D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Paragraph 4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in the Paragraph 4.06 of the Supplementary Conditions as containing reliable "technical data";
  - E. consider the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in

the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs;

- F. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and
- I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

4.09 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

#### **ARTICLE 5 – PRE-BID CONFERENCE**

5.01 A pre-Bid conference will be held at 2:00 p.m. local time on October 24, 2022 at Town of Emerald Isle Administrative Building Conference Room, 7500 Emerald Drive, Emerald Isle, NC 28594. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference, but it is not mandatory. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

#### **ARTICLE 6 – SITE AND OTHER AREAS**

6.01 The Site is identified in the Bidding Documents. Owner is the property owner of the identified access and staging areas, and no easements for permanent structures or permanent changes in existing facilities are applicable. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be

incorporated in the Work are to be obtained and paid for by Contractor. Easements for permanent structures or permanent changes in existing facilities are not applicable. (Owner is the property owner or has received permission from the property owner of the staging areas. Other areas in the project do not have permanent structures).

## **ARTICLE 7 – BID SECURITY**

- 7.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price and in the form of a certified check, bank money order, or a Bid bond (on the form attached) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.
- 7.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Agreement or 30 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.
- 7.03 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within 14 days after the Bid opening.

## **ARTICLE 8 – CONTRACT TIMES**

- 8.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment are set forth in the Agreement.

## **ARTICLE 9 – LIQUIDATED DAMAGES**

- 9.01 Provisions for liquidated damages are set forth in the Form of Agreement.

## **ARTICLE 10 – SUBSTITUTE AND “OR-EQUAL” ITEMS**

- 10.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or “or-equal” items. Whenever it is specified or described in the Bidding Documents that a substitute or “or-equal” item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement.

## **ARTICLE 11 – SUBCONTRACTORS, SUPPLIERS AND OTHERS**

- 11.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the

Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five (5) days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, in which case apparent Successful Bidder shall submit an acceptable substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award. Please see Paragraph 6.06 of the Supplementary Conditions for instructions concerning Minority Business Participation.

11.02 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.

11.03 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

## **ARTICLE 12 – PREPARATION OF BID**

12.01 The Bid Form is included with the Bidding Documents. Additional copies may be obtained from Engineer.

12.02 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each Bid item and adjustment unit price items listed therein. In the case of optional alternatives, the words "No Bid," "No Change," or "Not Applicable" may be entered.

12.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.

12.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.

12.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.

- 12.06 A Bid by an individual shall show the Bidder's name and official address.
- 12.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 12.08 All names shall be printed in ink below the signatures.
- 12.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 12.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state of North Carolina, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

### **ARTICLE 13 – BASIS OF BID; COMPARISON OF BIDS**

#### *13.01 Lump Sum and Unit Price*

Bidders shall submit (a) Lump Sum Price for each of the projects described in the plans and the contract documents and included in Article 5 of the 410-C Instructions to Bidders. Bidders shall also submit a completed bid tab with unit prices.

#### *13.02 Overhead and Profit*

The Bid prices shall include such amounts as the Bidder deems proper for overhead and profit on account of cash allowances, if any, named in the Contract Documents as provided in paragraph 11.02 of the General Conditions.

#### *13.03 Basis of Award*

The project will be awarded based on the lowest responsive sum consisting of the Total Base Bid Lump Sum Price for Items 1, 2A, 3A, 3B, and 3C or Items 1, 2B, 3A, 3B, and 3C. The owner reserves the right to award any or all projects to the lowest responsible bidder, or any combination of projects to the lowest responsive bidders for each individual project.

### **ARTICLE 14 – SUBMITTAL OF BID**

14.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the following documents:

- A. Required Bid security in the form of Bid Bond;
- B. Insurance Certificates;

- C. Non-collusion Affidavit;
- D. List of Proposed Subcontractors;
- E. List of Proposed Equipment;
- F. Identification of Minority Business Participation;
- G. Affidavit A – Listing of Good Faith Efforts
- H. Affidavit B – Intent to Perform Contract with Own Workforce (if Applicable); and
- I. Evidence of authority to do business in the state of the North Carolina; or a written covenant to obtain such license within the time for acceptance of Bids.

14.02 Bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to Town of Emerald Isle Town Administration Conference Room, 7509 Emerald Drive, Emerald Isle, NC 28594.

#### **ARTICLE 15 – MODIFICATION AND WITHDRAWAL OF BID**

- 15.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.
- 15.02 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.
- 15.03 For detailed rules governing the manner in which Owner will deal with a request for Withdrawal of Bid, Bidders are referred to North Carolina General Statutes 143-129.1.

## **ARTICLE 16 – OPENING OF BIDS**

16.01 Bids will be opened at the time and place indicated in the Advertisement or Invitation to Bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids. If initial receipt of Bids produces less than three (3) Bidders, the project will be re-advertised for a period of at least one week before Bids will be received again and opened regardless of the number of Bids received, per North Carolina law.

## **ARTICLE 17 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE**

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

## **ARTICLE 18 – EVALUATION OF BIDS AND AWARD OF CONTRACT**

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

18.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

18.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

18.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.

18.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents.

18.06 If the Contract is to be awarded, Owner will award the Contract to the Bidder whose Bid is in the best interests of the Project.

**ARTICLE 19 – CONTRACT SECURITY AND INSURANCE**

19.01 Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner’s requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by such bonds.

**ARTICLE 20 – SIGNING OF AGREEMENT**

20.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement along with the other Contract Documents which are identified in the Agreement as attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

**BID FORM**

Local Drainage Improvements: Lee Avenue, Reed Drive, & Cedar Street, TOWN OF EMERALD ISLE,  
NC

**TABLE OF CONTENTS**

	<b>Page</b>
Article 1 – Bid Recipient.....	1
Article 2 – Bidder’s Acknowledgements.....	1
Article 3 – Bidder’s Representations .....	1
Article 4 – Bidder’s Certification.....	2
Article 5 – Basis of Bid .....	3
Article 6 – Time of Completion .....	6
Article 7 – Attachments to This Bid .....	6
Article 8 – Defined Terms.....	6
Article 9 – Bid Submittal.....	7

**ARTICLE 1 – BID RECIPIENT**

This Bid is submitted to:

the Town of Emerald Isle, 7509 Emerald Drive, Emerald Isle, North Carolina 28594.

The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

**ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS**

Bidder accepts all terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for thirty (30) days after the Bid opening, or for such longer period that Bidder may agree to in writing upon request of Owner.

**ARTICLE 3 – BIDDER’S REPRESENTATIONS**

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____
_____	_____

B. Bidder has become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in SC-4.02 as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that will be identified in SC-4.06 as containing reliable "technical data."

E. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information,

observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.

- F. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
- I. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
- J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

#### **ARTICLE 4 – BIDDER'S CERTIFICATION**

Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

**ARTICLE 5 – BASIS OF BID**

**Note: Article 5 is modified from the original EJCDC document C-410 (2013 edition).**

Owner reserves the right to reject any and all bids based on, but not limited to, budget constraints, nonconformity, unbalancing, or conditioning of bid. Owner reserves the right to award any or all line items listed in the following section. The owner reserves the right to award any or all projects to the lowest responsible bidder, or any combination of projects to the lowest responsive bidders for each individual project.

**5.01 BASE BID:**

Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

1. Project 1 – Lee Avenue Culvert Replacement

Lump Sum Price: \_\_\_\_\_ (\$ \_\_\_\_\_)  
(use words) (figures)

2. Project 2 – Reed Drive Drainage Improvements

Lump Sum Price for Option 2A: \_\_\_\_\_ (\$ \_\_\_\_\_)  
(use words) (figures)

Lump Sum Price for Option 2B: \_\_\_\_\_ (\$ \_\_\_\_\_)  
(use words) (figures)

3. Cedar Street Project 3A – Driveway Berm

Lump Sum Price: \_\_\_\_\_ (\$ \_\_\_\_\_)  
(use words) (figures)

4. Cedar Street Project 3B – Bioretention Cell

Lump Sum Price: \_\_\_\_\_ (\$ \_\_\_\_\_)

(use words) (figures)

5. Cedar Street Project 3C—Overflow Drainage

Lump Sum Price: \_\_\_\_\_ (\$ \_\_\_\_\_)

(use words) (figures)

TOTAL BASE BID LUMP SUM PRICE (sum of Items 1, 2A, 3A, 3B, and 3C):

Lump Sum Price: \_\_\_\_\_ (\$ \_\_\_\_\_)

(use words) (figures)

TOTAL BASE BID LUMP SUM PRICE (sum of Items 1, 2B, 3A, 3B, and 3C):

Lump Sum Price: \_\_\_\_\_ (\$ \_\_\_\_\_)

(use words) (figures)

APPARENT LOW BIDDER: The Apparent Low Bidder will be the lowest bidder based on the Total Base Bid Lump Sum Price or the low price of each individual project. More than 1 apparent low bidder may be identified.

#### **ARTICLE 6 – TIME OF COMPLETION**

Bidder agrees that the Work will be substantially complete on or before:

Bidder agrees that the Work will be substantially complete on or before March 30, 2023 and will be completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions on or before April 30, 2023.

Bidder accepts the provisions of the Form of Agreement as to liquidated damages.

#### **ARTICLE 7 – ATTACHMENTS TO THIS BID**

The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security in the form of Bid Bond;
- B. Insurance Certificates;
- C. Non-collusion Affidavit;
- D. List of Proposed Subcontractors;
- E. List of Proposed Equipment;

- F. Identification of Minority Business Participation;
- G. Affidavit A – Listing of Good Faith Efforts;
- H. Affidavit B – Intent to Perform Contract with Own Workforce (if Applicable); and
- I. Evidence of authority to do business in the state of the North Carolina; or a written covenant to obtain such license within the time for acceptance of Bids.

### **ARTICLE 8 – DEFINED TERMS**

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

**ARTICLE 9 – BID SUBMITTAL**

9.01 This Bid is submitted by:

If Bidder is:

An Individual

Name (typed or printed): \_\_\_\_\_

By: \_\_\_\_\_  
(Individual's signature)

Doing business as: \_\_\_\_\_

A Partnership

Partnership Name: \_\_\_\_\_

By: \_\_\_\_\_  
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): \_\_\_\_\_

A Corporation

Corporation Name: \_\_\_\_\_ (SEAL)

State of Incorporation: \_\_\_\_\_

Type (General Business, Professional, Service, Limited Liability): \_\_\_\_\_

By: \_\_\_\_\_  
(Signature -- attach evidence of authority to sign)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_  
(CORPORATE SEAL)

Attest \_\_\_\_\_

Date of Qualification to do business in North Carolina is \_\_\_\_/\_\_\_\_/\_\_\_\_.

A Joint Venture

Name of Joint Venture: \_\_\_\_\_

First Joint Venturer Name: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_  
(Signature of first joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_

Second Joint Venturer Name: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_  
(Signature of second joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

Bidder's Business Address \_\_\_\_\_

\_\_\_\_\_

Phone No. \_\_\_\_\_ Fax No. \_\_\_\_\_

E-mail \_\_\_\_\_

SUBMITTED on \_\_\_\_\_, 20\_\_\_\_.

State Contractor License No. \_\_\_\_\_. *[If applicable]*

**BID BOND**

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address)*:

SURETY *(Name and Address of Principal Place of Business)*:

OWNER :

Town of Emerald Isle  
 7509 Emerald Drive  
 Emerald Isle, North Carolina 28594

BID

Bid Due Date: November 2, 3:00 p.m.  
 Description:  
 Local Drainage Improvements: Lee Avenue, Reed Drive, & Cedar Street

BOND

Bond Number:  
 Date *(Not earlier than Bid due date)*:  
 Penal sum 5% (Five Percent) (Words) \$ \_\_\_\_\_ (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

**BIDDER**

**SURETY**

\_\_\_\_\_  
 Bidder's Name and Corporate Seal (Seal) Surety's Name and Corporate Seal (Seal)

By: \_\_\_\_\_  
 Signature

By: \_\_\_\_\_  
 Signature (Attach Power of Attorney)

\_\_\_\_\_  
 Print Name

\_\_\_\_\_  
 Print Name

\_\_\_\_\_  
 Title

\_\_\_\_\_  
 Title

Attest: \_\_\_\_\_  
 Signature

Attest: \_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Title

\_\_\_\_\_  
 Title

*Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary.*

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
  - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
  - 3.2 All Bids are rejected by Owner, or
  - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

**THE TERM "BID" AS USED HEREIN INCLUDES A BID, OFFER, OR PROPOSAL AS APPLICABLE**

**NON-COLLUSION AFFIDAVIT**

Local Drainage Improvements: Lee Avenue, Reed Drive, & Cedar Street  
Town of Emerald Isle, North Carolina

Each Contractor submitting a bid must fill out the following affidavit:

STATE OF \_\_\_\_\_.

COUNTY OF \_\_\_\_\_.

Affiant, \_\_\_\_\_ makes oath that he is the \_\_\_\_\_ (title)  
of \_\_\_\_\_,

and that the undersigned affiant has not given or donated or promised to give or donate directly  
or indirectly to any official or employee of the Town of Emerald Isle, North Carolina, or to anyone  
else for his benefit any sum of money or other thing of value for aid in assistance in obtaining this  
contract for the Local Drainage Improvements: Lee Avenue, Reed Drive, & Cedar Street. The  
undersigned affiant also attests that they have not colluded with any other bidders to establish  
prices at artificial levels in order to obtain this contract.

\_\_\_\_\_ (signature)

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 2022.

\_\_\_\_\_  
Notary Public

My Commission Expires: \_\_\_\_\_.

\_\_\_\_\_

# LIST OF SUBCONTRACTORS

Local Drainage Improvements: Lee Avenue, Reed Drive, & Cedar Street  
Town of Emerald Isle, North Carolina

The undersigned states that the following is a full and complete list of the proposed subcontractors on this Project and the class of work to be performed by each, and that such list will not be added to or altered without written consent of the Owner.

Subcontractor and Address	Type of Work or Role in Project

Bidder: \_\_\_\_\_

By (name and title): \_\_\_\_\_

Signature and date: \_\_\_\_\_



State of North Carolina – AFFIDAVIT A – Listing of Good Faith Efforts

County of \_\_\_\_\_

(Name of Bidder)

Affidavit of \_\_\_\_\_

I have made a good faith effort to comply under the following areas checked:

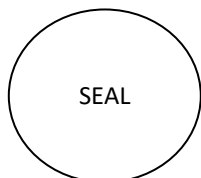
Bidders must earn at least 50 points from the good faith efforts listed for their bid to be considered responsive. (1 NC Administrative Code 30 I.0101)

- 1 - (10 pts) Contacted minority businesses that reasonably could have been expected to submit a quote...
2 - (10 pts) Made the construction plans, specifications and requirements available for review...
3 - (15 pts) Broken down or combined elements of work into economically feasible units...
4 - (10 pts) Worked with minority trade, community, or contractor organizations...
5 - (10 pts) Attended pre-bid meetings scheduled by the public owner.
6 - (20 pts) Provided assistance in getting required bonding or insurance...
7 - (15 pts) Negotiated in good faith with interested minority businesses...
8 - (25 pts) Provided assistance to an otherwise qualified minority business...
9 - (20 pts) Negotiated joint venture and partnership arrangements...
10 - (20 pts) Provided quick pay agreements and policies to enable minority contractors...

The undersigned, if apparent low Bidder, will enter into a formal agreement with the firms listed in the Identification of Minority Business Participation schedule conditional upon scope of contract to be executed with the Owner.

The undersigned hereby certifies that he or she has read the terms of the minority business commitment and is authorized to bind the Bidder to the commitment herein set forth.

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_
Signature: \_\_\_\_\_
Title: \_\_\_\_\_



State of \_\_\_\_\_ County of \_\_\_\_\_
Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_
Notary Public \_\_\_\_\_
My commission expire \_\_\_\_\_

State of North Carolina – AFFIDAVIT B – Intent to Perform Contract with Own Workforce

County of \_\_\_\_\_

Affidavit of \_\_\_\_\_  
(Name of Bidder)

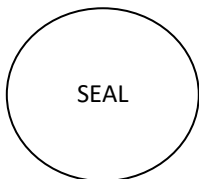
I hereby certify that it is our intent to perform 100% of the work required for the Local Drainage Improvements: Lee Avenue, Reed Drive, and Cedar Street, Town of Emerald Isle, Carteret County, NC contract.

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform all elements of the work on this project with his/her own current work forces; and

The Bidder agrees to provide any additional information or documentation requested by the Owner in support of the above statement. The Bidder agrees to make a Good Faith Effort to utilize minority suppliers where possible.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_



Signature: \_\_\_\_\_

Title: \_\_\_\_\_

State of \_\_\_\_\_ County of \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_  
Notary Public \_\_\_\_\_

My commission expires \_\_\_\_\_

**State of North Carolina – AFFIDAVIT C – Portion of the Work to be Performed by HUB Certified/Minority Businesses**

County of \_\_\_\_\_

**(Note this form is to be submitted only by the apparent lowest responsible, responsive Bidder.)**

If the portion of the work to be executed by HUB certified/minority businesses as defined in GS143-128.2(g) and 128.4(a),(b),(e) is equal to or greater than 10% of the Bidders total contract price, then the Bidder must complete this affidavit. This affidavit shall be provided by the apparent lowest responsible, responsive Bidder within **72 hours** after notification of being low Bidder.

Affidavit of \_\_\_\_\_ I do hereby certify that on the \_\_\_\_\_  
(Name of Bidder)

\_\_\_\_\_ (Project Name)  
Project ID# \_\_\_\_\_ Amount of Bid \$ \_\_\_\_\_

I will expend a minimum of \_\_\_\_\_ % of the total dollar amount of the contract with HUB certified/minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below.

(Attach additional sheets if required)

Name and Phone Number	*Minority Category	**HUB Certified (Y/N)	Work Description	Dollar Value

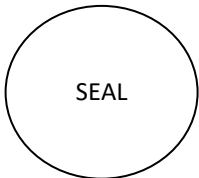
\*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**), American Indian (**I**), Female (**F**),  
Socially and Economically Disadvantaged (**D**)

**\*\*HUB Certification with the state HUB Office required to be counted toward state participation goals.**

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the Bidder to the commitment herein set forth.

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Title: \_\_\_\_\_



State of \_\_\_\_\_ County of \_\_\_\_\_  
Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_,  
Notary Public \_\_\_\_\_  
My commission expires \_\_\_\_\_

**State of North Carolina – AFFIDAVIT D – Good Faith Efforts**

County of \_\_\_\_\_

**(Note this form is to be submitted only by the apparent lowest responsible, responsive Bidder.)**

If the goal of 10% participation by HUB certified/minority business **is not** achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts:

Affidavit of \_\_\_\_\_ I do hereby certify that on the  
 \_\_\_\_\_  
 (Name of Bidder)

Project ID# \_\_\_\_\_ Amount of Bid \$ \_\_\_\_\_  
 \_\_\_\_\_  
 (Project Name)

I will expend a minimum of \_\_\_\_\_ % of the total dollar amount of the contract with HUB certified/minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below.

(Attach additional sheets if required)

Name and Phone Number	*Minority Category	**HUB Certified (Y/N)	Work Description	Dollar Value

\*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**), American Indian (**I**), Female (**F**),

Socially and Economically Disadvantaged (**D**)

**\*\*HUB Certification with the state HUB Office required to be counted toward state participation goals.**

**Examples** of documentation that may be required to demonstrate the Bidder's good faith efforts to meet the goals set forth in these provisions include, but are not necessarily limited to, the following:

- A. Copies of solicitations for quotes to at least three (3) minority business firms from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.
- B. Copies of quotes or responses received from each firm responding to the solicitation.
- C. A telephone log of follow-up calls to each firm sent a solicitation.
- D. For subcontracts where a minority business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.
- E. Documentation of any contacts or correspondence to minority business, community, or contractor organizations in an attempt to meet the goal.
- F. Copy of pre-bid roster.
- G. Letter documenting efforts to provide assistance in obtaining required bonding or insurance for minority business.
- H. Letter detailing reasons for rejection of minority business due to lack of qualification.
- I. Letter documenting proposed assistance offered to minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to the next lowest responsible and responsive bidder.

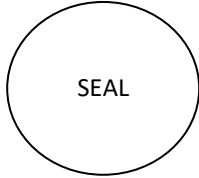
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the Bidder to the commitment herein set forth.

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_



State of \_\_\_\_\_ County of \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_\_,

Notary Public \_\_\_\_\_

My commission expires \_\_\_\_\_

SAMPLE - DO NOT SUBMIT WITH BID

## **SHEET FOR ATTACHING INSURANCE CERTIFICATES**

1. Worker's Compensation
2. Public Liability
3. Property Damage

Certificates of Insurance shall bear the following statement which shall be a provision of the policies:

“These policies cannot be canceled, altered or reduced in amount or coverage without advance notice given to the insured and Owner of such cancelation or alteration, a minimum of the lesser of, thirty (30) days advance notice or the minimum notice period required by any applicable state or other laws governing such terms.”

**CERTIFICATE OF TOWN'S ATTORNEY**

I, the Undersigned, \_\_\_\_\_  
the duly authorized and acting legal representative of \_\_\_\_\_  
\_\_\_\_\_, do hereby certify as follows:

I have examined the attached contract(s) and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly executed by the proper parties on behalf of the Town of Emerald Isle, North Carolina thereto acting through its duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the Town of Emerald Isle, North Carolina; and that the foregoing agreements constitute valid and legally binding obligations upon the Town in accordance with terms, conditions and provisions thereof.

\_\_\_\_\_

Date: \_\_\_\_\_

## Federal Funding Provisions

**Definitions:** As used throughout this Attachment, the following terms shall have the meaning set out below:

- a) "Town" or "Applicant" refers to the Town of Emerald Isle - Government activities and organizations.
- b) "Contract" Identifies this contract or any modification thereto.
- c) "Contractor or Vendor" means the individual, partnership, corporation, or other entity which is a party to this contract and who is responsible for all actions, performance and work there under, to include that of any subcontractor or vendor.

A. **Equal Employment Opportunity:** For contracts for construction work – "the construction, rehabilitation, alteration, conversion, extension, demolition or repair of buildings, highways, or other changes or improvements to real property, including facilities providing utility services." During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of

the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, that if the applicant so participating is a state or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

- B. **Davis-Bacon Act (40 U.S.C. 3141-3148)**: If this contract is a “prime construction contract in excess of \$2,000,” the contractor shall generally comply with the Davis-Bacon Act (40 U.S.C. §§ 3141-3144 and 3146-3148) as supplemented by Department of Labor regulations at 29 C.F.R. Part 5 (Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction) and shall specifically: (i) meet the requirements of 29 C.F.R. Section 5.5(a)(1)-(10) as may be applicable; (ii) pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor; and (iii) pay wages not less than once a week.
- C. **Copeland “Anti-Kickback” Act (40 U.S.C. 3145)**: If the Davis-Bacon Act applies to this contract, then
- i. The contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract;
  - ii. The contractor or subcontractor shall insert in any subcontracts the requirements in “i” above and such other clauses as FEMA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses; and

iii. breach of the contract clauses above shall be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.

D. **Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708)**: If this contract involves in excess of \$100,000 and the employment of mechanics, laborers, and construction work, contractor shall comply with 40 U.S.C. §§ 3702 and 3704, as supplemented by Department of Labor regulations at 29 C.F.R. Part 5, and the provisions of 29 C.F.R. § 5.5(b) are incorporated herein by reference:

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The Town shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

E. **Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387)**: If this contract involves in excess of \$150,000, the contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq. The contractor agrees to report each violation to the Town and understands and agrees that the Town will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency (FEMA), and the appropriate Environmental Protection Agency Regional Office. The contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with federal assistance provided by FEMA.

Further, The contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq. The contractor agrees to report each violation to the Town and understands and agrees that the Town will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency (FEMA), and the appropriate Environmental Protection Agency Regional Office. The contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with federal assistance provided by FEMA.

F. **Debarment and Suspension (Executive Orders 12549 and 12689)**: This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the contractor is required to verify that none of the contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded

(defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935). Additionally, the contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into. Additionally, the execution of this contract or the acceptance of benefits hereunder constitutes a certification by the contractor that the foregoing provisions have been complied with and is a material representation of fact relied upon by the Town. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to the Town, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment. Finally, the contractor agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. Part 3000, subpart C throughout the period of this contract and shall include a provision requiring such compliance in its lower tier covered transactions.

- G. **Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)**: Contractors who apply or bid for an award of more than \$100,000 shall file the required certification. Each tier certifies to the tier above that it will not and has not used federally appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-federal funds that takes place in connection with obtaining any federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the federal awarding agency.

If applicable, contractors must sign and submit a certification regarding lobbying found in Attachment (A) of this document.

- H. **Procurement of Recovered Materials (2 C.F.R. § 200.322)**: In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired - Competitively within a timeframe providing for compliance with the contract performance schedule; Meeting contract performance requirements; or at a reasonable price. Information about this requirement, along with the list of EPA-designated items, is available at EPA's Comprehensive Procurement Guidelines webpage: <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>. The Contractor further agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

I. **Prohibition on Contracting for Covered Telecommunications Equipment or Services:**

(a) Definitions. As used in this clause, the terms backhaul; covered foreign country; covered telecommunications equipment or services; interconnection arrangements; roaming; substantial or essential component; and telecommunications equipment or services have the meaning as defined in FEMA Policy 405-143-1, Prohibitions on Expending FEMA Award Funds for Covered Telecommunications Equipment or Services (Interim), as used in this clause—

(b) Prohibitions.

(1) Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of an executive agency on or after Aug. 13, 2020, from obligating or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons.

(2) Unless an exception in paragraph (c) of this clause applies, the contractor and its subcontractors may not use grant, cooperative agreement, loan, or loan guarantee funds from the Federal Emergency Management Agency to:

- (i) Procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;
- (ii) Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;

- (iii) Enter into, extend, or renew contracts with entities that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system; or
- (iv) Provide, as part of its performance of this contract, subcontract, or other contractual instrument, any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.

(c) Exceptions.

(1) This clause does not prohibit contractors from providing—

- (i) A service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or
- (ii) Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

(2) By necessary implication and regulation, the prohibitions also do not apply to:

- (i) Covered telecommunications equipment or services that:
  - i. Are not used as a substantial or essential component of any system; and
  - ii. Are not used as critical technology of any system.
- (ii) Other telecommunications equipment or services that are not considered covered telecommunications equipment or services.

(d) Reporting requirement.

(1) In the event the contractor identifies covered telecommunications equipment or services used as a substantial or essential component of any system, or as critical technology as part of any system, during contract performance, or the contractor is notified of such by a subcontractor at any tier or by any other source, the contractor shall report the information in paragraph (d)(2) of this clause to the recipient or subrecipient, unless elsewhere in this contract are established procedures for reporting the information.

(2) The Contractor shall report the following information pursuant to paragraph (d)(1) of this clause:

- (i) Within one business day from the date of such identification or notification: The contract number; the order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.
- (ii) Within 10 business days of submitting the information in paragraph (d)(2)(i) of this clause: Any further available information about mitigation actions undertaken or recommended. In addition, the contractor shall describe the efforts it undertook to prevent use or submission of covered telecommunications equipment or services, and any additional efforts that will be incorporated to prevent future use or submission of covered telecommunications equipment or services.

(e) Subcontracts. The Contractor shall insert the substance of this clause, including this paragraph (e), in all subcontracts and other contractual instruments.

J. **Domestic Preferences for Procurements:** As appropriate, and to the extent consistent with law, the contractor should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the **United States**. This includes, but is not limited to iron, aluminum, steel, cement, and other manufactured products.

*For purposes of this clause:*

Produced in the United States means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

Manufactured products mean items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

K. **Access to Records:** The Contractor agrees (i) to provide Town, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the

Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions; (ii) to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed; (iii) to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract; and (iv) that no language in this contract is intended to prohibit audits or internal reviews by the FEMA Administrator or the Comptroller General of the United States, in compliance with the Disaster Recovery Act of 2018. Additionally, the contractor shall comply with the records retention requirement of 2 CFR § 200.324.

- L. **US Department of Homeland Security (DHS) Seal, Logos, and Flags:** The contractor shall not use the DHS seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific FEMA pre-approval. The contractor shall include this provision in any subcontracts.
- M. **Compliance with Federal Law, Regulations, and Executive Orders – Acknowledgement of Federal Funding:** This is an acknowledgement that FEMA financial assistance will be used to fund all or a portion of the contract. The contractor will comply with all applicable federal law, regulations, executive orders, FEMA policies, procedures, and directives.
- N. **Federal Government Obligations:** The Federal Government is not a party to this contract and is not subject to any obligations or liabilities of Town, contractor, or any other party pertaining to any matter resulting from this contract.
- O. **Program Fraud:** The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor’s actions pertaining to this contract.
- P. **Affirmative Socioeconomic Steps:** If subcontracts are to be let, the prime contractor is required to take all necessary steps identified in 2 C.F.R. § 200.321(b)(1)-(5) to ensure that small and minority businesses, women’s business enterprises, and labor surplus area firms are used when possible.
- Q. **Copyright and Data Rights:** When applicable, the Contractor grants to the Town, a paid-up, royalty-free, nonexclusive, irrevocable, worldwide license in data first produced in the performance of this contract to reproduce, publish, or otherwise use, including prepare derivative works, distribute copies to the public, and perform publicly and display publicly such data. For data required by the contract but not first produced in the performance of this contract, the Contractor will identify such data and grant to the Town or acquires on its behalf a license of the same scope as for data first produced in the performance of this contract. Data, as used herein, shall include any work subject to copyright under 17 U.S.C. § 102, for example, any written reports or literary works, software and/or source code, music, choreography, pictures or images, graphics, sculptures, videos, motion pictures or other audiovisual works, sound and/or video recordings, and architectural works. Upon or before the completion of this contract, the Contractor will deliver to the Town data first produced in the performance of this contract and data required by the contract but not first produced in the performance of this contract in formats acceptable by Town.

Federal Funding Provisions  
Attachment (A)

**APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING**

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.

If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S.C. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor, \_\_\_\_\_, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

\_\_\_\_\_  
Signature of Contractor’s Authorized Official

\_\_\_\_\_  
Name and Title of Contractor’s Authorized Official

\_\_\_\_\_  
Date

**FORM OF AGREEMENT  
BETWEEN OWNER AND CONTRACTOR  
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)**

THIS AGREEMENT is by and between THE TOWN OF EMERALD ISLE (“Owner”) and \_\_\_\_\_ (“Contractor”).

Owner and Contractor hereby agree as follows:

**1. WORK**

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

1. Replacement of existing 43”x64” arch culvert on Lee Avenue including installing new headwalls and pavement repairs
2. Installation of French drain system, storm drain pipe, pump lift station, and forcemain on Reed Drive
3. Completion of three minor drainage projects on Cedar Street including a driveway berm, bioretention cell, and overflow pipe
4. .Notice of Award is expected to be issued on or before November 9, 2022, and a Notice to Proceed is expected to be issued by November 30, 2022.
5. Substantial Completion of all projects is to be completed by March 30, 2023

**2. THE PROJECT**

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Local Drainage Improvements: Lee Avenue, Reed Drive, & Cedar Street  
TOWN OF EMERALD ISLE  
CARTERET COUNTY, NORTH CAROLINA

**3. ENGINEER**

3.01 The Project has been designed by Moffatt & Nichol, Inc. (Engineer), 4700 Falls of Neuse Road, Suite 300 Raleigh, North Carolina 27609 which is to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract

Documents in connection with the completion of the Work in accordance with the Contract Documents.

**4. CONTRACT TIMES**

4.01 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Dates for Substantial Completion and Final Payment*

B. The Work will be substantially completed on or before March 30, 2023, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions on or before April 30, 2023

**ARTICLE 5 – CONTRACT PRICE**

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A, 5.01.B, and 5.01.C below:

A. For all Work other than Unit Price Work, a lump sum of:

Lump Sum Price: \_\_\_\_\_ \$ \_\_\_\_\_  
(use words) (figures)

All specific cash allowances are included in the above price in accordance with Paragraph 11.02 of the General Conditions.

B. This is a Lump Sum contract. Unit Prices will be used to compute progress payments and for modification of quantities in accordance with the Contract Documents. As provided in Paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 9.07 of the General Conditions.

C. For all Work, at the prices stated in Contractor’s Bid, attached hereto as an exhibit.

**ARTICLE 6 – PAYMENT PROCEDURES**

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. The first invoice received may not exceed 60% of the Mobilization and Demobilization Lump Sum Bid. Furthermore, there must be evidence of mobilization prior to this payment.
- B. Owner shall make progress payments on account of the Contract Price based on Contractor's Applications for Payment on or about the first day of the second month after acceptance of the Application (see SC-14.02) during performance of the Work as provided in Paragraph 6.02.B.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.
  - 1. Prior to **Final** Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions.
    - a. 95 percent of Work completed (with the balance being retainage). 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, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage (the Owner reserves the right to increase the retainage up to 5% of the total contract value if the character and progress of the work are not satisfactory to the Owner and Engineer); and
    - b. N/A percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
    - c. Once the project reaches Substantial Completion, the Contractor will be permitted to invoice for the remaining 40% of Mobilization & Demobilization as well as 75% of the retainage being withheld by the Owner. The final release of any remaining retainage withheld by the Owner will be available to be released to the Contractor upon Final Completion.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

**ARTICLE 7 – INTEREST**

- 7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate of 2 percent per annum.

## ARTICLE 8 – CONTRACTOR’S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:
- A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
  - B. Contractor has become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
  - D. Contractor understands that a source of funding for this contract is or may be federal funds and the following federal provisions, including but not limited to, apply pursuant to 2 C.F.R. §§ 200.317 to 200.326 and 2 C.F.R. Part 200, Appendix II (as applicable): Equal Employment Opportunity (41 C.F.R. Part 60); Davis-Bacon Act (40 U.S.C. 3141-3148); Copeland “Anti-Kickback” Act (40 U.S.C. 3145); Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708); Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387); Debarment and Suspension (Executive Orders 12549 and 12689); Byrd Anti-Lobbying Amendment (31 U.S.C. 1352); Procurement of Recovered Materials (2 C.F.R. § 200.322); and Record Retention Requirements (2 CFR § 200.324).
  - E. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in Paragraph SC-4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph SC-4.06 of the Supplementary Conditions as containing reliable "technical data."
  - F. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor’s safety precautions and programs.
  - G. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

- H. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- I. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- J. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

## **ARTICLE 9 – CONTRACT DOCUMENTS**

### **9.01 *Contents***

- A. The Contract Documents consist of the following:
  - 1. This Agreement (pages 1 to 9, inclusive).
  - 2. Performance bond (pages 1 to 3, inclusive).
  - 3. Payment bond (pages 1 to 3, inclusive).
  - 4. General Conditions (pages 1 to 60, inclusive).
  - 5. Specifications as listed in the table of contents of the Project Manual.
  - 6. Drawings consisting of sheets with each sheet bearing the following general title: Local Drainage Improvements: Lee Avenue, Reed Drive, & Cedar Street
  - 7. Addenda (numbers 1 to 3, inclusive).
  - 8. Exhibits to this Agreement (enumerated as follows):
    - a. Contractor’s Bid
    - b. Affidavit D – Good Faith Efforts.
    - c. Federal Funding Provisions
  - 9. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
    - a. Notice to Proceed.
    - b. Work Change Directives.
    - c. Change Orders.

- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

## **ARTICLE 10 – MISCELLANEOUS**

### **10.01 *Terms***

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

### **10.02 *Assignment of Contract***

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

### **10.03 *Successors and Assigns***

- A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

### **10.04 *Severability***

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

### **10.05 *Contractor's Certifications***

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
  - 1. “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on \_\_\_\_\_ (which is the Effective Date of the Agreement).

OWNER:

CONTRACTOR

\_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: \_\_\_\_\_

Attest: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Address for giving notices:

Address for giving notices:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

License No.: \_\_\_\_\_

(Where applicable)

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

·  
Agent for service of process:

\_\_\_\_\_

# PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):                      SURETY (*Name, and Address of Principal Place of Business*):

**OWNER:**

Town of Emerald Isle  
7509 Emerald Drive  
Emerald Isle, North Carolina 28594

**CONTRACT**

Effective Date of Agreement:

Amount:

Description:    Local Drainage Improvements: Lee Avenue, Reed Drive, & Cedar Street,  
Town of Emerald Isle, NC

**BOND**

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

**CONTRACTOR AS PRINCIPAL**

**SURETY**

\_\_\_\_\_ (Seal)  
Contractor's Name and Corporate Seal

\_\_\_\_\_ (Seal)  
Surety's Name and Corporate Seal

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
  - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
  - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
  - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
    1. Surety in accordance with the terms of the Contract; or
    2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
  - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
  - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
  - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
  - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
    1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
    2. Deny liability in whole or in part and notify Owner citing reasons therefor.
4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

11. Definitions.

11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.

11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address and Telephone)*

Surety Agency or Broker:

Owner's Representative *(Engineer or other party)*:

# PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER:

Town of Emerald Isle  
7509 Emerald Drive  
Emerald Isle, NC 28594

CONTRACT

Effective Date of Agreement:

Amount:

Description:

Local Drainage Improvements: Lee Avenue, Reed Drive, & Cedar Street,  
Town of Emerald Isle, NC

BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

**CONTRACTOR AS PRINCIPAL**

**SURETY**

\_\_\_\_\_  
(Seal)  
Contractor's Name and Corporate Seal

\_\_\_\_\_  
(Seal)  
Surety's Name and Corporate Seal

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.

1. With respect to Owner, this obligation shall be null and void if Contractor:

Promptly makes payment, directly or indirectly, for all sums due Claimants, and

Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.

2. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.

3. Surety shall have no obligation to Claimants under this Bond until:

Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

Claimants who do not have a direct contract with Contractor:

1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.

4. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.

5. Reserved.

6. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.

7. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

8. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or

otherwise have obligations to Claimants under this Bond.

9. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

10. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

11. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

12. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

13. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

#### 14. Definitions

**Claimant:** An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms “labor, materials or equipment” that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor’s subcontractors, and all other items for which a mechanic’s lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

**Contract:** The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

**Owner Default:** Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address, and Telephone)*

Surety Agency or Broker:

Owner’s Representative *(Engineer or other)*:

# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

## TABLE OF CONTENTS

	<b>Page</b>
Article 1 – Definitions and Terminology .....	1
1.01 Defined Terms.....	1
1.02 Terminology.....	5
Article 2 – Preliminary Matters.....	6
2.01 Delivery of Bonds and Evidence of Insurance.....	6
2.02 Copies of Documents.....	6
2.03 Commencement of Contract Times; Notice to Proceed .....	6
2.04 Starting the Work.....	6
2.05 Before Starting Construction .....	7
2.06 Preconstruction Conference; Designation of Authorized Representatives .....	7
2.07 Initial Acceptance of Schedules .....	7
Article 3 – Contract Documents: Intent, Amending, Reuse .....	8
3.01 Intent.....	8
3.02 Reference Standards .....	8
3.03 Reporting and Resolving Discrepancies .....	8
3.04 Amending and Supplementing Contract Documents .....	9
3.05 Reuse of Documents .....	9
3.06 Electronic Data.....	10
Article 4 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points .....	10
4.01 Availability of Lands .....	10
4.02 Subsurface and Physical Conditions .....	11
4.03 Differing Subsurface or Physical Conditions.....	11
4.04 Underground Facilities .....	12
4.05 Reference Points .....	13
4.06 Hazardous Environmental Condition at Site.....	14
Article 5 – Bonds and Insurance .....	15
5.01 Performance, Payment, and Other Bonds .....	15
5.02 Licensed Sureties and Insurers .....	16
5.03 Certificates of Insurance .....	16
5.04 Contractor’s Insurance.....	16
5.05 Owner’s Liability Insurance .....	18
5.06 Property Insurance .....	18
5.07 Waiver of Rights .....	19
5.08 Receipt and Application of Insurance Proceeds .....	20
5.09 Acceptance of Bonds and Insurance; Option to Replace.....	20

5.10	Partial Utilization, Acknowledgment of Property Insurer .....	21
<b>Article 6 – Contractor’s Responsibilities .....</b>		
6.01	Supervision and Superintendence .....	21
6.02	Labor; Working Hours.....	21
6.03	Services, Materials, and Equipment .....	22
6.04	Progress Schedule .....	22
6.05	Substitutes and “Or-Equals” .....	22
6.06	Concerning Subcontractors, Suppliers, and Others .....	25
6.07	Patent Fees and Royalties .....	26
6.08	Permits.....	26
6.09	Laws and Regulations.....	27
6.10	Taxes .....	27
6.11	Use of Site and Other Areas .....	27
6.12	Record Documents.....	28
6.13	Safety and Protection .....	28
6.14	Safety Representative .....	29
6.15	Hazard Communication Programs .....	29
6.16	Emergencies .....	29
6.17	Shop Drawings and Samples .....	30
6.18	Continuing the Work .....	31
6.19	Contractor’s General Warranty and Guarantee.....	31
6.20	Indemnification .....	32
6.21	Delegation of Professional Design Services .....	33
<b>Article 7 – Other Work at the Site.....</b>		
7.01	Related Work at Site .....	34
7.02	Coordination.....	34
7.03	Legal Relationships.....	35
<b>Article 8 – Owner’s Responsibilities .....</b>		
8.01	Communications to Contractor.....	35
8.02	Replacement of Engineer.....	35
8.03	Furnish Data .....	35
8.04	Pay When Due .....	35
8.05	Lands and Easements; Reports and Tests .....	35
8.06	Insurance .....	35
8.07	Change Orders.....	35
8.08	Inspections, Tests, and Approvals .....	36
8.09	Limitations on Owner’s Responsibilities .....	36
8.10	Undisclosed Hazardous Environmental Condition.....	36
8.11	Evidence of Financial Arrangements .....	36
8.12	Compliance with Safety Program.....	36
<b>Article 9 – Engineer’s Status During Construction .....</b>		
9.01	Owner’s Representative.....	36
9.02	Visits to Site .....	36
9.03	Project Representative .....	37

9.04	Authorized Variations in Work .....	37
9.05	Rejecting Defective Work .....	37
9.06	Shop Drawings, Change Orders and Payments .....	37
9.07	Determinations for Unit Price Work .....	38
9.08	Decisions on Requirements of Contract Documents and Acceptability of Work .....	38
9.09	Limitations on Engineer’s Authority and Responsibilities.....	38
9.10	Compliance with Safety Program.....	39
Article 10 – Changes in the Work; Claims .....		39
10.01	Authorized Changes in the Work .....	39
10.02	Unauthorized Changes in the Work .....	39
10.03	Execution of Change Orders.....	39
10.04	Notification to Surety.....	40
10.05	Claims.....	40
Article 11 – Cost of the Work; Allowances; Unit Price Work.....		41
11.01	Cost of the Work.....	41
11.02	Allowances.....	43
11.03	Unit Price Work .....	44
Article 12 – Change of Contract Price; Change of Contract Times.....		45
12.01	Change of Contract Price.....	45
12.02	Change of Contract Times.....	46
12.03	Delays.....	46
Article 13 – Tests and Inspections; Correction, Removal or Acceptance of Defective Work.....		47
13.01	Notice of Defects .....	47
13.02	Access to Work .....	47
13.03	Tests and Inspections .....	47
13.04	Uncovering Work .....	48
13.05	Owner May Stop the Work.....	48
13.06	Correction or Removal of Defective Work.....	48
13.07	Correction Period.....	49
13.08	Acceptance of Defective Work .....	50
13.09	Owner May Correct Defective Work.....	50
Article 14 – Payments to Contractor and Completion.....		51
14.01	Schedule of Values .....	51
14.02	Progress Payments .....	51
14.03	Contractor’s Warranty of Title .....	53
14.04	Substantial Completion.....	53
14.05	Partial Utilization .....	54
14.06	Final Inspection.....	55
14.07	Final Payment .....	55
14.08	Final Completion Delayed.....	56
14.09	Waiver of Claims .....	56

Article 15 – Suspension of Work and Termination.....	57
15.01 Owner May Suspend Work .....	57
15.02 Owner May Terminate for Cause.....	57
15.03 Owner May Terminate For Convenience.....	58
15.04 Contractor May Stop Work or Terminate .....	58
Article 16 – Dispute Resolution .....	59
16.01 Methods and Procedures.....	59
Article 17 – Miscellaneous.....	59
17.01 Giving Notice.....	59
17.02 Computation of Times .....	60
17.03 Cumulative Remedies.....	60
17.04 Survival of Obligations.....	60
17.05 Controlling Law .....	60
17.06 Headings.....	60

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

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

## 11.02 Allowances

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances:*

1. Contractor agrees that:
  - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
  - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
  1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
  2. there is no corresponding adjustment with respect to any other item of Work; and
  3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

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

### 12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
  3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
    - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
    - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

#### 12.02 *Change of Contract Times*

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

#### 12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

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

### *13.01 Notice of Defects*

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

### *13.02 Access to Work*

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

### *13.03 Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
  - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
  - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
  - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.

- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

#### 13.04 *Uncovering Work*

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

#### 13.05 *Owner May Stop the Work*

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

#### 13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

### 13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
1. repair such defective land or areas; or
  2. correct such defective Work; or
  3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

### 13.08 *Acceptance of Defective Work*

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

### 13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

## ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

### 14.01 *Schedule of Values*

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

### 14.02 *Progress Payments*

#### A. *Applications for Payments:*

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

#### B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
  - a. the Work has progressed to the point indicated;

- b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
    - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
  3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
    - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
    - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
  4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
    - a. to supervise, direct, or control the Work, or
    - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
    - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
    - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
    - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
  5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
    - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
    - b. the Contract Price has been reduced by Change Orders;

- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due:*

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

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
  - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
  - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - c. there are other items entitling Owner to a set-off against the amount recommended; or
  - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

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

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

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

#### 14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  - 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
  - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

#### 14.06 *Final Inspection*

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

#### 14.07 *Final Payment*

##### A. *Application for Payment:*

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

Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

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

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

*C. Payment Becomes Due:*

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

14.08 *Final Completion Delayed*

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

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
  1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

## **ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION**

### *15.01 Owner May Suspend Work*

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

### *15.02 Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:
  1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
  2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
  3. Contractor's repeated disregard of the authority of Engineer; or
  4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
  1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
  2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
  3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance,

Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

#### 15.03 *Owner May Terminate For Convenience*

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

#### 15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days

to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

## **ARTICLE 16 – DISPUTE RESOLUTION**

### *16.01 Methods and Procedures*

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
  2. agrees with the other party to submit the Claim to another dispute resolution process; or
  3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

## **ARTICLE 17 – MISCELLANEOUS**

### *17.01 Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

#### 17.02 *Computation of Times*

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

#### 17.03 *Cumulative Remedies*

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

#### 17.04 *Survival of Obligations*

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

#### 17.05 *Controlling Law*

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

#### 17.06 *Headings*

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

Local Drainage Improvements: Lee Avenue, Reed Drive, & Cedar Street

Town of Emerald Isle

Technical Specifications

TABLE OF CONTENTS

TS-01	EXCAVATION, GRADING, AND BACKFILLING
TS-02	STORM DRAINS
TS-06	CONCRETE
TS-07	CURB & GUTTER
TS-08	CONCRETE SIDEWALKS & DRIVEWAYS
TS-09	ASPHALT PAVING
TS-10	FINE & COARSE AGGREGATE BASE COURSE
TS-14	MATERIALS

**TECHNICAL SPECIFICATIONS**  
**SECTION I: EXCAVATING, GRADING & BACKFILLING**

T-1.01 **SCOPE:**

The work covered by this section of the specifications consists of furnishing all plant, labor, equipment, supplies and materials, and in performing all operations in connection with the excavations, grading and backfilling, including borrow, drainage structures, curb and gutter, sidewalks, driveways, pavements, slopes, storm drains, water and sanitary sewer lines, including all hauling, wetting, rolling and other operations pertaining thereto within the project or work limits, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract. Prior to any work, the Contractor shall comply with the provisions of the General Conditions Section G-1.52. Precautions prior to and during excavation of any street.

T-1.02 **EXCAVATION, UNDERCUTTING, BORROW, EMBANKMENT:**

T-1.02.1 **EXCAVATION:**

All excavation shall be performed in accordance with the grades and lines as established by the Engineer and as required by the work to be performed. Excavation, unless otherwise indicated in the Special Conditions, shall include the removal of all concrete, curb, rock, earth, fences, trees, shrubs, and other materials, excepting trees having a diameter of 6" or more, measured four feet above the ground, which shall be paid for as outlined in the proposal or shall be included in the cost of clearing and grubbing where indicated on the plans and in the proposal. Care will be exercised by the Contractor to prevent undercut lower than the required subgrades. In the event such undercutting takes place, the areas so cut will be backfilled as provided for in Paragraph T-1.02.2 on Embankment. All excavation, unless otherwise indicated, shall be performed on an unclassified basis. All excavation shall be performed in compliance with OSHA Safety and Health Standards Applicable to Construction, 29 CFR Part 1926, as amended.

All materials from excavation that are considered suitable by the Engineer shall be used as embankment, wherever required, and the Contractor shall arrange his work so that this usage of excavated material will be possible.

T-1.02.2 **EMBANKMENT, FILL:**

Where existing grades require the use of embankment or fill to reach the required section elevation, the Contractor shall deposit suitable spoil or borrow material from excavated areas. Such spoil material shall be free from debris, roots, trash, stones, or other deleterious materials, and shall be placed in successive layers of loose material not more than 12 inches in depth.

Each layer shall be spread uniformly by the use of a road machine or other approved device and rolled with an approved tamping or power roller until thoroughly compacted to 95 percent of maximum density obtained at optimum moisture content, as determined by the ASTM D 698 Standard Proctor Test Method.

When any portion of the embankment is constructed on an old road bed, the existing surface shall be scarified and manipulated as directed by the Engineer in order that, when compacted, it shall have a uniform density, as specified above.

Embankments or fills shall be maintained at all times during their construction, so as to prevent an accumulation of standing water in the event of rain.

T-1.02.3 **UNDERCUTTING:**

Any undercutting, unless authorized by the Engineer, shall be replaced and compacted, as specified for embankment, at the Contractor's expense. If the material, after excavation to subgrade is found to be soft, spongy or unfit for use as subgrade, such unsuitable materials shall be removed to a depth as directed by the Engineer and the subgrade shall be brought to proper elevation by filling with suitable spoil from excavation elsewhere.

T-1.02.4 **BORROW:**

The contractor shall use suitable excavation from the project. If suitable excavation is not available then the Contractor will supply the site for all borrow necessary in this work. The Contractor will provide all labor and equipment necessary to dig and haul such borrow material. All borrow or material sources supplied by the contractor and used on this job shall have the limits of the borrow source identified, and be excavated from a permitted borrow site. The contractor have Standard Proctor Test Method, ASTM D-698, test performed and submitted to the Engineer for approval, prior to beginning borrow operations. The placing of borrow shall be as provided for in the paragraph of Embankment. No overhaul will be allowed. Borrow shall be a natural sand material with not more than 15% passing the No. 200 sieve, and shall be furnished as directed for use to replace excavated soils found to be unsuitable for trench backfill (if any) and/or to supplement excavated soil supply if needed to complete backfilling operations to suitable grade. Digging, hauling and placing of borrow will be paid for as specified under Payment.

T-1.02.5 **GRADING & SLOPING BANKS:**

Where it is necessary to terrace or slope banks, either in the street right-of-way or behind the property line, the Contractor is hereby notified that this work will be considered **common excavation and paid for as such**. In grading these banks, a slope of 3 horizontal to 1 vertical will generally be held except in cases where it is necessary to build retaining walls or otherwise change this slope in order to protect property or meet other conditions. In these cases, the slope shall be as designated by the Engineer.

In the event that fill is required at the property line, this fill will be extended level with the top of the sidewalk (or level with the final grade at the property line where sidewalk is not installed) at least one foot behind the property line and then carried on a 3 horizontal to 1 vertical slope back on the property until it intersects the property grade.

Sloping in either cut or fill section shall be accomplished on straight grades as near as possible and fine grading and cleaning shall be done with a hand rake. This surface shall be prepared in such a manner that it is ready for fertilizing and seeding when completed.

T-1.03 **EXCAVATION & BACKFILLING FOR WATER MAINS, SANITARY SEWER & STORM DRAINS:**

Pipes shall be laid true to the lines and grades shown on the plans. The grade shown on the profile is the invert to which the work must conform. Work not conforming to the grade shall be corrected by the Contractor at his own expense.

The grade and alignment of the pipe may be done in one of the following ways:

1. By String Line

a. The string line shall be parallel with the grade line and vertically above the center line of the pipe. This line shall be established on level batter boards at intervals of not more than fifty (50) feet. Batter boards shall span the trench and be rigidly anchored to substantial posts driven into the ground on each side of the trench.

b. Three (3) adjacent batter boards must be set before laying pipe to provide a check on the grades and line. Elevation and position of the string line shall be determined from the elevation and position of offset points or stakes located along the pipe route. Pipe shall not be laid using side lines for line and grade.

2. By Laser Beams

a. Laser beams may be used in lieu of string lines when operated by trained personnel

b. The pipe shall be checked with a level between 50 and 100 feet out of the manhole to assure that the laser beam is on the correct grade. An additional check will be made at 100-foot intervals.

The Contractor is responsible for maintaining the line and grade. The pipe shall be checked at each manhole to assure that it is on the correct line and grade.

The locations and depths of the proposed lines are shown on the plans. The Engineer reserves the right to make changes in lines and grades of pipe lines and in locations of pipes and manholes when such changes may be necessary.

T-1.03.1 **BACKFILLING MATERIALS:**

**SUITABLE MATERIALS:**

Suitable material, when used as backfill in paved areas, shall be capable of being compacted as specified in paragraph "Compaction and Testing in Paved Areas" of this section of these specifications.

**TYPE 1 MATERIAL:**

Excavated material from the trench or materials from other sources, which are free from large clods, roots or stones larger than 1 inch.

**TYPE 2 MATERIAL:**

Excavated material from the trench or materials from other sources, which are free from large clods, roots or stones larger than 8 inches.

**CRUSHED STONE:**

Crushed stone shall be size number 57, with fines present to stabilize it in the trench. If amount of fines is insufficient, then stone screenings shall be added to extent required to stabilize it in the trench.

**CONCRETE:**

Concrete used for cradles, thrust blocks, or encasement shall be Class A concrete as specified in Section on CONCRETE. **Test of concrete for this usage are waived.**

T-1.03.2 **EXCAVATION:**

Perform all excavation of every description and of whatever substances encountered to the depth shown on the plans.

All excavated materials not required for fill or backfill shall be removed from the site of the work by the Contractor, but none shall be deposited on private property until written consent of the property owner has been filed with the Engineer.

All excavation, unless otherwise authorized by the Engineer, shall be made by open cut. Side walls of trenches shall be kept vertical and shall be properly sheathed and braced.

T-1.03.3 **EXISTING FACILITIES:**

Contractor is responsible for the location of existing utilities as required by North Carolina Statute, Chapter 87. Attention is directed to the fact that there may be water pipes, storm drains, catch basins, and other utilities in certain locations. Some of these have been indicated on the plans, but no attempt has been made to show all of the services, and the completeness of accuracy of the information given is not guaranteed.

All water or other utility lines shall be located on the ground with pipe locating equipment well ahead of the work at all times. All such locations shall be plainly marked by coded paint symbols on pavement or by marked stakes in the ground. Such locations shall be established at least 500 feet in advance of all trench excavation. All such location work shall be provided by the contractor at no extra cost.

As the excavation approaches pipes, conduits or other underground structures, digging by conventional trenching machine methods shall be done with extreme care. No extra compensation will be given if manual excavation is required to locate utilities and/or underground structures, and/or to install the proposed work.

When excavating within 2 feet (vertical or horizontal) of a gas, water, sewer, or oil line, the contractor shall use the manual method of excavation. At no time will conventional trenching equipment be permitted under these conditions. No extra compensation will be given for this manual excavation.

Excavation near structures will not be allowed closer to the structure than the depth of the excavation below the bottom of the foundation without shoring the excavation with sheathing.

Contractor shall carefully protect from disturbance and damage all land monuments and property markers until an authorized agent has witnessed or otherwise referenced their locations. These monuments and/or markers shall then only be removed when authorized by the agent or Owner.

T-1.03.4 **PROTECTION OF EXISTING STRUCTURES:**

All existing pipes, poles, wires, fences, curbing, catch basins, valves, property line markers and other structures which must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the Contractor and in accordance with the utility owners standards and specifications.

In case of damage to any structure, the Contractor shall notify the appropriate party so that proper steps may be taken to repair any and all damage done. If the owner of the structure wishes to make his own repairs, the Contractor shall reimburse the owner of the structure for all the time and materials required to make the repairs.

When the owners of the damaged structures do not wish to make the repairs themselves, the Contractor shall repair all damage, or, if not promptly done by him, the Owner may have the repairs made at the expense of the Contractor.

T-1-03.5 **CARE AND RESTORATION OF PROPERTY:**

Excavating machinery and cranes shall be operated with care to prevent damage to existing structures, paving and/or wires.

On paved surfaces, the Contractor shall not use or operate tractors, bulldozers or other power-operated equipment, the treads or wheels of which will cut or otherwise damage such surfaces.

The Contractor must exercise care not to damage paving, curb, inlets, sidewalk, etc. Any damages shall be replaced in kind by the Contractor at his own expense, to the satisfaction of the owner.

The restoration of existing property or structures shall be done as work progresses and shall not be left until the end of the construction period.

T-1.03.6 **TRENCHING:**

Trenches shall be dug to the depth required by the contract documents adding, however, to such depths the thickness of the pipe and the required bedding. A recess sufficiently large enough to receive the couplings, where applicable, and to permit making the joints, shall be cut out of the bottom of the trench. Where the bottom of the trench is or appears to be soft or spongy, the excavation shall be made deeper as described under this section to permit a bedding being laid.

T-1.03.7 **TUNNELING UNDER TREES, CURBS, ETC.:**

In areas where specific trees, curbs, etc., are designated to be saved, excavation may be made by alternate sections of open cut and wedge tunnel.

Backfilling of the tunnel section shall be by the use of mechanical tampers, starting at the wedge and working progressively away from the wedge.

If the wedge tunnel method is not deemed feasible, an alternate method of tunneling shall be designed and submitted by the Contractor's engineer.

T-1.03.8 **SHEETING AND SHORING:**

Where sheeting, shoring, bracing or trench boxes are used, they must be designed and sealed by a professional engineer licensed to practice in the State in which the construction work is being accomplished.

Trenches shall, at all times, be properly and adequately sheeted and braced to prevent accidents, caving of the sides of the trench or breaking of the ground outside of the lines of the trenches proper or damage to buildings or other structures along the line of construction. Underground structures of all types shall be protected by the Contractor, who shall use all necessary shoring, bracing or other appliances for the protection of same. Care must be taken not to damage in any way water mains, water service pipes, drain pipes, sanitary or stormwater sewers, gas mains, oil mains, electric conduits or other structures encountered on the lines of the work.

No sheeting or shoring shall be left in place unless so authorized by the Engineer.

T-1.03.9 **QUICKSAND EXCAVATION:**

Where quicksand excavation is encountered, the Contractor shall drive either tight tongue and groove wooden sheet piling or steel sheet piling to a depth, which will effectually cut off the flow of sand. Well points and other methods shall then be used to dewater the trench. Excavation and construction shall follow as rapidly as possible thereafter. A satisfactory foundation must, however, be secured.

T-1.03.10 **TRENCHING IN ADVANCE OF PIPE LAYING:**

The trench for the pipe lines shall not be opened for a distance of more than one hundred (100) feet at any one time. At no time will the Contractor be permitted to leave the trench open at the end of a working day.

T-1.03.11 **KEEPING TRENCH DRY:**

All ground water which may be found in the trenches and any water which may get into them from any cause whatsoever shall be pumped or bailed out so that the trench shall be dry during pipe laying period. No water shall be permitted to reach concrete until it has set sufficiently. All water pumped from the trenches shall be disposed of in compliance with the applicable local regulations of the appropriate governing body. The Contractor shall provide a minimum of two pumps for each trench opened in wet ground, one operating and one standby. The standby pump shall be of a size that will replace the largest operating pump. The Contractor shall be required to well point, pump, or provide other measures necessary to keep the trench dry, at no additional cost to the owner.

The Contractor shall provide and place all necessary flumes or other channels of adequate size to carry temporarily all streams, brooks, stormwater or other water which may flow along or across the lines of the pipe line. All flumes or channels thus utilized shall be tight so as to prevent leakage into the trenches.

T-1.03.12 **PIPE BEDDING:**

**ORDINARY BEDDING (DIP PIPE):**

Ductile iron pipe (DIP) in ordinary bedding shall be supported by the following method. The trench shall be mechanically excavated to a point not less than 0.3 times the diameter above the final pipe invert leaving the bottom in a substantially undisturbed condition. The final excavation shall be performed by pick and shovel to form a shaped excavation fitting the bottom quadrant (90 deg.) of the pipe barrel and providing uniform support along the length of the pipe section at the required line and grade. Suitable recesses shall be provided in the undisturbed bedding to permit adequate clearance for bells, couplings or similar projections so that no part of the load is supported by the bells. The full load should rest on the barrel of the pipe.

**CRUSHED STONE BEDDING (PVC, DIP, RCP, AND CMP IN UNSTABLE OR WET CONDITIONS):**

Crushed stone bedding shall be used for all PVC, DIP, RCP, and CMP pipe in unstable or wet conditions, or as otherwise directed by the Engineer. Wet conditions are defined as standing water, running water, or water that requires removal from trench by pumping, well point, etc. This bedding shall be constructed in accordance with the Construction Details. The crushed stone shall be placed in the trench 6" below the bottom of the pipe and for its full width to uniformly support the pipe at the required line and grade. The bedding shall extend upward around the pipe barrel until the crushed stone reaches one (1) foot above the top of the pipe. Suitable recesses shall be provided

to permit adequate clearance for bells, couplings or similar projections. Material shall be spread in four-inch layers, and each layer shall be compacted with twenty-pound hand tampers or pneumatic tampers of the proper size, to operate between trench wall and pipe without damaging the pipe until the required total depth of bedding has been built up.

**CONCRETE ENCASEMENT:**

Where specified or required in the field, the pipe shall be supported by Concrete Encasement. The trench shall be excavated to a minimum depth of six (6) inches below the bottom of the pipe or as shown on the construction details. The excavated space shall then be completely filled with and the entire pipe encased in concrete such that the concrete encasement measures a minimum six (6) inches deep above the barrel of the pipe. The total minimum width of the concrete encasement shall equal the width of trench excavation. Unless otherwise shown on the plans or specified herein, concrete shall be Class A in accordance with the requirements of Section 6, CONCRETE. Freshly poured concrete shall be maintained free from ground water for at least the first four hours. No backfilling of the trench shall begin until a minimum time period of 24 hours has elapsed after the encasement has been poured. Steel reinforcing, if required, shall be as shown on the plans or construction details.

**CONCRETE CRADLE:**

Where specified or required in the field, the pipe shall be supported on Concrete Cradle. Concrete Cradle shall be installed in unstable soil conditions where crushed stone encasement is determined to be insufficient support by the Engineer. The Concrete Cradle shall be furnished and installed equal to the "Concrete Encasement", except that only that portion of the encasement at and below the horizontal diameter of the pipe shall be poured, forming a true cradle under the bottom half of the pipe.

**CRUSHED STONE FOUNDATION:**

When bedding occurs in unstable soil conditions, or when suitable supporting soil or rock stratum occurs at a depth greater than 6 inches below the bottom of the required pipe invert, or where the trench is excavated below the specified depth, the foundation shall be modified as follows:

Except in the case of over-excavation where no extra excavation would have been required, the trench shall be excavated to the depth necessary to reach the suitable supporting stratum. Crushed stone shall be spread in four-inch layers, and each layer shall be compacted with twenty-pound hand or pneumatic tampers. The foundation shall carry vertically from the supporting stratum up to the required level. The determination as to the suitability of the supporting soil or rock stratum will be made by the Engineer. Extra payment for additional crushed stone foundation required as a result of unsuitable soil conditions will be made at the contract unit price. The amount of payment will be determined by the Engineer. Extra bedding as a result of over-excavation will be at the Contractor's expense.

**T-1.03.13 BACKFILLING:**

No backfilling shall be done before the Engineer gives permission. After pipes have been checked for alignment and bedding, the backfilling may be started. Backfill material may be deposited in trench either by hand or machine. Sufficient number of men shall be available to spread the backfill in uniform layers.

**BACKFILLING IN NON-TRAFFIC AREAS (GRASS AND EARTH PLOTS):**

1. Initial Backfilling of Pipe (Ordinary Bedding Material for DIP Pipe)

a. After preparing the trench for ordinary soil bedding as described under Paragraph T-1.03.12 of this section, this portion the pipe trench shall be backfilled with suitable materials (Type 1) under and around the pipe carefully deposited in uniform layers on both sides of pipe, and compacted by hand or pneumatic tampers until backfill reaches one (1) foot above top of pipe. The depth of backfill layers shall be six (6) inches maximum. Each layer of material shall be compacted to a dry density 90 percent of the maximum determined by the Standard Proctor Compaction Test.

b. When crushed stone or concrete encasement is used, the initial backfill of suitable materials will not be required.

c. The tampers shall be of the proper size to operate between trench wall and pipe without damaging the pipe.

2. Initial Backfilling of Pipe (Crushed Stone Bedding for PVC pipe, DIP in unstable or wet conditions, or Crushed Stone foundation):

a. This portion of the pipe trench shall be backfilled with crushed stone to provide crushed stone encasement.

b. When concrete cradle is used, the initial backfill will start at the top of the concrete and then continue as specified above.

c. When concrete encasement is used, the initial backfill of crushed stone will not be required.

3. Backfilling Trench to Subgrade After Initial Backfilling.

a. After initial backfilling has been compacted as specified above, the remainder of the trench shall be backfilled with suitable material (Type 2). When the material excavated from the trench is deemed unsuitable for backfilling, the Contractor shall supply and install either suitable material (Type 2) from outside sources or, at his option, "Select Backfill" at no change in contract price.

b. Final backfilling material may be dumped into trench by front end loader, then compacted using the following method:

Compact backfill in layers, 6 inches minimum with hand or pneumatic tampers, to a dry density 95 percent of the maximum determined by the Standard Proctor Compaction Test.

4. Settlement

a. If settlement occurs within warranty period, additional backfill shall be deposited and mechanically compacted to the required elevation with 90 percent compaction.

**BACKFILLING IN TRAFFIC AREAS (STATE HIGHWAYS, PAVED STREETS, PAVED PARKING LOTS, ALLEYS, DRIVEWAYS, HIGHWAY AND STREET SHOULDERS):**

1. Initial Backfilling of Pipe (Ordinary Bedding for DIP Pipe)

a. After preparing the trench for ordinary bedding as described under Paragraph 1-3.12 of this section, this portion of the pipe trench shall be backfilled with suitable materials (Type 1) under and around the pipe, carefully deposited in uniform layers on both sides of pipe and compacted by hand or pneumatic tampers until backfill reaches one (1) foot above top of pipe. The depth of backfill layers shall be six (6) inches maximum. Each layer of material shall be compacted to a dry density 95 percent of the maximum determined by the Standard Proctor Compaction Test.

b. When crushed stone or concrete encasement is used, the initial backfill of suitable materials will not be required.

c. The tampers shall be of the proper size to operate between trench wall and pipe without damaging the pipe.

2. Initial Backfilling of Pipe (Crushed Stone Encasement for PVC pipe, DIP in unstable or wet conditions, or crushed stone encasement)

a. This portion of the pipe trench shall be backfilled with crushed stone to provide crushed stone encasement.

b. When concrete cradle is used, the initial backfill will start at the top of the concrete and then continue as specified above.

c. When concrete encasement is used, the initial backfill of crushed stone will not be required.

3. Backfilling Trench to Subgrade After Initial Backfilling (Suitable Materials)

a. After initial backfilling has been compacted as specified above, backfill the remainder of the trench in compacted layers not to exceed twelve (12) inches using a mechanical tamper up to the bottom elevation of the pavement structure with suitable materials (Type 2) to be a dry density 95 percent of the maximum determined by the Modified Proctor Compaction Test.

**T-1.03.14 COMPACTION AND TESTING:**

The backfill shall be thoroughly compacted over and around the pipe by use of vibratory tamping pads, or where these cannot be used, by mechanical or hand tamping. Backfilling shall be compacted to at least the levels outlined above.

The optimum moisture content and the maximum density of each type of material used for trench backfill shall be determined by "Tests for Moisture-Density Relations of Soils, using 10-pound Rammer and 18-inch Drop" (ASTM D698 or AASHTO T-180).

The field moisture content of materials being compacted shall be determined by "Laboratory determination of Moisture Content of Soil" (ASTM D2216). The field density of compacted material shall be determined by "a nuclear Density Gauge test (ASTMD6938-17)

An independent soils engineering and testing laboratory shall perform sufficient tests and inspection procedures, to the satisfaction of the Engineer, both in the field and lab to ensure that the provisions of this specification are met. The testing shall be paid by the Contractor. The testing lab shall be approved by the Engineer.

After testing is completed and reports are provided, all subgrades below the paving will be examined by the Engineer before any paving is authorized.

The responsibility of the soils engineering and testing laboratory is to the Engineer, to whom that firm must promptly, faithfully and accurately report the results of its tests and inspections. The firm must, in addition, work in coordination with the Contractor, making all tests required. The reports must state whether or not the reported results comply with contract requirements. The testing and control firm shall promptly type and deliver all its reports to the Engineer with a copy to the Contractor.

T-1.03.15 **DISPOSAL OF MATERIAL:**

Excavated material shall be so placed as not to unreasonably interfere with travel. All asphalt and other street surfacing, surface loam and sod shall be kept separate from the remainder of the excavated material.

Upon completion of the backfilling, the property shall be cleaned, all surplus material removed, and the surface restored to the condition in which it was before ground was broken.

Unless otherwise specified, all materials left over shall become property of the Contractor. Also, underground structures removed, such as brick, concrete and sewer pipe, shall become the property of the Contractor, unless otherwise noted on the plans.

If the Contractor shall fail to promptly remove surplus material, the owner may have the material removed and charge the cost thereof as money paid to the Contractor. All surplus excavation shall be removed from the site of the work by the Contractor, but none shall be deposited on private property until written consent of the property owner has been filed with the Engineer. Contractor's disposal shall comply with all Federal, State and local laws and regulations.

T-1.03.16 **CUT-BACK OF PAVEMENT REQUIRED:**

When pipe lines are placed under existing pavements, a cut-back of the pavement of 12" will be required on each side of the trench. After the pipe line has been laid and backfilled in Town streets, a minimum 6-inch compacted base of marl-type rock shall be placed over the total width of the pavement cut. After manipulation and the compaction, this base shall be 2 inches below the level of the adjacent pavement. A wearing surface of 2 inches (or equal to existing pavement thickness, whichever is greater) of bituminous concrete, Type I, shall then be applied over this base in such a manner as to, when rolled, match the grade of existing pavement. N.C. D.O.T. street base and pavement will be specified on plans.

T-1.04 **GRADING & PREPARATION OF SUBGRADES:**

T-1.04.1 **ASPHALT PAVEMENT:**

After all excavation, undercutting and backfilling have been completed, the subgrade shall be properly shaped and compacted. The area to be compacted shall include all areas beneath pavement and curb and gutter and shall extend at least one foot behind the back of the curb. The degree of compaction of the top six inches over this entire area shall be at least 95% of that obtained by compacting a sample of the soil or materials with the equipment and in the manner prescribed by the Standard Proctor method, so that it conforms to the lines and grades as shown and shall be brought to a firm, unyielding condition before any base course, surface course, or pavement is placed thereon. If the subgrade does not contain sufficient moisture for compaction, it shall be wetted as directed by the Engineer.

All soft and yielding material, boulders, loose stones, or any other unsuitable materials in the sub-grade, which will not readily compact, shall be removed and replaced with suitable material which shall then be thoroughly compacted. All roots, stumps, and other perishable matter encountered in the preparation of the subgrade shall be removed to a depth of not less than two feet below the surface of the pavement, unless otherwise directed by the Engineer. Any portion of the subgrade inaccessible to the roller shall be thoroughly compacted with hand or mechanical tampers.

T-1.04.2 **CURB & GUTTER:**

The subgrade shall be constructed true to grade and cross-sections as required. The subgrade shall be of materials equal in bearing quality to the subgrade under the adjacent roadway or street and shall be placed and compacted to conform to applicable requirements of T-1.04.1 above. All roots, stumps, and other perishable matter encountered at the subgrade shall be removed to a depth of not less than 12 inches below the subgrade and undercut filled and compacted with select material.

Excavation to an elevation slightly above finished subgrade shall be maintained in a smooth, compacted condition, in conformity with the required section and established grade until the concrete is in place. The subgrade shall be wet down sufficiently in advance of the placing of the concrete to ensure a firm and moist condition. In cold weather, the subgrade shall be so treated, protected, and prepared as to produce a satisfactory subgrade entirely free from frost when the concrete is deposited.

T-1.04.3 **SIDEWALKS & DRIVEWAYS:**

The subgrade shall be constructed true to grade and cross-section as required. In areas where sidewalks or driveways are to be poured, the following conditions will be observed relating to compaction of the subgrade.

Where good firm material (original material, not fill) has been carefully graded, so that no undercutting has occurred, this material shall be considered acceptable subgrade, upon approval by the Engineer.

Where fill material has been placed, where undercutting has occurred, or where loose or unsuitable material is encountered, such fill or loose material shall be compacted to 95% as specified above for Embankments.

Where roots, stumps or other perishable matter is encountered at the subgrade, they shall be removed to a depth of 4 inches below the subgrade.

In cold weather, the subgrade shall be so treated, protected, and prepared as to produce and provide a satisfactory subgrade entirely free from frost when the concrete is deposited.

All subgrades shall be graded and protected so as to prevent an accumulation of standing water, and consequent subgrade saturation, in the event of rain.

T-1.05 **BACKFILLING FOR DRAINAGE STRUCTURES:**

Backfilling around and adjacent to all drainage structures shall be as specified in paragraph T-1.03.1.

T-1.06 **BACKFILL OF CURB & GUTTER & SIDEWALKS:**

Immediately after the removal of forms for curb and gutter, sidewalks and driveways, the space between the back of the curb and sidewalks shall be backfilled, smoothed off and maintained so as to prevent the accumulation of standing water in the event of rain.

T-1.07 **SALVAGE OF USABLE MATERIALS:**  
Note used

T-1.08 **FINISHING SLOPES AND SURFACES:**  
The surface of all areas of earth and other materials shall be finished to a reasonably smooth and compact surface substantially in accordance with the surface lines, cross-sections and elevation indicated on the drawings, or as established by the Engineer.

T-1.09 **PROTECTION OF TREES:**  
Only where it is found to be absolutely necessary shall trees be removed. These trees to be removed will be designated by the Engineer. The Contractor shall take all possible precautions to ensure that all other trees are not damaged.

T-1.10 **AREAS TO BE CLEARED AND GRUBBED:**

T-1.10.1 Unless clearing limits are otherwise designated, the street right-of-way lines or easement lines shall normally constitute the clearing and grubbing limits. Special conditions may require that areas other than street rights-of-way be included within clearing and grubbing limits; in this case, the limits will be clearly designated on the plans.

The areas designated to be cleared and grubbed under this item shall be staked on the ground in advance by the Contractor and approved by the Engineer.

T-1.10.2 **CLEARING:**  
Clearing shall consist of felling, cutting, and satisfactory disposal of trees and other vegetation designated for removal.

T-1.10.3 **GRUBBING:**  
Grubbing shall consist of the removal of all stumps and roots having a diameter of three inches or larger, to a depth of at least three feet below the subgrade, and the disposal thereof.

T-1.10.4 **DISPOSAL OF CLEARED AND GRUBBED MATERIAL:**  
All timber, logs, roots, brush, etc., from the clearing and grubbing operation shall be removed from the site and disposed of by the Contractor at a permitted disposal site.

T-1.11 **METHODS OF MEASUREMENT:**

T-1.11.1 **EXCAVATION:**  
The unit of measurement for excavation shall be cubic yards, which will be computed by the average end-area method from the cross sections taken before and after the excavation operations. The yardage to be paid for under this section of the specifications shall be the number of cubic yards of material, measured in its original position and removed from the excavation areas. The measurement will include the excavation below grade, where ordered, and allowance made on the same basis for suitable excavation as replacement. The measurement will not include the yardage excavated without authorization beyond the normal slope lines nor the yardage of any material which is used for purposes other than those directed.

Borrow shall be measured by the cubic yard, compacted in-place, by the width, length, and depth of placement. The contractor shall also provide tickets for each load used on the project, which shows the amount per truck. The contractor and the inspector shall agree as to borrow quantity before submittal for payment.

The salvage of usable material, removal of excess material, the finishing of slopes and surfaces and the forming of fill, embankments and subgrade will be considered as a subsidiary obligation of the Contractor and will be covered under the contract unit price for excavation.

T-1.11.2 **EXCAVATION AND BACKFILL:**

All excavation and backfill in connection with drainage structures, water mains, sanitary sewers, storm drains, curb and gutter, sidewalk and driveways shall be considered a subsidiary obligation of the Contractor, for which payment shall be included in the unit price for the basic item.

T-1.11.3 **CLEARING AND GRUBBING:**

Measurement, if allowed, shall be as specified under the Special Condition. If not specified, then this work shall be considered incidental to the contract and included in the unit price of excavation.

T-1.12 **PAYMENT:**

T-1.12.1 **EXCAVATION:**

The yardage of excavation and borrow measured as specified herein, will be paid for at the contract prices per cubic yard for excavation and borrow respectively, which payment shall constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete all items of work, including all hauling, construction of fills, and embankments, spreading, rolling, wetting, and compacting of subgrades, and disposal of all surplus and unsuitable materials, as indicated on the drawings and specified herein.

T-1.12.2 **CLEARING AND GRUBBING:**

Payment shall be made according to the Special Conditions and at the price shown in the proposal, and should include all labor, equipment, tools, and incidentals necessary to complete the work specified above.

## **TECHNICAL SPECIFICATIONS**

### **SECTION 2: STORM DRAINS**

T-2.01 **SCOPE:**

The work covered by this section of the specifications consists of furnishing all labor, materials, plant, and equipment necessary to construct all storm drain lines, structures, and appurtenances where shown on the plans or as directed by the Engineer. The Contractor is cautioned to review the General Specifications pertaining to precautions for excavation of streets.

T-2.02 **GENERAL:**

Storm drain lines, structures, etc. shall be constructed to line and grade as established by the Engineer. It shall be the Contractor's responsibility to protect and maintain any grade alignment stakes. All pipe lines and structures shall be constructed by the use of competent workmen under the supervision of an experienced foreman. Proper materials and equipment shall be used and shall be subject to the approval of the Engineer. Great care shall be taken to obtain well-aligned and tight pipelines so as to assure good flow and the exclusion of ground water and foreign substances.

T-2.03 **MATERIALS:**

T-2.03.1 **PIPE:**

All storm drain pipe shall be reinforced concrete pipe unless otherwise indicated on the plans, specifications, and proposal or unless otherwise directed by the Engineer. Only sound, undamaged pipe shall be used. The Contractor or his suppliers shall be responsible for the delivery, storage, and handling of the pipe. The Contractor shall, at his own expense, replace any damaged or otherwise unacceptable sections of pipe.

**REINFORCED CONCRETE PIPE:**

Reinforced concrete pipe (RCP) shall be manufactured in accordance with ASTM Specification C-76, Class III and shall be clearly marked as such on each joint. RCP shall be required to be furnished in eight (8) foot joints for sizes twelve (12) inches through twenty-four (24) inches except where shorter joints are needed for tie-ins. The Town prefers that ALL sizes of RCP be furnished in the eight (8) foot lengths when the Contractor has the proper equipment and sufficient working area. Permission may be granted for use of other length joints by the Engineer on a case-by-case basis.

**REINFORCED CONCRETE ARCHED AND ELLIPTICAL PIPE:**

Reinforced concrete arched and elliptical pipe shall be manufactured in accordance with ASTM C 506 latest revision.

**REINFORCED CONCRETE ELLIPTICAL PIPE:**

Reinforced concrete elliptical pipe shall be manufactured in accordance with ASTM C 507 and AASHTO M-207.

**REINFORCED CONCRETE BOX CULVERTS:**

Reinforced concrete box culverts shall be manufactured in accordance with the latest edition of the AASHTO Specifications and shall be designed for H-20 loading in the longitudinal and transverse directions. Shop drawings and specifications shall be submitted to the Engineer for review and approval prior to installation. The Engineer

may request design calculations sealed by a Licensed Professional Engineer registered in North Carolina on a case-by-case basis.

**ALUMINUM CORRUGATED PIPE:**

Aluminum corrugated pipe shall be used primarily for risers and barrels for water quality and retention/detention basins. Aluminum corrugated pipe can be used within street rights-of-ways or public easements on a case by case basis when approved by the Engineering Department. Specifications for aluminum corrugated pipe shall be included in Special Conditions when called for on the plans and specifications.

**HIGH DENSITY POLYETHYLENE PIPE (HDPE):**

HDPE shall not be permitted within rights-of-ways or public easements.

T-2.03.2 **FLARED END SECTIONS:**

Flared end sections (FES) shall be installed at locations shown on the plans or as directed by the Engineer. FES's shall be manufactured of the same material as the pipe to which it is being connected and shall be manufactured and installed with the same type of joint as the pipe.

**REINFORCED CONCRETE FLARED END SECTIONS:**

Reinforced concrete flared end sections shall be manufactured in accordance with plans that have been approved by the North Carolina Department of Transportation. The concrete used in FES's shall attain a strength of 3500 psi when tested in accordance with AASHTO T22. Where grates are to be installed on FES's, provisions for mounting the grate shall be provided.

T-2.03.3 **BRICK:**

Bricks shall conform to AASHTO M-91-90, Grade MS, and shall be WHOLE solid brick of standard size, with straight and parallel edges and square corners. They shall be of compact texture, full weight, entirely true, free from injurious cracks and flaws, tough, strong, and shall have a clear ring when struck together.

T-2.03.4 **CASTINGS:**

All castings for storm drain structures shall be Gray Iron castings manufactured in accordance with ASTM A-48, latest revision. Storm drain manholes shall have the words "STORM DRAIN" or "STORM SEWER" cast in the lids.

T-2.03.5 **FILTER FABRIC:**

Filter fabric shall be Mirafi 140N Filter Fabric or an approved equal. The Contractor shall furnish the Engineer sufficient data to evaluate the adequacy of any substitute non-woven filter fabric. No installation of substitute fabric shall be permitted until written approval has been furnished by the Engineer.

T-2.04 **STRUCTURES:**

T-2.04.1 **MANHOLES:**

Where shown on the plans or otherwise directed by the Engineer, storm drain manholes shall be constructed in accordance with these specifications. All inverts in storm drain manholes shall be shaped to provide smooth flow through the manhole and to prevent ponding of water and settlement of sediment and debris.

**PRECAST MANHOLES:**

Precast manholes shall be permitted unless specifically stated otherwise on the plans, Special Conditions, or Proposal. Precast manholes shall be constructed in accordance with ASTM Specification C-478 and shall have an inside diameter of four (4) feet unless specified otherwise on the plans, Special Conditions, Proposal, or directed by the Engineer. A six (6) inch extended footing shall be required on all four-foot diameter precast manholes. (See T-14.23)

**CORRUGATED METAL PIPE MANHOLES:**

Corrugated metal manholes shall not be permitted unless specified in the Special Conditions.

T-2.04.2 **JUNCTION BOXES:**

**REINFORCED CONCRETE JUNCTION BOXES:**

Reinforced concrete junction boxes shall be constructed at locations shown on the plans or where directed by the Engineer. The reinforced concrete junction boxes shall be constructed in accordance with the details on the plans and in accordance with applicable sections of the ACI Manual of Concrete Practices and NCDOT Standards. All tops for

junction boxes shall be cast to provide for a Town of Emerald Isle approved manhole ring and cover.

**PRECAST REINFORCED CONCRETE JUNCTION BOXES:**

Precast reinforced concrete junction boxes shall be manufactured to the inside dimensions shown on the plans or as directed by the Engineer. The manufacturer of the precast boxes shall provide detailed shop drawings and design calculations that have been sealed by Professional Engineer registered in the State of North Carolina. All boxes shall be designed for a minimum of H-20 loading with appropriate safety factors indicated. All tops for junction boxes shall be cast to provide for a Town of Emerald Isle approved manhole ring and cover.

T-2.04.3 **CATCH BASINS AND INLETS:**

**PRECAST CATCH BASINS:**

Precast catch basins shall be permitted unless specifically stated otherwise on the plans, Special Conditions, or Proposal. Precast catch basins shall be constructed in accordance NCDOT standards and shall have an inside diameter of four (4) feet unless specified otherwise on the plans, Special Conditions, Proposal, or directed by the Engineer. A six (6) inch extended footing shall be required on all four-foot diameter catch basins manholes. (See T-14.23)

T-2.04.4 **REINFORCED CONCRETE HEADWALLS:**

Reinforced concrete headwalls shall be constructed at locations shown on the plans or where directed by the Engineer. All reinforced concrete headwalls shall be constructed in accordance with the details and specifications included with the project and in accordance with applicable sections of the ACI Manual of Concrete Practices.

T-2.05 **CHANNEL LININGS:**

**RIP RAP:**

Rip rap shall consist of field stone or rough unhewn quarry stone. The stone shall be sound, tough, dense, resistant to the action of air and water, and suitable in all other respects for the purposes intended. The stone shall be graded to meet the following requirements:

Class I - Stone shall vary in weight from 5 to 200 pounds with at least 30 percent of the total weight of rip rap weighing a minimum of 60 lbs. and not more than 10 percent weighing less than 15 lbs.

Class II - Stone shall vary in weight from 25 to 250 lbs. with at least 60 percent of the total weight of the rip rap shall weigh a minimum of 100 lbs. and no more than 5 percent shall weigh less than 50 lbs.

Class A - Stone shall vary in size from 2-inches to 6-inches and while no specific gradation is specified, the stone shall be equally distributed within the range. The size shall be determined by measuring its long dimensions.

Class B - Stone shall vary in size from 5-inches to 15-inches and while no specific gradation is specified, the stone shall be equally distributed within the range. The size shall be determined by measuring its long dimensions.

Rip rap shall be grouted into place with flowable fill concrete if shown on the plans.

T-2.06 **SUBDRAINS:**

**SUBDRAIN PIPE:**

Subdrain pipe shall be six (6) inch perforated pipe with the perforations on the bottom of the pipe. Metal subdrain pipe shall be galvanized corrugated steel pipe meeting ASTM A-760 and AASHTO M-36. PVC subdrain pipe shall be Schedule 40 meeting the requirements of ASTM Specification D-1785.

T-2.07 **INSTALLATION:**

T-2.07.1 **PIPE INSTALLATION:**

All pipe and related structures shall be installed to the line and grade as shown on the plans or as established by the Engineer. The Contractor shall adhere to any and all construction techniques established by the pipe manufacturer unless directed otherwise by the Engineer. The Contractor shall be responsible for and correct any and all defects due to settlement, poor workmanship, improper handling, or lack of maintenance. It shall be the Contractor's responsibility to maintain the new and existing pipe system as well as existing utilities on the job site for the duration of the project. This is to include, but not be limited to, the infiltration of sand and debris into the new and existing storm drainage system and into the other utility lines. Should sand or debris collect in any portion of the new or existing systems as a result of construction, the Contractor shall be required to remove said sand and debris at his own expense.

T-2.07.2 **PIPE JOINTS:**

**JOINTS:**

All pipe joints, regardless of pipe material, shall be wrapped with filter fabric along the exterior of the pipe. The filter fabric shall be secured to the exterior of the pipe with a bituminous adhesive. The filter fabric shall cover the circumference of the joint completely and extend at least twelve inches beyond the center of the joint in both directions.

**REINFORCED CONCRETE PIPE:**

Joints for reinforced concrete pipe shall be tongue and groove with flexible watertight joints unless specified otherwise on the plans, specifications, or proposal or unless directed otherwise by the Engineer. The joint material shall be as recommended by the

reinforced concrete pipe manufacturer and shall provide water tight seals at all joints, meeting the requirements of Section T-14.10.2. Joint materials specifications shall be submitted to the Engineer for review and approval prior to installation.

**REINFORCED CONCRETE ARCHED AND ELLIPTICAL PIPE:**

Joints for reinforced concrete arched and elliptical pipe shall conform to the specifications for joints for reinforced concrete pipe.

**REINFORCED CONCRETE BOX CULVERTS:**

Joints for reinforced concrete box culverts shall conform to the specifications for joints for reinforced concrete pipe.

**ALUMINUM CORRUGATED PIPE:**

Aluminum corrugated pipe joints shall be in accordance with the manufacturer's recommendation and shall provide a watertight seal at all joints. Specifications for joints and fittings for aluminum corrugated pipe shall be submitted to the Engineer for review and approval prior to installation.

**CORRUGATED POLYETHYLENE PIPE:**

Corrugated polyethylene pipe joints shall be in accordance with the manufacturer's recommendations and shall provide a watertight seal or shall be installed such as to prevent any infiltration of sand or soil.

**CORRUGATED POLYPROPYLENE PIPE:**

Corrugated polypropylene pipe joints shall be in accordance with the manufacturer's recommendations and shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477.

T-2.07.3 **FLARED END SECTIONS:**

All flared end sections shall be manufactured of the same material as the pipe to which it is being connected, with the exception of aluminum. No aluminum flared end sections shall be permitted. The contractor shall use a concrete headwall when using aluminum pipes. The flared end section shall be installed such as to minimize and prevent undermining of the flared end section and to minimize erosion of the receiving channel. The Contractor shall use extreme care not to undercut the soil under the flared end section. Where the soil is undercut, the Contractor shall be required to replace the material and to place the material in six (6) inch lifts achieving 100 percent of the maximum density at optimum moisture, as determined by ASTM D-1557 Standard Test Method.

T-2.07.4 **STRUCTURES:**

All structures shall be constructed on firm, undisturbed soil at locations shown on the plans or as directed by the Engineer, provided that all precast structures shall have a minimum of six (6) inches of washed stone (#57) bedding and the cost of the stone bedding shall be considered incidental to the precast structure. Additional stone bedding thickness may be required as directed by the engineer for structures deeper than six feet. Where the Contractor undercuts the soil for the footing, the Contractor shall be required to use washed stone (#57) to bring the subgrade back to proper elevation. Should the contractor encounter unsuitable material at the subgrade elevation for the manhole footing, he shall immediately notify the Engineer and assist the Engineer in determining

the severity of the problem and work with the Engineer in resolving the situation.

The inverts of all structures shall be constructed and shaped to provide free flow of water without ponding and to eliminate and prevent accumulation of sediment and debris. All connections to structures shall be watertight and shall be grouted from both the exterior and interior of the structure, fully encapsulate bricks, if used, with grout. All connections to structures shall be wrapped with filter fabric along the exterior of the pipe and the structure. The filter fabric shall be secured to the exterior of the pipe and the structure with a bituminous adhesive.

## **MANHOLES:**

### **BRICK MANHOLES:**

Brick manholes shall be constructed on concrete footing a minimum of six (6) inches thick and having a diameter a minimum of twelve (12) inches larger than the outside diameter of the structure. Brick manholes shall be plastered with  $\frac{3}{4}$  inch cement on both the exterior and interior of the structure. All brick shall be whole, solid, uniform brick made of cement or hard burned clay. The brick shall be fully soaked in water prior to being set in cement mortar. All pipes entering or leaving the manhole shall be set prior to the setting of bricks. Bricks and mortar shall be placed around the pipes in a manner to ensure a neat watertight seal. Steps shall be installed one (1) foot on center directly below the access opening.

### **PRECAST MANHOLES:**

The Contractor shall use extreme care in handling, setting, and connecting to the precast manhole to prevent any structural damage. The Town reserves the right to reject any structure that has been damaged and could result in a loss of structural strength or integrity. All connections to precast manholes shall be watertight and shall be grouted from both the exterior and interior of the structure. Steps shall be installed one (1) foot on center directly below the access opening.

### **INTERFERENCE MANHOLES:**

Installation of interference manholes shall be in accordance with the specifications for the type of manhole being installed. The carrier pipe through the interference manhole shall always be metal (steel or ductile iron). When the carrier pipe is an existing pipe to be replaced, the carrier pipe shall be a separate bid item unless specifically stated otherwise on the plans or special conditions. A minimum of twenty-four (24) inches clearance shall be provided between the outside bottom of the carrier pipe and the bottom of the manhole invert, said clearance may have to be a "sumped" area in some cases. Steps shall be installed one (1) foot on center directly below the access opening.

### **REINFORCED CONCRETE JUNCTION BOXES:**

Reinforced concrete junction boxes shall be constructed in accordance with the details on the plans, specifications, and in accordance with the applicable sections of the latest edition of the ACI Manual of Concrete Practices. All pipes entering or leaving the junction box shall be set prior to the placing of the concrete for the walls. Steps shall be installed one (1) foot on center directly below the access opening.

### **PRECAST REINFORCED CONCRETE JUNCTION BOXES:**

All connections to the precast junction boxes shall be watertight and shall be sealed from both the interior and exterior of the structure. Care shall be taken in handling, setting, and connecting to the structure to prevent any structural damage. The Town reserves the right to reject any structure that has been damaged and could result in a loss of structural strength or integrity. Steps shall be installed one (1) foot on center directly below the access opening.

### **BRICK CATCH BASINS:**

Brick catch basins shall be constructed on concrete footing a minimum of six (6) inches thick and extending a minimum of four (4) inches past the outside face of the structure. Brick catch basins shall be plastered with  $\frac{3}{4}$  inch cement on both the exterior and interior of the structure. All brick shall be whole, solid, uniform brick made of cement or hard burned clay. The brick shall be fully soaked in water prior to being set in cement mortar. All pipes entering or leaving the catch basin shall be set prior to the setting of bricks. Bricks and mortar shall be placed around the pipes in a manner to ensure a neat watertight seal.

**DROP INLETS:**

Drop inlets shall be constructed on concrete footing a minimum of six (6) inches thick and extending a minimum of four (4) inches past the outside face of the structure. Brick drop inlets shall be plastered with  $\frac{3}{4}$  inch cement on both the exterior and interior of the structure. All brick shall be whole, solid, uniform brick made of cement or hard burned clay. The brick shall be fully soaked in water prior to being set in cement mortar. All pipes entering or leaving the drop inlet shall be set prior to the setting of bricks. Bricks and mortar shall be placed around the pipes in a manner to ensure a neat watertight seal.

**REINFORCED CONCRETE HEADWALLS:**

Reinforced concrete headwalls shall be constructed of Class A concrete as specified in T-6.09 of the concrete section of the specifications. All concrete shall comply with the requirements in Section 6 of the specifications and with the applicable sections of the ACI Manual on Concrete Practices. Reinforcing steel shall be Grade 60 Deformed bars complying with ASTM A - 615 and shall be of the size and quantity specified in the details and/or specifications. Steel shall be placed in accordance with the details and specifications and shall be placed such that a minimum of two (2) inches of concrete covers the steel.

T-2.07.5 **CHANNEL LININGS:**

**RIP RAP:**

Rip rap shall be installed at the locations shown on the plans or as directed by the Engineer

T-2.07.6 **SUBDRAINS:**

Sub drains shall be installed at locations shown on the plans or as directed by the Engineer. The sub-drain shall be installed in accordance with SD 2-04. A minimum of six (6) inches of washed stone shall be placed around the perforated pipe. The washed stone shall be wrapped in an approved non-woven filter fabric. Unless directed otherwise, all subdrains shall be connected to the storm drain system at structures and the invert of the subdrain shall be a minimum of six (6) inches above the invert of the structure.

T-2.08 **EXCAVATION AND BACKFILL:**

T-2.08.1 **EXCAVATION FOR PIPE LINES:**

Excavation of all trenches for pipe lines shall be done to line and grade as established by the Engineer. The width of the trench shall not be greater than necessary to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. The bedding surface shall provide a firm foundation of uniform density through the entire length of the pipe. Recesses shall be excavated to accommodate bells and joints. The bottom of the trench shall be carefully shaped and rounded to the shape of the lowest 1/4 of the outside of the pipe for its entire length.

T-2.08.2 **EXCAVATION FOR STRUCTURES:**

Excavation for all structures shall be done such that the structure can be set to line and grade as established by the Engineer. The width and depth of the trench shall not be greater than that necessary to properly set and seal the structure in accordance with the plans and specifications.

T-2.08.3 **UNDERCUTTING:**

Any undercutting in good soil shall be replaced at the Contractor's expense, and the replacement material shall be compacted to 95 percent of the maximum density obtained at optimum moisture content as determined by ASTM D-1557 Standard Test Method. In the event that the material encountered at grade is found to be soft, spongy, or in any other way unsuitable, the Contractor shall notify the Engineer immediately. If instructed to remove the unsuitable material to a specified depth, the contractor shall do so and replace the same with borrow material acceptable to the Engineer. This material shall be placed in layers not to exceed six (6) inches in thickness and compacted to 95% of the maximum density by the method described above.

T-2.08.4 **SHORING, SHEETING, AND WELL-POINTING:**

Shoring, sheeting, and/or well-pointing shall be used where and as necessary, in order to prevent damage to existing facilities or structures, or as a matter of safety, or as directed by the Engineer. The cost of shoring, sheeting, and/or well-pointing as required are to be included in the unit prices as bid for storm drains (pipes and structures) and there shall be no additional payment allowed for these items.

T-2.08.5 **BACKFILL:**

Before backfilling is commenced over pipes and installations, fine earth, sand, or rock dust shall be solidly tamped around and above the pipe to a depth of one (1) foot above the top of the pipe. Care shall be taken to prevent any disturbance to the pipe, structures, or newly made joints. The filling of the trench shall be carried on simultaneously on both sides of the pipes and structures in such a manner that injurious side pressures do not occur. NO SEPARATE PAYMENT SHALL BE ALLOWED FOR BACKFILLING OF STORM DRAINS.

Sheeting and shoring generally should be removed only when the trench below it has become substantially filled, and every precaution shall be taken to prevent any slides of material from the sides of the trench onto or against the pipe and/or structures.

The material for backfilling, unless specified otherwise, shall be earth, loam, gravel, or quarry spoil from trenches and shall be free from stones larger than two (2) inches in diameter. It shall be free from all perishable and objectionable materials. Before placing

any backfill, all rubbish, forms, blocks, wires, or other unsuitable material shall be removed from the excavation. The backfilling shall be placed in layers not to exceed twelve (12) inches thick and compacted to a minimum density of 95 percent as determined by ASTM D 1557 Standard Test Method.

Material for backfill shall generally be material excavated from the trench or excess material from the project site created as a result of required grading. When there is not sufficient suitable material available at the site, the Contractor shall immediately notify the Engineer and request directions on how to proceed. Should the Engineer direct that borrow be used, the Contractor shall provide fill material. Fill material, if directed to be supplied by the Engineer, shall be paid for on a cubic yard basis as bid in the proposal, or at a unit price negotiated by the Engineer and Contractor.

The unit price of fill material, if used, should include all the cost of providing the fill material to the site and disposal of the objectionable material. The cost of placing and compacting the material shall be included in the cost of the pipe and structures.

T-2.08.6 **CUT-BACK OF PAVEMENT:**

When pipe lines and/or structures are placed under existing pavements, a cut-back of the pavement of twelve (12) inches shall be required on each side of the ditch line, per Standard Detail SD 1-05. After the pipe has been laid and backfilled in accordance with the plans and specifications, a six (6) inch, or as specified on the plans or in the Special Conditions Section, a compacted base of marl-type rock shall be placed over the total width of the pavement cut. After manipulation and compaction, this base shall be two (2) inches below the level of the adjacent pavement. A wearing surface of two (2) inches of bituminous concrete, Type I-2, shall then be placed over this base in such a manner as to, when rolled, match the grade of the existing pavement.

This type of pavement repair shall be permitted by the Town for all types of bituminous- surfaced streets, regardless of the existing type of base, unless specified otherwise on the plans or in the Special Conditions Section.

T-2.09 **EXISTING PIPES AND STRUCTURES:**

T-2.09.1 **TAPPING EXISTING STRUCTURES:**

Where shown on the plans or directed by the Engineer, the Contractor shall connect new pipe, install new structures, etc. or otherwise make connection to the existing storm drain systems. This connection (tap) shall be accomplished with minimal damage to the existing structure. All gaps, cracks, etc. shall be mortared so as to prevent any ground-water infiltration. This shall be accomplished with the type brick and mortar used in construction of new manholes unless otherwise specified or directed by the Engineer. NO EXTRA PAYMENT SHALL BE ALLOWED FOR THIS WORK.

T-2.09.2 **REPLACEMENT OF EXISTING STRUCTURES:**

Where shown on the plans or directed by the Engineer, the Contractor shall replace an existing structure with a new structure. Unless noted otherwise, the Contractor shall completely remove the old structure, including the footing and shall build the new structure in accordance with the appropriate standards and specifications or as directed by the Engineer.

T-2.09.3 **REMOVAL OF EXISTING PIPE AND/OR STRUCTURES:**

Unless noted otherwise in the Special Conditions section or on the plans, the Contractor shall remove ALL abandoned pipe and/or structures. Unless noted otherwise in the proposal, NO EXTRA PAYMENT SHALL BE ALLOWED FOR THIS WORK.

T-2.09.4 **SALVAGING EXISTING PIPE, CASTINGS, ETC.:**

Note Used

T-2.09.5 **PLUGGING EXISTING LINES:**

The Contractor shall install a masonry plug where shown on the plans or directed by the Engineer. Unless otherwise stated in the Special Conditions section or in the proposal, NO EXTRA PAYMENT SHALL BE ALLOWED FOR THIS WORK.

T-2.09.6 **GROUT FILLING ABANDONED LINES AND/OR STRUCTURES:**

Where shown on the plans, specified in the Special Conditions section, or directed by the Engineer, the Contractor shall fill existing pipes and/or structures as required with concrete or grout. This concrete or grout shall be a minimum 2000 psi. For pipe, this grout shall be pumped under pressure into the section being filled in such a manner to ensure that the line completely fills with the concrete or grout.

T-2.09.7 **REPLACEMENT OF EXISTING IMPROVEMENTS:**

Where the storm drain crosses existing improvements, i.e., asphalt, base, curb, driveways, sidewalks, brick pavers, water/sewer services, other utilities, etc., it shall be the Contractor's responsibility to protect and/or to replace these improvements. The cost of protecting and/or replacing these improvements shall be included in the unit prices for new storm drain pipes and structures and NO EXTRA PAYMENT SHALL BE ALLOWED unless otherwise specified in the Special Conditions section. The Engineer shall be the judge as to the extent of replacement required. In the instance of asphalt replacement, it shall be done in accordance with Section T-2.08.6 and Standard Detail SD 1-05.

T-2.10 **MEASUREMENT AND PAYMENT:**

T-2.10.1 **PIPE:**

Payment for pipe shall be for the actual linear footage installed for each size and cut range specified in the proposal. The actual amount of pipe in a given cut range shall be determined by the initial grade at the point of installation and the installed pipe invert unless otherwise specified in the Special Conditions section. No payment through structures will be allowed.

T-2.10.2 **BOX CULVERTS:**

Box culverts shall be measured in the same method as pipe and as described in Section T-2.10.1.

T-2.10.3 **FLARED END SECTIONS:**

Flared end sections shall be paid on a "per each" basis for the specific sizes used as bid in the proposal.

- T-2.10.4 **CATCH BASINS AND MANHOLES:**  
Catch basins and manholes shall be paid for as specified in the proposal for the actual quantity installed for the various diameters and ranges of cut. The appropriate cut for a given structure shall be determined in the field and shall be measured in feet from the lowest invert of the manhole or basin to the rim.
- T-2.10.5 **JUNCTION BOXES:**  
Junction boxes shall be measured on a “per each” basis using the inside dimensions and as bid in the proposal. The unit price for junction boxes shall include all costs associated with constructing and/or installing the box including steps, castings, etc.
- T-2.10.6 **HEADWALLS:**  
Headwalls shall be measured on a “per each” basis for the headwall actually installed for the various ranges of pipe(s) in the headwall and as bid in the proposal unless otherwise specified in the Special Conditions section and/or in the proposal.
- T-2.10.7 **CHANNEL LININGS AND OUTLET STABILIZATION:**
- RIP RAP:**  
Rip rap shall be measured on a square yard basis for the actual quantity installed as determined by final field measurements for the various thickness(es) and type(s) specified in the Special Conditions section and/or the proposal.
- T-2.10.8 **SUBDRAINS:**  
Subdrains shall be measured on a linear foot basis for the actual quantity installed.
- T-2.10.9 **EXCAVATION AND BACKFILL:**  
No extra payment will be allowed for excavation and/or backfill required for the installation of storm drain pipes and/or structures, except that mucking required below the bedding of the pipe shall be paid for as common excavation. Where undercutting is required for the placement of stone bedding (specified by the Engineer), the cost of the undercutting shall be included in the cost of the stone bedding.
- BORROW OR SELECT FILL:**  
When the Engineer has directed the Contractor to provide select fill (borrow) for the backfilling of pipes and structures, the borrow will be measured on a per cubic yard basis. The method of measurement shall be computed by measuring the trench to be backfilled and subtracting the volume of the pipe and structures, or at the direction of the Engineer by using truck counts and allowing a shrinkage of 20% for the voids.

**TECHNICAL SPECIFICATIONS  
SECTION 6: CONCRETE: PROPORTIONING, MIXING, TESTING,  
PLACING AND CURING**

**4/04/2001**

T-6.1 **GENERAL:**

Concrete shall consist of a mixture of Portland cement, aggregates and water, proportioned in accordance with the requirements of this specification. Admixtures shall be included with these primary ingredients only when specifically authorized.

T-6.02 **SPECIAL PRECAUTIONS IN FREEZING WEATHER:**

T-6.02.1 **FROZEN AGGREGATES:**

Frozen aggregates or aggregates containing lumps of frozen material shall be thawed before using.

T-6.02.2 **WORK IN FREEZING WEATHER:**

All concrete work during cold weather shall be in conformance with ACI-306R. In general, no concrete shall be placed when the ambient temperature is 40 degrees F. or below without the consent of the Engineer.

T-6.03 **PROPORTIONS AND CONSISTENCY:**

In proportioning concrete materials one (1) bag (sack) of cement shall be considered as being one (1) cubic foot volume and ninety-four (94) pounds weight.

T-6.03.1 **AGGREGATES:**

The weight per unit volume of the aggregates shall be based on dry and rodded weights determined in accordance with ASTM C-29 latest revision.

T-6.03.2 **WATER:**

Total or maximum water shall be considered as all added water, including absorbed (surface) water in the aggregates.

Water shall be measured by volume or weight. The device for the measurement of water shall be readily adjustable under all operating conditions and shall be accurate to one-half (1/2) percent or less.

T-6.03.3 **CEMENT:**

Cement shall be measured by weight when bulk cement is used and where batching it is necessary to use a portion of a bag, otherwise for bag cement, the bag weight of ninety-four (94) pounds may be used. Cement shall not be weighed in the same batch box as the aggregates, but a separate scale shall be used.

T-6.03.4 **ADMIXTURES:**

Powdered admixtures shall be measured by weight and liquid admixtures by weight or volume.

T-6.03.5 **WEIGHING HOPPERS & SCALES:**

Scales utilized in proportioning shall be either springless dial, multiple beam type, or solid-state digital strain gage transducer type. Scale gradations shall be no greater than the following:

Aggregate Scales	30 lbs
Cement Scales	6 lbs
Water Scales	6 lbs

All scale indicators shall be enclosed against moisture and dust.

Weighing equipment shall be insulated against vibration and movement of other operating equipment in the plant. When the entire plant is running, the scale reading at cut-off shall not vary more than 1 percent for cement, 1 percent for water, 1-1/2 percent for any size of aggregate, nor 1 percent for the total aggregate in any batch.

T-6.03.6 **CONSISTENCY:**

The consistency of the concrete shall be determined by the slump test, hereinafter referred to, and said mixes shall be of the consistency required by the Engineer; but the ratio of the aggregate to total aggregate shall be maintained as shown in Table 1, T-6.08.

T-6.04 **MIXING AND DELIVERY:**

All concrete under this specification shall be machine mixed in accordance with ACI 304R. Hand mixing may be allowed where the volume to be placed is less than one (1) cubic yard.

The mixing equipment shall be capable of mixing the aggregates, cement, and water within the specified time into a thoroughly mixed and homogenous mass that can be discharged without segregation.

T-6.04.1 **HAND MIXING:**

Hand mixing shall be permitted when the amount of concrete required for any job is less than one (1) cubic yard. Hand mixed concrete shall be mixed on a watertight platform or in a mortar box in batches not to exceed 1/3 cubic yards each. The aggregate shall first be spread in a uniform layer over which the required quantity of cement shall be evenly distributed. The entire batch shall be turned with shovels until the ingredients are thoroughly blended before adding the water. After adding the proper amount of water, the batch shall again be turned with shovels until a uniform consistency is obtained. Methods of hand mixing which allow the loss of mixing water will not be permitted.

T-6.05 **HANDLING AND PLACING CONCRETE:**

No concrete shall be used which does not reach its final position in the forms within one (1) hour after water is first added to the mix, except when concrete is continually agitated, when the time may be extended to one and one-half (1-1/2) hours.

T-6.06 **INSPECTION:**

Proper facilities shall be provided for the inspection and sampling of concrete at the mixing plant, loading plant and point of delivery.

T-6.06.1 **FACILITIES:**

The manufacturer shall afford the inspector, without charge to the Town, all reasonable facilities for securing samples to determine if the concrete is being furnished in accordance with the requirements of this specification. All inspection and sampling shall be so conducted as not to interfere unnecessarily with the manufacture and delivery of the concrete.

6.06.2 **PLACING CONCRETE:**

Concrete shall be placed so as to avoid segregation of the materials and the displacement of the reinforcement. The use of long chutes for conveying concrete from the mixer will be permitted only on written authority of the Engineer. In case an

inferior quality of concrete is produced by the use of chutes, the Engineer may order discontinuance of their use and the substitution of a satisfactory method of placing.

Open troughs and chutes shall be of metal or metal lined; where steep slopes are required, the chutes shall be equipped with baffle boards or be in short lengths that reverse the direction of movement.

**Concrete shall not be dropped more than six feet into the forms so as to avoid the segregation of aggregate and mortar.**

All chutes, troughs and pipes shall be kept free from coatings of hardened concrete by thoroughly flushing with water after each run; water used for flushing shall be discharged clear of the concrete already in place.

T-6.06.3 **CONSOLIDATION OF CONCRETE (ACI 309R):**

Concrete shall be compacted by continuous working with a suitable tool or by vibrating the forms in a manner acceptable to the Engineer; the mortar shall be flushed to the surface by the use of a suitable spading tool. If puddling cannot be done because of the obstruction of reinforcement or other cause, compacting shall be accomplished by vibrating the form in a manner satisfactory to the Engineer.

Concrete shall be placed in horizontal layers not more than twenty-four (24) inches thick except as hereinafter provided. When less than a complete layer is placed in one operation, it shall be terminated in a vertical bulkhead. Each layer shall be placed and compacted before the preceding batch has taken initial set to prevent injury to the green concrete and avoid surfaces of separation between the batches.

Construction joints shall be placed across regions of low shearing stress, in locations that will be hidden from view to the greatest possible extent, and at only the locations shown on the plans or as directed by the Engineer.

Re-tempering of mortar or concrete that has partially hardened with or without additional materials or water is prohibited.

All concrete shall be placed so as to be properly finished and curing begun during the daylight hours. At no time shall concrete be placed which will require the finishing, etc., to be performed by artificial light. Paving operations shall be as scheduled by the Engineer.

T-6.07 **FINISHING AND CURING OF CONCRETE:**

T-6.07.1 **FINISHING:**  
**BROOMED FINISH:**

Concrete for curb, curb and gutter, sidewalk and driveways shall have a broomed finish. This finish shall be accomplished as follows: The surface shall be screeded and tamped with a special tool to force the coarse aggregate away from the surface, floated to bring the surface to the required finish level, steel-troweling to an even smooth surface and brooming with a fiber-bristle brush. The surface shall be of uniform texture.

**SCRATCHED FINISH:**

Surfaces intended to receive bonded applied cementations applications shall have a scratched finish. After the concrete has been placed, struck off, consolidated and leveled, the surface shall be roughened with stiff brushes or rakes before final set.

**FLOATED FINISH:**

Surfaces intended to receive roofing, weatherproofing, membranes, or sand bed terrazzo shall have a floated finish. After the concrete has been placed, struck off, consolidated, and leveled, the concrete shall not be worked further until ready for floating. Floating shall begin when the water sheen has disappeared, and/or when the mix has stiffened sufficiently to permit the proper operation of a power-driven float.

The surface shall then be consolidated with power driven floats of the impact type except in thin sections such as pan slabs. Hand floating with wood or cork-faced floats shall be used in locations inaccessible to the power driven machine. Trueness of surface shall be rechecked at this stage with a 10-foot straightedge applied at not less than two different angles. All high spots shall be cut down and all low spots filled during this procedure to produce planes checking true under the straightedge in any direction with tolerances not exceeding 1/8-inch in ten (10) feet. The slab shall then be refloated immediately to a uniform, smooth, granular texture.

**TROWELED FINISH:**

Floors intended as walking surfaces or to receive floor covering shall have a troweled finish. Where a troweled finish is specified, the surface shall be finished first with impact power floats, as specified above where applicable, then with power trowels, and finally, with hand trowels. The first troweling after power floating shall be done by a power trowel and shall produce a smooth surface that is relatively free of defects that may still contain some trowel marks. Additional troweling shall be done by hand after the surface has hardened sufficiently. The final troweling shall be done by hand after the surface has hardened sufficiently. The final troweling shall be done when a ringing sound is produced as the trowel is moved over the surface. The surface shall be thoroughly consolidated by the hand troweling operations. The finished surface shall be free of any trowel marks and shall be uniform in texture and appearance. On surfaces intended to support floor coverings, any defects of sufficient magnitude to show through the floor covering shall be removed by grinding.

**FORMED SURFACES (RUBBED FINISH) - EXPOSED SURFACES:**

Unless otherwise specified herein or noted on the contract drawings, all exposed surfaces of concrete walls, columns, beams, underside of slabs, etc., shall have a uniform rubbed finish, free from form marks, irregularities and blemishes, obtained by hand or machine rubbing employing an abrasive material such as carborundum. The finished surface shall have a smooth, even, uniform surface, color and texture. Cement washes will not be acceptable.

**UNEXPOSED SURFACES:**

Surfaces of walls that are three feet or more below water level and/or finished grade, and other surfaces not exposed to view, shall have fins and other projections removed.

T-6.07.2 **CURING:**

Curing shall be accomplished by preventing loss of moisture, rapid temperature change, and mechanical injury or injury from rain or flowing water for a period of seven (7) days when normal Portland cement has been used and three (3) days when high-early-strength Portland cement has been used. Curing shall be started as soon after placing and finishing as free water has disappeared from the surface of the concrete. Curing

may be accomplished by any of the following methods or combination thereof, as approved. All curing shall be in conformance with ACI 308.

**MOIST CURING:**

Unformed surfaces shall be covered with burlap, cotton, or other approved fabric mats, or with sand and shall be kept continually wet. Forms shall be kept continually wet and if removed before the end of the curing period, curing shall be continued as on unformed surfaces, using suitable materials. Burlap shall be used only on surfaces that will be unexposed in the finished work and shall be in two layers.

**WATERPROOF PAPER CURING:**

Surfaces shall be covered with waterproof paper lapped four (4) inches at edges and ends and sealed with mastic or pressure-sensitive tape not less than one and one-half (1-1/2) inches wide. Paper shall be weighted to prevent displacement, and tears and holes appearing during the curing period shall be immediately repaired by patching.

**MEMBRANE-CURING METHOD:**

The entire exposed surface shall be covered with a pigmented membrane-forming curing compound approved by the Engineer. The curing compound shall be applied in two coats by hand operated pressure sprayers at a coverage of approximately 200 square feet per gallon for both coats. The second coat shall be applied in a direction approximately at right angles to the direction of the first coat. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel and shall be free from pinholes or other imperfections. Concrete surfaces that are subjected to heavy rainfall within three (3) hours after the curing compound has been applied shall be resprayed by the method and at the coverage above, at no additional cost to the Town.

Concrete surfaces to which membrane-curing compounds have been applied shall be adequately protected for seven (7) days from pedestrian and vehicular traffic and from any other action that might disrupt the continuity of the membrane. Any area covered with curing compound and damaged by subsequent construction operations within the seven-day curing period shall be re-sprayed at no additional expense to the Town.

T-6.08 **TABLE I - RECOMMENDED PROPORTIONS OF AGGREGATES**

Maximum Size of Course Aggregate – Inches	Ratio of Fine (*) to Total Aggregate on Basis of Dry, Compacted Columns, Measured Separately	
	Minimum	Maximum
3/8	0.55	0.70
3/4	0.40	0.60
1 and over	0.30	0.50

(\*) NOTE: The finer the sand, the lower will be the percentage required.

T-6.09 **TABLE II - CONCRETE PROPORTIONS AND STRENGTH REQUIREMENTS**

<u>Concrete Classification</u>	<u>Type of Construction</u>	<u>Max. Gal. Per Cement</u>	<u>Water Per Bag</u>	<u>Min. Bags per 1 Cu Yd Concrete</u>	<u>Cement 1 Cu Yd</u>	<u>Min. Comp Strength Lbs Per Sq In at Age 28 Days</u>
AA	Reinforced Piles, Thin Wall Light Structural Members Max slump - 3 1/2"	5-1/2		6-3/4		4000
A	Reinforced Retaining Walls, Sidewalks, Driveways, Curbs, Retaining Walls not Reinforced and Cradles for Sewers Max slump - 3 1/2"	6-3/4		5-3/4		3000

T-6.10 **SAMPLING AND TESTING:**

All sampling, curing and testing of Portland cement concrete shall be in accordance with the current A.S.T.M. and ACI Standards. Not less than three cylinders shall be taken for testing at any one time. Unless otherwise directed by the Engineer, a minimum of one cylinder shall be taken for breaking at seven days and two cylinders taken for breaking at twenty-eight (28) days from each batch to be tested. The cost of concrete for samples is to be considered incidental to the project.

**TECHNICAL SPECIFICATIONS**  
**SECTION 8: CONCRETE SIDEWALKS & DRIVEWAYS**

T-8.01 **SCOPE:**

The work covered by this section of the specifications consists of furnishing all plant, labor, equipment, appliances and materials and in performing all operations in connection with the construction of Portland cement concrete sidewalks and driveways, complete, in strict accordance with this section of the specifications, and the applicable drawings. **IMPORTANT: SEE PARAGRAPH G-1.52.**

T-8.02 **GENERAL:**

Concrete for sidewalks and driveways shall be Class A Concrete proportioned, mixed, tested and placed, in strict accordance with the specifications given in Section 6, "Concrete Proportioning, Mixing, Testing and Placing," and Section 14, "Materials."

The alignment and grade of sidewalks will be established as directed by the Engineer. The normal cross-section, as shown on the drawings, will be followed. Generally, the alignment and grade of the sidewalks will be determined from the previously placed concrete curb and gutter. Typical sections will be deviated from only where directed by the Engineer. Driveways shall connect the openings in the curb and gutter and extend across to the back edge of the sidewalks as shown on the drawings. In the event any of the sidewalks or driveways are damaged from any cause, or prove defective in any way, or are out of alignment or proper grade, the contractor shall remove such sections and replace at his own expense. No driveways shall be less than twelve (12) feet wide, clear width, except where specifically designated by the Engineer.

Concrete shall not be placed in the forms for sidewalks and driveways until the forms and subgrade have been tested, inspected and approved by the Engineer.

T-8.03 **EXCAVATION AND SUBGRADE PREPARATION:**

Excavation and subgrade preparation for concrete sidewalk and driveways shall be in strict compliance with the specifications as stated in Section 1, Paragraph T-1.04.3.

T-8.04 **FORMS:**

Forms shall be of wood or metal, straight and free from warp, and of sufficient strength to resist springing during the process of depositing and consolidation of the concrete. The width of the forms for sidewalk and driveways shall be equal to the full depth of the sidewalk or driveway. Forms shall be securely staked and braced true to the line and grade set by the Engineer. Suitable metal or wooden division plates shall be provided to completely separate adjacent slab during construction. Forms shall be cleaned and well oiled before being set.

T-8.05 **WIDTH AND THICKNESS:**

The width and thickness of walks and driveways, and the specific size of slabs, shall be as shown on the drawings or as directed by the Engineer. Sidewalks shall be marked in sections with a proper lining tool so as to form squares the size of which will depend upon the width of the walks. The edges of driveways will be worked with an edging tool and will be sectioned into squares or marked as shown on the plans and details, or as directed by the Engineer.

All sidewalks shall be constructed to the uniform thickness of four (4) inches. Driveways shall have a uniform thickness of six (6) inches, including that section which crosses the sidewalk area.

T-8.06 **CONSTRUCTION OF SIDEWALKS AND DRIVEWAYS:**

After the forms have been set, the Engineer shall inspect the form for proper line and grade and shall check the subgrade for proper compaction before allowing any concrete

to be placed. Concrete for sidewalks and driveways shall be Class "A" concrete. All materials incorporated in this concrete shall conform to the provisions as set out hereinbefore and shall be mixed and deposited in accordance with the requirements of these specifications. When sufficient concrete has been deposited in the forms, it shall be well "spaded" along all areas in contact with the forms in order to eliminate all "honeycombing." Sidewalks shall be "scored" (1 inch deep) in sections equal to the width or as directed by the Engineer. If a sidewalk is greater than six (6) feet in width, scoring shall be as directed by the Engineer. All "scores" shall be straight and rounded at the surface with the proper edging tool, or as directed by the Engineer. Expansion joint shall be installed for every thirty (30) linear feet of sidewalk, against all structures, pavement and curbs, and at such other places as shown on the plans and details, or as directed by the Engineer.

All concrete pours shall terminate at a template. If pouring is to be resumed within one hour or less, any excess concrete that exists after the template has been reached may be spread in the bottom two (2) inches of the adjoining sidewalk section, or disposed of if directed by the Engineer.

The Engineer shall require any concrete that fails to meet the required compressive strength for Class "A" concrete after 28 days to be removed from any portion of a sidewalk or driveway and be replaced at the Contractor's own expense.

T-8.07 **CONCRETE CURING AND FINISHING:**

The curing and finishing of concrete sidewalks and driveways shall be in strict compliance with the specifications as stated in Section 6, "Concrete Proportioning, Mixing, Testing and Placing."

T-8.08 **MEASUREMENT:**

Concrete sidewalk and driveways shall be measured by area in square yards. The measurement of four (4) inch concrete sidewalk shall be by actual field measurement and shall not include that portion of six (6) inch concrete where driveways cut across the sidewalk area. This area shall be measured as six (6) inch concrete driveway. Driveway measurement shall include all six (6) inch concrete between the property line and a line drawn one foot behind the face of curb or gutter line for types "A" and "B" curb returns, that portion of the radii falling within this area shall be converted to equivalent six (6) inch concrete (0.4 sq. yd. for each 4-1/2-ft. radius and 0.3 sq. yd. for each 3-ft. radius) and paid for as six (6) inch concrete driveway.

Where type "D" curb is used and driveway returns (2-ft. radii) are installed, the six (6) inch concrete driveway shall be measured from the back of curb to the property line (or where directed to end by the Engineer).

T-8.09 **PAYMENT:**

The quantity of four (4) inch sidewalk and six (6) inch driveways measured as hereinbefore specified, will be paid for at the applicable contract unit price. The price per square yard shall include full compensation for furnishing all labor, materials, tools and equipment and doing all work involved in excavating, backfill and preparation of the subgrade for sidewalks and driveways, and constructing sidewalks and driveways complete-in-place, as hereinbefore specified.

T-8.10 **TREE PROTECTION PROCEDURES (AP 88-1):**

T-8.10.1 **PURPOSE:**

The purpose of this policy is to outline the procedures to be used in determining how to accomplish concrete repair work when there is a conflict with trees located in the public right-of-way.

T-8.10.2 **PROCEDURES FOR SIDEWALK REPAIR WORK:**

If a problem with a tree is encountered when trying to accomplish sidewalk repair the first course of action will be to determine if there is enough room in the public right-of-way between the property line and the tree roots to cobble the sidewalk around the tree roots and still provide a sidewalk that is at least three (3) feet wide. If there is not enough room in the public right-of-way to do this, the next course of action will be to use asphalt for the sidewalk material instead of concrete and lay the asphalt over the tree roots. The installation of the asphalt sidewalk should be done in such a way that a safe sidewalk results in terms of smoothness and slope. When asphalt is used it should be sprinkled with dried cement or a similar material to lighten the appearance so it blends in as well as possible with the concrete sidewalk adjacent to it. The final course of action will be to remove the tree if conditions warrant such removal.

The Street Division will contact the Parks Division to determine if conditions exist that warrant tree removal. Examples of such conditions could be: the tree is already dead or dying and poses a threat to public safety, the tree roots are too large for the plaza area afforded and are causing severe sidewalk and/or curb damage.

It is understood that under this procedure tree roots will **NOT** be cut in order to repair damaged sidewalks unless both the Parks Division and the Streets Division agree that this is a viable course of action due to the circumstances of the situation.

T-8.10.2 **PROCEDURES FOR OTHER CONCRETE REPAIR WORK:**

The Streets Division will contact the Parks Division when curb and gutter repair or any other type of concrete repair work is needed due to damage caused by tree roots. Together the Divisions will determine the course of action to be followed in addressing the situation. Possible courses of action may include: doing nothing; repairing the concrete material with another material such as asphalt; or removing the tree.

**TECHNICAL SPECIFICATIONS  
SECTION 9: ASPHALT PAVING**

T-9.01

**SCOPE:**

All work covered by this section shall be performed according to the most recent version of the *North Carolina Department of Transportation Standard Specifications For Roads and Structures*, except as modified below shall apply. The work consists of performing all operations in connection with the construction of a hot-mix pavement consisting of a base, intermediate or surface course on a previously prepared base or existing pavement, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract. Said operations shall include producing, weighing, transporting, placing and compacting the plant mix; furnishing aggregate, asphalt binder, anti-strip additive, and all other materials for the plant mix; furnishing and applying tack coat as specified in Section T-9.22; furnishing scales; maintaining the course until final acceptance of the project; making any repairs or corrections to the course that may become necessary; providing and conducting quality control as specified in Section T-9.06. The design requirements for the various mix types are given in Tables 1-3 for mix types.

Define “warm mix asphalt (WMA)” as additives or processes that allow a reduction in the temperature at which asphalt mixtures are produced and placed. WMA is allowed for use at the Contractor’s option when shown in the contract or as approved by the Town Engineer.

T-9.02

**MATERIALS:**

All materials shall meet the requirements of NCDOT Division 10 and *NCDOT Standard Specifications for Roads and Structures*.

<b>Item</b>	<b>NCDOT Section</b>
Coarse aggregate	1012-1(B)
Fine aggregate	1012-1(C)
Mineral Filler	1012-1(D)
Reclaimed asphalt pavement (RAP)	1012-1(F)
Reclaimed asphalt shingles (RAS)	1012-1(E)
Anti-strip additives	1020-8
Asphalt Binder, Performance Grade	1020-2
Silicone	1020-9

Use only WMA additives or processes listed on the NCDOT Approved Product List maintained by the NCDOT Materials and Tests Unit.

T-9.03

**GENERAL REQUIREMENTS:**

The bituminous surface, intermediate or base course shall be of the type as hereinafter specified or as shown on the plans, and shall consist of fine and coarse mineral aggregate and mineral filler uniformly mixed with hot bituminous material as specified in Section T-9.02 and Section 14 "Materials" of these specifications, placed and compacted on a

prepared base course or existing surface course to the depth specified or as shown on the plans.

T-9.04

**PROPORTIONING AND MIXING OF ASPHALTIC CONCRETE:**

The bituminous concrete base, intermediate, leveling and or surface course material shall be mixed in accordance with the specifications mixture of aggregate and bituminous material mixed in a NCDOT certified plant conforming to the requirements of Article 610-5, 610-6 and Sub-article 610-5 (1) and (2) described in the most recent edition of NCDOT Standard Specifications for Roads and Structures and shall be for placing as laid out herein elsewhere, in conformity with the lines and grades, thickness and section, as shown on the plans, or as directed by the Project Engineer.

T-9.05  
T-9.05-1

**QUALITY MANAGEMENT SYSTEM FOR ASPHALT PAVEMENTS:**

**DESCRIPTION:**

Produce and construct asphalt mixtures and pavements in accordance with Section 609 of the latest *NCDOT Standard Specifications for Roads and Structures* manual and all applicable Project or Standard Special Conditions for this project. Perform all quality control activities in accordance Section T-9.05 – T-9.06, unless otherwise approved by the Project Engineer.

**(A) Quality Control:**

Provide and conduct a quality control program in accordance with Section T-9.05 – Section T-9.06 and these specifications. A quality control program is defined as all activities, including mix design, process control inspection, plant and equipment calibration, sampling and testing, and necessary adjustments in the process that are related to production of a pavement which meets all requirements of the *NCDOT Standard Specifications for Roads and Structures*..

**(B) Quality Assurance:**

The Town will conduct a quality assurance program in accordance with Section T-9.07 and these specifications. A quality assurance program is defined as all activities, including inspections, sampling, and testing related to determining that the quality of the completed pavement conforms to specification requirements.

T-9.05-2

**MIX DESIGN/JOB MIX FORMULA REQUIREMENTS):**

Apply all requirements of Article 610-3 of the latest edition of the *NCDOT Standard Specifications for Roads and Structures*.

T-9.05-3

**COMPOSITION OF MIXTURES (MIX DESIGN & JOB MIX FORMULA):**

**(A) Mix Design-General:**

Warm mix asphalt (WMA) is allowed for use at the Contractor’s option in accordance with the NCDOT Approved Products List for WMA Technologies available at:

<https://connect.ncdot.gov/resources/Materials/MaterialsResources/Warm%20Mix%20Asphalt%20Approved%20List.pdf>

Prepare the asphalt mix design utilizing a mixture of course and fine aggregate, asphalt binder, mineral filler, and other additives when required. Size, uniformity grade, and combine the several aggregate fractions in such proportions that the resulting mixture meets the grading and physical requirements of the specifications for the specified mix type. Materials, which will not produce a mixture within the design criteria required by the specifications, will be rejected, unless otherwise approved.

At least 10 days prior to start of asphalt mix production, submit, in writing the mix design and proposed job mix formula (JMF) targets for each required mix type and combination of aggregates to the Project Director for review and approval. Prepare the mix design

using a NCDOT certified mix design technician in an approved mix design laboratory and in accordance with the procedures outlined in Section 4.5 of the HMA/QMS Manual.

For the final surface layer of the specified mix type, use a mix design with an aggregate blend gradation above the maximum density line on the 2.36 mm and larger sieves.

For Type S9.5B, the percent passing the 2.36 mm sieve shall be a minimum of 60% and a maximum of 70%.

When the Contractor elects to use a recycled mixture on a project, he must submit to the Town Engineer his proposed mix design and JMF target values in accordance with Article 1012-1 and Section 610-3 of the NCDOT Standard Specifications for Roads and Structures and the following applicable requirements.

Reclaimed asphalt pavement (RAP) may constitute up to 20% of the total material used in recycled mixtures, except for mix Type S 9.5D, and mixtures containing reclaimed asphalt shingle material (RAS). Reclaimed asphalt shingle (RAS) material may constitute up to 6% by weight of total mixture for any mix. When both RAP and RAS are used, do not use a combined percentage of RAS and RAP greater than 20% by weight of total mixture, unless otherwise approved. When the percent of binder contributed from RAS or a combination of RAS and RAP exceeds 20% but not more than 30% of the total binder in the completed mix, the virgin binder PG grade shall be one grade below (both high and low temperature grade) the binder grade specified in Table 610-3 for the mix type, unless otherwise approved. When the percent of binder contributed from RAS or a combination of RAS and RAP exceeds 30% of the total binder in the completed mix, the Engineer will establish and approve the virgin binder PG grade. Use approved methods to determine if any binder grade adjustments are necessary to achieve the performance grade for the specified mix type.

For Type S 9.5D mixes, the maximum percentage of reclaimed asphalt material is limited to 20% and shall be produced using virgin asphalt binder grade PG 76-22. For all other recycled mix types, the virgin binder PG grade shall be as specified in Table 610-5 for the specified mix type.

If a change in the source of RAP or RAS be made, a new mix design and JMF may be required in accordance with Article 1012-1. Samples of the completed recycled mixture may be taken by the Department on a random basis to determine the PG grading on the recovered asphalt binder in accordance with AASHTO M 320. If the grading is determined to be a value other than required for the specified mix type, the Engineer may require the Contractor to adjust any combination of the grade, the percentage of additional asphalt binder or the blend of reclaimed material to bring the grade to the specified value.

**(B) Mix Design Criteria:**

Design and produce asphalt concrete mixtures which conform to the gradation requirements and design criteria in Table 610-2 and Table 610-3 for the mix type specified. The mix type designates the nominal maximum aggregate size and the design traffic level.

Table 610-2 provides gradation control points to be adhered to in the development of the design aggregate structure for each mix type. Aggregate gradations must be equal to or pass between the control points, unless approved in writing. Table 610-2 provides the mix design criteria for the various mix types.

Use an anti-strip additive in all Superpave asphalt mixes. It may be hydrated lime or a chemical additive or a combination of both as needed to meet the retained strength

requirements as specified in Tables 610-3. When a chemical additive is used, add at rate of not less than 0.25% by weight of binder in the mix. When hydrated lime is used, add at a rate of not less than 1.0 % by weight of the total dry aggregate.

When WMA is used, submit the mix design without including the WMA technology

**(C) Job Mix Formula:**

Establish the job mix formula (JMF) gradation target values within the design criteria specified for the particular type of asphalt mixture to be produced. Establish the JMF asphalt binder content at the percentage, which will produce voids in total mix (VTM) at the midpoint of the specification design range for VTM, unless otherwise approved. The formula for each mixture will establish the following: blend percentage of each aggregate fraction, the percentage of reclaimed aggregate, if applicable, a single percentage of combined aggregate passing each required sieve size, the total percentage (by weight of total mixture) and grade of asphalt binder required for the mixture (by weight of total mixture), the percentage and grade of asphalt binder to be added to the mixture (for recycled mixtures), the percentage of chemical anti-strip additive to be added to the asphalt binder or percentage of hydrated lime to be added to the aggregate, the temperature at which the mixture is to be discharged from the plant, the required field density, and other volumetric properties.

The mixing temperature at the asphalt plant will be established on the job mix formula. Unless otherwise requested, refer to Table 610-1 to establish the JMF temperature.

**(NCDOT TABLE 610-1)  
MIXING TEMPERATURE AT THE ASPHALT PLANT**

<b>Binder Grade</b>	<b>JMF Mix Temperature</b>
PG 58-28; PG 64-22	250-290 Degree F
PG 76-22	300-325 Degree F

A. The mix temperature, when checked in the truck at the roadway, shall be within plus and minus 25 degree of the temperature specified on the JMF.

When using RAP or RAS with a different binder than specified, use mixing and compaction temperatures in Table 610-1 based on the original binder grade for that mix type shown in Table 610-3.

When RAS is used, the JMF mix temperature shall be established at 275 Degree F or higher.

Have on hand at the asphalt plant the approved mix design and job mix formula prior to beginning the work.

The job mix formula for each mixture will remain in effect until modified in writing, provided the results of QMS tests performed in accordance with Section T-9.06 on material currently being produced conform with specification requirements. When a change in sources of aggregate materials is to be made, a new mix design and job mix formula will be required before the new mixture is produced, unless otherwise approved. When a change in sources of RAP or RAS material is to be made, a new mix design and/or job mix formula may be required in accordance with Article 1012-1 of the most recent *NCDOT Standard Specifications for Roads and Structures* manual. When unsatisfactory results or other conditions make it necessary, the Contractor shall revoke the existing job mix formula or establish a new job mix formula.

Standard Sieves (mm)	TABLE 610-2 AGGREGATE GRADATION CRITERIA (Percent Passing Control Points)							
	Mix Type (Nominal Maximum Aggregate Size)							
	4.75 mm		9.5 mm (a)		19.0 mm		25.0 mm	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
50.0	-	-	-	-	-	-	-	-
37.5	-	-	-	-	-	-	100.0	-
25.0	-	-	-	-	100.0	-	90.0	100.0
19.0	-	-	-	-	90.0	100.0	-	90.0
12.5	100.0	-	100.0	-	-	90.0	-	-
9.50	95.0	100.0	90.0	100.0	-	-	-	-
4.75	90.0	100.0	-	90.0	-	-	-	-
2.36	-	-	32.0 (b)	67.0 (b)	23.0	49.0	19.0	45.0
1.18	30.0	60.0	-	-	-	-	-	-
0.075	6.0	12.0	4.0	8.0	3.0	8.0	3.0	7.0

(a) For the final surface layer of the specified mix type, use a mix design with an aggregate blend gradation above the maximum density line on 2.36 mm and larger sieves.

(b) For Type S9.5B, the percent passing the 2.36 mm sieve shall be a minimum of 60% and a maximum of 70%.

### Asphalt Mix Design & Job Mix Formula - 2018

TABLE 2

TABLE 610-3 (NCDOT)

### SUPERPAVE MIX DESIGN CRITERIA

Mix Type	Design ESALs Millions (a)	Binder PG Grade (b)	Compaction Levels No. Gyration @		Max. Rut Depth (mm)	Volumetric Properties (c)			
			N <sub>ini</sub>	N <sub>des</sub>		VMA % Min.	VTM %	VFA Min. - Max.	%G <sub>mm</sub> @ N <sub>ini</sub>
S4.75A	< 1	64-22	6	50	11.5	16.0	4.0 - 6.0	65 - 80	≤ 91.5
S-9.5B	0-3	64 -22	6	50	9.5	16.0	3.0 - 5.0	70 - 80	≤ 91.5
S-9.5C	3 - 30	64 -22	7	65	6.5	15.5	3.0 - 5.0	65 - 78	≤ 90.5
S-9.5D	> 30	76 -22	8	100	4.5	15.5	3.0 - 5.0	65 - 78	≤ 90.0
I-19.0C	ALL	64 -22	7	65	-----	13.5	3.0 - 5.0	65 - 78	≤ 90.5
B-25.0C	ALL	64 -22	7	65	-----	12.5	3.0 - 5.0	65 - 78	≤ 90.5
	<b>Design Parameter</b>					<b>Design Criteria</b>			
All Mix Types	1. Dust to Binder Ratio (P <sub>0.075</sub> / P <sub>be</sub> )					0.6 – 1.4 (c)			
	2. Tensile Strength (TSR) D					85% Minimum E			

- (a) Based on 20-year design traffic.
- (b) Volumetric Properties based on specimens compacted to  $N_{des}$  as modified by the NCDOT.
- (c) Dust to Binder Ratio ( $P_{0.075} / P_{be}$ ) for Type S4.75A is 1.0 – 2.0.
- (d) NCDOT-T-283 (No Freeze-Thaw cycle required).
- (e) TSR for Type S4.75A & B25.0C mixes is 80% minimum.

Recycled Material	Intermediate & Base Mixes	Surface Mixes	Mixes Using PG 76-22
RAS	23%	20%	18%
RAP or RAP/RAS Combination	45%	40%	18%

Mix Type	% RBR ≤ 20%	21% ≤ %RBR ≤ 30%	% RBR > 30%
S4.75A, S9.5B, S9.5C, I19.0C, B25.0C	PG 64-22	PG 64-22A	PG 58-28
S9.5D, OGFC	PG 76-22B	N/A	N/A

- A. If the mix contain any amount of RAS, the virgin binder shall be PG 58-28.
- B. Maximum Recycled Binder Replacement (%RBR) is 18% for Mixes using PG76-22 binder.

T-9.06

**CONTRACTOR'S QUALITY CONTROL SYSTEM:**

**(A) Personnel Requirements:**

Obtain all certifications in accordance with NCDOT's QMS Asphalt Technician Certification Program as outlined in the most recent edition of NCDOT's HMA/QMS Manual. Perform all sampling, testing, data analysis and data posting by or under the direct supervision of a certified QMS asphalt plant technician.

Provide a certified Asphalt Plant Technician Level I to perform quality control operations and activities at each plant site at all times during production of material for the project. A plant operator who is a certified Asphalt Plant Technician Level I may be utilized to meet this requirement when daily production for each mix design is less than 100 tons (100 metric tons). When performing in this capacity, the plant operator will be responsible for all quality control activities, which are necessary and required

Provide and have readily available a certified Asphalt Plant Technician Level II to supervise, coordinate, and make any necessary adjustments in the mix quality control process in a timely manner. The Level II Technician may serve in a dual capacity and fulfill the Level I Technician requirements specified above.

Provide a certified QMS Roadway Technician with each paving operation at all times during placement of asphalt. This person is responsible for monitoring all roadway paving operations and all quality control processes and activities, to include stopping production or implementing corrective measures when warranted. Provide a certified nuclear gauge operator when nuclear density control is being used.

**(B) Field Laboratory Requirements:**

For a contract with 5000 or more total tons (metric tons) of asphalt mix, the asphalt producer shall furnish and maintain an NCDOT certified laboratory at the plant site. A minimum of 320 square feet (30 square meters) of floor space (exclusive of toilet facilities), equipment, and supplies necessary for performing Contractor quality control testing is required. Provide convenient telephone and fax machine access for QMS personnel at the plant site.

For a contract with less than 5000 total tons (metric tons) of asphalt mix, the quality control testing may be conducted in an NCDOT certified off-site laboratory. All other requirements in these specifications still apply.

Provide testing equipment meeting the requirements of the test methods herein identified in Subarticle 609-5(C) 2 of the NCDOT Standard Specifications for Roads & Structures manual. Provide equipment that is properly calibrated and maintained. Allow all measuring and testing devices to be inspected to confirm both calibration and condition. If at any time the Contractor or Project Director determines that the equipment is not operating properly or is not within the limits of dimensions or calibration described in the applicable test method, the Contractor or Project Director may stop production until corrective action is taken. Maintain and have available a record of all calibration results at the laboratory.

**(C) Plant Mix Quality Control:**

**(1) General:**

Include in the quality control process the preliminary inspections, plant calibrations and field verification of the mix and JMF as described in Section T-9.04-4. In addition, conduct at a minimum but not limited to, the sampling, testing, and determination of all parameters outlined in these provisions using test methods and minimum frequencies as

specified herein. Perform additional sampling and testing when conditions dictate. Obtain all scheduled samples at randomly selected locations in accordance with the current edition of NCDOT's most recent edition of the *HMA/QMS Manual*. Log all samples taken on NCDOT forms. Split and retain all samples taken in accordance with prescribed procedures in the *Manual*. Provide documentation as required in Section T-9.06. Identify any additional quality control samples taken and tested at times other than the regularly scheduled random samples or directed samples that take the place of regularly scheduled as process control (PC) samples on the appropriate forms. Process Control test results should not be plotted on control charts nor reported to the Town Quality Assurance Laboratory.

Retain the untested split portion of quality control aggregate and mix samples and the tested TSR specimens for 5 calendar days at the plant site, commencing the day the samples are tested. Retain the QC compacted volumetric test specimens for 5 calendar days, commencing the day the specimens are prepared. Permission for disposal may be given by Town Quality Assurance personnel prior to these minimum storage periods. Retain the split portion of the Contractor's mix verification and referee mix samples until either procured by or permission for disposal is given by the Town Quality Assurance personnel. Store all retained samples in a dry and protected location.

**(2) Required Sampling and Testing Frequencies:**

Sample and test the completed mixture from each JMF at the following minimum frequency during mix production: Complete all tests within 24 hours of the time the sample is taken, unless specified otherwise within these provisions.

If the Contractor's testing frequency fail to meet the minimum frequency requirements as specified, all mix without the specified test representation will be considered unsatisfactory. If the Town allows the mix to remain in place, payment will be made at 50 percent of the contract unit bid price for the mixture.

If desired, innovative equipment or techniques not addressed by these specifications to produce or monitor the production of mix may be utilized, subject to approval.

### **QUALITY CONTROL MINIMUM SAMPLING AND TESTING SCHEDULE**

Sample and test the completed mixture from each JMF at the following minimum frequency during mix production:

Accumulative Production Increment	Number of Samples per Increment
750 tons	1

If production is discontinued or interrupted before the accumulative production increment tonnage is completed, continue the increment on the next production day(s) until the increment tonnage is completed. Obtain a random sample within the specified increment at the location determined in accordance with the current edition of NCDOT's HMA/QMS Manual. Conduct quality control sampling and testing on each random sample as scheduled below. **When daily production of each mix design exceeds 100 tons (100 metric tons) and a regularly scheduled full test series random sample location for that mix design does not occur during that day's production, perform at least one partial test series consisting of Items A and B in the schedule below.** These partial test series and associated tests do not substitute for the regularly scheduled random sample for that increment.

Perform the following full test series on all regularly scheduled random samples:

During mix production the Contractor shall conduct quality control sampling and testing on the asphalt mixture consisting of:

#### Full Test Series

Asphalt Mixture – Sampled from Truck at Plant (AASHTO T 168 Modified) (Split Sample Required)

A. Binder Content, % Ignition Furnace (AASHTO T 308 Modified)

2. Note: Contractor may request and use other means (namely AASHTO T 164) of determining percent asphalt binder, subject to approval).

B. Gradation on Recovered Blended Aggregate from Mix Sample (AASHTO T 30 Modified) Gradation required on all sieves specified on JMF

C. Maximum Specific Gravity (AASHTO T 209), optional (ASTM D 6857)

D. Bulk Specific Gravity of Compacted Specimens (AASHTO T 166), Optional (ASTM D 6752), Average of 3 specimens at Ndes gyrations (AASHTO T 312)

E. Air Voids (VTM) (AASHTO T 269), Average of 3 specimens at Ndes gyrations

F Voids in Mineral Aggregate (VMA) (calculation)

G. Voids Filled with Asphalt (VFA) (calculation)

H. P0.075/Pbe Ratio

I. % Maximum Specific Gravity at Nini (calculation)

In addition to the above schedule, conduct the following sampling and testing as indicated:

A. Aggregate Stockpile Gradations (AASHTO T 27 and T 11)

(Sampled from stockpiles or cold feed system as follows; split samples not required)

1. Coarse Aggregates (Approved Standard Sizes)
  - a. At beginning of production\*
  - b. Weekly thereafter\*
2. Fine Aggregates (Stone Screenings, Natural Sands, Etc.)
  - a. At or within 1 week prior to mix verification (Gradations valid for multiple mix designs) \*,
  - b. Weekly after mix verification\*.
  - c. Anytime production is stopped due to plant mix gradation related problems.

\*In lieu of the aggregate stockpile gradations performed by QC, gradation quality control data conducted by the aggregate producer, which is representative of the Contractor's current stockpiles, may be furnished.

B. Reclaimed Asphalt Pavement (RAP) Binder Content and Gradation (AASHTO T 308 Modified or T 164 and AASHTO T 30 Modified or T 164 and AASHTO T 30 Modified) (sampled from stockpiles or cold feed system at beginning of production and weekly thereafter). Have RAP approved for use in accordance with Subarticle 1012-1(G). (Split Sample Required).

C. Reclaimed Asphalt Shingle Material (RAS) Binder Content and gradation (AASHTO T 308 Modified or and AASHTO T 30 Modified) (Sampled from stockpiles or cold feed system at beginning of production and weekly thereafter) (If RAP mixtures are being produced) Have RAS approved for use in accordance with NCDOT Standard Specifications for Roads and Structures, Subarticle 1012-1(F). (Split Sample Required).

D. Combined Aggregate Moisture Content (AASHTO T 255) Drum Plant Only (sampled from stockpiles or cold feed system a minimum of once daily).

E. Retained Tensile Strength (TSR) - (AASHTO T 283 Modified): Additional TSR testing is required when a change is made in antistrip additive dosage or when a new anti-strip additive source or grade is utilized, unless otherwise approved. Other TSR test(s) may be directed as deemed necessary. TSR testing is not required for mix verification but may be performed at that time.

FOR WMA: See Section 7.16.1 (D) of QMS Manual.

F. Draindown Test for Uncompacted Asphalt Mixtures (AASHTO T 305)

NOTE: Any retained samples shall be stored by the Contractor in a safe, dry place for 7 calendar days, or until disposal permission is given by the Quality Assurance personnel, whichever occurs first.

**(3) Control Charts:**

Standardized control charts shall be maintained by the Contractor at the Quality Control field laboratory on forms furnished by NCDOT. For mix incorporated into the project, record full test series data from all regularly scheduled random samples, or directed samples which replace regularly scheduled samples, on control charts the same day the tests results are obtained. Partial test series results obtained due to reasons outlined in Subarticle 609-6(B) will be reported to Quality Assurance personnel on the proper forms but will not be plotted on the control charts. Process Control (PC) samples which are taken within an increment other than regularly scheduled random samples or directed samples that do not replace the scheduled random sample will not be plotted on control charts nor reported to Quality Assurance Laboratory Personnel.

Results of quality assurance tests performed by the Town QA Division will be provided to the Contractor.

Record the following data on the standardized control charts:

1. Aggregate Gradation Test Results:
  - a. For each mix type: one sieve size smaller than the mix nominal maximum size.
  - b. For all mix types: 2.36 mm and 0.075 mm sieves
2. Binder Content, %, Pb
3. Bulk Specific Gravity of Compacted Specimens at Ndes (NCDOT-T-166 or NCDOT – T-331)
4. Maximum Specific Gravity Determined by (NCDOT-T-209 or NCDOT-D-6857)
5. Percent Voids in Total Mix, (VTM)
6. Percent Voids in Mineral Aggregate, (VMA)
7. P0.075/Pbe Ratio
8. Percent Maximum Specific Gravity at Nini gyrations, (%Gmm @ Nini)

Both the full test series individual test values and the moving average of the last four (4) data points will be plotted on each chart. The Contractor's test data will be shown in black and the moving average in red. The Town's assurance data will be plotted in blue. Denote the moving average control limits with a dash green line and the individual test limits with a dash red line.

The moving average(s) shall be continuous except that a new moving average(s) shall be re-established only when:

1. Change in the binder percentage, aggregate blend or Gmm is made on the JMF, or
2. When the Contractor elects to stop or is required to stop production after one or two moving average values, respectively, fall outside the control limits outlined in Subarticle 609-6(D).
3. Failure to stop production after two consecutive moving averages exceed the moving average limits occurs, but production does stop at a subsequent time, re-establish a new moving average beginning at the actual production stop point.

In these cases, re-establish the moving averages for all mix properties. Moving averages will not be reestablished when production stoppage occurs due to an individual test result exceeding the individual test limits and/or specifications.

NOTE: New Moving Averages will be established at the beginning of each calendar year.

All individual test results are part of the plant quality control record and must be included in moving average calculations with the following exception. When the Contractor's testing data has been proven incorrect, use the correct data as determined by the Town in lieu of the Contractor's data to determine the appropriate pay factor in accordance with Section T-9.06 and T-9.21

In this case, replace the data in question and any related data proven incorrect.

#### **(4) Control Limits:**

The following are established as control limits for mix production. Apply the individual limits to the individual test results. Control limits for the moving average limits are based on a moving average of the last 4 data points. Apply all control limits to the applicable target source.

**Table 609-1 NCDOT  
Control Limits**

<b>Mix Control Criteria</b>	<b>Target Source</b>	<b>Moving Average Limit</b>	<b>Individual Limit</b>
12.5mm Sieve (Type P-57 only)	JMF	±5.0 %	±8.0 %
4.75mm Sieve (Type P-57 only)	JMF	±5.0 %	±8.0 %
2.36mm Sieve	JMF	±4.0 %	±8.0 %
1.18 mm Sieve (S4.75A only)	JMF	±4.0 %	±8.0 %
0.075mm Sieve	JMF	±1.5 %	±2.5 %
Binder Content	JMF	±0.3 %	±0.7 %
VTM @ Ndes	JMF	±1.0 %	±2.0%
VMA @ Ndes	Min. Spec. Limit	Min. Spec. Limit	-1.0%
P0.075/ Pbe Ratio	Max. Spec. Limit	±0.4	±0.8
%Gmm @ Nini	Max. Spec. Limit	N/A	+2.0%
TSR	Min. Spec. Limits	N/A	- 15%

**(5) Warning Bands:**

DELETED

**(6) Corrective Actions:**

All required corrective actions are based upon initial test results and shall be taken immediately upon obtaining those results. If more than one corrective action or adjustment applies, give precedence to the more severe of these actions. Stopping production when required takes precedence over all other corrective actions. Document all corrective actions.

**A. Individual Test Exceeding Individual Test Limits**

When any of the following occur, production of a mix shall cease immediately:

- (1) When an individual test result for a mix control criteria (including results for required partial test series on mix) exceeds both the individual test control limits and the applicable specification design criteria, or,
- (2) When two consecutive field TSR values fail to meet the minimum specification requirement, or,
- (3) When two consecutive binder content test results exceed the individual limits, or
- (4) Two consecutive moving average values for any one of the mix control criteria fall outside the moving average limits.

Do not resume normal plant production until one of the following has occurred.

Option 1: Approval has been granted by the appropriate Town QA Supervisor.

Option 2: The mix in question has been satisfactorily verified. Normal production may resume based on the approval of the contractor's Level II technician, provided notification and the verification test results have been furnished to the Town QA Laboratory.

Failure to fully comply with one of the above provisions will result in immediate production stoppage by the Project Manager. Normal production shall not then resume until a complete verification process has been performed and approved by the Project Director.

Acceptance of all mix failing to meet the individual test control limits (including results for both full and partial test series on mix) or minimum TSR requirements as described above will be determined in accordance with Article 105-3. In addition, any mix, which is obviously unacceptable, will be rejected for use in the work.

Failure to stop production when required will make all mix unacceptable from the stop point tonnage to the point when Option 1 or Option 2 occurs or to the tonnage point when production is actually stopped, whichever occurs first.

In any case, remove and replace this mix with materials that comply with the Specifications at no additional costs to the Town, unless otherwise approved. Payment will be made for the actual quantities of materials required to replace the removed quantities, not to exceed the original amounts.

Immediately notify the Project Director when any moving average value exceeds the moving average limit. If two consecutive moving average values for any one of the mix control criteria fall outside the moving average limits, cease production of that mix, immediately notify the Project Director of the stoppage, and make adjustments. The Contractor may elect to stop production after only one moving average value falls outside the moving average. In either case, do not determine a new moving average until the fourth test after the elective or mandatory stop in production.

**(7) Allowable Retesting for Mix Deficiencies** the Contractor may elect to resample and retest for plant mix deficiencies when individual QC test(s) exceed one or more mix property target(s) by more than the tolerances indicated below. Perform the retesting within 10 days after initial test results are determined. Retesting shall be approved prior to being performed and in accordance with NCDOT GUIDELINES FOR RETESTS OF PLANT MIX DEFICIENCIES outlined in the HMA/QMS Manual. The Contractor, under the supervision of the Town’s QA personnel, will perform these retests. Retests for any mix deficiency other than as listed below will not be allowed unless otherwise permitted. Acceptance of the mix in question will be based on the retest data.

The Town reserves the right to require the Contractor to resample and retest at any time or location as directed.

<b>Table 609-2 RETEST LIMITS FOR MIX DEFICIENCIES</b>	
<b>Property</b>	<b>Limit</b>
VTM	By more than +/- 2.5%
VMA	By more than +/- 2.0%
% Binder Content	By more than +/- 1.0%
0.0075 mm sieve	By more than +/- 3.0%
2.36 mm sieve (1.18 mm sieve for 4.75A) (12.5mm & 4.75 mm Sieves for Type p-57)	Exceeds both the Specification mix design limits and one or more of the above tolerances
TSR	By more that – 15% form the Specification limit

**(D) Field Compaction Quality Control:**

**(1) General:**

Perform quality control of the compaction process in accordance with these provisions and applicable requirements of Section T-9.06(D)(1-5). The Contractor shall use pavement core samples as the method of density control.

Conduct density sampling and testing by the core method based on test sections consisting of not more than 500 linear feet or fraction thereof per day on pavement placed at the paver laydown width. Perform density sampling and testing on all pavements listed below unless otherwise approved.

- (a) All full width travel lane pavements, including normal travel lanes, turn lanes, collector lanes, ramps and loops, and temporary pavements,
- (b) Pavement widening 4.0 feet or greater,
- (c) Uniform width paved shoulders 2.0 feet or greater,
- (d) And wedging as outlined in the NCDOT *HMA/QMS Manual*.

Perform the sampling and testing at the minimum test frequencies as specified above. Should the density testing frequency fail to meet the minimum frequency as specified above, all mix without the required density test representation will be considered unsatisfactory and if allowed to remain in place, will be paid for at 50 percent of the contract unit bid price for the mixture.

**Conduct all QC core density testing the same day that the mix being tested is placed and compacted. Obtain all core samples no later than the beginning of the next production day. Test QC core samples and submit test results within one working day of the time the samples are taken. Should the specified density tests not be completed within the allowable time, cease production at that point until such time the required tests are complete. Failure to provide samples may result in suspension of all project operations.**

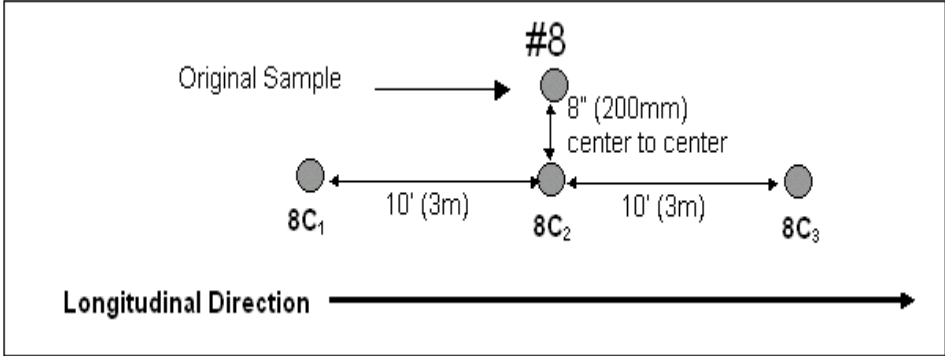
Retain quality control density core samples at the plant site for 5 calendar days, commencing the day the samples are tested, or until permission for disposal is granted by the quality assurance personnel, whichever occurs first. Retain the Town's quality assurance comparison and verification core samples in a sealed container at the plant site until obtained by quality assurance personnel. Store all retained density samples on a smooth, flat surface in a cool, dry, and protected location.

Check core samples may be taken by the Contractor for any of the following reasons:

- (a) When core sample control is being used and a test section core sample(s) is more than 2.0 percent below the average of all core samples from the same lot, that core(s) samples may be checked,
- (b) When a control strip fails and a core sample(s) is more than 2.0 percent below the average of the control strip, that core(s) may be checked.

For each core sample that is to be checked, take 3 check samples as follows: one adjacent to the initial sample and one ten feet in each direction, longitudinally, of the initial sample. The results of these 3 check samples will be averaged and this average will be used in lieu of the initial core results in question. The initial core sample results will not be used if check samples are taken.

Check samples shall be taken within 2 calendar days of the date of the initial sample. Only one set of check samples per sample location will be allowed. If full depth cores are necessary at these check sample locations, separation of the layer to be tested will be the responsibility of the Contractor. Take all check samples in the presence of a representative of the Town QA laboratory. In addition, a QA comparison core sample(s) may be taken adjacent to one or more of these check samples. (See Figure 10-20).



Original Sample #8 = 89.3%

Check Samples  
 8C<sub>1</sub> = 88.4%  
 8C<sub>2</sub> = 88.8%  
 8C<sub>3</sub> = 88.7%  
Avg. = 88.6%

**Must use average of 3 check samples (88.6%) instead of original sample results (89.3%)**

**Figure 10-20**

**(2) Pavement Samples (Cores):**

When cored samples are required by either density method, obtain cores from the full layer depth of the compacted pavement. The pavement will be accepted for density on equally spaced locations consisting of not more than 500 linear foot or fraction thereof per day on pavement placed at the paver laydown width.

When full depth cores are taken, the Contractor is responsible for separating the layer of mix to be tested in a manner such that it is not damaged. The use of a separator medium, including a shovel of asphalt mix, beneath the layer to be tested is prohibited.

Pavement layers may be cooled by approved artificial methods to allow cutting the core samples as quickly as possible. No additional compensation will be made for the costs of artificial cooling.

Take pavement specimens for density testing purposes utilizing a 6-inch (152.4 mm) core drill. Use approved coring equipment that is capable of taking a representative sample of the compacted pavement. In the event a malfunction of the coring equipment occurs, utilize other approved means to obtain the required samples. Repair the coring equipment and restore to use within three working days.

Where samples have been taken, clean the inside surfaces of the sample hole, dry, lightly coat with tack coat, and immediately place and compact new mix of the same type to

conform to the surrounding area. Use a circular tamp or another approved device to achieve compaction.

**(3) Cored Sample Density Procedures:**

In addition to the above requirements, perform core sample density control procedures as noted herein. When cored sample control is being utilized, the testing frequency will be a minimum of two random 6-inch (152 mm) core samples every 500 linear foot or fraction thereof per day on pavement placed at the paver lay down width. An initial control strip is not required at the beginning of placement of each job mix formula but may be performed by the Contractor for use in determining the necessary compactive effort and roller patterns.

**(5) Documentation (Records):**

Document all quality control observations, records of inspection, samples taken, adjustments to the mix, and test results on a daily basis. Record adjustment to mix production and test results.

Make all such records available to the Project Director upon request, at any time during project construction.

Falsification of test results, documentation of observations, records of inspection, adjustments to the process, discarding of samples and/or test results, or any other deliberate misrepresentation of the facts will result in the mixture being removed and replaced with mix, which complies with the Specifications. Payment will be made for the actual quantities of materials required to replace the falsified quantities, not to exceed the original amounts.

T-9.07

**QUALITY ASSURANCE:**

The Town's quality assurance program will be conducted by a certified QMS technician(s) and will be accomplished in whole or part in the following ways:

Plant Mix Quality Assurance:

1. By periodically observing laboratory and field tests performed by the Contractor;
2. By monitoring test data and or control charts exhibiting test results of control parameters;
3. Conducting verification sampling and testing on samples taken
4. By directing the Contractor to take additional samples at any time and any location during production (in lieu of the next scheduled random sample) and;
5. By any combination of the above

Density Quality Assurance:

1. By periodically observing tests performed by the Contractor in the field and in the Contractor's laboratory.
2. By testing randomly selected comparison core samples taken adjacent to the Contractor's quality control core samples (8 inches center-to-center) at a frequency equal to or greater than 5% of the frequency required of the contractor.
3. By retesting randomly selected QC core samples.

In all cases, the Town's quality assurance and verification testing will be independent of the Contractor's tests.

Differences between the Contractor and the Town's sample test results will be considered acceptable if within the following limits:

<b><u>Mix Property</u></b>	<b><u>Limits of Precision</u></b>
25.0mm sieve (Base Mix)	±10.0%
19.0mm sieve (Base Mix)	±10.0%
12.5mm sieve (Intermediate Mix)	±6.0%
9.5mm sieve (Surface Mix)	±5.0%
4.75mm sieve (Surface mixes)	±5.0%
2.36mm sieve (All mixes)	±5.0%
0.075mm sieve (All mixes)	±2.0%
Asphalt Binder Content, %	±0.5%
Maximum Specific Gravity (Gmm)	±0.020%
Bulk Specific Gravity (Gmb)	±0.030%
TSR	±15.0%
Retest of QC Core Sample	± 1.2% (% Compaction)
Comparison QA Core Sample	± 2.0% (% Compaction)
QA Verification Core Sample	± 2.0% (% Compaction)
Density Gauge Comparison of QC Test	± 2.0% (% Compaction)
QA Density Gauge Verification Test	± 2.0% (% Compaction)

In the event comparison test results are outside the above acceptable limits of precision, or the quality assurance test results are either outside the individual test control limits or fail to meet Specification requirements, the Project Director will immediately investigate the reason for the difference. If the potential for a pavement failure is present, the Project Director may suspend production, wholly or in part. The Project Director's investigation may include but not be limited to:

1. Joint testing of any remaining split samples,
2. Review & observation of the QC technician's sampling and testing procedures.
3. Comparison testing of other retained quality control samples, and/or additional density core samples.

The Project Director will periodically witness the sampling and testing being performed by the Contractor. If the Project Director observes that the sampling and quality control tests are not being performed in accordance with the applicable test procedures, the Project Director may ask that production stops until corrective action is taken. The Project Director will promptly notify the Contractor of observed deficiencies, both verbally and in writing. The Project Director will document all witnessed samples and tests.

The Project Director will obtain verification samples for testing independent of the Contractor's quality control process. These samples will be split for testing by the Project Director and the Contractor if required.

T-9.08

**TYPICAL ASPHALT BINDER CONTENT (BY WEIGHT OF TOTAL MIX):**

The approximate asphalt binder content of the asphalt concrete plant mixtures used on this project will be as follows:

PG 64-22		PG 76-22	
SA-1	6.8%		
S 4.75 A	7.0%		
S 9.5 B	6.7%	S 9.5 D	5.7%
S 9.5 C	6.0%		
I 19.0 C	4.8%		
B 25.0 C	4.5%		
		OGFC, Type FC-1 Mod.	6.1%
PADC, Type P-57	2.5%		
PADC, Type P-78M	3.0%		

The actual asphalt binder content will be established prior to construction by the Project Director within the limits established in the most recent edition of NCDOT's *Standard Specifications for Roads and Structures* manual and by the approved mix design and job mix formula (JMF) targets for each required mix type and combination of aggregates.

T 9.09

**WEATHER, TEMPERATURE, AND SEASONAL LIMITATIONS FOR PRODUCING AND PLACING ASPHALT MIXTURES:**

Do not produce or place asphalt mixtures during rainy weather, when the subgrade or base course is frozen, or when the moisture on the surface to be paved would prevent proper bond. Do not place asphalt material when the air or surface temperature, measured at the location of the paving operation away from artificial heat, do not meet Table 610-5.

As an exception to the above, when in any day's operations the placement of a layer of asphalt base course material or intermediate material 2" (50 mm) or greater in thickness has started, it may continue until the temperature drops to 32°F (0° C).

**TABLE 4  
TABLE 610-6 (NCDOT)  
PLACEMENT TEMPERATURES FOR ASPHALT**

Asphalt Concrete Mix Type	Minimum Surface Temperature and Air Temperature
B 25.0B, C,	35°F
Type I 19.0 C	35°F
S4.75A, S9.5B, S 9.5C	40°F <sup>a</sup>
S 9.5D	50°F

- a. For the final layer of surface mixes containing recycled asphalt shingles (RAS), the minimum surface and air temperature shall be 50°F.

T-9.10

**QMS CERTIFIED FIELD LABORATORY:**

The Contractor shall provide an NCDOT certified field laboratory suitable for testing observance only for the Project Director/ Project Manager which laboratory shall be conveniently located at the asphalt plant site.

T-9.11

**ASPHALT MIXTURE PRODUCTION:**

**(A) General:**

Utilize plants which are either of the batch mixing, continuous mixing, or drum mixing type, and so designed, equipped, and operated that the weighing, proportioning, and mixing of the materials will result in a uniform and satisfactory asphalt mixture meeting

the requirements of these specifications. All plants must conform to requirements of Section T-9.04 and Section T-9.11(A-B) and T-9.12 for the preparation of asphalt mixtures

Prior to production of the mix, stockpile aggregates for a sufficient period of time to facilitate the drainage of free moisture. Keep the different aggregate sizes separated until they have been delivered to the cold feeders. Keep the separate stockpiles readily accessible for sampling. When mineral filler is required in the mix, feed or weigh-in separately from the other aggregates.

Introduce the asphalt binder and other additives, when required; into the mixture at the amounts and percentages specified by the job mix formula. No working tolerance will be allowed. Introduce the dried and heated aggregates, and mineral filler, when required, in amounts and at temperatures such that the mixture produced is within the production control limits of Section T-9.06-4. Provide a positive means of controlling mixing time so as to obtain complete and uniform coating of the aggregate particles and thorough distribution of the asphalt binder throughout the aggregate. Produce the mixture at the asphalt plant within  $\pm 25^{\circ}\text{F}$  ( $\pm 14^{\circ}\text{C}$ ) of the temperature established on the JMF. **Assure the temperature of the mix immediately before discharge from the hauling vehicle is within  $+25^{\circ}\text{F}$  ( $14^{\circ}\text{C}$ ) to  $-25^{\circ}\text{F}$  ( $-14^{\circ}\text{C}$ ) of the JMF temperature. Any asphalt mixture more than  $+25^{\circ}\text{F}$  ( $14^{\circ}\text{C}$ ) or less than  $-25^{\circ}\text{F}$  ( $-14^{\circ}\text{C}$ ) of the JMF temperature shall be rejected and removed at no cost to the Town.**

**Trucks should be checked for the temperature requirements by measuring the temperature with a calibrated digital or dial stem thermometer (having a probe length of 10" or greater) in the 3/8"-5/8" hole in the side of the truck bed prior to dumping mix into the paver. When checked in the truck at the roadway, mix temperature is outside of the above range, minimum of 3 additional readings should be made in different points of the load. The 4 readings are then averaged, and the average used as the temperature of that load. The temperature of the mixture, when discharged from the mixer, shall not exceed 350 Degree F.**

**Note: Mix shall not be rejected based on a single reading of a Dial Stem thermometer.**

All asphalt plants must be NCDOT certified as meeting the requirements of these specifications.

Any completely automatically controlled asphalt plant which, due to the basic design of the plant, does not meet all the requirements of these specifications for conventional batch mixing, continuous mixing, or drum mixing may be utilized on a project by project basis provided a uniformly consistent mix meeting all mix requirements can be produced and the plant has been approved in writing.

**(B) Requirements for All Plants:**

**(1) Equipment for Preparation of Asphalt Binder:**

Equip tanks for the supplying of asphalt binder to the plant to uniformly heat and hold the material at the required temperature prior to introduction into the mixer unit. Provide a circulating system for asphalt materials, which is capable of the proper mixing of additives. Provide a system with adequate pump or pumps to charge the mixing unit and unload asphalt material simultaneously. Include provisions for measuring and sampling plant supply tanks.

**(2) Anti-Strip Additive Equipment:**

When chemical anti-strip additive is to be added to the asphalt binder at the asphalt plant or supplier's terminal, in-line blending equipment shall be used at either location. Provide a thermostatically controlled heating system capable of heating and maintaining the additive tanks, contents and distribution system at the additive supplier's recommended temperature for the additive being used. Interlock the additive metering system with the asphalt binder control equipment in such a manner as to automatically vary the additive feed rate to maintain the required proportions. Provide a system, which will automatically

indicate in the plant control room the amount or rate of flow, when flow is occurring, and when flow is obstructed or stops. Inject the additive into the asphalt binder feed line prior to introduction into the aggregate. Equip the feed line with an in-line blending device capable of thoroughly mixing the additive with the asphalt binder prior to mixing with the aggregate. Provide a metering system capable of being calibrated, checked, and monitored for accuracy and amount of additive used.

Equip the system with an in-line totalizing flow meter capable of measuring the actual quantity in gallons (liters) of anti-strip additive, which is injected into the asphalt binder being introduced into the aggregate. Provide a system, which is capable of being easily read but not capable of being reset. Install the totalizer meter in the anti-strip feed line beyond the calibration bypass and as close to the actual point of additive introduction into the feed line as practical.

When hydrated lime anti-strip additive is used, provide a separate bin or tank and feeder system to store and proportion the lime into the aggregate in either dry or slurry form. Mix the lime and aggregate by pugmill or other approved means to achieve a uniform lime coating of the aggregate prior to entering the drier. When the lime is added in dry form, the aggregate shall contain at least 3 percent free moisture. The stockpiling of lime treated aggregate will not be permitted. Control the lime feeder system by a proportioning device that is accurate to within  $\pm 10$  percent of the specified amount. Provide a proportioning device with a convenient and accurate means of calibration and that is interlocked with the aggregate feed or weigh system so as to maintain the correct proportion. Provide a flow indicator or sensor that is interlocked with the plant controls such that production of the mixture will be interrupted if there is a stoppage or reduction of the lime feed.

**(3) Aggregate Cold Feed Equipment:**

Utilize cold bins and a feeder system to proportion the aggregates and feed them to the dryer. Use separate cold bins for each size aggregate and each natural sand being used to provide a uniform and continuous flow. Provide separate dry storage when mineral filler is required. Equip cold aggregate bins with feeder units having interlocking controls capable of maintaining a constant ratio between the relative quantities of each size aggregate at varying plant production rates.

Provide cold feeders, which are capable of being easily and accurately, calibrated to ensure full control of the mix gradation.

**(4) Dryer:**

Use a plant with a dryer or dryers, which continuously agitate the aggregate during the heating and drying process.

**(5) Control Unit for Asphalt Binder:**

Provide satisfactory means, either by weighing or metering to introduce the proper amount of asphalt binder into the mix.

**(6) Thermometric Equipment:**

**(a) Asphalt Binder Thermometric Equipment:**

Provide a thermometric device of adequate temperature range fixed in the asphalt binder feed line.

**(b) Dryer Thermometric Equipment:**

Equip the dryer with an automatic burner control device, which uses an approved thermometric instrument located in the discharge chute to actuate the automatic controls.

**(7) Pollution Control Equipment:**

Equip all plants with such pollution control equipment as is necessary to meet all applicable Local, State, and Federal pollution requirements. Register and certify all plants by applicable environmental regulatory agencies.

**(8) Safety Requirements:**

Provide adequate safety devices at all points where accessibility to plant operations is required. Provide accessibility to the top of truck bodies by a platform or other suitable device to enable Quality Control and Quality Assurance personnel to obtain samples and mixture temperature data. Thoroughly guard and protect all gears, pulleys, chains, sprockets, and other dangerous moving parts. Provide ample and unobstructed space on the mixing platform. Maintain a clear and unobstructed passage at all times in and around the truck loading area. Keep all work areas free from asphalt drippings.

**(9) Production Consistency:**

Any asphalt plant that cannot consistently produce a high-quality mix meeting the requirements of these specifications will be considered in non-compliance with these specifications and all mix will be rejected.

Upon a malfunction of required automatic equipment on a batch mixing plant, the plant may continue to operate manually for the following 2 consecutive working days, provided acceptable mixture is being produced.

When a malfunction of required automatic equipment on a drum mixer or continuous plant occurs, manual operation of the plant will not be allowed except an emergency traffic condition exists; the plant may be allowed to operate manually until the unsafe traffic condition is corrected.

T-9.12

**HOT MIX STORAGE SYSTEMS:**

When a storage system is used, provide a system capable of conveying the mix from the plant to the storage bin and storing the mix without a loss in temperature, segregation or oxidation of the mix. Limit storage time to the ability of the storage system to maintain the mix within the specification requirements.

Provide a continuous type or skip bucket type conveyor system. Enclose continuous type conveyors so that the mix temperature is maintained within specification requirements. Provide a system designed in such manner as to prevent segregation of the mix during discharge from the conveyor into the bins and equipped with discharge gates that will not cause segregation of the mix while loading the mix into trucks.

T-9.13

**HAULING OF ASPHALT MIXTURE:**

From the paving plant to the site shall be in trucks having tight, clean, smooth beds that have been sprayed with an approved release agent to prevent adhesion of the mixture to the truck bodies. **Fuel oil is not allowed for this purpose.** Remove excess release agent before loading. Cover each load of mixture with a solid, waterproof tarp constructed of canvas, vinyl, or other suitable material securely fastened and overlapping top of the truck

bed to protect the asphalt from the weather, entrance of moisture and to prevent the loss of temperature. A 3/8 to 5/8-inch diameter hole shall be provided on each side of the vehicle body near the center of the body and above the bed of the vehicle for the purpose of inserting a thermometer.

**Assure the temperature of the mix immediately before to discharge from the hauling vehicle is within a tolerance of +25°F (+14°C) to -25°F (-14°C) of the JMF temperature. Any asphalt mixture more than +25°F (14°C) or less than -25°F (-14°C) of the JMF temperature shall be rejected and removed at no cost to the Town.**

Trucks should be checked for the temperature requirements by measuring the temperature with a calibrated digital or dial stem thermometer (having a probe length of 10" or greater) in the 3/8"-5/8" hole in the side of the truck bed prior to dumping mix into the paver. When checked in the truck at the roadway, mix temperature is outside of the above range, minimum of 3 additional readings should be made in different points of the load. The 4 readings are then averaged, and the average used as the temperature of that load. The temperature of the mixture, when discharged from the mixer, shall not exceed 350 Degree F.

**Note: Mix shall not be rejected based on a single reading of a Dial Stem thermometer.**

Deliveries shall be made so that spreading and rolling of all the mixture prepared for a day's run can be completed during daylight hours.

The Quality Control Technician/ certified QMS Roadway Technician will reject any loads wet excessively by rain.

Hauling over freshly laid material will not be permitted.

**Cleaning truck beds of excess asphalt in front of the paver shall not be permitted under any condition. Any loose or bulk asphalt dumped in front of the paver which is not within +25°F (14°C) to -25°F (14°C) of the JMF temperature shall be removed prior to continuing paving operations. Any loose or bulk asphalt dumped in front of the paver which is within +25°F (14°C) to -25°F (14°C) of the JMF temperature shall be spread to a thickness of 1" or less before resuming paving operations. Paving over loose or bulk asphalt discharged from the hauling vehicle which is not within +25°F (14°C) to -25°F (14°C) of the JMF temperature shall result in an immediate verbal "Stop Work Order" from the Quality Control Technician/ certified QMS Roadway Technician. Any and all asphalt lost or rejected due to inadequate temperatures resulting from the immediate verbal "Stop Work Order" will be incurred at the expense of the Contractor and at no cost to the Town with no additional contract extension days being provided to the Contractor.**

T-9.14

**PLACING & FINISHING ASPHALTIC SURFACE COURSE:**

Apply tack coat in accordance with Section 605 of the current version of the NCDOT Standard Specifications for Roads and Structures.

The Contractor shall furnish all equipment, tools, machinery and plant necessary for handling, preparing, manufacturing and executing completion of this work.

**Superpave Asphalt mixtures immediately before discharge from the hauling vehicle will be rejected if the asphalt temperature is not within +25°F (14°C) to -25°F (14°C) of the JMF temperature.**

Trucks should be checked for the temperature requirements by measuring the temperature with a calibrated digital or dial stem thermometer(having a probe length of 10" or greater) in the 3/8"-5/8" hole in the side of the truck bed prior to dumping mix into the paver. When checked in the truck at the roadway, mix temperature is outside of the above range, minimum of 3 additional readings should be made in different points of the load. The 4 readings are then averaged, and the average used as the temperature of that load. The temperature of the mixture, when discharged from the mixer, shall not exceed 350 Degree F.

**Note: Mix shall not be rejected based on a single reading of a Dial Stem thermometer.**

Mixtures produced simultaneously from different plant sources cannot be intermingled by hauling to the same paver on the roadway unless the mixtures are being produced from the same material sources and same job mix formula.

Prior to delivery of surface course materials, the base course shall be completed for receiving the surface course material, and shall be kept free from traffic, with the exception of the mixture vehicles and those other vehicles necessary for the placing of the pavement. The pavement shall be placed only when weather conditions are suitable. Asphalt mixtures shall not be produced or placed during rainy weather, when the subgrade or base course is frozen, or when the moisture on the surface to be paved would prevent proper bond.

Upon arrival on work, the mixture shall be laid by an approved self-contained, power-propelled type-paving machine and finished to the proper grade, cross sections, thicknesses, and widths shown on the plans and typical sections and to required density and uniform texture. **The paver shall be equipped with either tamping bars or vibrators, depending on the screed type, and must be fully activated at all times**

**during the laydown operations.** The screed shall be adequate length to spread and finish the full uniform width travel lane being placed, unless otherwise permitted. Do not use strike off devices, either mechanically or manually operated, in spreading and finishing mixture placed in the uniform width travel lane.

Utilize a paver with a receiving hopper and an automatically controlled distribution system which is capable of uniformly maintaining a proper head of material in front of the full length of the screed, including screed extensions. Equip the screed unit with a sliding shoe attachment, which will form a slope on the edge of the mat to prevent edge raveling when the mixture is compacted.

**Prior to beginning operations, a string line shall be placed by the Contractor along the edge of the proposed pavement to provide horizontal control for the paver operator., except that a string line will not be required when the first layer is placed adjacent to a curb section. The objective is to ensure a true and uniform line for the pavement edge(s).**

Operate pavers at forward speeds consistent with plant production, material delivery, and satisfactory laying of the mixture so as to ensure a uniform and continuous laydown operation. Coordinate and adjust the paving operation and loading operation so as to maintain an adequate amount of asphalt mixture in the paver hopper between truck exchanges. Take necessary precautions during production, loading of trucks, transportation, truck exchanges with paver, folding of the hopper wings, and conveying

material in front of the screed to prevent segregation of the asphalt mixtures. Do not allow the paver hopper to become empty between loads. Should unevenness of texture, tearing, segregation, or shoving occur during the paving operation due to unsatisfactory methods or equipment, immediately take such action as may be necessary to correct such unsatisfactory work. Excessively throwing back material will not be permitted.

Use pavers equipped with an electronic screed control that will automatically control the longitudinal profile and cross slope of the pavement. Control the longitudinal profile through the use of either a mobile grade reference(s), including mechanical, sonic and laser grade sensing and averaging devices, an erected string line(s) when specified, joint matching shoe(s), slope control devices or the approved methods or combination of methods. Unless otherwise specified, use a mobile grade reference system capable of averaging the existing grade or pavement over a minimum 30-foot (9.1 meter) distance or by non-contacting laser or sonar type ski with at least four referencing stations mounted on the paver at a minimum length of 24 feet. Establish the position of the reference system such that the average profile grade is established at the approximate midpoint of the system. The transverse cross-slope shall be controlled as directed by the Project Director.

Use an erected fixed string line for both and longitudinal profile and cross slope control when required by the contract. When an erected fixed string line is required, furnish and erect the necessary guideline for the equipment. Support the string line with grade stakes placed at maximum intervals of 25 feet (7.6 meter) for the finished pavement grade.

Use the 30 foot minimum length mobile grade reference system or the non-contacting laser or sonar type ski *with at least four referencing stations mounted on the paver at a minimum length of 24 feet* to control the longitudinal profile when placing the initial lanes and all adjacent lanes of all layers, including resurfacing and asphalt in-lays, unless otherwise specified or approved. A joint matching device short (6 inch [152.4 mm] shoes) may be used only when approved.

A joint matching device short (6 inch [152.4 mm] shoe) may be used only when approved. Waiver of the use of automatic screed controls does not relieve the Contractor of achieving plan grades and cross-slopes.

Utilize the automatic slope control system unless otherwise approved. The Project Director may waive the use of automatic slope controls in areas where the existing surface (subgrade, base, asphalt layer, etc.) exhibits the desired cross slope of the final surface. The Project Director may also waive the use of automatic slope controls in areas where the use of such equipment is impractical due to irregular shape or cross section (such as resurfacing). When the use of the automatic slope controls is waived, the Project Director may require the use of mobile grade references on either or both sides of the paver. Manual screed operation will be permitted in the construction of irregularly shaped and minor areas, subject to approval. Waiver of the use of automatic screed controls does not relieve the Contractor of achieving plan grades and cross-slopes.

In the case of malfunction of the automatic screed control equipment, the paver may be manually operated for the remainder of the workday provided this method of operation produces acceptable results. Do not resume work thereafter until the automatic system is functional.

The Project Director or his designee will waive the requirement for use of pavers for spreading and finishing where irregularities or obstacles make their use impractical. Spread, rake, and lute the mixture by hand methods or other approved methods in these areas.

Operate the paver as continuously as possible. Pave intersections, auxiliary lanes, and other irregular areas after the main line roadway has been paved, unless otherwise approved.

Repair any damage caused by hauling equipment across structures at no additional cost to the Town.

If the paver is equipped with pneumatic tires or moves on tracks (crawlers) the Contractor must check for proper tire pressure and loose crawlers, Low tire pressure or loose crawlers can cause unnecessary movement of the paver and when transmitted to the screed unit will result in an uneven pavement surface.

Fine graded asphalt mixes, which cling to the sides of the hopper, should normally be continually loosened and pushed into the active mix. When the mix is permitted to accumulate, it cools rapidly and eventually a slug of semi-cold mix usually segregated will reach the screed resulting in a non-uniform surface texture.

A sufficient number of experienced shovelers and rakers shall follow the spreading machine, adding hot mixture and raking the mixtures as required to produce a course that, when completed, will conform to all requirements specified herein. In areas where the use of machine spreading is impractical, the mixture may be spread by hand. The mixture shall be distributed into place from the dump beds by means of hot shovels and then spread with hot rakes in a uniformly loose layer of such thickness that, when compacted, it will conform to the required grade and thickness. Any part of the mix that has formed into lumps and does not break down easily should be discarded. The loads shall not be dumped any faster than the shovelers and rakers can properly handle them. Prior to the placing of additional asphalt to bring up to grade low places in the surface existing after the initial placing of asphalt, the area to be filled shall be thoroughly scarified by asphalt rakes. After additional mixture is placed it shall be raked carefully so as to be slightly higher than the surrounding area, so that when properly compacted, it will be at the same grade as the surrounding area.

Contact surfaces of forms, curbing, gutters, manholes, etc., shall be painted with a thin uniform coating of tack just before the surface mixture is placed against them. **Immediately adjacent to the headers, flush curbing, gutters, liners, and other structures the surface course mixture shall be spread uniformly high so that after compression it will be level with the edge of such structures.**

T-9.15

**COMPACTION ASPHALT SURFACE COURSE :**

Immediately after the asphalt mixture has been spread, struck off, and surface and edge irregularities adjusted, thoroughly and uniformly compact the pavement. Compact the mix to the required degree of compaction for the type of mixture being placed.

Provide sufficient number and weight of rollers, except as noted, to compact the mixture to the required density while it is still in a workable condition. **Where uniform density is not being obtained throughout the depth of the layer of material being tested, change the type and/or weight of the compaction equipment as necessary to achieve uniform density even though such equipment has been previously approved.**

Compact all final wearing surfaces, except open-graded asphalt friction course shall be compacted using a minimum of 2 steel wheel tandem rollers, unless otherwise approved.

Pneumatic-tire rollers with 2 tandem axles and smooth tread tires may be used for intermediate rolling.

Limit rolling for open-graded asphalt friction course to one coverage with a tandem steel wheel roller weighing a maximum of 10 tons (9.1 metric tons), with additional rolling limited to one coverage with the roller where necessary to improve the riding surface.

Steel-wheel tandem vibratory rollers specifically designed for the compaction of asphalt pavements may be used on all layers 1" or greater in thickness during the breakdown and intermediate rolling phase. Do not operate vibratory rollers in the vibratory mode during the finish rolling phase on any mix type or pavement course, open-graded asphalt friction course or on permeable asphalt drainage course.

When vibratory rollers are used, use rollers which have variable amplitude and frequency capabilities, and which are designed specifically for asphalt pavement compaction. Provide rollers equipped with controls, which automatically disengage the vibration mechanism before the roller stops when being used in the vibratory mode

The Project Director may prohibit or restrict the use of vibratory rollers where damage to the pavement being placed, the underlying pavement structure, drainage structures, utilities, or other facilities is likely to occur or is evident.

Do not use rolling equipment, which results in excessive crushing of the aggregate or excessive displacement of the mixture.

In areas inaccessible to standard rolling equipment, thoroughly compact the mixture by the use of hand tampers, hand operated mechanical tampers, small rollers, or other approved methods.

Use rollers which are in good condition and capable of being reversed without backlash to compact the mixture. Operate rollers with the drive wheels nearest the paver and at uniform speeds slow enough to avoid displacement of the mixture. Equip steel wheel rollers with wetting devices, which will prevent the mixture from sticking to the roller wheels

Begin compaction of the material immediately after the material is spread and shaped to the required width and depth. **Carry out compaction in such a manner as to obtain uniform density over the entire section.** Perform compaction rolling at the maximum temperature at which the mix will support the rollers without moving horizontally. Complete the compaction (including both intermediate rolling) prior to the mixture cooling below a workable temperature. Perform finish rolling to remove roller marks resulting from the compaction rolling operations.

It is the Contractor's responsibility to determine roller requirements based on contract specifications.

T-9.16  
T-9.16.1

**PAVEMENT DENSITY TESTING PROCEDURES:**  
**DENSITY TESTING METHODS:**

The Contractor shall perform quality control (QC) of the compaction process in accordance with Section T-9.06(D) (1-5), Section T-9.16 and T-9.17. **The Contractor shall use pavement core samples as the method of density control.**

As stated above, the degree or amount of compaction obtained by rolling is determined by obtaining cores from the pavement.

Density test locations shall be determined on equally spaced locations consisting of not more than 500 linear feet or fraction thereof per day on pavement placed at the paver

laydown width. Perform density sampling and testing on all pavements listed below unless otherwise approved.

T-9.16.2

**DENSITY REQUIREMENTS – SUPERPAVE MIXES:**

**TABLE 5  
NCDOT Table 610-7  
MINIMUM DENSITY REQUIREMENTS**

<b>MIX TYPE SUPERPAVE MIXES</b>	<b>MINIMUM % OF Gmm (AASHTO T 209)</b>
S 4.75 A	85.0 (a)
S 9.5B	90.0
S 9.5C, S9.5D, I 19.0C, B 25.0C	92.0

(a) Compaction to the above specified density will be required when the S 4.75 A mix is applied at a rate of 100 lbs./sy (55 kg/m<sup>2</sup>)

Compact the asphalt plant mix to at least the minimum percentage of the maximum specific gravity listed in Table 5, except as noted below. Perform density sampling and testing on all pavements listed below unless otherwise approved.

- (A) Full width travel lane pavements, including normal travel lanes, turn lanes, collector lanes, ramps and loops, and temporary pavements,
- (B) Pavement widening 4.0 feet or greater,
- (C) Uniform width paved shoulders paved in the same operation as the travel lane. Uniform width paved shoulders greater than 4.0 feet paved as a separate operation from the travel lane.

Compact base and intermediate mix types (surface mixes not included) utilized for pavement widening of less than 4.0 feet and all mix types used in tapers, irregular areas and intersections (excluding full width travel lanes of uniform thickness), using equipment and procedures appropriate for the pavement area width and/or shape. Compaction with

equipment other than conventional steel drum rollers may be necessary to achieve adequate compaction. Occasional density sampling and testing to evaluate the compaction process may be required. Densities lower than that specified in Table 5/ NCDOT Table 610-6 may be accepted, in accordance with Section T-9.17 for the specific mix types and areas listed directly above.

T-9.17

**DENSITY ACCEPTANCE (CORE SAMPLE CONTROL):**

The Town will evaluate the asphalt pavement for density acceptance after the asphalt mix has been placed and compacted using the Contractor's quality control test results, the Town's quality assurance test results, and by observation of the Contractor's density quality control process conducted in accordance with Section T-9.06 Section T-9.07. Minimum density requirements for all mixes will be as specified in Table 5. Density acceptance will be as provided herein. Core sample densities will be determined by use of the average maximum specific gravity (Gmm), until a moving average of the last four maximum specific gravities is attained. Once a moving average of the last four maximum specific gravities is established, the last Gmm moving average in effect at the end of the same day's production will then be used to determine density acceptance.

The pavement will be accepted for density on test sections consisting of not more than 500 linear foot or fraction thereof per day on pavement placed at the paver laydown width.

A failing test section for density acceptance purposes is defined as a maximum 500-foot test section or fraction thereof per day on pavement placed at the paver laydown width for which the average of all densities fails to meet the minimum specification requirement. In addition, any test section or portion of a test section that is obviously unacceptable will be rejected for use in the work

If the Project Director determines that a given test section of mix does not meet the minimum specification requirements, but the work is reasonably acceptable, the test section will be accepted at a reduced pay factor in accordance with the following formula. **The reduced pay factor will apply only to the mix unit price.**

$$\text{Reduced Pay Factor} = 100 + [(\text{Actual Density} - \text{Specified Density}/2) \times 30]$$

Where: Actual Density = the lot average density, not to exceed 2.0% of the specified density.

Specified Density = the density in Table 5 or as specified in the contract.

When the deficiency of the test section density exceeds 3.0 %, the Project Director will determine whether or not the mix is reasonably acceptable. If determined to be reasonably acceptable, the mix will be paid for at 50 percent of the contract price. If it is determined not acceptable, the mix will be removed and replaced with mix meeting the requirements of these specifications.

Any reduction in pay due to failing density will be in addition to any reduction in pay due to failing mix property test results on the same mix.

Perform the production and construction of all asphalt mixtures and pavements in accordance with these provisions. There will be no direct payment for work covered by this provision. Payment at the contract unit prices for the various asphalt items will be full compensation for all work covered by this provision.

T-9.18

**JOINTS: GENERAL:**  
**(A) Transverse Joints :**

If traffic will not pass over the end of the paving, a butt joint will be permitted, provided proper compaction is achieved. If traffic will pass over the joint, construct a sloped wedge ahead of the end of the full depth pavement to provide for proper compaction and protection of the full depth pavement. Construct the joint square to the lane alignment and discard all excess material. Place a paper-parting strip beneath this wedge to facilitate joint construction unless waived by the Town Quality Control Technician. Required minimum length to compacted thickness ratio of the taper is 12:1.

Before paving operations are resumed, remove the sloped wedge and cut back into the previously constructed pavement to the point of full pavement depth. Coat the exposed edge of the previously constructed pavement with tack coat.

When laying of the mixture is resumed at the joint, complete and then test the construction of the joint in accordance with Article 610-12 while the mixture is still in a workable condition. All joints shall present the same texture, density, and smoothness as other sections of the course.

The joints between old and new pavements or between successive days' work shall be carefully made in such manner as to ensure a continuous bond between old and new sections of the course. All contact surfaces of previously constructed pavements shall be painted with a thin, uniform tack coat of hot bituminous material just before the fresh mixture is placed.

**In all cases, before paving operations are resumed, the edge of the previously laid course shall be saw-cut back to expose an even vertical surface** to the point of full pavement depth. Coat the exposed edge of the previously constructed pavement with tack coat.

T-9.19

**LONGITUDINAL :**

**(B) Longitudinal Joints :**

Tack the exposed edge of all longitudinal joints prior to placing the adjoining pavement.

Form longitudinal joints by allowing the paver to deposit the mixture adjacent to the joint to such depth that maximum compaction can be obtained along the joint. Pinch the joint by rolling immediately behind the paver.

**When multi-lane multi-layer construction is required, offset the longitudinal joints in each layer from that in the layer immediately below by approximately 6 inches.**

**The locations of joints must also be planned such that the joint in the final layer of pavement is located, where possible, between designated travel lanes of the final traffic pattern. Joints shall not be located in a wheel path.**

T-9.20

**SURFACE REQUIREMENTS AND ACCEPTANCE:**

Construct pavements using quality paving practices as detailed herein. Construct the pavement surface smooth and true to the plan grade and cross slope. Immediately correct any defective areas with satisfactory material compacted to conform to the surrounding area.

**Pavement imperfections resulting from unsatisfactory workmanship such as segregation, improper longitudinal joint placement or alignment, non-uniform edge alignment and excessive pavement repairs will be considered unsatisfactory**

The Contractor and Town Quality Control Technician will test each pavement layer at all joints and at other selected locations using a 10-foot (3.05 m) straightedge furnished by the Contractor. No paving will be allowed without straight edge on site. Apply the straightedge parallel to and or perpendicular to the centerline of the surface. Do not exceed 1/8-inch variation of the surface being tested from the edge of the straightedge between any 2 contact points. Correct areas found to exceed this tolerance by removal of the defective work and replacement with new material, unless other corrective measures are permitted. Provide the work and materials required in the correction of defective work at no cost to the Town.

T-9.21

**LIMITED PRODUCTION POLICY FOR UNSATISFACTORY LAYDOWN:**

In the event the laydown of the mix is unsatisfactory due to ride quality, excessive tearing, corrugation, rough surface, segregation, or other mat deficiencies, the Town Quality Control Technician will advise the Contractor that the work is unsatisfactory and that steps must be taken to obtain a satisfactory laydown.

When directed due to unsatisfactory laydown or workmanship, the Contractor should operate under the limited production procedures. Limited production for unsatisfactory laydown is defined as being restricted to the production, placement, and compaction and final surface testing (if applicable) of a sufficient quantity of mix necessary to construct only 500 feet of pavement at the laydown width. The Contractor will remain on limited production until such time as satisfactory laydown results are obtained or until three consecutive 500-foot sections at the laydown width have been attempted without achieving satisfactory laydown results. If the Contractor fails to achieve satisfactory laydown results after three consecutive 500-foot sections at laydown width have been attempted, cease production of that mix type until such time as the cause of the unsatisfactory laydown results can be determined. Once satisfactory laydown has been achieved normal production may resume.

Mix placed under the limited production procedures or rejected due to improper temperatures due to the limited production procedures for unsatisfactory laydown or workmanship will be evaluated for acceptance

T-9.22 **TACK COAT: DESCRIPTION:**  
Apply tack coat material to existing asphalt or concrete surfaces in accordance with these specifications.

**Apply tack coat beneath each layer of asphalt plant mix to be placed, unless otherwise approved.**

Where a prime coat or a newly placed asphalt surface treatment mat coat has been applied, apply tack coat as directed.

T-9.22.1 **MATERIALS:**  
Refer to the latest edition of *NCDOT Standard Specifications for Roads and Structures*

<b>Item</b>	<b>Section</b>
Asphalt binder, Grade PG 64-22	1020-2
Emulsified Asphalt, Grade RS-1H	1020-3
Emulsified Asphalt, Grade CRS-1H	1020-3
Emulsified Asphalt, Grade CRS-1	1020-3
Emulsified Asphalt, Grade HFMS-1	1020-3
Emulsified Asphalt, Grade CRS-2	1020-3

Do not dilute or mix the tack coat material with water, solvents, or other materials prior to application.

Unless otherwise specified in the project special provisions, the Contractor may utilize any of the grades of tack coat material specified in this article.

When tack coat is required beneath an open-graded asphalt friction course, the asphalt grade and rate of application to be used on the project will be specified on the job mix formula in accordance with Section 650-5 of the latest edition of *NCDOT's Standard Specification for Roads and Structures*.

T-9.22.2 **WEATHER LIMITATIONS:**  
Apply tack coat only when the surface to be treated is sufficiently dry and when the atmospheric temperature is 35°F or above in the shade away from artificial heat.

Do not apply tack coat when the weather is foggy or rainy.

T-9.22.3 **SURFACE PREPARATION:**

Clean the existing asphalt or concrete surface to which tack coat is to be applied of all dust and foreign material prior to placing the tack coat.

**Remove grass, dirt, and other materials from the edge of the existing pavement prior to the placement of tack coat.**

T-9.22.4

**APPLICATION EQUIPMENT:**

Provide equipment for heating and uniformly applying the asphalt material in accordance with the requirements of the latest edition of NCDOT's HMA/QMS manual

T-9.22.5

**APPLICATION RATES AND TEMPERATURES:**

Apply tack coat uniformly across the existing surface at target application rates shown in Table 605-1.

<b>TABLE 605-1</b>	
<b>APPLICATION RATES FOR TACK COAT</b>	
<b>Existing Surface</b>	<b>Target Rate (gal/sy)</b>
	<b>Emulsified Asphalt</b>
New Asphalt	0.04 ± 0.01
Oxidized or Milled Asphalt	0.06 ± 0.01
Concrete	0.08 ± 0.01

Apply tack coat at a temperature within the ranges shown in Table 605-2. Tack coat shall not be overheated during storage, transport or at application

**TABLE 605-2  
APPLICATION TEMPERATURE FOR TACK COAT**

<b>Asphalt Material</b>	<b>Temperature Range</b>
Asphalt Binder, Grade PG 64-22	350- 400°F
Emulsified Asphalt, Grade RS-1H	130-160°F
Emulsified Asphalt, Grade CRS-1	130-160°F
Emulsified Asphalt, Grade CRS-1H	130-160°F
Emulsified Asphalt, Grade HFMS-1	130-160°
Emulsified Asphalt, Grade CRS-2	130-160°F

T-9.22.6

**APPLICATION OF TACK COAT:**

Apply only as much tack coat material as can be covered with base, intermediate, or surface course material during the next day's operation except where public traffic is being maintained.

Where public traffic is being maintained, apply only as much tack coat as can be covered during the same day's operation. In addition, the Project Director or Town Quality Control Technician/ certified QMS Roadway Technician may limit the application of tack coat in advance of the paving operation depending on traffic conditions, project location, proximity to business or residential areas, or other reasons. In the event that tack coat material is not covered in the same day's operation, the Project Director may require the application of suitable granular material or other means to provide a safe traffic condition at no additional cost to the Town. All suitable granular material shall be removed prior to paving at no cost to the Town.

Apply tack coat material with a distributor spray bar, which can be adjusted to uniformly coat the entire surface at the directed rate. Use a hand hose attachment only on irregular areas and areas inaccessible to the spray bar. Cover these areas uniformly and completely.

Apply tack coat as directed by the Project Director and in the presence of the Town Quality Control Technician/ certified QMS Roadway Technician or his designee. Do not place any asphalt mixture until the tack coat has sufficiently cured.

Paint or spray contact surfaces of headers, curbs, gutters, manholes, vertical faces of old pavements, and all exposed transverse and longitudinal edges of each course with tack coat before mixture is placed adjacent to such surfaces.

All asphaltic cement or other materials which discolor the surface of concrete structures and items which are spilled or placed on such surfaces shall be removed at the Contractor's expense, and his inability to remove such foreign and disfiguring stains shall result in the complete removal of the structures. These removed structures or surfaces shall be replaced at his expense.

T-9.22.7 **PROTECTION OF TACK COAT:**

After the tack coat has been applied, protect it until it has cured for a sufficient length of time to prevent it from being picked up by traffic.

T-9.22.8 **MEASUREMENT AND PAYMENT:**

There will be do direct payment for work covered by this section. The cost of tack coat shall be included in the unit price bid for bituminous concrete base, intermediate, leveling, surface course or other various mix items as shown in the proposal.

T-9.23 **PREPARATION OF EXISTING PAVEMENTS PRIOR TO RESURFACING:**

T-9.23.1 **CLEANING:**

Immediately prior to tacking and resurfacing the Contractor shall sweep the street free of all loose dirt, clay, fuel, oil, grass, or other foreign matter on the surface and edge of the existing pavement. The Town Quality Control shall ensure that all areas are properly cleaned and tacked before the pavement layer is placed. Sweeping shall be performed with power brooms wherever possible. Stiff bristled hand push brooms will be allowed in areas inaccessible to the power broom.

T-9.24 **CASTING ADJUSTMENTS WITHOUT ADJUSTMENT RINGS (SEWER, STORMWATER, WATER VALVES, CLEAN OUTS & CHANGING OUT NON-STANDARD TO STANDARD MOMUMENT CASTINGS:**

All castings designated to be adjusted without the use of adjustment rings shall meet all requirements of Section T-9.24. All castings adjusted for the milling and paving operations shall have asphalt "ramps" installed prior to removing any lighted barricades. Lighted barricades are to be placed over castings until asphalt "ramps" are installed. Monthly progress payments **will not** be processed if there are any ramps not installed in accordance with this paragraph. Asphalt "ramps" must be removed before placing final course of asphalt. Cost of asphalt used is incidental to the casting adjustment. If these provisions are not complied with, the castings shall be paid at ½ of the bid price and will not be paid until final payment. All castings shall be raised prior to final surface course placement. The Contractor shall be entirely responsible for all settlement over any and all trenches, excavations and areas where castings were adjusted at any time prior to the completion of his contract, and for a period of twelve (18) months after completion of his contract.

NCDOT approved releasing agents shall be used on the castings prior to paving. (FUEL OIL IS NOT PERMITTED).

A 10' straightedge shall be placed across all castings by the Contractor parallel to and perpendicular to the centerline of the final surface course after finish rolling has been completed. Any casting which exceed 1/8" (one eighth inch) variation from the surface being tested from the edge of the 10' straightedge to any one or more contact points of the adjusted casting shall be reset to finished grade by the Contractor at no cost to the Town.

New monument castings replacing old monument castings will be provided by the Town of Wilmington.

T-9.25 **CASTING ADJUSTMENTS USING ADJUSTMENT RINGS (MANHOLES AND STAANDARD EXISTING MOMUMENT CASTINGS):**

All castings designated to be adjusted with the use of approved adjustment rings shall provide manhole riser rings with expandable mechanism equal to American Highway Products or approved equal.

T-9.26 **SCALES AND PUBLIC WEIGHMASTER:**

When material is to be paid for on a ton basis, the Contractor shall furnish platform scales or other weighing devices which have been certified by the N. C. Department of Agriculture. The scales may be constructed and operated to provide automatic weighing, recording, and printing of tickets for the load being weighed. The Town may deny or withhold any portion of payment for any load of materials weighed if in relation to such load of materials, the Contractor falsifies any weighing certification information or otherwise fails to comply with the requirements contained in this contract. All scales shall be operated by a public weighmaster licensed in accordance with *Chapter 81A of the*

*General Statutes of North Carolina.* A certified weight certificate shall be issued by a North Carolina public weighmaster for each load

T-9.27 **MEASUREMENT AND PAYMENT:**

*Hot or Warm Mix Asphalt Pavement* will be paid at the contract unit price per ton that will be the actual number of tons of each type of hot mix asphalt incorporated into the completed and accepted work. The unit price shall include all costs associated with mixing, delivering, placing and compacting, and shall also include the cost of any prime or tack coat required.

Any reduction in pay due to failing density will be in addition to any reduction in pay due to failing mix property test results on the same mix.

<b>Pay Item</b>	<b>Pay Unit</b>
Hot or Warm Mix Asphalt Pavement	Ton

**TECHNICAL SPECIFICATIONS**  
**SECTION 10: FINE & COARSE AGGREGATE BASE COURSE**

T-10.01 **SCOPE:**

**BASE COURSE:**

The Contractor for this section shall furnish all materials, labor, equipment and plant necessary for, and to complete in place as shown on the drawings or in the specifications and as directed by the Engineer, the pavement base course of the thickness specified on the plans and in the Project Specifications. Placing, shaping, compacting and reworking of the base course is included in this section. Excavating and grading shall be in conformity with the Section of these specifications entitled, "Excavation, Grading and Backfill."

T-10.02 **BASE COURSE MATERIALS:**

Base course for bituminous concrete pavement shall be fine aggregate, coarse aggregate, or soil cement as shown herein or as shown on the Contract Plans.

T-10.02.1 **FINE AGGREGATE BASE COURSE MATERIAL:**

Fine aggregate base course material shall consist of a mixture of clay, silt, fine and coarse sand and gravel so proportioned as to meet the requirements of these specifications.

The fine aggregate mixture shall be free from vegetative matter and lumps or balls of clay, and shall meet the requirements for Type "A" grading given below, using A.A.S.H.T.O. Method T-88.

TYPE "A": This fine aggregate type shall not contain more than 35 percent of aggregate passing the two (2) inch and retained on the No. 10 sieve, and its soil mortar (material passing the No. 10 sieve) shall conform to the following grading requirements:

<b>SIEVE DESIGNATION</b>	<b>PERCENTAGE BY WEIGHT PASSING</b>
No. 10	100
No. 40	40-75
No. 200	12 - 35

The fraction passing the No. 200 sieve shall be less than two-thirds the fraction passing the No. 40 sieve. The material passing the No. 40 sieve shall have a plasticity index not greater than six and a liquid limit not greater than twenty-five, when tested in accordance with A.A.S.H.T.O. Methods T-89, T-90 and T-91.

T-10.02.2 **COARSE AGGREGATE BASE COURSE MATERIAL:**

Coarse aggregate base material shall consist of crushed stone, crushed or uncrushed gravel, crushed or uncrushed shell rock or other inert materials having similar characteristics, so proportioned as to meet the grading requirements as specified below, using A.A.S.H.T.O. Method T-88:

<b>SIEVE DESIGNATION</b>	<b>PERCENTAGE BY WEIGHT PASSING</b>
--------------------------	-------------------------------------

1-1/2 inch	100
1 inch	80 - 95
1/2 inch	60 - 75
No. 4	40 - 55
No. 10	28 - 43
No. 40	15 - 27
No. 200	5 - 12

The material passing the No. 200 sieve shall be not more than two-thirds the percentage passing the No. 40 sieve.

The fraction retained on the No. 4 sieve prior to spreading on the road shall meet the following requirements:

1. When tested in accordance with the A.A.S.H.T.O. method T-96, test grading A, it shall show a loss of not greater than 55 percent.
2. The material passing the No. 40 sieve obtained from the above test shall have plasticity index not greater than 6, and liquid limit not greater than 30, when tested with A.A.S.H.T.O. Method T-89, T-90, T-91 and modification of the Liquid Limit Test.
3. When subjected to five alternations of the soundness test, A.A.S.H.T.O. Method T-104, using sodium Sulphate, the weighted average loss shall not be more than 15 percent.

The material passing the No. 4 sieve prior to spreading on the road shall meet the following requirements:

1. The material passing the No. 10 sieve shall meet the following grading requirements:

<b>SIEVE DESIGNATION</b>	<b>PERCENTAGE BY WEIGHT PASSING</b>
No. 10	100
No. 40	40 - 85
No. 200	12 - 35

2. The fraction passing the No. 40 sieve shall have a plasticity index of not greater than 6, and a liquid limit not greater than 30, when tested in accordance with A.A.S.H.T.O. Methods T-89, T-90, T-91 and modification of the Liquid Limit Test.
3. The materials passing the No. 200 sieve shall not be more than two-thirds the percentage passing the No. 40 sieve.
4. The fraction passing the No. 10 sieve shall consist of a mixture of screenings or sand, silt, and clay, and it may occur as topsoil meeting the requirements without mixture; or it may be deficient in one or more of the ingredients, coarse or fine sand

or screenings, silt, or clay, in which case the required ingredients must be incorporated; or it may consist of crushed decomposed rock which shall meet the requirements stipulated in 1, 2, and 3 above.

After the base course has been completed, that portion of the material which passes the No. 40 sieve shall have a plasticity index of not greater than 6, and a liquid limit of not greater than 30, when tested in accordance with A.A.S.H.T.O. Methods T-89, T-90, T-91 and the modification of the Liquid Limit Test.

T-10.02.3 **SOIL CEMENT BASE COURSE MATERIAL:**

Soil cement base material shall consist of Portland cement and soil in accordance with Section 541, Standard specifications for roads and structures of the N.C. Department of Transportation.

Portland cement shall conform to the requirements of ASTM designation C 150

Type I. Soil for the soil cement mixture shall be existing in place material, except that any rubble or lumps existing or uncovered during mixing which is larger than 3 inches in diameter shall be removed from the site and the maximum allowable volume of these lumps for any square foot of base surface shall not be greater than 50 percent of the base volume. If additional soil is required to bring the base course to grade, the material shall be provided by the Contractor at no additional cost to the owner and shall be clean, sandy soil-free of organic matter with allowable clay content of 0 to 5 percent. The entire soil mixture shall be classified generally as cohesionless soil.

Cement shall be stored in such a manner as to prevent deterioration or intrusion of foreign matter. Any material that has deteriorated or has become lumpy from water intrusion shall not be used.

The soil cement mixture shall be proportioned with cement volume being 14 percent of soil volume.

Before applying cement remove all vegetation and foreign material and blade finish to a fairly level surface so that cement application may be uniformly distributed.

T-10.02.4 **SOURCE OF MATERIALS:**

Material for the base course shall be obtained from sources selected by the Contractor, subject to the approval of the Engineer.

T-10.02.5 **SAMPLING AND TESTING:**

All test samples shall be taken by the Engineer and all tests will be made by the Town at no cost to the Contractor.

T-10.02.6 **WATER:**

Water, if used in construction, shall be free from oil and other deleterious matter and shall be subject to the approval of the Engineer.

T-10.03 **EQUIPMENT:**

All plant, equipment, tools, and machines used in the performance of the work covered by this section shall be subject to the approval of the Engineer, and shall be maintained in satisfactory working condition at all times.

**T-10.03.1 POWER ROLLERS:**

The rollers shall be self-propelled, three-wheel type, weighing not less than ten (10) tons, and having a minimum weight of 300 pounds per inch width of rear wheel. The wheels shall be equipped with adjustable scrapers.

**T-10.03.2 TAMPING ROLLERS:** (sheepsfoot type)

Tamping rollers shall consist of one or more units. Each unit shall consist of a watertight cylindrical drum not less than forty-eight (48) inches in length, surmounted by metal studs with tamping feet projecting not less than seven (7) inches from the surface of the drum, and spaced not less than six (6) nor more than ten (10) inches, measured diagonally from center to center. The tamping feet shall be an approved type suitable for compacting stabilized aggregate base courses. Each unit shall be equipped with a suitable device for cleaning the tamping foot. The rolling units of multiple type tamping rollers shall be pivoted on the main frame in a manner which will permit the units to adapt themselves to uneven ground surfaces and to rotate independently. When fully loaded, the roller shall produce at least 300 pounds per square inch on the combined areas of the tamping feet in contact with the ground.

**T-10.03.3 VIBRATING WHEEL ROLLERS:**

Vibrating wheel rollers shall consist of a self-propelled or trailer-type drum wheel roller having a weight of not less than 300 lbs. per inch of wheel width and having a vibrator motor unit capable of causing an effective vibration of soils being compacted.

**T-10.03.4 BLADE GRADERS:**

Blade graders shall have a wheel base of not less than 15 feet, a blade of not less than 10 feet, and shall be self-propelled.

**T-10.03.5 RUBBER-TIRED ROLLERS:**

The rubber-tired rollers shall consist of two axles on which are mounted not less than nine (9) pneumatic-tired wheels in such a manner that a rear group of tires will not follow in the tracks of the forward group. The axles shall be mounted in a rigid frame provided with a loading platform or body suitable for ballast loading. The tires shall be uniformly inflated. The rollers shall be weighted as directed by the Engineer. The tractor or other towing equipment shall also be pneumatic-tired.

**T-10.03.6 TRAVELING MIXED PLANTS:**

Traveling mixing plants shall be so designed and constructed that they will pick up the windrowed aggregate without damaging the subgrade or leaving any portion of the windrow on the subgrade. Machines shall be mounted on pneumatic-tired wheels or smooth-tread crawler type tracks of such width that, when the plant is fully loaded, they will not cut or damage the subgrade. The equipment for proportioning the aggregates

and water shall accurately measure the specified amounts of the materials while the machine is in operation. Each plant shall be capable of producing a uniform mixture without loss of the aggregate and shall have capacity of not less than 100 tons of mixed material per hour.

T-10.03.7 **SPRINKLING EQUIPMENT:**

The sprinkling equipment shall consist of tank trucks, pressure distributors, or other equipment designed to apply water uniformly and at controlled quantities to variable widths of surface.

T-10.03.8 **DISKS:**

Disks shall be of the tandem type, and shall be constructed so as to prevent any cutting of the subgrade during mixing operations.

T-10.03.9 **PLOWS:**

Plows shall be of the multiple-furrow type, and shall be so designed that the depth of furrow can be accurately controlled.

T-10.03.10 **HAULING EQUIPMENT:**

Hauling equipment shall consist of pneumatic-tired vehicles having dump bodies suitable for dumping materials in windrows or in layers on the subgrade of select-material base course.

T-10.03.11 **TAMPERS:**

Hand tampers shall weigh not less than fifth (50) pounds and shall have a face area of not more than one-hundred (100) square inches. Mechanical tampers shall be of an approved type.

T-10.03.12 **MISCELLANEOUS EQUIPMENT:**

Scarifiers, tractors, spring-tooth or spike-tooth harrows, windrow equalizers, spreaders, and other equipment shall be of approved type, suitable for constructing stabilized aggregate base courses.

T-10.04 **OPERATION OF PITS:**

All work involved in the clearing, stripping and excavating, in addition to the processing and blending, in the opening and operation of new pits, or in the operation of approved existing pits, shall be performed by the Contractor. The methods of operating the pits and the processing and blending of the material may be changed or modified by the Engineer without adjustments in the contract unit prices, when such action is necessary in order to obtain material conforming to the specified requirements.

T-10.05 **STOCKPILING MATERIAL:**

Approved material available from the excavation and grading operations shall be stockpiled in the manner and at the locations designated by the Engineer. Prior to stockpiling of material, the storage sites shall be cleared and leveled by the Contractor. When aggregate or binder material obtained from other sources is to be stockpiled, such

materials shall be separately stockpiled in a similar manner on the cleared and leveled areas designated by the Engineer.

T-10.06 **WEATHER LIMITATIONS:**

Stabilized aggregate base courses shall not be constructed when the atmospheric temperature is below 35 degrees F. When the temperature falls below 35 degrees F., it shall be the responsibility of the Contractor to protect all areas of completed base course against any detrimental effects, by methods approved by the Engineer. Any areas of completed base course that are damaged by freezing, shall be reconditioned, reshaped and recompact by the Contractor in conformance with the requirements of this specification without additional cost to the Town.

T-10.07 **PREPARATION OF SUBGRADE:**

Prior to constructing the base course, curb and gutter shall have been constructed and cured; the previously constructed subgrade shall be dry and cleaned of all foreign substances. The surface of the subgrade will be inspected by the Engineer for adequate compaction and surface tolerances. Any ruts or soft-yielding spots that may appear in the subgrade, any areas having inadequate compaction, and any deviations of the surface from the requirements set forth therein shall be corrected by loosening, removing, and adding approved material, reshaping, and recompacting the affected areas to line and grade, and to the specified density requirements at the Contractor's expense.

T-10.08 **PLACING AND MIXING OF MATERIAL:**

The base material shall not be dumped directly onto the subgrade from trucks. Dumping shall be either on old pavement or on material already dumped and spread, and material shall be spread by means of bulldozers or graders of a size suitable for such spreading. Spreading will begin at the point nearest the source of supply and all hauling shall be over the material dumped and spread. Constant machining shall accompany the traffic in order to prevent rutting and to provide for even compaction. Hauling shall be distributed over the entire width of the street. Any portions of the layer spread that become segregated shall be remixed by scarifying and the addition of new material to produce a satisfactory blend of materials.

T-10.09 **MANIPULATION AND COMPACTION:**

After sufficient material has been placed on the sub-grade to obtain the specified thickness of base, it shall be well rolled and machined until thoroughly compacted. Frequent template checks shall be made to ensure that a minimum amount of patching is necessary after complete compaction is secured. If patching is required, the base material in place shall be scarified to ensure adequate bonding together of previously placed base and new material. The base course shall be compacted its full depth to at least 95 percent of the density at optimum moisture, as determined by ASTM D 698, latest revision.

T-10.10 **EDGES OF BASE COURSE WHEN CURB OR SIDE ARE NOT USED:**

Earth or other approved material shall be placed along the edges of the base course in such quantity as will compact to the thickness of the course being constructed, or, when

the course is being constructed in two or more layers, to the thickness of each layer of the course, allowing in each operation at least a one (1) foot width of the shoulder to be rolled and compacted simultaneously with the rolling and compacting of each layer of the base course, as approved by the Engineer.

T-10.11 **SMOOTHNESS TEST:**

The surface shall not show any deviations in excess of 3/8 inch when tested with a 10-foot straight-edge applied parallel with and at right angles to the centerline of the paved area. Any deviation in excess of this amount shall be corrected by the Contractor by loosening, adding or removing material, reshaping, watering, and compacting as directed by the Engineer. When the base course is to be constructed in more than one layer, the smoothness requirements specified above shall apply only to the top layer. The surface of the underlying layers shall be finished as directed by the Engineer.

T-10.12 **THICKNESS:**

Compacted thickness of base course shall be shown on the plans and as specified in the Project Specifications. The Contractor will be responsible for securing this final compacted thickness in all cases.

T-10.13 **MAINTENANCE:**

Areas of roadway where base material has been placed will be kept constantly in a moist condition by wetting until final grading and surfacing to prevent dust. No means but wetting shall be used for such dust control. Traffic shall be kept off the base after final compaction and cross-section has been attained, just before surfacing.

T-10.14 **METHOD OF MEASUREMENT:**

T-10.14.1 **SQUARE YARDAGE:**

The square yardage of base course shall be the number of square yards of completed and accepted base course determined by the Engineer.

T-10.14.2 **TONNAGE:**

When called for in the Proposal, some coarse aggregate base may be used for "tie-ins" at intersections and at other points where a standard thickness base cannot be used. Where this item is called for and used, it will be measured by tons actually placed.

T-10.15 **BASIS OF PAYMENT:**

Base course shall be paid for at the contract price per cubic yard or ton, which payment shall constitute full compensation for the construction and completion of the base course, including: the preparation of sub-grade; furnishing all materials, supplies, equipment and tools; the handling, mixing, manipulation, placing, shaping, compacting, rolling, finishing, and the correcting of unsatisfactory areas and mixtures; the furnishing and application of water; the placing and compacting of portions of the shoulders at edges of base course; and the furnishing of all other labor and incidentals necessary for and incidental to the work required by this section of the specifications.

**TECHNICAL SPECIFICATIONS**  
**SECTION 14: MATERIALS**

T-14.01 **SCOPE:**

This section includes all materials that may be used in the work as set out herein but does not intend in any way to suggest that all materials listed are included. The intention of the section is to denote the quality and type of materials desired and required. The name of a certain brand, make, manufacturer or definite specification is to denote the quality of material desired, but does not restrict bidders to the specific brand, make, manufacturer or specifications named; it is to set forth and convey to prospective bidders the general style, type, character and quality of the article desired.

T-14.02 **AGGREGATES:**

T-14.02.1 **CONCRETE AGGREGATES:**

Fine concrete aggregates shall conform to either A.S.T.M. C-33 or AASHTO M 6-87. Coarse concrete aggregates shall conform to AASHTO M 80-87.

T-14.02.2 **MORTAR AGGREGATES:**

Mortar aggregates shall conform to A.S.T.M.-C-144-84/ AASHTO M-45-89.

T-14.02.3 **ASPHALT AGGREGATES:**

Fine aggregates used in asphaltic concrete shall be graded from coarse to fine to meet the gradation, as provided under Section 9, "Paving," and shall be composed of sand, stone screenings or a blend of both, which shall be of grains of quartz or other hard, durable rock, rough surfaced and angular grains, clean and free from any injurious materials. Stone screenings shall be produced from stone that shall have a percent of wear not more than 65, as determined by AASHTO Test T-96. In all cases, sand samples shall be submitted to the Town and shall be subject to the approval of the Engineer.

Coarse aggregates shall consist of clear, tough, durable fragments, free from an excess of flat, elongated, soft or disintegrated pieces and shall not contain clay, silt or other objectionable matter. Coarse aggregates shall be of crushed stone retaining on a number 10 sieve. Test for quality shall be according to the AASHTO Test T-96, and shall have a loss of not more than 55 percent. In all cases, coarse aggregate samples shall be submitted to the Town and shall be subject to the approval of the Engineer.

Mineral filler shall consist of thoroughly dry limestone dust, Portland Cement, or other materials approved by the Engineer. It shall meet the following requirements:

**PERCENT OF TOTAL**

Passing 30 mesh sieve	100
Passing 100 mesh sieve	85-100
Passing 200 mesh sieve	65-100

T-14.03 **CEMENT:**

T-14.03.1 **PORTLAND:**

Portland cement shall conform to ASTM C-150-latest edition, Type I or III / AASHTO M 85-89, Type I or III.

- T-14.03.2 **MASONRY:**  
Masonry cement shall conform to ASTM C 150-86/ASSHTO M 85-89. Type I shall be used on aboveground structures. Type II shall be used on underground drainage and sanitary sewer structures.
- T-14.03.3 **ASPHALTIC:**  
Shall be 85-100 penetration petroleum asphalt to meet AASHTO M-20-42, subject to the approval of the Engineer.
- T-14.04 **WATER:**  
All water used for mixing mortar or concrete shall be clean, free from acid, strong alkali, or matter in suspension, and will be obtained from the Town water supply system unless otherwise permitted by the Engineer.
- T-14.05 **MORTAR:**  
Mortar shall be prepared from cement, sand and water that fulfill the requirements as stated for each. The mortar shall consist of one (1) part by volume of Portland Cement and three (3) parts by volume of sand. A maximum of ten (10) percent of lime putty or dry hydrated lime to each volume of cement may be used to attain workability, if desired, or if so instructed by the Engineer. Prepared types of mortar cement may be used only with the written permission of the engineer. The mortar shall be mixed in boxes prepared for that purpose, and must be cleaned after each batch is removed. No mortar may be used that shows signs of setting, or that has been allowed to stand for a period of thirty (30) minutes after mixing.
- T-14.06 **BRICK:**  
Bricks shall conform to AASHTO, M114, Grade MW, and shall be whole solid brick of standard size, with straight and parallel edges and square corners. They shall be of compact texture, full weight and entirely true, free from injurious cracks and flaws, tough, strong, and shall have a clear ring when struck together.
- T-14.07 **BRICK FOR SANITARY SEWER, DRAINAGE, AND WATER MAIN MANHOLES:**  
None but whole, solid, sound, hard, straight, thoroughly burned brick, uniform in structure, with true and even faces shall be used. The brick shall be entirely free from injurious defects, and shall ring clear when two are struck together. All brick shall meet ASTM Standard Specifications for Sewer Brick ASTM Designation C-32, Grade MS, latest revision, according to the various classification according to use as given therein.
- CONCRETE BRICK:**  
Concrete brick shall be sized 4"X4"X8", and conform to ASTM C 139-79 / AASHTO C 145-75.
- T-14.08 **GRAY IRON CASTINGS:**
- T-14.08.1 **REQUIREMENTS AND METHODS OF TESTING:**  
All iron castings for manhole and well hole frames and covers, inlet frames, covers and traps, and for other sewer appurtenances, unless otherwise specified in the plans, shall

conform to the requirements for Gray Iron Castings of the American Society for Testing Materials.

T-14.08.2 **CLASSIFICATION:**

All castings shall conform to ASTM A 48-83, Class 30 "Gray Iron Castings" unless specified otherwise on the plans or in the Special Conditions.

T.14.08.3 **WORKMANSHIP AND FINISH:**

The castings shall be true to pattern and free from cracks, gas holes, flaws and excessive shrinkage. Surfaces of the castings shall be free from burnt-on sand and shall be reasonably smooth. Runners, risers, fins, and other cast-on pieces shall be removed.

In other respects, the castings shall conform to whatever points may be specified in the plans. All covers for manholes, wall holes, inlets, etc., must have a continuous and even bearing on the frames. Castings tolerances shall be plus or minus 1/16 inch per foot.

T-14.08.4 **INSPECTION:**

The Engineer shall have free entry at all times while work on the material to be used in this contract is being performed, to all parts of the manufacturer's work which concern the manufacture of the castings ordered. The manufacturer shall afford the Engineer all reasonable facilities to satisfy him that the castings are being furnished in accordance with these specifications. All tests and inspections shall be made at the place of manufacture prior to shipment, unless otherwise specified on the plans, and shall be so conducted as not to interfere unnecessarily with the operation of the work. When offered for inspection, the castings shall not be painted or covered with any material that will hide defects.

T-14.08.5 **CERTIFICATION:**

Upon request of the Engineer, the manufacturer shall certify that his product conforms to the requirements of these specifications.

The weights of all castings shall be certified by the founder furnishing them and shall not be less than those called for on the plans.

T-14.08.6 **MANHOLE CASTINGS:**

Manhole castings shall conform to ASTM "Gray Iron Casting" and be marked "SANITARY SEWERS" or "STORM SEWER" as required, and shall be East Jordan Iron Works, No. V-1384, Ennis Enterprises No. MH-GRE-24, Vulcan Foundry No.V-2384, or equal. Watertight or lockable manhole castings shall be specified under "Special Conditions."

T-14.08.7 **MANHOLE STEPS:**

**STORM DRAIN MANHOLE STEPS:**

Manhole steps for masonry structures shall be East Jordan Iron Works, Inc., No. 8500, Neehah Foundry Co. No. R-1980-1, Vulcan Foundry No.1999-6, or equal. Manhole steps for precast manholes shall be fabricated from ½-inch steel rod encapsulated in polypropylene plastic. The step shall be twelve-inches wide with serrated tread and lugs to prevent feet from off the step and shall be spaced on 16-inch centers.

**SANITARY SEWER MANHOLE STEPS:**

Sanitary sewer manholes shall not be furnished with manhole steps unless specified in the Special Conditions.

T-14.09 **SANITARY SEWER PIPE AND FITTINGS:**

T-14.09.1 **DUCTILE IRON PIPE AND FITTINGS:**

Ductile iron pipe shall meet the requirements of Section T-14.11.1 of these specifications except that the interior coatings shall be ceramic epoxy coating, 40 mils thick, equal to Protecto 401. Fittings shall meet the requirements of Section T-14.11.4 of these specifications except that “push-on-joints” may be used in lieu of mechanical joint fittings and the interior coating shall be a ceramic epoxy coating, 40 mils thick, equal to Protecto 401.

T-14.09.2 **POLYVINYL CHLORIDE (PVC) PIPE:**

PVC pipe and fittings for sanitary sewer shall meet the following requirements:

- A. PVC pipe shall have integral wall bell and spigot push-on joints and shall meet the requirements of ASTM D 3034, Type PSM, SDR 35 or SDR 26 conforming to ASTM 2241 and NSF for 8-inch to 15-inch pipe. When pressure pipe is required or specified, the PVC pipe shall meet the requirements of ASTM D-2241. Fittings shall be push-on-joint PVC furnished by the pipe manufacturer.
- B. PVC pipe, with push-on joints and elastomeric gaskets, conforming to the standards of AWWA C900, Class 150 or AWWA C905, Class 150 for pipes larger than 14-inches, shall be required when the depth of main, measured from the invert of the pipe to finished grade, equals or exceeds ten (10) feet. All PVC mains shall be fully encased in stone bedding when the depth equals or exceeds eight feet.

T-14.09.3 **SANITARY SEWER SERVICE PIPE:**

Pipe for sanitary sewer service lines and stacks (4 and 6-inch diameter) shall be either polyvinyl chloride (PVC) or cast iron pipe. PVC pipe shall be SDR 26, with integral bell and spigot and push-on joints conforming to ASTM D-3034, type PSM Fittings shall also conform to ASTM D-3034. Solvent welded joints shall not be acceptable. Cast iron pipe shall be used where directed and shall be heavy-duty cast iron soil pipe conforming to ASTM A-74-latest edition with push-on joints with rubber gaskets conforming to ASTM C-564-latest edition.

T-14.09.4 **TRANSITION FITTINGS:**

Transition fittings for connection between pipes of dissimilar material shall be as follows:

- A. 4-inch to 6-inch couplings: Adjustable repair couplings meeting ASTM C 564, with rigid wide non-shear band stainless steel as manufactured by Mission Rubber Company, Inc., Fernco, Romac, or equal.
- B. 8-inch and larger couplings: Mechanical joint ductile iron sleeve or adapter conforming to Section T-14-11.4

T-14.10 **REINFORCED CONCRETE PIPE AND JOINT MATERIAL:**

T-14.10.1 Concrete pipe used for storm drain pipe shall conform to the requirements of ASTM-C-76 latest revision, Class III.

T-14.10.2 Concrete pipe for use as casement pipe shall conform to the requirements of ASTM C-76, latest revision, Class IV.

T-14.10.3 Concrete pipe joint material shall meet ASSHTO M-198, ASTM C-990, and Fed. Spec. SS-S-210A.

T-14.11 **WATER PIPE AND FITTINGS:**

T-14.11.1 **PUSH JOINT DUCTILE IRON PIPE:**

Push joint ductile cast iron pipe shall be Class 51. The pipe shall be centrifugally cast and shall be made of ductile cast iron 60-42-10 grade in accordance with ANSI/AWWA C150/A21.51 and ANSI/AWWA C151/A21.51 under Special Thickness Class. The pipe shall be furnished in nominal 16-foot to 20-foot laying lengths. All pipe shall be cement mortar lined and seal coated inside, and bituminous coated outside in accordance with ANSI/AWWA C104/A21.4. Pipe shall be furnished complete with gaskets and lubricant, per ANSI/AWWA C104/A21.4.

T-14.11.2 **POLYVINYL CHLORIDE (PVC) PIPE FOR 4 THROUGH 12 INCHES:**

PVC pipe for water pipe shall conform to AWWA C900, Class 150, with push-on joints. Elastomeric gaskets shall conform to ASTM F477. Pipe shall be furnished complete with gaskets and lubricant.

T-14.11.3 **POLYVINYL CHLORIDE (PVC) PIPE FOR 2 AND 3 INCHES:**

PVC pipe for water pipe, 2 through 3 inches in diameter shall be 200 PSI, SDR 21 conforming to ANSI/ASTM D-2241, NSF approved, with push-on-joints meeting ANSI/ASTM D-3139. The pipe compound shall be PVC 1120.

T-14.11.4 **DUCTILE IRON FITTINGS:**

The fittings shall be standard mechanical joint fittings made of ductile iron in accordance with ANSI/AWWA C110/A21.10. Compact ductile iron fittings meeting ANSI/AWWA C153/A21.53-94 shall also be acceptable. Standard mechanical accessories shall be furnished for each bell opening consisting of HSCI bolts, cast iron glands, and plain rubber gaskets in accordance with ANSI/AWWA A21.11-90. Fittings shall be cement mortar lined and seal coated inside per ANSI/AWWA C104/A21.4-90. Where flanges are indicated on fittings they shall be F and D 125 pound per ASME/ANSI B16.42-87.

Fusion bonded epoxy coated ductile iron fittings meeting C116/A21.16-98, NSF 61 with a normal coating thickness of 6-8 mils are acceptable.

T-14.11.5 **PVC FITTINGS:**

PVC fittings for PVC pipe, 4 inches and larger shall be mechanical joint ductile iron fittings as specified under Section T-14.11.4 above. Fittings for PVC pipe, 2 through 3 inches shall be molded PVC, Class 200 conforming to SDR 21 in accordance to ANSI/ASTM D-2241, NSF approved, with push-on-joints meeting ANSI/ASTM D-3139 with gaskets conforming to ASTM F-477.

T-14.12 **WATER SERVICE LATERALS:**

T-14.12.1 **COPPER PIPE SERVICE LATERALS:**

Copper pipe water services shall be installed only where shown on the plans and/or directed by the Engineer. Copper pipe for water services shall be Type K soft, complying with Federal Specifications WW-T-799 and ASTM-B-88.

T-14.12.2 **POLYETHYLENE PIPE SERVICE LATERALS:**

Polyethylene pipe for water services shall be polyethylene tubing, CTS, SDR 9, 200 PSI, conforming to AWWA C901, PE 3408. Each service shall be either 1" or 2" size. A pipe marking wire, 10-gauge, insulated solid core, shall be attached at 10-foot intervals with duct tape to each service lateral.

- T-14.13 **PIPE MARKING TAPE and WIRE REQUIRED FOR PVC AND POLYETHYLENE PIPE:**  
**Tape** shall be a minimum 3-inches wide, blue in color, bearing continuous message "CAUTION WATER LINE BURIED BELOW". Tape shall be made of plastic or other permanent material with metallized foil core. Tape shall also be used for buried force mains bearing the same type of caution message.  
**Wire** - #10 INSULATED COPPER WIRE shall be installed along the top of the PVC pipe. PVC pipe shall be marked by installing the #10 insulated copper wire along the top along the entire length and strapping the wire to the main with duct tape at intervals of twice per joint. The insulated wire shall be stripped to bare wire at the contact points with fittings and valves. The insulation shall be resistant to petroleum products. Each valve and fitting shall be wrapped around twice with the copper wire.
- T-14.14 **VALVE BOXES AND EXTENSIONS:**  
Valve boxes and extensions furnished shall be Wilmington Standard Telescoping valve box and extension.
- T-14.15 **WATER SERVICE FITTINGS:**
- T-14.15.1 **COPPER SERVICE FITTINGS: (USE ONLY AS DIRECTED BY ENGINEER):**
- T-14.15.2 **POLYETHYLENE SERVICE FITTINGS:**  
Service saddles shall be as specified in T-14.15.1. Corporation stop shall be 1-inch or 2-inch, CC x CTS, equal to Mueller P15013 w/ss stiffener, Ford FB 1000 w/ss stiffener or McDonald 4701-22 w/ ss stiffener. Curb stops shall be equal to Ford B61-444 w/ss stiffener, Mueller P-25172 w/ss stiffener, or McDonald 6102W-22 w/ss stiffener. Each curb stop shall be furnished with an IMP brass bushing, 1" x 3/4", and brass meter coupling equal to McDonald 4620, Ford C38-23-2.25, or Mueller H 10890. Each service shall be furnished with a brass meter yoke with lock stop, 7-inch riser, 5/8" x 3/4" size unless directed otherwise, equal to Mueller B 24118, McDonald 18-207WX, or Ford V42-7. The meter yoke shall be furnished with a brass meter coupling as specified above. The meter box shall be as shown on Standard Details SD 4-12 or SD 4-13.
- T-14.16 **VALVES:**  
All valves shall conform to AWWA Specification C500, latest revision, gate valves or ordinary water works service except as hereinafter stated and shall have mechanical joint ends. All valves shall be resilient wedge gate valves, open right and shall have a 2-inch square head nut upon the end of the stem, with the direction arrow clearly and plainly cast thereon. Valves shall be as manufactured by Clow Corporation, Darling Valve Manufacturing, Mueller Company, Henry Pratt Company, American AVK Company's Series 25; or equal. The Town will accept interior and exterior coating of fusion bonded epoxy, normal coating of 6-8 mils, meeting the requirements of AWWA/ANSI C550-01.
- T-14.16.1 **VERTICAL GATE VALVES:**  
Shall be used on all lines 12 inches and under and shall be non-rising stem type, 175 psi working pressure and 300 psi test pressure with "O" ring stem seal. Valves shall be Resilient Wedge Gate or double disc type with cast iron body and bronze disc seats, stem and wedges. In the open position, the area of the opening shall be equal or greater than the area of the same nominal size pipe.
- T-14.16.2 **HORIZONTAL GATE VALVES OR BUTTERFLY VALVES:**

Shall be used on all lines 16 inches and larger. Horizontal valves shall be 150 psi working pressure. 16-inch valves and larger shall be 150 psi working pressure and 300 psi test pressure. All valves shall have conventional packing. Valves shall be equipped with a bevel gear, non-rising type, with grease case of the totally enclosed type and shall be provided with suitable rollers, track, scrapers, and a guide for a disc mechanism through its entire travel length. Valves 16 inches and larger shall have a by-pass with non-rising type valve. Valves shall be double disc, with cast iron body and bronze disc seats, tracks, stem, and wedges. Area of opening in the open position shall be equal to or greater than the nominal pipe diameter.

Butterfly valves shall meet the full requirements of AWWA Standard C504-70 for Class 150B. The manufacturer shall have manufactured tight-closing, rubber-seat butterfly valves for buried service for a period of at least five years. All butterfly valves shall be Henry Pratt Company's "Groundhog," Mueller "Lineseal III," American-Darling "AFC Butterfly valve" or equal.

T-14.16.3 **TAPPING SLEEVE AND VALVES:**

Sleeve shall be DI or SS 150 psi working pressure, mechanical joint. Valve shall be vertical type with "O" ring seals, mechanical joint outlet end, and flange end for connection to tapping sleeve. Flange end shall have machined projections to ensure correct alignment. Seat opening of valve shall be slightly larger than nominal size to provide for full diameter cut to be made. Sleeve shall be furnished by valve manufacturer. (SS Tapping sleeve- heavy duty, fully gasketed and SS MJ or flange) Testing of TS&V shall be as recommended by manufacturer.

T-14.17 **HYDRANT:**

T-14.17.1 **FIRE HYDRANT PAINT:**

Paint shall be applied using two (2) coats of the specified paint according to the manufacturer's recommendation. The final coat must be applied after final installation. All hydrant barrels shall be painted with **heavy-duty aluminum paint** for industrial or commercial-use, by Rustoleum, Glidden, Sherwin Williams, Tnemec, or equal.

Fire hydrants on 6-inch and 8-inch diameter mains shall have the nozzle caps and bonnet painted with industrial or commercial-use **alkyd paint**, safety yellow color by Rustoleum, Glidden, Sherwin Williams, Tnemec, or equal.

Fire hydrants on lines greater than 10-inch diameter shall have the nozzle caps and bonnet painted with industrial or commercial-use alkyd, safety green color by Rustoleum, Glidden, Sherwin Williams, Tnemec, or equal.

T-14.18 **REINFORCING STEEL:**

Reinforcing steel shall conform to ASTM A-615, Grade 60. The steel shall have the net sectional area shown on the plans and shall be of deformed bars unless otherwise specified. Welding of Reinforcing steel shall conform to AWS D12.1. Welded wire fabric shall conform to ASTM A-185.

T-14.19 **FORMS:**

Forming material shall be finished with tongue and grooved type, dressed on one side and of sufficient thickness as to prevent warping when the concrete is placed. Plywood may be used where applicable with proper bracing. Forms shall be so constructed as to ensure against misplacement and misalignment when filled. The cost of forms shall be

included in the price for concrete unless otherwise shown in the proposal. Formwork shall conform to ACI 347, "Recommended Practice of Concrete-Formwork."

T-14.20 **CONCRETE MEMBRANE CURING COMPOUND (WHITE):**

The membrane-curing compound used in concrete curing shall be as specified in AASHTO Specification M-148-49 for a white curing membrane.

T-14.20.1 **EXPANSION JOINT FILLER (FOR CONCRETE CONSTRUCTION):**

Expansion joint filler for concrete construction shall be bituminous, preformed, non-extruding joint filler, as specified in AASHTO M-33-48.

T-14.21 **LUMBER:**

Lumber shall be straight and sound and free from shakes, racks, large or loose knots, and other defects impairing its strength or durability. It shall be squared to the desired dimensions when the work demands, or when requested by the Engineer. If plans or the Special Conditions section of the Specifications indicate the character of lumber to be used on specific structures, they are hereby made a part of this paragraph. Such lumber as is required in sheeting, shoring, bridging, etc. shall be included in the bid price for furnishing and installing the proposed improvements.

T-14.22 **GALVANIZING:**

T-14.22.1 **REQUIREMENTS AND METHODS OF TESTING:**

Galvanizing of structural shapes used in structures shall conform to the requirements of, and shall be tested in accordance with ASTM A-123-84/AASHTO M-111-87. Galvanizing of fasteners and hardware shall conform to, and shall be tested in accordance with ASTM A-153-87/AASHTO M-227-90.

T-14.22.2 **WORKMANSHIP AND FINISH:**

The zinc coating shall be adherent, smooth, continuous and thorough. It shall be free from such imperfections as lumps, blisters, gritty areas, uncoated spots, acid and black spots, dross and flux. The coating shall not be so loosely adhering as to be removable by any reasonable process of handling and erection. Light blows with a one-half (1/2) pound hammer shall not cause peeling of the coating adjacent to the area deformed by the hammer blow. The coating shall not interfere with the intended use of material.

After immersion in molten zinc, the structural shapes, plates or bars shall not be subjected to any process of scraping or wiping which will reduce the uniformity or the specified weight of the zinc coating.

T-14.23 **MANHOLES PRECAST:**

Precast manholes shall have shaped invert with 4-foot minimum diameter, unless specified different on the plans. Unless shown different on the plans the wall, base, and top shall be constructed of 4000 psi concrete in accordance with ASTM C-478.

The other material requirements are as follows:

- a) H-20 Highway Loading.
- b) One pour monolithic base section base extends 6 inches beyond outside wall for manholes smaller than 5 feet I.D., and all manholes deeper than 8 feet.
- c) Reinforced steel - ASTM A-185.

- d) Steel reinforced Copolymer Polypropylene Plastic steps for storm drain manholes only. Sanitary sewer manholes shall not be furnished with manhole steps unless directed by the Engineer.
- e) Flexible boot connector ASTM C-928 with cast iron or stainless steel hardware.
- f) Section joint sealant - Butyl rubber sealant AASHTO M-198, ASTM C-990, and Fed. Spec. SS-S-210A.

T-14.24 **BEDDING MATERIAL:**

Material for pipe bedding where required by the Engineer shall be well-graded crushed stone or crushed gravel meeting the requirements of ASTM designation C-33, gradation 57 (3/4-in. to No. 4).

T-14.25 **RESTRAINT GLAND for DIP:**

The mechanical joint gland style restraint for mechanical joint fittings used on ductile iron pipe may be used for fire hydrant installations and any other location required by the Engineer to be restraint joint fittings. This type of restraint system can be used in lieu the restraint system using tie bolts and restraining rods as shown on the standard detail SD 4-02. The gland style restraint shall be a follower gland, which uses a series of individual actuated gripping wedges to positively engage the pipe surface while allowing joint deflection both before and after installation. This wedging action offers high pressure restraint capacity for mechanical joint fittings, valves, hydrant and pipe with 3-inch through 16-inch being rated at 350 psi and larger size rated at 250 psi. All sizes are tested to a minimum of 2:1 safety factor. The mechanical joint restraint glands shall be equal to Megalug, Series 1100 manufactured by Ebaa Iron, Inc., Stargrip Series 3000 manufactured by Star Pipe Products, or RomaGrip by Romac Industries, Inc.

T-14.26 **RESTRAINT GLAND FOR PVC:**

The mechanical joint gland style restraint for mechanical joint fittings used on PVC pipe can be used at locations required by the Engineer to be restraint joint fittings. This type of restraint system may be used in lieu of the restraint system using tie bolts and restraining rods as shown on Standard Detail SD 4-02. The gland style restraint shall be a follower gland, which uses a series of individual actuated gripping wedges to positively engage the PVC pipe surface while allowing joint deflection both before and after installation. This wedging action offers high pressure restraint capacity for mechanical joint fittings, valves, and pipe with 3-inch through 16-inch being rated at 350 psi and larger size rated at 250 psi. All sizes are tested to a minimum of 2:1 safety factor. The mechanical joint restraint glands shall be equal to Megalug, Series 2000PV manufactured by Ebaa Iron, Inc., PVC Stargrip Series 4000 manufactured by Star Pipe Products, or PVC-RomaGrip by Romac Industries, Inc.

T-14.27 **BLOCKING TAPPING TEES on PVC or AC PIPE for fire hydrant installation:**

Bags of concrete mix may be used for blocking from the tee to undisturbed soil. Care shall be taken so as not to obstruct access to the nuts and bolts on the mechanical joints.

T-14.28 **GENERAL:**

Any material required, but not listed in this section or not specified elsewhere in the specifications, shall be subject to the approval of the Engineer.

## **SPECIAL CONDITIONS FOR THIS CONTRACT**

### **GENERAL**

This section of specifications describes provisions unique to this project. The specifications, the plans, the special and general provisions, and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. In case of discrepancy or conflict, annotated dimensions shall govern over scaled dimensions; plans shall govern over technical specifications. Special provisions shall govern over technical specifications, and technical specifications shall govern over general provisions.

#### **T-15.01 PROJECT TIME FRAME:**

All work included under this contract is to be completed within the time limit as set forth in the proposal. The expected time to complete construction is 4 months or 122 calendar days; therefore, the project has been given a timeframe of 122 days from the beginning date of construction.

Extensions to the contract may change for various reasons, such as changes in scope, unknowns or inclement weather, supply chain issues and can be brought forward by either the project engineer or the contractor. The contractor shall have 30 days from the time of occurrence to submit written requests for consideration of time extensions. All time extension must be documented and presented at monthly progress meetings. The guidelines are defined in the Project Proposal and General Provisions.

#### **T-15.04 LIQUIDATED DAMAGES:**

The Contractor's attention is hereby called to the calendar day completion stipulated in the proposal and the corresponding liquidated damages clause. The Contractor shall retain the required number of workmen or crews in order to complete this work with the time allotted.

#### **T-15.05 MOBILIZATION:**

The contractor shall be paid a mobilization cost as bid in the proposal. The mobilization item shall include, but not be limited to, the Contractor's startup expenses, cost of insurance, permits, bonds, etc. and will be paid for per the lump-sum bid price. The mobilization cost can be up to ten percent of the total bid cost. Partial payment for the item of "Mobilization" will be made in the first and second partial pay estimates paid on the contract, and will be made at the rate of 50 percent of the lump sum price for mobilization on each of these partial pay estimates, less the retainage provided for in the General Provisions, provided the amount bid for mobilization does not exceed 5 percent of the total amount bid for the contract.

When the amount bid for mobilization exceeds 5 percent of the total amount of the contract, 2 ½ percent of the total amount bid will be paid on each of the first two partial payment estimates and the portion exceeding 5 percent will be paid on the final pay estimate.

When there is more than one section with payment for mobilization, the term payment for mobilization shall be figured based on each individual section rather than the total contract amount.

T-15.06 **SUPERINTENDENT:**

The Contractor shall have a superintendent authorized to direct work crews or stop work present on the job site at all times. Upon start of construction, the Contractor shall provide the Engineer with names, addresses, and telephone numbers of Superintendent(s) and two people to be contacted after office hours in case of emergency.

T-15.07 **DRAWINGS AND INSTRUCTIONS:**

The owner shall provide the contractor with three (3) sets of plans, drawings, and specifications after the execution of the contract. If additional plans, drawings and specifications are required, the contractor shall compensate the owner for same. The Engineer shall provide the contractor with such revised plans, drawings and specifications as may be required to show any authorized changes or extra work. These plans, drawings, and specifications are the property of the Town of Wilmington, North Carolina, and are furnished to the contractor for the construction of the project under this contract only.

T-15.08 **PROGRESS SCHEDULE, MEETINGS AND REPORTS:**

At the preconstruction conference, the contractor shall furnish and present a schedule of work. The schedule of work shall indicate the sequence of major work tasks with anticipated start and completion dates of each task. The schedule should conform to the traffic control plan and address priorities established by the Town. Preconstruction meetings with NCDEQ and CFPUA will also be required. Monthly progress meetings are expected throughout the duration of the project.

Monthly progress meetings shall include:

1. Contractor's Project Manager
2. Contractor's Project Superintendent
3. Town's designated Representative(s)
4. Engineer's designated Representative(s)
5. Corresponding Subcontractors

Engineer shall schedule monthly meetings, at a minimum, for the most convenient time frame. The Engineer shall take meeting minutes, review previous minutes with participants at meeting, and submit copies of meeting minutes to participants within 7 days. The Engineer shall have available at each meeting full chronological file of all previous meeting minutes.

The contractor shall provide and present monthly progress reports. Each progress report shall include:

- a. Narrative that is sufficient to describe current and anticipated delaying factors, their effect on the progress schedule, and proposed corrective actions.
- b. A copy of the accepted graphic schedule marked to indicate actual progress.
- c. A copy of the monthly rain gage logs.

Failure to provide the rain gage logs and schedule updates will result in delay of processing pay requests until the documents are provided

The contractor may be requested to provide and present construction plan mark-ups for discussion. If the work falls behind schedule, the Contractor shall submit additional progress reports at such intervals as the Engineer may request.

T-15.09.1 **INSPECTIONS:**

Inspections will be provided by a Town Construction Inspector or assigned representative. Contractor shall not interfere, hinder or misrepresent construction details or events. Punch lists will be generated during the project.

1. Periodic inspections
2. End of project inspections
3. Final inspection is when all punch list items have been corrected
4. Final Inspection.
5. Inspection at the end of the warranty period

The contractor shall clear all pipes, gutters, driveways, and other contract items of all dirt and debris before inspections are made. The Town will not inspect the improved areas until they are cleaned. Failure by the Town to do final inspection at areas not cleaned shall not relieve the contractor of any liquidated damages. The cost of the cleaning shall be incidental and included in each item bid in the proposal.

T-15.09.2 **MONTHLY QUANTITIES AND PAY REQUESTS:**

Pay request shall be first reviewed in the field by the contractor and the project inspector. Second, the contractor shall present in draft form the pay request to the project engineer and Town for review and approval. Then a final version and documentation submitted to Town Engineering for processing. The final version shall consist of five (5) copies of each verified pay request to Town Engineering. Three (3) copies will be processed by the Town, one (1) copy will be returned to the contractor, and one (1) copy will be forwarded to the engineer. If the pay request submitted is found not to be accurate or out of compliance with the contract or lacking accurate supporting documentation (mbe/payroll/sub-contractor utilization/material tickets or reports, etc), the contractor will be notified and will be required to revise and resubmit the pay request. No separate measurement or payment will be made for this item.

T-15.10 **SHOP DRAWINGS AND ENGINEERING DATA:**

T-15.10.1 **GENERAL:**

Engineering data covering all fabricated material that will become a permanent part of the work under this Contract shall be submitted to the Engineer for review. The data shall include drawings and descriptive information in sufficient detail to show the kind, size, arrangement, and operation of component materials and devices; the external connections, anchorages, and supports required; performance characteristics; and dimensions needed for installation and correlation with other materials.

All submittals, regardless of origin, shall be stamped with the approval of the Contractor and identified with the name and number of this contract, Contractor's name, and references to applicable specification paragraphs and Contract Drawings. Each submittal shall indicate the intended use of the item in the work. When catalog pages are submitted, applicable items shall be clearly identified and inapplicable data crossed out. The current revision, issue number, and date shall be indicated on all drawings and other descriptive data.

Contractor's stamp of approval is a representation to the Town and Engineer that Contractor accepts full responsibility for determining and verifying all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, and that he has reviewed and coordinated each submittal with the requirements of the work and the contract documents.

Contractor shall accept full responsibility for the completeness of each submission. When an item consists of components from several sources, Contractor shall submit a complete initial submittal including all components.

All deviations from the Contract Documents shall be identified on each submittal and shall be tabulated in Contractor's letter of transmittal. Such submittals shall, as pertinent to the deviation, indicate essential details of all changes proposed by the Contractor (including modifications to other facilities that may be a result of the deviation).

Five copies (or one reproducible copy) of each drawing and necessary data shall be submitted to Engineer for review and distributed as follows:

Engineer – 3

Contractor – 2

If additional copies are required by the Contractor, the number submitted shall increase accordingly. Facsimile (fax) copies will not be acceptable. Engineer will not accept submittals from anyone but the Contractor. Submittals shall be

consecutively numbered in direct sequence of submittal and without division by subcontracts or trades.

T-15.10.2 **ENGINEER'S REVIEW OF DRAWINGS AND DATA:**

Engineer's review of drawings and data submitted by the Contractor will cover only general conformity to the Drawings and Specifications, external connections, and dimensions, which affect the layout. Engineer's review does not indicate a thorough review of all dimensions, quantities, and details of the material, equipment, device, or item shown. Engineer's review of submittals shall not relieve the Contractor from responsibility for errors, omissions, or deviations, nor responsibility for compliance with the Contract Documents.

Engineer's submittal review period shall be 21 consecutive calendar days in length and shall commence on the first calendar day immediately following the date of arrival of the submittal or re-submittal in the Engineer's office. The time required to mail the submittal or re-submittal back to the Contractor shall not be considered a part of the submittal review period.

When the drawings and data are returned marked "NOT ACCEPTABLE" or "RETURNED FOR CORRECTION", the corrections shall be made as noted thereon and as instructed by the Engineer and five corrected copies (or one corrected reproducible copy) resubmitted. Facsimile (fax) copies will not be acceptable.

When the drawings and data are returned marked "EXCEPTIONS NOTED", or "RECORD COPY", no additional copies need be furnished unless requested by the Engineer at time of review.

T-15.10.3 **RE-SUBMITTAL OF DRAWINGS AND DATA:**

The Contractor shall accept full responsibility for the completeness of each re-submittal. The Contractor shall verify that all corrected data and additional information previously requested by the Engineer are provided on the re-submittal.

When corrected copies are re-submitted, the Contractor shall in writing direct specific attention to all revisions and shall list separately any revisions made other than those called for by the Engineer on previous submissions.

Requirements specified for initial submittals shall also apply to re-submittals. Re-submittals shall bear the number of the first submittal followed by a letter (A, B, etc.) to indicate the sequence of the re-submittal.

Re-submittals shall be made within 30 days of the date of the letter returning the material to be modified or corrected, unless within 14 days the Contractor submits an acceptable request for an extension of the stipulated time period, listing the reasons the re-submittal cannot be complete within that time.

Any need for more than one re-submission, or any other delay in obtaining the Engineer's review of submittals, will not entitle the Contractor or an extension of the Contract Times unless delay of the work is directly caused by a change in the work authorized by a change order or by failure of the Engineer to review any submittal within the submittal review period specified herein and to return the submittal to the Contractor.

T-15.10.4 **CONSTRUCTION VIDEO:**

a. Pre-construction: The Contractor shall video the project site in its entirety prior to construction, with emphasis on the adjoining properties, drives, trees, drainage, ditches, driveway pipes, cross pipes, shoulders, and condition of roadway. Appropriate narration will include location and description of property and physical features.

It is preferred that the Contractor provide the Town three copies of the project video in digital format to the Town at the preconstruction conference but it is required prior to mobilization. No separate payment will be made for this work, and all associated cost will be considered incidental to other items in the contract. It is also required that the video be submitted to the Town prior to processing any pay requests.

T-15.11 **DRAWINGS SHOWING CHANGES DURING CONSTRUCTION:**

The Contractor shall maintain a set of plans and specifications marked "Construction Record Drawings".

The Contractor shall keep a complete and up-to-date record in red pencil of any and all changes made during construction. This set of contract documents shall be submitted to the Engineer and approved by him prior to the Engineer recommending final payment.

T-15.12 **VALUE ENGINEERING:**

Value engineering is a concept that encourages the Contractor to look for ways to save money on the project without sacrificing quality and / or long-term cost. With Value Engineering, if the Contractor provides the Town with a means to save construction cost without hindering the quality of the final product, and the Town accepts the idea on this project, the Town will share 50% of the cost savings with the Contractor. The value of any cost savings and its acceptability shall be determined by the Town.

T-15.13 **WORK HOURS AND CONDITIONS:**

General work hours shall be from 7:00am to dark unless otherwise required by special permit conditions.

No lane closures shall be allowed between the hours of 6:00am to 9:00am and 5:00pm to 7:00pm.

Further restrictions may apply due to traffic conditions; however, contractor may submit written request in regards to work hours and traffic control plan to the Engineer for consideration by the Town.

No lane closures or impediment to traffic shall be allowed on weekends without prior written approval from Town Engineering. No lane closures shall be allowed on Town Holidays and local events.

All excavations within the theoretical 1:1 slope from the existing edge of the travel lane shall utilize proper shoring, limited exposure, and overnight backfilling. The length of parallel excavation shall be limited to the lengths necessary to install and back fill one joint at a time.

Trenching, boring pits, and/or other excavations shall not be left open or unsafe overnight. The contractor shall provide a competent person on-site to supervise excavations at all times.

T-15.13.1 **TRAFFIC CONTROL:**

The contractor shall be responsible for maintaining an approved traffic control plan during the course of this work. The Traffic Control Plan implemented for this project shall be devised through a joint effort of the Project Engineer, Town Traffic Engineer, and the contractor immediately prior to construction. In all instances, however, the contractor shall be required to furnish, place and maintain all signs, barricades, cones and other traffic handling devices necessary to implement the Traffic Control Plan.

The Traffic Control plan shall be submitted at the pre-construction meeting and shall be approved by the Town prior to beginning construction. All traffic control devices shall conform to the requirements of the National Manual on Uniform Traffic Control Devices. A copy of this "Manual" is available for viewing in the Town Engineer's Office.

The contractor is hereby advised that non-compliance with the approved traffic control plan as described above could result in a "stop work" order, with no work continuing until necessary corrective measures have been performed. Work stoppages shall be at the expense of the contractor. No additional payment shall be allowed.

The cost of the traffic control system and its implementation shall be included as noted on the bid tab.

T-15.14 **PUBLIC TRAFFIC:**

Since it will be necessary to block certain streets while the work is being accomplished, the contractor shall maintain access via offsite detours.

Contractor shall notify affected property owners 72 hours in advance of construction of a possible need for the homeowner to secure outside transportation. This may include the homeowner parking their car in an area outside the construction area secured by the contractor if necessary. No extra payment will be allowed for the implementation of the access and or transportation through the construction area or for the secured parking area.

T-15.15 **EMERGENCY SERVICES NOTIFICATION:**

Prior to any street being closed to traffic, The Contractor shall notify the Emergency Services Dispatchers. The Contractor may call the 911 system at 341-4247 and request that the Sheriff and EMT personnel be notified, or the Contractor may call each service individually **24 Hours** in advance.

The Contractor will make provisions for access to all parts of the work for emergency vehicles (police, rescue, fire) and will assist in providing personnel to deliver sanitary pickup cans and other materials as required to a point where the Town crew or Town's Contractor can load their carrier. The Contractor should include all cost incurred for this item in the unit price bid for each item in the proposal.

T-15.16 **NON-TOWN UTILITIES:**

Contractor responsible for any damage to electric, cable TV, telephone and gas utilities. The contractor is responsible for coordination of such relocation or removal, schedule his work to coincide with such, and pay any associated cost. No extra payment will be made to the Contractor for this work.

NOTE: Utilities as shown on the plans are based on best available information and exact locations shall be the responsibility of the Contractor.

T-15.17 **NOTIFYING UTILITY COMPANIES:**

The contractor's attention is hereby called to **North Carolina's Underground Utility Damage Prevention Act 87-100** and the **Town of Wilmington Municipal Code, Chapter 11, Article V**. Notification of the utility companies and departments shall be made prior to any excavation under this project. The Contractor is reminded that utility companies usually require a 72-hour notice. All services need to be located.

The following numbers are an aid to the contractor:

**NC ONE CALL CENTER 1-800-632-4949** (requires 72 hours notice).

**Prior to road closures, call 910-343-4255 (This is the 911 Center).**

T-15.18 **AS-BUILTS:**

The contractor will employ an engineer or land surveyor licensed in the State of North Carolina to provide accurate reproducible as-built drawings to the Town

upon completion of construction. Upon checking by the owner any discrepancies will be indicated, then these plans shall be returned to the contractor for correction prior to final payment and final inspection. The as-built drawings must conform to the as-built check list.

Payment: No separate payment will be made for as-built drawings. All costs incurred by the contractor for this work should be included in the unit price or lump sum price for the item of work to which it pertains.

### **As-Built Check List**

Project Name: \_\_\_\_\_  
Date: \_\_\_\_\_  
Reviewed By: \_\_\_\_\_ C.O.W. Project Number: \_\_\_\_\_

Water, sanitary sewer and storm drainage projects shall require plan and profile drawings. Record drawings shall be submitted in both digital and hard copy form. Digital files shall be AutoCAD version 2000 or later. Hard copies shall have an Engineer's seal affixed and the Surveyor's "Standards of Practice" statement Signed and Sealed.

Plans shall include:

- Vicinity map, north arrow, date, legend, sheet numbers and index
- Engineer's seal and Surveyor's seal
- Original design plan base map information (including, but not limited to):
  - Vertical & horizontal datum, survey benchmarks, right-of-way and easement lines, lot numbers and lot lines
- Streets and curb lines with spot elevations provided at the top of curb, edge of pavement and at the centerline every 100 ft and at all grade breaks and radius points
- Sidewalks with spot elevations provided at the inside edge, outside edge and at the centerline every 100 ft and at all grade breaks
- Size, slope and material for all storm drainage pipes
- Type/material, top elevation, inverts in and out for all storm drainage structures
- Location/type of streetlights and significant trees
- Location/type of dry utility junction box/hand hole locations
- Scale for drawings shall be 1"=20' or 1"=30'; the exception being utility plans, which may be submitted at 1"=40' or less. No plans accepted at 1"=50' or more.
- Other major structures such as slabs, retaining walls, foundations, etc. or as requested by Engineer
- Existing or newly installed survey monuments
- Cape Fear Public Utility Authority Checklist items
- Note or show utility crossings

- Details if needed
- Any State of NC permit numbers (if applicable)

T-15.19 **ENCROACHMENT:**

Where existing fences, posts, walls, etc., are encroached on the Town right-of-way and are to be removed, the contractor shall be required to coordinate the removal of said encroachments with the Town and the affected property owners. The contractor shall remove the encroachments and place them on the property of the affected owner if the owner so desires. If the owner has no preference, the contractor shall remove and dispose of such items and include the costs thereof in his price for comprehensive grading. No extra payment for removal of these items will be allowed unless specifically noted on the plans.

T-15.20 **USE OF A PORTION OF THE WORK:**

Whenever, in the opinion of the Engineer, any portion of the work is completed, or is in an acceptable condition for use, it shall be used for the purpose intended. Such use shall not be held in any way as an acceptance of that portion of the work used, or as a waiver of any of the provision of these specifications. Necessary repairs or renewals in any section of the work due to defective materials, defective workmanship, or natural causes, under the instructions of the Engineer shall be performed by the contractor at no additional cost to the Town.

T-15.21 **PROTECTION OF EXISTING UTILITIES:**

The contractor shall use the necessary precautions to protect existing water, sewer, gas, telephone, and storm drainage lines, etc. and service lateral during the course of construction. The cost of protecting such lines and services shall be considered incidental to the project and no additional payment will be allowed.

T-15.22 **CLEAN-UP AND RESTORATION:**

The Contractor, during the course of this work shall maintain and clean up the streets, side yards, pavements, drainage structures, etc. and shall schedule at the end of each day of work the removal of debris, grading of all disturbed areas and restoration to a usable state all means of access for the public and private property owners.

The Town has a system of recording complaints that may be received from residents. The Engineers representative and representative of the Contractor will meet with the person registering a complaint within one day after complaints are logged in. During this meeting, a reasonable course of action will be arrived at between the property owner and the Town. It is not the intent of the Town to require the Contractor accomplish unreasonable tasks, however, if the Contractor has not satisfactorily acted on resolving complaints by the end of the month, that month's payment request will not be processed. The payment request will be processed as soon as corrective action is taken. The Town of Wilmington also

reserves the right to issue stop work order as stated in paragraph G-1.59 of the General Specifications if the Contractor's actions or non-action so dictates.

T-15.23 **INCIDENTAL RESTORATION:**

At locations shown on the plans or designated by the Engineer, the contractor shall remove and reset existing signs, bollards, fencing, mailboxes, outside lighting, hedges or shrubbery, masonry or wooden flower boxes, and all miscellaneous yard/driveway ornamentation, etc., in accordance with the following provisions.

The existing items will be removed and replaced at the locations indicated on the plans or designated by the Engineer.

After resetting, all items shall be in a condition equal to or better than existed before being removed. The contractor will be required to replace any components that have been unnecessarily damaged by him.

Cost of this work shall be deemed included in the prices bid for all scheduled items.

T-15.24 **NOTIFICATION OF PROPERTY OWNERS:**

The contractor shall be required to submit a plan for systematic notification of affected property owners. Such notices shall include, but not be limited to, the following items: schedule of work; access to streets or alleys during construction; removal of vegetation and above ground items; replacements of streets and driveways; parking; location of services. Plan shall be approved by the Engineer and the Town. Upon approval, the contractor shall be required to provide all labor, materials, and other support in order to implement the plan.

T-15.25 **EROSION AND SEDIMENT CONTROLS:**

The contractor shall install the devices as required to comply with the erosion and sedimentation control measures shown on the plans and required by the NC Division of Energy, Mineral, and Land Resources representatives. The devices shall be installed prior to any excavation or land disturbing activity and shall be based on performance. All measures shall be properly maintained until such time as they can be removed. In the event that the Engineer or a representative of the Division of Energy, Mineral, and Land Resources determines that adequate measures have not been provided and or maintained, the Engineer shall give a stop work order on the project until protective measures have been taken. No additional time will be given the Contractor when the stop work is a result of his failure to comply with the N.C. Sedimentation Control Act.

T-15.26 **SEEDING:**

The Contractor shall provide seeding in the locations shown on the plans or as directed by the Engineer per the seeding table shown on sheet LS301. Seeding shall include fertilization. All costs associated with the installation of seed shall be paid for by the unit provided on the bid tab.

T-15.27 **MATERIALS TESTING AND QUALITY CONTROL:**

The Town reserves the right to require certification or test any materials used, installed or stored on the project. The contractor is required to utilize approved materials and suppliers and shall facilitate the testing needs for the project through communication, coordination and control of sub-contractors, during installation or delivery. Such efforts to provide assistance shall be deemed incidental to the project at no cost to the Town.

At the beginning of the project the Town and contractor will establish a Materials Testing and Quality Control protocol for the project. This plan shall be made available to personnel, sub-contractors, inspectors and technicians.

As needed, the Town will contract directly with materials testing firm(s) to conduct on-site observation, record-keeping, testing, sampling and laboratory analysis of construction methods and materials. Town will pay for quality control and materials testing services. However, the cost of any re-tests and associated labor required because of failing tests due to poor workmanship or omissions by the contractor or his sub-contractors will also be the responsibility of the contractor. This includes any testing performed after remedial work.

T-15.27.1 **SAMPLING AND TESTING:**

Materials testing will be conducted in accordance with the latest applicable methods and procedures such as ASTM, ACI, NCDOT, etc. Typical material testing procedures expected in this projects testing plan are:

Asphalt – cores for thickness, asphalt content and density (compaction), QC reports.

Concrete – cylinder molds with compressive strength breaks in 7 days, 14, or 28 days.

Soil - observation, proof roll, proctor tests and density tests for undercut, sub-base, trench, embankment, etc.

Stone – gradation, thickness, density testing for base.

Contractor is responsible to provide a “hot box” for on-site curing of concrete cylinders in a suitable and safe location.

Any materials or installations found out of compliance with the project specifications will require immediate suspension of construction and require contractor to submit and/or perform corrective action through repair, rework, or pay reduction factors using industry standards Town specifications guidelines.

T-15.27.2 **MATERIALS CERTIFICATION AND DELIVERY:**

Upon request of the Engineer the contractor shall make available to the Town all documentation pertaining to the origin, manufacturing, job mix formula or delivery of materials to the job-site. All necessary documentation, whether original or

signed must be provided in a legible and thorough manner to complete quantity verification and may include but not limited to shipping receipts, trucking delivery tickets, plant or quarry tickets, manufacturers certification, Buy America, shop drawings, etc. This may pertain to deliveries of asphalt (surface, intermediate, base, binder), cement, stone (abc, #57, riprap), soils, mulch, castings (steel), pipe (rcp pvc, ductile), fixtures, landscaping, seed, etc.

- T-15.28 **SAWING EXISTING SIDEWALKS, ROADWAYS AND DRIVEWAYS:**  
Where it is necessary to remove existing sidewalks or driveways, the contractor will be required to furnish a neat edge along the pavement retained by sawing a neat line approximately two inches deep, with a concrete saw, before breaking the adjacent pavement away.
- T-15.29 **NOISE CONTROL:**  
The Contractor shall conduct all his work and use appropriate construction methods and equipment to prevent exceeding legal noise levels. The Contractor shall comply with Section 6-9, Noises of the Wilmington Town Code. In addition, the Contractor shall provide baffles and/or enclosures on any dewatering pumps, by-pass pumps, or generators that must be operated after normal working hours. The Contractor should also consider noise reduction when placing such equipment in the project work areas.
- T-15.30 **COMPREHENSIVE GRADING:**  
Comprehensive grading may include, but not be limited to, common excavation, other on-site soil relocation, fine grading, subgrade, backfill, etc. as shown on the plans. The contractor is responsible for providing the grades as shown on the plans and the site is a balanced plan.
- T-15.31 **UNSUITABLE SOILS:**  
For construction of streambank stabilization structures (i.e., rock vanes, cross vanes, constructed riffles, boulder steps), unsuitable soils encountered above the proposed project sub-grade shall be disposed of and replaced with Select Material at the Contractor's expense.
- T-15.32 **ASPHALT PAVING MEASUREMENT AND PAYMENT:**  
Payment for bituminous concrete plant mixes shall be at the unit price bid for the actual quantities installed. The unit price shall include all costs associated with mixing, delivering, placing and compacting, and shall include the cost of any asphalt binder, prime or tack coat required.
- T-15.33 **AGGREGATE BASE COURSE MEASUREMENT AND PAYMENT:**  
Base course shall be paid for at the contract price bid in the proposal per cubic yard (CY), which payment shall constitute full compensation for the construction and completion of the base course, including tools; the handling, mixing, manipulation, placing, shaping, compacting, rolling, finishing, and the correcting of unsatisfactory areas and mixtures; the furnishings and application of water; the

placing and compacting of portions of the shoulders at edges of base course; and the furnishing of all other labor and incidentals necessary for the work required by the specifications.

T-15.34 **STORM DRAIN PIPE MEASUREMENT AND PAYMENT:**

Payment for pipe shall be for the actual linear footage installed for various sizes specified in the proposal. The actual amount of pipe shall be determined by final measurements unless specified otherwise. No payment through structures will be allowed.

Payment for pipe installation shall constitute full compensation for all labor, equipment, tools, supplies material and incidentals necessary to complete all items of work, as indicated on the drawings and specified herein. Pipe bedding required for storm drain pipe installation is included as a separate bid item.

T-15.35 **CATCH BASIN, MANHOLE, INTERFERENCE MANHOLE, SPECIAL JUNCTION BOXES, DROP INLET, JUNCTION BOXES, AND RISER MEASUREMENT AND PAYMENT:**

Catch basins, manholes, interference manhole, special junction boxes, drop inlets, junction boxes, and riser shall be paid for as specified in the proposal for the actual quantity installed for the various types. Each structure shall be placed on twelve inches of No. 57 stone. The cost should be included in the unit price of the item.

Payment for structure installation shall constitute full compensation for all labor, equipment, tools, supplies and incidentals necessary to complete all items of work, as indicated on the drawings and specified herein.

T-15.36 **DRIVEWAY REMOVAL:**

All existing driveway requiring removal to construct the new pavement section shall be removed and replaced with either concrete, asphalt, or stone matching the existing driveway. Existing soil driveways shall be provided with 6-inch stone base course, replaced at the width as the existing drive. Driveway replacement shall include, but is not limited to, concrete or asphalt driveway removal, grading, sub-grade preparation and replacement. Payment for driveway removal will be per unit square yard (SY) as noted on the bid tab.

T-15.42 **FINAL CLEANUP:**

The contractor shall clear all streets, curbs, gutters, driveways and other contract items of all dirt and debris before final inspection will be made. The Town will not inspect the improved areas until they are cleaned. Failure by the Town to perform final inspection if the areas are not cleaned shall not relieve the contractor of any liquidated damages. No extra payment will be allowed for this cleaning. The cost of the cleaning shall be included in each item bid.