

# BID AND SPECIFICATIONS DOCUMENTS

Facilities Management Design Division  
NCDOT  
Raleigh, NC

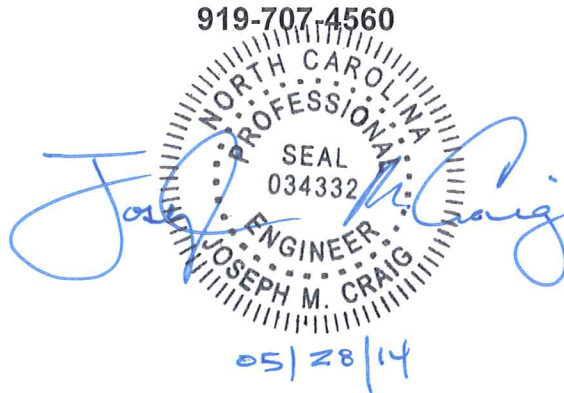
Westgate Road Modular Site

SCO ID# 12-09486-01A

Bid Date: **06/24/2014**

## OWNER

Facilities Management Division  
NC Department of Transportation  
1 South Wilmington Street  
Raleigh, NC 27601  
919-707-4560



## ENGINEER

SEPI ENGINEERING & CONSTRUCTION, INC.  
1025 Wade Avenue  
Raleigh, North Carolina 27605  
(919) 789-9977



# PROJECT MANUAL

## BID AND SPECIFICATION DOCUMENTS

Facilities Management Division  
NC Department of Transportation  
Westgate Modular Site  
Raleigh, North Carolina  
SCO ID# 12-09486-01A

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## ADVERTISEMENT FOR BIDS

Sealed proposals will be received until 2:00 pm on June 24, 2014, in the Facilities Management Division of the North Carolina Department of Transportation Offices located at 1 South Wilmington Street, Raleigh, NC 27601 for the construction of the NCDOT Westgate Road Modular Site including site preparation for modular units, placement of modular units, access drives, parking lot and full water, sewer and electrical service connections including a 2" PVC water tap and service, a 4" sewer service, electrical service and panel and associated stormwater and drainage improvements known as the plans entitled. The project will be bid and contracted as a Single Prime contract.

### **Westgate Road Modular Site — Site/Civil** SCO ID #12-09486-01A

at which time and place bids will be opened and read. All bids should be accompanied with the following:

- a. The latest financial statement showing assets and liabilities of the company
- b. A list of completed projects of similar size with references
- c. A list of all completed and ongoing projects of the last three years with Owner contacts
- d. Permanent name and address of place of business
- e. The number of regular employees of the organization and length of time the organization has been in business under present name

Complete plans and specifications for this project can be obtained from Mr. Mark D. Gibson at (919) 707-4550 or [mdgibson1@ncdot.gov](mailto:mdgibson1@ncdot.gov) during normal office hours after June 1, 2014. The cost of the plans is \$100.00 plus sales tax. Digital documents will also be available in the plan rooms of the Associated General Contractors, Carolinas Branch, Raleigh (919) 781-3270 ([mgilchrist@carolinasagc.org](mailto:mgilchrist@carolinasagc.org)); in the North Carolina office of McGraw-Hill Dodge Corporation (704) 599-9461 ([dodge\\_document\\_ca@mcgraw-hill.com](mailto:dodge_document_ca@mcgraw-hill.com)); in the Eastern Regional Office of Reed Construction Data in Norcross, GA (800) 424-3996 ([docprocessing@reedbusiness.com](mailto:docprocessing@reedbusiness.com)); in Minority Plan Rooms in: NCIMED 5800 Farrington Place Raleigh, NC 27609 (919) 956-8889 ([crcnc@ncimed.com](mailto:crcnc@ncimed.com)); and the Hispanic Contractors Association of the Carolinas in Raleigh (877) 227-1680 ([HCAcarolinas@isqft.com](mailto:HCAcarolinas@isqft.com)).

The State reserves the unqualified right to reject any and all proposals.

Owner:  
Priscilla T. Williams, PE, Director  
Facilities Management Division, NCDOT  
1 South Wilmington Street  
Raleigh, North Carolina 27601  
(919) 707-4540

# NOTICE TO BIDDERS

Sealed proposals will be received by the Facilities Management Division of the North Carolina Department of Transportation in Raleigh, NC, in the office of Mr. Mark D. Gibson at 1 South Wilmington Street, Raleigh, NC 27601 up to 2:00 pm on June 24, 2014, and immediately thereafter publicly opened and read for the furnishing of labor, material and equipment entering into the construction of the

Westgate Road Modular Site  
SCO ID# 12-09486-01A

The project is the construction of a modular unit site including site preparation for modular units, placement of modular units, access drives, parking lot and full water, sewer and electrical service connections including a 2" PVC water tap and service, a 4" sewer service, electrical service and panel and associated stormwater and drainage improvements

Bids will be received for Single Prime Contract. All proposals shall be lump sum.

## Pre-Bid Meeting

**Pre-Bid Meeting:** A mandatory pre-bid meeting will be held for all interested bidders starting at **10:00 AM** on **June 9, 2014** at the Facilities Management Division Office (1 South Wilmington St., Raleigh, NC 27601), in Room 521, to verify existing conditions and review the scope this project.

**HUB Outreach Meeting:** A non-mandatory HUB Outreach will be held for all interested parties starting immediately after the Pre-Bid on **June 9, 2014** to review the scope of this project.

Digital documents will also be available in the plan rooms of the:

[Associated General Contractors, Carolinas Branch, Raleigh \(919\) 781-3270  
\(mgilchrist@carolinasagc.org\)](mailto:mgilchrist@carolinasagc.org)

[North Carolina office of McGraw-Hill Dodge Corporation \(704\) 599-9461  
\(dodge\\_document\\_ca@mcgraw-hill.com\)](mailto:dodge_document_ca@mcgraw-hill.com)

[Eastern Regional Office of Reed Construction Data in Norcross, GA \(800\) 424-3996  
\(docprocessing@reedbusiness.com\)](mailto:docprocessing@reedbusiness.com)

Minority Plan Rooms in:

[NCIMED 5800 Farrington Place Raleigh, NC 27609 \(919\) 956-8889  
\(crcnc@ncimed.com\)](mailto:crcnc@ncimed.com)

[Hispanic Contractors Association of the Carolinas in Raleigh \(877\) 227-1680  
\(HCAcarolinas@isqft.com\).](mailto:HCAcarolinas@isqft.com)

or may be obtained by those qualified as prime bidders, upon deposit of one hundred dollars (\$ 100.00) plus sales tax. The full plan deposit will be returned to those bidders provided all documents are returned in good, usable condition within ten (10) days after the bid date.

**NOTE:** The bidder shall include with the bid proposal the form *Identification of Minority Business Participation* identifying the minority business participation it will use on the project and shall include either *Affidavit A* or *Affidavit B* as applicable. Forms and instructions are included within the Proposal Form in the bid documents. Failure to complete these forms is grounds for rejection of the bid. (GS143-128.2c Effective 1/1/2002.)

Contractors are hereby notified that they must have proper license under the State laws governing their respective trades and that North Carolina General Statute 87 will be observed in receiving and awarding contracts. General Contractors must have general license classification for unclassified.

General contractors are notified that Chapter 87, Article 1, General Statutes of North Carolina, will be observed in receiving and awarding general contracts. General contractors submitting bids on this project must have license classification for General Contractor

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 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 ten days after the award or to give satisfactory surety as required by law.

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

Payment will be made based on ninety-five percent (95%) of monthly estimates and final payment made upon completion and acceptance of work.

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of 30 days.

The owner reserves the right to reject any or all bids and to waive informalities.

Designer:  
SEPI Engineering & Construction, Inc.

(Name)

1025 Wade Avenue, Raleigh, NC 27605

(Address)

(919) 789-9977

(Phone)

Owner:  
Facilities Management Division of the North  
Carolina Department of Transportation  
(Agency/Institution)

1 South Wilmington Street, Raleigh, NC 27601

(919) 707-4560

**INSTRUCTIONS TO BIDDERS  
AND  
GENERAL CONDITIONS OF THE CONTRACT**

**STANDARD FORM FOR CONSTRUCTION PROJECTS**

**STATE CONSTRUCTION OFFICE  
NORTH CAROLINA  
DEPARTMENT OF ADMINISTRATION**

**Form OC-15**

**This document is intended for use on State capital construction projects and shall not be used on any project that is not reviewed and approved by the State Construction Office. Extensive modification to the General Conditions by means of “Supplementary General Conditions” is strongly discouraged. State agencies and institutions may include special requirements in “Division 1 – General Requirements” of the specifications, where they do not conflict with the General Conditions.**

**Twenty Fourth Edition January 2013**



## **INSTRUCTIONS TO BIDDERS**

**For a proposal to be considered it must be in accordance with the following instructions:**

### **1. PROPOSALS**

Proposals must be made in strict accordance with the Form of Proposal provided therefor, and all blank spaces for bids, alternates, and unit prices applicable to bidder's work shall be properly filled in. When requested alternates are not bid, the proposer shall so indicate by the words "No Bid". Any blanks shall also be interpreted as "No Bid". The bidder agrees that bid on Form of Proposal detached from specifications will be considered and will have the same force and effect as if attached thereto. Photocopied or faxed proposals will not be considered. Numbers shall be stated both in writing and in figures for the base bids and alternates. If figures and writing differ, the written number will supersede the figures.

Any modifications to the Form of Proposal (including alternates and/or unit prices) will disqualify the bid and may cause the bid to be rejected.

The bidder shall fill in the Form of Proposal as follows:

- a. If the documents are executed by a sole owner, that fact shall be evidenced by the word "Owner" appearing after the name of the person executing them.
- b. If the documents are executed by a partnership, that fact shall be evidenced by the word "Co-Partner" appearing after the name of the partner executing them.
- c. If the documents are executed on the part of a corporation, they shall be executed by either the president or the vice president and attested by the secretary or assistant secretary in either case, and the title of the office of such persons shall appear after their signatures. The seal of the corporation shall be impressed on each signature page of the documents.
- d. If the proposal is made by a joint venture, it shall be executed by each member of the joint venture in the above form for sole owner, partnership or corporation, whichever form is applicable.
- e. All signatures shall be properly witnessed.
- f. If the contractor's license of a bidder is held by a person other than an owner, partner or officer of a firm, then the licensee shall also sign and be a party to the proposal. The title "Licensee" shall appear under his/her signature.

Proposals should be addressed as indicated in the Advertisement for Bids and be delivered, enclosed in an opaque sealed envelope, marked "Proposal" and bearing the title of the work, name of the bidder, and the contractor's license number of the bidder. Bidders should clearly mark on the outside of the bid envelope which contract(s) they are bidding.

Bidder shall identify on the bid, the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit listing good faith efforts or an affidavit indicating work under contract will be self-performed, as required by G.S. 143-128.2(c) and G.S. 143-128.2(f). Failure to comply with these requirements is grounds for rejection of the bid.

For projects bid in the single-prime alternative, the names and license numbers of major subcontractors shall be listed on the proposal form.

It shall be the specific responsibility of the bidder to deliver his bid to the proper official at the selected place and prior to the announced time for the opening of bids. Later delivery of a bid for any reason, including delivery by any delivery service, shall disqualify the bid.

Unit prices quoted in the proposal shall include overhead and profit and shall be the full compensation for the contractor's cost involved in the work. See General Conditions, Article 19c-1.

## **2. EXAMINATION OF CONDITIONS**

It is understood and mutually agreed that by submitting a bid the bidder acknowledges that he has carefully examined all documents pertaining to the work, the location, accessibility and general character of the site of the work and all existing buildings and structures within and adjacent to the site, and has satisfied himself as to the nature of the work, the condition of existing buildings and structures, the conformation of the ground, the character, quality and quantity of the material to be encountered, the character of the equipment, machinery, plant and any other facilities needed preliminary to and during prosecution of the work, the general and local conditions, the construction hazards, and all other matters, including, but not limited to, the labor situation which can in any way affect the work under the contract, and including all safety measures required by the Occupational Safety and Health Act of 1970 and all rules and regulations issued pursuant thereto. It is further mutually agreed that by submitting a proposal the bidder acknowledges that he has satisfied himself as to the feasibility and meaning of the plans, drawings, specifications and other contract documents for the construction of the work and that he accepts all the terms, conditions and stipulations contained therein; and that he is prepared to work in cooperation with other contractors performing work on the site.

Reference is made to contract documents for the identification of those surveys and investigation reports of subsurface or latent physical conditions at the site or otherwise affecting performance of the work which have been relied upon by the designer in preparing the documents. The owner will make copies of all such surveys and reports available to the bidder upon request.

Each bidder may, at his own expense, make such additional surveys and investigations as he may deem necessary to determine his bid price for the performance of the work. Any on-site investigation shall be done at the convenience of the owner. Any reasonable request for access to the site will be honored by the owner.

## **3. BULLETINS AND ADDENDA**

Any addenda to specifications issued during the time of bidding are to be considered covered in the proposal and in closing a contract they will become a part thereof. It shall be the bidder's responsibility to ascertain prior to bid time the addenda issued and to see that his bid includes any changes thereby required.

Should the bidder find discrepancies in, or omission from, the drawings or documents or should he be in doubt as to their meaning, he shall at once notify the designer who will send written instructions in the form of addenda to all bidders. Notification should be no later than seven (7) days prior to the date set for receipt of bids. Neither the owner nor the designer will be responsible for any oral instructions.

All addenda should be acknowledged by the bidder(s) on the Form of Proposal. However, even if not acknowledged, by submitting a bid, the bidder has certified that he has reviewed all issued addenda and has included all costs associated within his bid.

#### **4. BID SECURITY**

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, or a bid bond in an amount equal to not less than five percent (5%) of the proposal, said deposit to be retained by the owner as liquidated damages in event of failure of the successful bidder to execute the contract within ten (10) days after the award or to give satisfactory surety as required by law (G.S. 143-129).

Bid bond shall be conditioned that the surety will, upon demand, forthwith make payment to the obligee upon said bond if the bidder fails to execute the contract. The owner may retain bid securities of any bidder(s) who may have a reasonable chance of award of contract for the full duration of time stated in the Notice to Bidders. Other bid securities may be released sooner, at the discretion of the owner. All bid securities (cash or certified checks) shall be returned to the bidders promptly after award of contracts, and no later than seven (7) days after expiration of the holding period stated in the Notice to Bidders. Standard Form of Bid Bond is included in these specifications and shall be used.

#### **5. RECEIPT OF BIDS**

Bids shall be received in strict accordance with requirements of the General Statutes of North Carolina. Bid security shall be required as prescribed by statute. Prior to the closing of the bid, the bidder will be permitted to change or withdraw his bid. Guidelines for opening of public construction bids are available from the State Construction Office.

#### **6. OPENING OF BIDS**

Upon opening, all bids shall be read aloud. Once bidding is closed, there shall not be any withdrawal of bids by any bidder and no bids may be returned by the designer to any bidder. After the opening of bids, no bid may be withdrawn, except under the provisions of General Statute 143-129.1, for a period of thirty days unless otherwise specified. Should the successful bidder default and fail to execute a contract, the contract may be awarded to the next lowest and responsible bidder. The owner reserves the unqualified right to reject any and all bids. Reasons for rejection may include, but shall not be limited to, the following:

- a. If the Form of Proposal furnished to the bidder is not used or is altered.
- b. If the bidder fails to insert a price for all bid items, alternate and unit prices requested.
- c. If the bidder adds any provisions reserving the right to accept or reject any award.
- d. If there are unauthorized additions or conditional bids, or irregularities of any kind which tend to make the proposal incomplete, indefinite or ambiguous as to its meaning.
- e. If the bidder fails to complete the proposal form where information is requested so the bid may be properly evaluated by the owner.
- f. If the unit prices contained in the bid schedule are unacceptable to the owner and the State Construction Office.
- g. If the bidder fails to comply with other instructions stated herein.

## **7. BID EVALUATION**

The award of the contract will be made to the lowest responsible bidder as soon as practical. The owner may award on the basis of the base bid and any alternates the owner chooses.

Before awarding a contract, the owner may require the apparent low bidder to qualify himself to be a responsible bidder by furnishing any or all of the following data:

- a. The latest financial statement showing assets and liabilities of the company or other information satisfactory to the owner.
- b. A listing of completed projects of similar size.
- c. Permanent name and address of place of business.
- d. The number of regular employees of the organization and length of time the organization has been in business under present name.
- e. The name and home office address of the surety proposed and the name and address of the responsible local claim agent.
- f. The names of members of the firms who hold appropriate trade licenses, together with license numbers.
- g. If prequalified, contractor info will be reviewed and evaluated comparatively to submitted prequalification package.

Failure or refusal to furnish any of the above information, if requested, shall constitute a basis for disqualification of any bidder.

In determining the lowest responsible, responsive bidder, the owner shall take into consideration the bidder's compliance with the requirements of G.S. 143-128.2(c), the past performance of the bidder on construction contracts for the State with particular concern given to completion times, quality of work, cooperation with other contractors, and cooperation with the designer and owner. Failure of the low bidder to furnish affidavit and/or documentation as required by G.S. 143-128.2(c) shall constitute a basis for disqualification of the bid.

Should the owner adjudge that the apparent low bidder is not the lowest responsible, responsive bidder by virtue of the above information, said apparent low bidder will be so notified and his bid security shall be returned to him.

## **8. PERFORMANCE BOND**

The successful bidder, upon award of contract, shall furnish a performance bond in an amount equal to 100 percent of the contract price. See Article 35, General Conditions.

## **9. PAYMENT BOND**

The successful bidder, upon award of contract, shall furnish a payment bond in an amount equal to 100 percent of the contract price. See Article 35, General Conditions.

## 10. PAYMENTS

Payments to the successful bidders (contractors) will be made on the basis of monthly estimates. See Article 31, General Conditions.

## 11. PRE-BID CONFERENCE

Prior to the date set for receiving bids, the Designer may arrange and conduct a Pre-Bid Conference for all prospective bidders. The purpose of this conference is to review project requirements and to respond to questions from prospective bidders and their subcontractors or material suppliers related to the intent of bid documents. Attendance by prospective bidders shall be as required by the "Notice to Bidders".

## 12. SUBSTITUTIONS

In accordance with the provisions of G.S. 133-3, material, product, or equipment substitutions proposed by the bidders to those specified herein can only be considered during the bidding phase until ten (10) days prior to the receipt of bids when submitted to the Designer with sufficient data to confirm material, product, or equipment equality. Proposed substitutions submitted after this time will be considered only as potential change order.

Submittals for proposed substitutions shall include the following information:

- a. Name, address, and telephone number of manufacturer and supplier as appropriate.
- b. Trade name, model or catalog designation.
- c. Product data including performance and test data, reference standards, and technical descriptions of material, product, or equipment. Include color samples and samples of available finishes as appropriate.
- d. Detailed comparison with specified products including performance capabilities, warranties, and test results.
- e. Other pertinent data including data requested by the Designer to confirm product equality.

If a proposed material, product, or equipment substitution is deemed equal by the Designer to those specified, all bidders of record will be notified by Addendum.

## GENERAL CONDITIONS OF THE CONTRACT

The use or reproduction of this document or any part thereof is authorized for and limited to use on projects of the State of North Carolina, and is distributed by, through and at the discretion of the State Construction Office, Raleigh, North Carolina, for that distinct and sole purpose.

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## ARTICLE 1 - DEFINITIONS

- a. The **contract documents** consist of the Notice to Bidders; Instructions to Bidders; General Conditions of the Contract; special conditions if applicable; Supplementary General Conditions; the drawing and specifications, including all bulletins, addenda or other modifications of the drawings and specifications incorporated into the documents prior to their execution; the proposal; the contract; the performance bond; the payment bond; insurance certificates; the approval of the attorney general; and the certificate of the Office of State Budget and Management. All of these items together form the contract.
- b. The **owner** is the State of North Carolina through the agency named in the contract.
- c. The **designer(s)** are those referred to within this contract, or their authorized representatives. The Designer(s), as referred to herein, shall mean architect and/or engineer. They will be referred to hereinafter as if each were of the singular number, masculine gender.
- d. The **contractor**, as referred to hereinafter, shall be deemed to be either of the several contracting parties called the "Party of the First Part" in either of the several contracts in connection with the total project. Where, in special instances hereinafter, a particular contractor is intended, an adjective precedes the word "contractor," as "general," "heating," etc. For the purposes of a single prime contract, the term Contractor shall be deemed to be the single contracting entity identified as the "Party of the First Part" in the single Construction Contract. Any references or adjectives that name or infer multiple prime contractors shall be interpreted to mean the single prime Contractor.
- e. A **subcontractor**, as the term is used herein, shall be understood to be one who has entered into a direct contract with a contractor, and includes one who furnishes materials worked to a special design in accordance with plans and specifications covered by the contract, but does not include one who only sells or furnishes materials not requiring work so described or detailed.
- f. **Written notice** shall be defined as notice in writing delivered in person to the contractor, or to a partner of the firm in the case of a partnership, or to a member of the contracting organization, or to an officer of the organization in the case of a corporation, or sent to the last known business address of the contracting organization by registered mail.
- g. **Work**, as used herein as a noun, is intended to include materials, labor, and workmanship of the appropriate contractor.
- h. The **project** is the total construction work to be performed under the contract documents by the several contractors.
- i. **Project Expediter**, as used herein, is an entity stated in the contract documents, designated to effectively facilitate scheduling and coordination of work activities. See Article 14(f) for responsibilities of a Project Expediter. **For the purposes of a single prime contract, the single prime contractor shall be designated as the Project Expediter.**
- j. **Change order**, as used herein, shall mean a written order to the contractor subsequent to the signing of the contract authorizing a change in the contract. The change order shall be signed by the contractor, designer and the owner, and approved by the State Construction Office, in that order (Article 19).



- k. **Field Order**, as used herein, shall mean a written approval for the contractor to proceed with the work requested by owner prior to issuance of a formal Change Order. The field order shall be signed by the contractor, designer, owner, and State Construction Office.
- l. **Time of completion**, as stated in the contract documents, is to be interpreted as consecutive calendar days measured from the date established in the written Notice to Proceed, or such other date as may be established herein (Article 23).
- m. **Liquidated damages**, as stated in the contract documents [, is an amount reasonably estimated in advance to cover the consequential damages associated with the Owner's economic loss in not being able to use the Project for its intended purposes at the end of the contract's completion date as amended by change order, if any, by reason of failure of the contractor(s) to complete the work within the time specified. Liquidated damages does not include the Owner's extended contract administration costs (including but not limited to additional fees for architectural and engineering services, testing services, inspection services, commissioning services, etc.), such other damages directly resulting from delays caused solely by the contractor, or consequential damages that the Owner identified in the bid documents that may be impacted by any delay caused solely by the Contractor (e.g., if a multi-phased project-subsequent phases, delays in start other projects that are dependent on the completion of this Project, extension of leases and/or maintenance agreements for other facilities).
- n. **Surety**, as used herein, shall mean the bonding company or corporate body which is bound with and for the contractor, and which engages to be responsible for the contractor and his acceptable performance of the work.
- o. **Routine written communications between the Designer and the Contractor** are any communication other than a "request for information" provided in letter, memo, or transmittal format, sent by mail, courier, electronic mail, or facsimile. Such communications can not be identified as "request for information".
- p. **Clarification or Request for information (RFI)** is a request from the Contractor seeking an interpretation or clarification by the Designer relative to the contract documents. The RFI, which shall be labeled (RFI), shall clearly and concisely set forth the issue or item requiring clarification or interpretation and why the response is needed. The RFI must set forth the Contractor's interpretation or understanding of the contract documents requirements in question, along with reasons for such an understanding.
- q. **Approval** means written or imprinted acknowledgement that materials, equipment or methods of construction are acceptable for use in the work.
- r. **Inspection** shall mean examination or observation of work completed or in progress to determine its compliance with contract documents.
- s. **"Equal to" or "approved equal"** shall mean materials, products, equipment, assemblies, or installation methods considered equal by the bidder in all characteristics (physical, functional, and aesthetic) to those specified in the contract documents. Acceptance of equal is subject to approval of Designer and owner.
- t. **"Substitution" or "substitute"** shall mean materials, products, equipment, assemblies, or installation methods deviating in at least one characteristic (physical, functional, or aesthetic) from those specified, but which in the opinion of the bidder would improve competition and/or enhance the finished installation. Acceptance of substitution is subject to the approval of the Designer and owner.

- u. **Provide** shall mean furnish and install complete in place, new, clean, operational, and ready for use.
- v. **Indicated and shown** shall mean provide as detailed, or called for, and reasonably implied in the contract documents.
- w. **Special inspector** is one who inspects materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with the approved construction documents and referenced standards.
- x. **Commissioning** is a quality assurance process that verifies and documents that building components and systems operate in accordance to the owner's project requirements and the project design documents.
- y. **Designer Final Inspection** is the inspection performed by the design team to determine the completeness of the project in accordance with approved plans and specifications. This inspection occurs prior to SCO final inspection.
- z. **SCO Final Inspection** is the inspection performed by the State Construction Office to determine the completeness of the project in accordance with NC Building Codes and approved plans and specifications.
- aa. **Beneficial Occupancy** is requested by the owner and is occupancy or partial occupancy of the building after all life safety items have been completed as determined by the State Construction Office. Life safety items include but not limited to fire alarm, sprinkler, egress and exit lighting, fire rated walls, egress paths and security.
- bb. Final Acceptance is the date in which the State Construction Office accepts the construction as totally complete. This includes the SCO Final Inspection and certification by the designer that all punch lists are completed.

## ARTICLE 2 - INTENT AND EXECUTION OF DOCUMENTS

- a. The drawings and specifications are complementary, one to the other, and that which is shown on the drawings or called for in the specifications shall be as binding as if it were both called for and shown. The intent of the drawings and specifications is to establish the scope of all labor, materials, transportation, equipment, and any and all other things necessary to provide a bid for a complete job. In case of discrepancy or disagreement in the contract documents, the order of precedence shall be: Form of Contract, specifications, large-scale detail drawings, small-scale drawings.
- b. The wording of the specifications shall be interpreted in accordance with common usage of the language except that words having a commonly used technical or trade meaning shall be so interpreted in preference to other meanings.
- c. The contractor shall execute each copy of the proposal, contract, performance bond and payment bond as follows:
  - 1. If the documents are executed by a sole owner, that fact shall be evidenced by the word "Owner" appearing after the name of the person executing them.
  - 2. If the documents are executed by a partnership, that fact shall be evidenced by the word "Co-Partner" appearing after the name of the partner executing them.

3. If the documents are executed on the part of a corporation, they shall be executed by either the president or the vice president and attested by the secretary or assistant secretary in either case, and the title of the office of such persons shall appear after their signatures. The seal of the corporation shall be impressed on each signature page of the documents.
4. If the documents are made by a joint venture, they shall be executed by each member of the joint venture in the above form for sole owner, partnership or corporation, whichever form is applicable to each particular member.
5. All signatures shall be properly witnessed.
6. If the contractor's license is held by a person other than an owner, partner or officer of a firm, then the licensee shall also sign and be a party to the contract. The title "Licensee" shall appear under his/her signature.
7. The bonds shall be executed by an attorney-in-fact. There shall be attached to each copy of the bond a certified copy of power of attorney properly executed and dated.
8. Each copy of the bonds shall be countersigned by an authorized individual agent of the bonding company licensed to do business in North Carolina. The title "Licensed Resident Agent" shall appear after the signature.
9. The seal of the bonding company shall be impressed on each signature page of the bonds.
10. The contractor's signature on the performance bond and the payment bond shall correspond with that on the contract. The date of performance and payment bond shall not be prior to the date of the contract.

### **ARTICLE 3 - CLARIFICATIONS AND DETAIL DRAWINGS**

- a. In such cases where the nature of the work requires clarification by the designer, such clarification shall be furnished by the designer with reasonable promptness by means of written instructions or detail drawings, or both. Clarifications and drawings shall be consistent with the intent of contract documents, and shall become a part thereof.
- b. The contractor(s) and the designer shall prepare, if deemed necessary, a schedule fixing dates upon which foreseeable clarifications will be required. The schedule will be subject to addition or change in accordance with progress of the work. The designer shall furnish drawings or clarifications in accordance with that schedule. The contractor shall not proceed with the work without such detail drawings and/or written clarifications.

### **ARTICLE 4 - COPIES OF DRAWINGS AND SPECIFICATIONS**

The designer or Owner shall furnish free of charge to the contractors electronic copies of plans and specifications. If requested by the contractor, paper copies of plans and specifications shall be furnished free of charge as follows:

- a. General contractor - Up to twelve (12) sets of general contractor drawings and specifications, up to six (6) sets of which shall include drawings and specifications of all other contracts, plus a clean set of black line prints on white paper of all appropriate drawings, upon which the contractor shall clearly and legibly record all work-in-place that is at variance with the contract documents.

- b. Each other contractor - Up to six (6) sets of the appropriate drawings and specifications, up to three (3) sets of which shall include drawings and specifications of all other contracts, plus a clean set of black line prints on white paper of all appropriate drawings, upon which the contractor shall clearly and legibly record all work-in-place that is at variance with the contract documents.
- c. Additional sets shall be furnished at cost, including mailing, to the contractor upon request by the contractor. This cost shall be stated in the bidding documents.
- d. For the purposes of a single-prime contract, the contractor shall receive up to 30 sets of drawings and specifications, plus a clean set of black line prints on white paper of all appropriate drawings, upon which the contractor shall clearly and legibly record all work-in-place that is at variance with the contract documents.

#### **ARTICLE 5 - SHOP DRAWINGS, SUBMITTALS, SAMPLES, DATA**

- a. Within 15 consecutive calendar days after the notice to proceed, each prime contractor shall submit a schedule for submission of all shop drawings, product data, samples, and similar submittals through the Project Expediter to the Designer. This schedule shall indicate the items, relevant specification sections, other related submittal, data, and the date when these items will be furnished to the designer.
- b. The Contractor(s) shall review, approve and submit to the Designer all Shop Drawings, Coordination Drawings, Product Data, Samples, Color Charts, and similar submittal data required or reasonably implied by the Contract Documents. Required Submittals shall bear the Contractor's stamp of approval, any exceptions to the Contract Documents shall be noted on the submittals, and copies of all submittals shall be of sufficient quantity for the Designer to retain up to three (3) copies of each submittal for his own use plus additional copies as may be required by the Contractor. Submittals shall be presented to the Designer in accordance with the schedule submitted in paragraph (a). so as to cause no delay in the activities of the Owner or of separate Contractors.
- c. The Designer shall review required submittals promptly, noting desired corrections if any, and retaining three (3) copies (1 for the Designer, 1 for the owner and 1 for SCO) for his use. The remaining copies of each submittal shall be returned to the Contractor not later than twenty (20) days from the date of receipt by the Designer, for the Contractor's use or for corrections and resubmittal as noted by the Designer. When resubmittals are required, the submittal procedure shall be the same as for the original submittals.
- d. Approval of shop drawings/submittals by the Designer shall not be construed as relieving the Contractor from responsibility for compliance with the design or terms of the contract documents nor from responsibility of errors of any sort in the shop drawings, unless such lack of compliance or errors first have been called in writing to the attention of the Designer by the Contractor.

#### **ARTICLE 6 - WORKING DRAWINGS AND SPECIFICATIONS AT THE JOB SITE**

- a. The contractor shall maintain, in readable condition at his job office, one complete set of working drawings and specifications for his work including all shop drawings. Such drawings and specifications shall be available for use by the designer, his authorized representative, owner or State Construction Office.

- b. The contractor shall maintain at the job office, a day-to-day record of work-in-place that is at variance with the contract documents. Such variations shall be fully noted on project drawings by the contractor and submitted to the designer upon project completion and no later than 30 days after final acceptance of the project.
- c. The contractor shall maintain at the job office a record of all required tests that have been performed, clearly indicating the scope of work inspected and the date of approval or rejection.

## **ARTICLE 7 - OWNERSHIP OF DRAWINGS AND SPECIFICATIONS**

All drawings and specifications are instruments of service and remain the property of the owner. The use of these instruments on work other than this contract without permission of the owner is prohibited. All copies of drawings and specifications other than contract copies shall be returned to the owner upon request after completion of the work.

## **ARTICLE 8 - MATERIALS, EQUIPMENT, EMPLOYEES**

- a. The contractor shall, unless otherwise specified, supply and pay for all labor, transportation, materials, tools, apparatus, lights, power, heat, sanitary facilities, water, scaffolding and incidentals necessary for the completion of his work, and shall install, maintain and remove all equipment of the construction, other utensils or things, and be responsible for the safe, proper and lawful construction, maintenance and use of same, and shall construct in the best and most workmanlike manner, a complete job and everything incidental thereto, as shown on the plans, stated in the specifications, or reasonably implied therefrom, all in accordance with the contract documents.
- b. All materials shall be new and of quality specified, except where reclaimed material is authorized herein and approved for use. Workmanship shall at all times be of a grade accepted as the best practice of the particular trade involved, and as stipulated in written standards of recognized organizations or institutes of the respective trades except as exceeded or qualified by the specifications.
- c. Upon notice, the contractor shall furnish evidence as to quality of materials.
- d. Products are generally specified by ASTM or other reference standard and/or by manufacturer's name and model number or trade name. When specified only by reference standard, the Contractor may select any product meeting this standard, by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the Contractor has the option of using any product and manufacturer combination listed. However, the contractor shall be aware that the cited examples are used only to denote the quality standard of product desired and that they do not restrict bidders to a specific brand, make, manufacturer or specific name; that they are used only to set forth and convey to bidders the general style, type, character and quality of product desired; and that equivalent products will be acceptable. Request for substitution of materials, items, or equipment shall be submitted to the designer for approval or disapproval; such approval or disapproval shall be made by the designer prior to the opening of bids. Alternate materials may be requested after the award if it can clearly be demonstrated that it is an added benefit to the owner and the designer and owner approves.
- e. The designer is the judge of equality for proposed substitution of products, materials or equipment.

- g. If at any time during the construction and completion of the work covered by these contract documents, the language, conduct, or attire of any workman of the various crafts be adjudged a nuisance to the owner or designer, or if any workman be considered detrimental to the work, the contractor shall order such parties removed immediately from grounds.

#### **ARTICLE 9 - ROYALTIES, LICENSES AND PATENTS**

It is the intention of the contract documents that the work covered herein will not constitute in any way infringement of any patent whatsoever unless the fact of such patent is clearly evidenced herein. The contractor shall protect and save harmless the owner against suit on account of alleged or actual infringement. The contractor shall pay all royalties and/or license fees required on account of patented articles or processes, whether the patent rights are evidenced hereinafter.

#### **ARTICLE 10 - PERMITS, INSPECTIONS, FEES, REGULATIONS**

- a. The contractor shall give all notices and comply with all laws, ordinances, codes, rules and regulations bearing on the conduct of the work under this contract. If the contractor observes that the drawings and specifications are at variance therewith, he shall promptly notify the designer in writing. See Instructions to Bidders, Paragraph 3, Bulletins and Addenda. Any necessary changes required after contract award shall be made by change order in accordance with Article 19. If the contractor performs any work knowing it to be contrary to such laws, ordinances, codes, rules and regulations, and without such notice to the designer, he shall bear all cost arising therefrom. Additional requirements implemented after bidding will be subject to equitable negotiations.
- b. All work under this contract shall conform to the North Carolina State Building Code and other State, local and national codes as are applicable. The cost of all required inspections and permits shall be the responsibility of the contractor and included within the bid proposal. All water taps, meter barrels, vaults and impact fees shall be paid by the contractor unless otherwise noted.
- d. Projects constructed by the State of North Carolina or by any agency or institution of the State are not subject to inspection by any county or municipal authorities and are not subject to county or municipal building codes. The contractor shall, however, cooperate with the county or municipal authorities by obtaining building permits. Permits shall be obtained at no cost.
- e. Projects involving local funding (community colleges) are subject also to county and municipal building codes and inspection by local authorities. The contractor shall pay the cost of these permits and inspections.

## ARTICLE 11 - PROTECTION OF WORK, PROPERTY AND THE PUBLIC

- a. The contractors shall be jointly responsible for the entire site and the building or construction of the same and provide all the necessary protections, as required by the owner or designer, and by laws or ordinances governing such conditions. They shall be responsible for any damage to the owner's property, or of that of others on the job, by them, their personnel, or their subcontractors, and shall make good such damages. They shall be responsible for and pay for any damages caused to the owner. All contractors shall have access to the project at all times.
- b. The contractor shall provide cover and protect all portions of the structure when the work is not in progress, provide and set all temporary roofs, covers for doorways, sash and windows, and all other materials necessary to protect all the work on the building, whether set by him, or any of the subcontractors. Any work damaged through the lack of proper protection or from any other cause, shall be repaired or replaced without extra cost to the owner.
- c. No fires of any kind will be allowed inside or around the operations during the course of construction without special permission from the designer and owner.
- d. The contractor shall protect all trees and shrubs designated to remain in the vicinity of the operations by building substantial boxes around same. He shall barricade all walks, roads, etc., as directed by the designer to keep the public away from the construction. All trenches, excavations or other hazards in the vicinity of the work shall be well barricaded and properly lighted at night.
- e. The contractor shall provide all necessary safety measures for the protection of all persons on the job, including the requirements of the A.G.C. *Accident Prevention Manual in Construction*, as amended, and shall fully comply with all state laws or regulations and North Carolina State Building Code requirements to prevent accident or injury to persons on or about the location of the work. He shall clearly mark or post signs warning of hazards existing, and shall barricade excavations, elevator shafts, stairwells and similar hazards. He shall protect against damage or injury resulting from falling materials and he shall maintain all protective devices and signs throughout the progress of the work.
- f. The contractor shall adhere to the rules, regulations and interpretations of the North Carolina Department of Labor relating to Occupational Safety and Health Standards for the Construction Industry (Title 29, Code of Federal Regulations, Part 1926, published in Volume 39, Number 122, Part II, June 24, 1974, *Federal Register*), and revisions thereto as adopted by General Statutes of North Carolina 95-126 through 155.
- g. The contractor shall designate a responsible person of his organization as safety officer/inspector to inspect the project site for unsafe health and safety hazards, to report these hazards to the contractor for correction, and whose duties also include accident prevention on the project, and to provide other safety and health measures on the project site as required by the terms and conditions of the contract. The name of the safety inspector shall be made known to the designer and owner at the time of the preconstruction conference and in all cases prior to any work starting on the project.
- h. In the event of emergency affecting the safety of life, the protection of work, or the safety of adjoining properties, the contractor is hereby authorized to act at his own discretion, without further authorization from anyone, to prevent such threatened injury or damage.

Any compensation claimed by the contractor on account of such action shall be determined as provided for under Article 19(b).

- i. Any and all costs associated with correcting damage caused to adjacent properties of the construction site or staging area shall be borne by the contractor. These costs shall include but not be limited to flooding, mud, sand, stone, debris, and discharging of waste products.

## **ARTICLE 12 - SEDIMENTATION POLLUTION CONTROL ACT OF 1973**

- a. Any land-disturbing activity performed by the contractor(s) in connection with the project shall comply with all erosion control measures set forth in the contract documents and any additional measures which may be required in order to ensure that the project is in full compliance with the Sedimentation Pollution Control Act of 1973, as implemented by Title 15, North Carolina Administrative Code, Chapter 4, Sedimentation Control, Subchapters 4A, 4B and 4C, as amended (15 N.C.A.C. 4A, 4B and 4C).
- b. Upon receipt of notice that a land-disturbing activity is in violation of said act, the contractor(s) shall be responsible for ensuring that all steps or actions necessary to bring the project in compliance with said act are promptly taken.
- c. The contractor(s) shall be responsible for defending any legal actions instituted pursuant to N.C.G.S. 113A-64 against any party or persons described in this article.
- d. To the fullest extent permitted by law, the contractor(s) shall indemnify and hold harmless the owner, the designer and the agents, consultants and employees of the owner and designer, from and against all claims, damages, civil penalties, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance of work or failure of performance of work, provided that any such claim, damage, civil penalty, loss or expense is attributable to a violation of the Sedimentation Pollution Control Act. Such obligation shall not be construed to negate, abridge or otherwise reduced any other right or obligation of indemnity which would otherwise exist as to any party or persons described in this article.

## **ARTICLE 13 - INSPECTION OF THE WORK**

- a. It is a condition of this contract that the work shall be subject to inspection during normal working hours and during any time work is in preparation and progress by the designer, designated official representatives of the owner, State Construction Office and those persons required by state law to test special work for official approval. The contractor shall therefore provide safe access to the work at all times for such inspections.
- b. All instructions to the contractor will be made only by or through the designer or his designated project representative. Observations made by official representatives of the owner shall be conveyed to the designer for review and coordination prior to issuance to the contractor.
- c. All work shall be inspected by designer, special inspector and/or State Construction Office prior to being covered by the contractor. Contractor shall give a minimum two weeks notice unless otherwise agreed to by all parties. If inspection fails, after the first reinspection all costs associated with additional reinspections shall be borne by the contractor.



- d. Where special inspection or testing is required by virtue of any state laws, instructions of the designer, specifications or codes, the contractor shall give adequate notice to the designer of the time set for such inspection or test, if the inspection or test will be conducted by a party other than the designer. Such special tests or inspections will be made in the presence of the designer, or his authorized representative, and it shall be the contractor's responsibility to serve ample notice of such tests.
- e. All laboratory tests shall be paid by the owner unless provided otherwise in the contract documents except the general contractor shall pay for laboratory tests to establish design mix for concrete, and for additional tests to prove compliance with contract documents where materials have tested deficient except when the testing laboratory did not follow the appropriate ASTM testing procedures.
- f. Should any work be covered up or concealed prior to inspection and approval by the designer, special inspector, and/or State Construction Office such work shall be uncovered or exposed for inspection, if so requested by the designer in writing. Inspection of the work will be made upon notice from the contractor. All cost involved in uncovering, repairing, replacing, recovering and restoring to design condition, the work that has been covered or concealed will be paid by the contractor involved.

#### **ARTICLE 14 - CONSTRUCTION SUPERVISION AND SCHEDULE**

- a. Throughout the progress of the work, each contractor shall keep at the job site, a competent superintendent and supervisory staff satisfactory to the designer and the owner. The superintendent and supervisory staff shall not be changed without the consent of the designer and owner unless said superintendent ceases to be employed by the contractor or ceases to be competent as determined by the contractor, designer or owner. The superintendent and other staff designated by the contractor in writing shall have authority to act on behalf of the contractor, and instructions, directions or notices given to him shall be as binding as if given to the contractor. However, directions, instructions, and notices shall be confirmed in writing.
- b. The contractor shall examine and study the drawings and specifications and fully understand the project design, and shall provide constant and efficient supervision to the work. Should he discover any discrepancies of any sort in the drawings or specifications, he shall report them to the designer without delay. He will not be held responsible for discrepancies in the drawings and/or specifications, but shall be held responsible to report them should they become known to him.
- c. All contractors shall be required to cooperate and consult with each other during the construction of this project. Prior to installation of work, all contractors shall jointly prepare coordination drawings, showing locations of various ductworks, piping, motors, pumps, and other mechanical or electrical equipment, in relation to the structure, walls and ceilings. These drawings shall be submitted to the designer through the Project Expediter for information only. Each contractor shall lay out and execute his work to cause the least delay to other contractors. Each contractor shall be financially responsible for any damage to other contractor's work and for undue delay caused to other contractors on the project.
- d. The contractor is required to attend job site progress conferences as called by the designer. The contractor shall be represented at these job progress conferences by both home office and project personnel. These representatives shall have authority to act on behalf of the contractor. These meetings shall be open to subcontractors, material

suppliers and any others who can contribute toward maintaining required job progress. It shall be the principal purpose of these meetings, or conferences, to effect coordination, cooperation and assistance in every practical way toward the end of maintaining progress of the project on schedule and to complete the project within the specified contract time. Each contractor shall be prepared to assess progress of the work as required in his particular contract and to recommend remedial measures for correction of progress as may be appropriate. The designer or his authorized representative shall be the coordinator of the conferences and shall preside as chairman. The contractor shall turn over a copy of his daily reports to the Designer and Owner at the job site progress conference. Owner will determine daily report format.

- e. The contractor(s) shall, employ an engineer or a land surveyor licensed in the State of North Carolina to lay out the work and to establish a bench mark in a location where same will not be disturbed and where direct instruments sights may be taken.
- f. The designer shall designate a Project Expediter on projects involving two or more prime contracts. The Project Expediter shall be designated in the Supplementary General Conditions. The Project Expediter shall have at a minimum the following responsibilities.
  - 1. Prepare the project construction schedule and shall allow all prime contractors (multi-prime contract) and subcontractors (single-prime contract) performing general, plumbing, HVAC, and electrical work equal input into the preparation of the initial construction schedule.
  - 2. Maintain a project progress schedule for all contractors.
  - 3. Give adequate notice to all contractors to ensure efficient continuity of all phases of the work.
  - 4. Notify the designer of any changes in the project schedule.
  - 5. Recommend to the owner whether payment to a contractor shall be approved.
- g. It shall be the responsibility of the Project Expediter to cooperate with and obtain from several prime contractors and subcontractors on the job, their respective work activities and integrate these activities into a project construction schedule in form of a detailed bar chart or Critical Path Method (CPM), schedule. Each prime contractor shall provide work activities within fourteen (14) days of request by the Project Expediter. A “work activity”, for scheduling purposes, shall be any component or contractual requirement of the project requiring at least one (1) day, but not more than fourteen (14) days, to complete or fulfill. The project construction schedule shall graphically show all salient features of the work required to construct the project from start to finish and within the allotted time established in the contract. The time (in days) between the contractor’s early completion and contractual completion dates is part of the project total float time; and shall be used as such, unless amended by a change order. On a multi-prime project, each prime contractor shall review the proposed construction schedule and approve same in writing. The Project Expediter shall submit the proposed construction schedule to the designer for comments. The complete Project construction schedule shall be of the type set forth in the Supplementary General Condition or subparagraph (1) or (2) below, as appropriate:

1. For a project with total contracts of \$500,000 or less, a bar chart schedule will satisfy the above requirement. The schedule shall indicate the estimated starting and completion dates for each major element of the work.
2. For a project with total contracts over \$500,000, a Critical Path Method (CPM) schedule shall be utilized to control the planning and scheduling of the Work. The CPM schedule shall be the responsibility of the Project Expediter and shall be paid for by the Project Expediter.

**Bar Chart Schedule:** Where a bar chart schedule is required, it shall be time-scaled in weekly increments, shall indicate the estimated starting and completion dates for each major element of the work by trade and by area, level, or zone, and shall schedule dates for all salient features, including but not limited to the placing of orders for materials, submission of shop drawings and other Submittals for approval, approval of shop drawings by designers, the manufacture and delivery of material, the testing and the installation of materials, supplies and equipment, and all Work activities to be performed by the Contractor. The Contractor shall allow sufficient time in his schedule for all commissioning, required inspections and completion of final punchlist(s). Each Work activity will be assigned a time estimate by the Contractor. One day shall be the smallest time unit used.

**CPM Schedule:** Where a CPM schedule is required, it shall be in time-scaled precedence format using the Project Expediter's logic and time estimates. The CPM schedule shall be drawn or plotted with activities grouped or zoned by Work area or subcontract as opposed to a random (or scattered) format. The CPM schedule shall be time-scaled on a weekly basis and shall be drawn or plotted at a level of detail and logic which will schedule all salient features of the work to be performed by the Contractor. The Contractor shall allow sufficient time in his schedule for all commissioning, required inspections and completion of final punchlist(s).. Each Work activity will be assigned a time estimate by the Contractor. One day shall be the smallest time unit used.

The CPM schedule will identify and describe each activity, state the duration of each activity, the calendar dates for the early and late start and the early and late finish of each activity, and clearly highlight all activities on the critical path. "Total float" and "free float" shall be indicated for all activities. Float time shall not be considered for the exclusive use or benefit of either the Owner or the Contractor, but must be allocated in the best interest of completing the Work within the Contract time. Extensions to the Contract time, when granted by Change Order, will be granted only when equitable time adjustment exceeds the Total Float in the activity or path of activities affected by the change. On contracts with a price over \$2,500,000, the CPM schedule shall also show what part of the Contract Price is attributable to each activity on the schedule, the sum of which for all activities shall equal the total Contract Price.

**Early Completion of Project:** The Contractor may attempt to complete the project prior to the Contract Completion Date. However, such planned early completion shall be for the Contractor's convenience only and shall not create any additional rights of the Contractor or obligations of the Owner under this Contract, nor shall it change the Time

for Completion or the Contract Completion Date. The Contractor shall not be required to pay liquidated damages to the Owner because of its failure to complete by its planned earlier date. Likewise, the Owner shall not pay the Contractor any additional compensation for early completion nor will the Owner owe the Contractor any compensation should the Owner, its officers, employees, or agents cause the Contractor not to complete earlier than the date required by the Contract Documents.

- h. The proposed project construction schedule shall be presented to the designer no later than fifteen (15) days after written notice to proceed. No application for payment will be processed until this schedule is accepted by the designer and owner.
- i. The approved project construction schedule shall be distributed to all contractors and displayed at the job site by the Project Expediter.
- j. The several contractors shall be responsible for their work activities and shall notify the Project Expediter of any necessary changes or adjustments to their work. The Project Expediter shall maintain the project construction schedule, making biweekly adjustments, updates, corrections, etc., that are necessary to finish the project within the Contract time, keeping all contractors and the designer fully informed. Copy of a bar chart schedule annotated to show the current progress shall be submitted by the Contractor(s) to the designer, along with monthly request for payment. For project requiring CPM schedule, the Contractor shall submit a biweekly report of the status of all activities. The bar chart schedule or status report shall show the actual Work completed to date in comparison with the original Work scheduled for all activities. If any activities of the work of several contractors are behind schedule, the contractor must indicate in writing, what measures will be taken to bring each such activity back on schedule and to ensure that the Contract Completion Date is not exceeded. A plan of action and recovery schedule shall be developed and submitted to the designer by the Project Expediter, when (1) the contractor's report indicates delays, that are in the opinion of the designer or the owner, of sufficient magnitude that the contractor's ability to complete the work by the scheduled completion is brought into question; (2) the updated construction schedule is thirty (30) days behind the planned or baseline schedule and no legitimate time extensions, as determined by the Designer, are in process; and (3) the contractor desires to make changes in the logic (sequencing of work) or the planned duration of future activities of the CPM schedule which, in the opinion of the designer or the owner, are of a major nature. The plan of action, when required shall be submitted to the Owner for review within two (2) business days of the Contractor receiving the Owner's written demand. The recovery schedule, when required, shall be submitted to the Owner within five (5) calendar days of the Contractor's receiving the Owner's written demand. Failure to provide an updated construction schedule or a recovery schedule may be grounds for rejection of payment applications or withholding of funds as set forth in Article 33.
- k. The Project Expediter shall notify each contractor of such events or time frames that are critical to the progress of the job. Such notice shall be timely and reasonable. Should the progress be delayed due to the work of any of the several contractors, it shall be the duty of the Project Expediter to immediately notify the contractor(s) responsible for such delay, the designer, the State Construction Office and other prime contractors. The designer shall determine the contractor(s) who caused the delays and notify the bonding company of the responsible contractor(s) of the delays; and shall make a recommendation to the owner regarding further action.
- l. Designation as Project Expediter entails an additional project control responsibility and does not alter in any way the responsibility of the contractor so designated, nor the

responsibility of the other contractors involved in the project. The project expeditor's Superintendent(s) shall be in attendance at the Project site at all times when work is in progress unless conditions are beyond the control of the Contractor or until termination of the Contract in accordance with the Contract Documents. It is understood that such Superintendent shall be acceptable to the Owner and Designer and shall be the one who will be continued in that capacity for the duration of the project unless he ceases to be on the Contractor's payroll or the Owner otherwise agrees. The Superintendent shall not be employed on any other project for or by the Contractor or by any other entity during the course of the Work. If the Superintendent is employed by the Contractor on another project without the Owner's approval, then the Owner may deduct from the Contractor's monthly general condition costs and amount representing the Superintendent's cost and shall deduct that amount for each month thereafter until the Contractor has the Superintendent back on the Owner's Project full-time.

#### **ARTICLE 15 - SEPARATE CONTRACTS AND CONTRACTOR RELATIONSHIPS**

- a. Effective from January 1, 2002, Chapter 143, Article 8, was amended, to allow public contracts to be delivered by the following delivery methods: single-prime, dual (single-prime and separate-prime), construction manager at risk, and alternative contracting method as approved by the State Building Commission. The owner reserves the right to prepare separate specifications, receive separate bids, and award separate contracts for such other major items of work as may be in the best interest of the State. For the purposes of a single prime contract, refer to Article 1 – Definitions.
- b. All contractors shall cooperate with each other in the execution of their work, and shall plan their work in such manner as to avoid conflicting schedules or delay of the work. See Article 14, Construction Supervision.
- c. If any part of contractor's work depends upon the work of another contractor, defects which may affect that work shall be reported to the designer in order that prompt inspection may be made and the defects corrected. Commencement of work by a contractor where such condition exists will constitute acceptance of the other contractor's work as being satisfactory in all respects to receive the work commenced, except as to defects which may later develop. The designer shall be the judge as to the quality of work and shall settle all disputes on the matter between contractors.
- d. Any mechanical or electrical work such as sleeves, inserts, chases, openings, penetrations, etc., which is located in the work of the general contractor shall be built in by the general contractor. The respective mechanical and electrical contractors shall set all sleeves, inserts and other devices that are to be incorporated into the structure in cooperation and under the supervision of the general contractor. The responsibility for the exact location of such items shall be that of the mechanical and/or electrical contractor.
- e. The designer and the owner shall have access to the work whenever it is in preparation and progress and during normal working hours. The contractor shall provide facilities for such access so the designer may perform his functions under the contract documents.
- f. Should a contractor cause damage to the work or property of another contractor, he shall be directly responsible, and upon notice, shall promptly settle the claim or otherwise resolve the dispute.

#### **ARTICLE 16 - SUBCONTRACTS AND SUBCONTRACTORS**

- a. Within thirty (30) days after award of the contract, the contractor shall submit to the designer, owner and to the State Construction Office a list giving the names and addresses of subcontractors and equipment and material suppliers he proposes to use, together with the scope of their respective parts of the work. Should any subcontractor be disapproved by the designer or owner, the designer or owner shall submit his reasons for disapproval in writing to the State Construction Office for its consideration with a copy to the contractor. If the State Construction Office concurs with the designer's or owner's recommendation, the contractor shall submit a substitute for approval. The designer and owner shall act promptly in the approval of subcontractors, and when approval of the list is given, no changes of subcontractors will be permitted except for cause or reason considered justifiable by the designer or owner.
- b. The designer will furnish to any subcontractor, upon request, evidence regarding amounts of money paid to the contractor on account of the subcontractor's work.
- c. The contractor is and remains fully responsible for his own acts or omissions as well as those of any subcontractor or of any employee of either. The contractor agrees that no contractual relationship exists between the subcontractor and the owner in regard to the contract, and that the subcontractor acts on this work as an agent or employee of the contractor.
- d. The owner reserves the right to limit the amount of portions of work to be subcontracted as hereinafter specified.

## **ARTICLE 17 - CONTRACTOR AND SUBCONTRACTOR RELATIONSHIPS**

The contractor agrees that the terms of these contract documents shall apply equally to each subcontractor as to the contractor, and the contractor agrees to take such action as may be necessary to bind each subcontractor to these terms. The contractor further agrees to conform to the Code of Ethical Conduct as adopted by the Associated General Contractors of America, Inc., with respect to contractor-subcontractor relationships, and that payments to subcontractors shall be made in accordance with the provisions of G.S. 143-134.1 titled Interest on final payments due to prime contractors: payments to subcontractors.

- a. On all public construction contracts which are let by a board or governing body of the state government or any political subdivision thereof, except contracts let by the Department of Transportation pursuant to G.S. 136-28.1, the balance due prime contractors shall be paid in full within 45 days after respective prime contracts of the project have been accepted by the owner, certified by the architect, engineer or designer to be completed in accordance with terms of the plans and specifications, or occupied by the owner and used for the purpose for which the project was constructed, whichever occurs first. Provided, however, that whenever the architect or consulting engineer in charge of the project determines that delay in completion of the project in accordance with terms of the plans and specifications is the fault of the contractor, the project may be occupied and used for the purposes for which it was constructed without payment of any interest on amounts withheld past the 45 day limit. No payment shall be delayed because of the failure of another prime contractor on such project to complete his contract. Should final payment to any prime contractor beyond the date such contracts have been certified to be completed by the designer or architect, accepted by the owner, or occupied by the owner and used for the purposes for which the project was constructed, be delayed by more than 45 days, said prime contractor shall be paid interest, beginning on the 46th day, at the rate of one percent (1%) per month or fraction thereof unless a lower rate is

agreed upon on such unpaid balance as may be due. In addition to the above final payment provisions, periodic payments due a prime contractor during construction shall be paid in accordance with the payment provisions of the contract documents or said prime contractor shall be paid interest on any such unpaid amount at the rate stipulated above for delayed final payments. Such interest shall begin on the date the payment is due and continue until the date on which payment is made. Such due date may be established by the terms of the contract. Funds for payment of such interest on state-owned projects shall be obtained from the current budget of the owning department, institution or agency. Where a conditional acceptance of a contract exists, and where the owner is retaining a reasonable sum pending correction of such conditions, interest on such reasonable sum shall not apply.

- b. Within seven days of receipt by the prime contractor of each periodic or final payment, the prime contractor shall pay the subcontractor based on work completed or service provided under the subcontract. Should any periodic or final payment to the subcontractor be delayed by more than seven days after receipt of periodic or final payment by the prime contractor, the prime contractor shall pay the subcontractor interest, beginning on the eighth day, at the rate of one percent (1%) per month or fraction thereof on such unpaid balance as may be due.
- c. The percentage of retainage on payments made by the prime contractor to the subcontractor shall not exceed the percentage of retainage on payments made by the owner to the prime contractor. Any percentage of retainage on payments made by the prime contractor to the subcontractor that exceeds the percentage of retainage on payments made by the owner to the prime contractor shall be subject to interest to be paid by the prime contractor to the subcontractor at the rate of one percent (1%) per month or fraction thereof.
- d. Nothing in this section shall prevent the prime contractor at the time of application and certification to the owner from withholding application and certification to the owner for payment to the subcontractor for unsatisfactory job progress; defective construction not remedied; disputed work; third-party claims filed or reasonable evidence that claim will be filed; failure of subcontractor to make timely payments for labor, equipment and materials; damage to prime contractor or another subcontractor; reasonable evidence that subcontract cannot be completed for the unpaid balance of the subcontract sum; or a reasonable amount for retainage not to exceed the initial percentage retained by owner.

## **ARTICLE 18 - DESIGNER'S STATUS**

- a. The designer shall provide general administration of the performance of construction contracts, including liaison and necessary inspection of the work to ensure compliance with plans and specifications. He is the agent of the owner only for the purpose of constructing this work and to the extent stipulated in the contract documents. He has authority to direct work to be performed, to stop work, to order work removed, or to order corrections of faulty work, where any such action by the designer may be necessary to assure successful completion of the work.
- b. The designer is the impartial interpreter of the contract documents, and, as such, he shall exercise his powers under the contract to enforce faithful performance by both the owner and the contractor, taking sides with neither.
- c. Should the designer cease to be employed on the work for any reason whatsoever, then the owner shall employ a competent replacement who shall assume the status of the former designer.

- d. The designer and his consultants will make inspections of the project. He will inspect the progress, the quality and the quantity of the work.
- e. The designer and the owner shall have access to the work whenever it is in preparation and progress during normal working hours. The contractor shall provide facilities for such access so the designer and owner may perform their functions under the contract documents.
- f. Based on the designer's inspections and evaluations of the project, the designer shall issue interpretations, directives and decisions as may be necessary to administer the project. His decisions relating to artistic effect and technical matters shall be final, provided such decisions are within the limitations of the contract.

## **ARTICLE 19 - CHANGES IN THE WORK**

- a. The owner may have changes made in the work covered by the contract. These changes will not invalidate and will not relieve or release the contractor from any guarantee given by him pertinent to the contract provisions. These changes will not affect the validity of the guarantee bond and will not relieve the surety or sureties of said bond. All extra work shall be executed under conditions of the original contract.
- b. Except in an emergency endangering life or property, no change shall be made by the contractor except upon receipt of approved change order or written field order from the designer, countersigned by the owner and the state construction office authorizing such change. No claim for adjustments of the contract price shall be valid unless this procedure is followed.

A field order, transmitted by fax, electronically, or hand delivered, may be used where the change involved impacts the critical path of the work. A formal change order shall be issued as expeditiously as possible.

In the event of emergency endangering life or property, the contractor may be directed to proceed on a time and material basis whereupon the contractor shall proceed and keep accurately on such form as specified by the designer or owner, a correct account of costs together with all proper invoices, payrolls and supporting data. Upon completion of the work the change order will be prepared as outlined under either Method "c(1)" or Method "c(2)" or both.

- c. In determining the values of changes, either additive or deductive, contractors are restricted to the use of the following methods:
  - 1. Where the extra work involved is covered by unit prices quoted in the proposal, or subsequently agreed to by the Contractor, Designer, Owner and State Construction Office the value of the change shall be computed by application of unit prices based on quantities, estimated or actual as agreed of the items involved, except in such cases where a quantity exceeds the estimated quantity allowance in the contract by one hundred percent (100%) or more. In such cases, either party may elect to proceed under subparagraph c2 herein. If neither party elects to proceed under c2, then unit prices shall apply.
  - 2. The contracting parties shall negotiate and agree upon the equitable value of the change prior to issuance of the change order, and the change order shall stipulate the corresponding lump sum adjustment to the contract price.



- d. Under Paragraph "b" and Methods "c(2)" above, the allowances for overhead and profit combined shall be as follows: all contractors (the single contracting entity (prime), his subcontractors(1<sup>st</sup> tier subs), or their sub-subcontractors (2<sup>nd</sup> tier subs, 3<sup>rd</sup> tier subs, etc)) shall be allowed a maximum of 10% on work they each self-perform; the prime contractor shall be allowed a maximum of 5% on contracted work of his 1<sup>st</sup> tier sub; 1<sup>st</sup> tier, 2<sup>nd</sup> tier, 3<sup>rd</sup> tier, etc contractors shall be allowed a maximum of 2.5% on the contracted work of their subs. ; Under Method "c(1)", no additional allowances shall be made for overhead and profit. In the case of deductible change orders, under Method "c(2)" and Paragraph (b) above, the contractor shall include no less than five percent (5%) profit, but no allowances for overhead.
- e. The term "net cost" as used herein shall mean the difference between all proper cost additions and deductions. The "cost" as used herein shall be limited to the following:
1. The actual costs of materials and supplies incorporated or consumed as part of the work;
  2. The actual costs of labor expended on the project site; labor expended in coordination, change order negotiation, record document maintenance, shop drawing revision or other tasks necessary to the administration of the project are considered overhead whether they take place in an office or on the project site.
  3. The actual costs of labor burden, limited to the costs of social security (FICA) and Medicare/Medicaid taxes; unemployment insurance costs; health/dental/vision insurance premiums; paid employee leave for holidays, vacation, sick leave, and/or petty leave, not to exceed a total of 30 days per year; retirement contributions; worker's compensation insurance premiums; and the costs of general liability insurance when premiums are computed based on payroll amounts; the total of which shall not exceed thirty percent (30%) of the actual costs of labor;
  4. The actual costs of rental for tools, excluding hand tools; equipment; machinery; and temporary facilities required for the work;
  5. The actual costs of premiums for bonds, insurance, permit fees, and sales or use taxes related to the work.

Overtime and extra pay for holidays and weekends may be a cost item only to the extent approved by the owner.

- f. Should concealed conditions be encountered in the performance of the work below grade, or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the contract documents, the contract sum and time for completion may be equitably adjusted by change order upon claim by either party made within thirty (30) days after the condition has been identified. The cost of such change shall be arrived at by one of the foregoing methods. All change orders shall be supported by a unit cost breakdown showing method of arriving at net cost as defined above.
- g. In all change orders, the procedure will be for the designer to request proposals for the change order work in writing. The contractor will provide such proposal and supporting data in suitable format. The designer shall verify correctness. Delay in the processing of the change order due to lack of proper submittal by the contractor of all required supporting data shall not constitute grounds for a time extension or basis of a claim. Within fourteen (14) days after receipt of the contractor's accepted proposal including all supporting documentation required by the designer, the designer shall prepare the change order and forward to the contractor for his signature or otherwise respond, in writing, to

the contractor's proposal. Within seven (7) days after receipt of the change order executed by the contractor, the designer shall, certify the change order by his signature, and forward the change order and all supporting data to the owner for the owner's signature. The owner shall execute the change order and forward to the State Construction Office for final approval, within seven (7) days of receipt. The State Construction Office shall act on the change order within seven (7) days. In case of emergency or extenuating circumstances, approval of changes may be obtained verbally by telephone or field orders approved by all parties, then shall be substantiated in writing as outlined under normal procedure.

- h. At the time of signing a change order, the contractor shall be required to certify as follows:

"I certify that my bonding company will be notified forthwith that my contract has been changed by the amount of this change order, and that a copy of the approved change order will be mailed upon receipt by me to my surety."

- i. A change order, when issued, shall be full compensation, or credit, for the work included, omitted or substituted. It shall show on its face the adjustment in time for completion of the project as a result of the change in the work.
- j. If, during the progress of the work, the owner requests a change order and the contractor's terms are unacceptable, the owner, with the approval of the State Construction Office, may require the contractor to perform such work on a time and material basis whereupon the contractor shall proceed and keep accurately on such form as specified by the Designer or owner, a correct account of cost together with all proper invoices, payrolls and supporting data. Upon completion of the work a change order will be prepared with allowances for overhead and profit per paragraph d. above and "net cost" and "cost" per paragraph e. above. Without prejudice, nothing in this paragraph shall preclude the owner from performing or to have performed that portion of the work requested in the change order.

## **ARTICLE 20 - CLAIMS FOR EXTRA COST**

- a. Should the contractor consider that as a result of instructions given by the designer, he is entitled to extra cost above that stated in the contract, he shall give written notice thereof to the designer within seven (7) days without delay. The written notice shall clearly state that a claim for extra cost is being made and shall provide a detailed justification for the extra cost. The contractor shall not proceed with the work affected until further advised, except in emergency involving the safety of life or property, which condition is covered in Article 19(b) and Article 11(h). No claims for extra compensation shall be considered unless the claim is so made. The designer shall render a written decision within seven (7) days of receipt of claim.
- b. The contractor shall not act on instructions received by him from persons other than the designer, and any claims for extra compensation or extension of time on account of such instruction will not be honored. The designer shall not be responsible for misunderstandings claimed by the contractor of verbal instructions which have not been confirmed in writing, and in no case shall instructions be interpreted as permitting a departure from the contract documents unless such instruction is confirmed in writing and supported by a properly authorized change order.
- c. Should a claim for extra compensation that complies with the requirements of (a) above by the contractor and is denied by the designer or owner, and cannot be resolved by a

representative of the State Construction Office, the contractor may request a mediation in connection with GS 143-128(f1) in the dispute resolution rules adopted by the State Building Commission (1 N.C.A.C. 30H .0101 through .1001). If the contractor is unable to resolve its claim as a result of mediation, the contractor may pursue the claim in accordance with the provisions of G.S. 143-135.3, or G.S. 143-135.6 where Community Colleges are the owner, and the following:

1. A contractor who has not completed a contract with a board for construction or repair work and who has not received the amount he claims is due under the contract may submit a verified written claim to the director of the State Construction Office of the Department of Administration for the amount the contractor claims is due. The director may deny, allow or compromise the claim, in whole or in part. A claim under this subsection is not a contested case under Chapter 150B of the General Statutes.
2. (a) A contractor who has completed a contract with a board for construction or repair work and who has not received the amount he claims is due under the contract may submit a verified written claim to the director of the State Construction Office of the Department of Administration for the amount the contractor claims is due. The claim shall be submitted within sixty (60) days after the contractor receives a final statement of the board's disposition of his claim and shall state the factual basis for the claim.
  - (b) The director shall investigate a submitted claim within ninety (90) days of receiving the claim, or within any longer time period upon which the director and the contractor agree. The contractor may appear before the director, either in person or through counsel, to present facts and arguments in support of his claim. The director may allow, deny or compromise the claim, in whole or in part. The director shall give the contractor a written statement of the director's decision on the contractor's claim.
  - (c) A contractor who is dissatisfied with the director's decision on a claim submitted under this subsection may commence a contested case on the claim under Chapter 150B of the General Statutes. The contested case shall be commenced within sixty (60) days of receiving the director's written statement of the decision.
  - (d) As to any portion of a claim that is denied by the director, the contractor may, in lieu of the procedures set forth in the preceding subsection of this section, within six (6) months of receipt of the director's final decision, institute a civil action for the sum he claims to be entitled to under the contract by filing a verified complaint and the issuance of a summons in the Superior Court of Wake County or in the superior court of any county where the work under the contract was performed. The procedure shall be the same as in all civil actions except that all issues shall be tried by the judge, without a jury.

## **ARTICLE 21 - MINOR CHANGES IN THE WORK**

The designer will have the authority to order minor changes in the work not involving an adjustment in the contract sum or time for completion, and not inconsistent with the intent of the contract documents. Such changes shall be effected by written order, copied to the State Construction Office, and shall be binding on the owner and the contractor.

## **ARTICLE 22 - UNCORRECTED FAULTY WORK**

Should the correction of faulty or damaged work be considered inadvisable or inexpedient by the owner and the designer, the owner shall be reimbursed by the contractor. A change order will be issued to reflect a reduction in the contract sum.

#### **ARTICLE 23 - TIME OF COMPLETION, DELAYS, EXTENSION OF TIME**

- a. The time of completion is stated in the Supplementary General Conditions and in the Form of Construction Contract. The Project Expediter, upon notice of award of contract, shall prepare a construction schedule to complete the project within the time of completion as required by Article 14.
- b. The contractors shall commence work to be performed under this agreement on a date to be specified in a written Notice to Proceed from the designer and shall fully complete all work hereunder within the time of completion stated. Time is of the essence and the contractor acknowledges the Owner will likely suffer financial damage for failure to complete the work within the time of completion. For each day in excess of the above number of days, the contractor(s) shall pay the owner the sum stated as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the owner by reason of failure of said contractor(s) to complete the work within the time specified, such time being in the essence of this contract and a material consideration thereof.
- c. In the event of multiple prime contractors, the designer shall be the judge as to the division of responsibility between the contractor(s), based on the construction schedule, weekly reports and job records, and shall apportion the amount of liquidated damages to be paid by each of them, according to delay caused by any or all of them.
- d. If the contractor is delayed at any time in the progress of his work solely by any act or negligence of the owner, the designer, or by any employee of either; by any separate contractor employed by the owner; by changes ordered in the work; by labor disputes at the project site; by abnormal weather conditions not reasonably anticipated for the locality where the work is performed; by unavoidable casualties; by any causes beyond the contractor's control; or by any other causes which the designer and owner determine may justify the delay, then the contract time may be extended by change order only for the time which the designer and owner may determine is reasonable.

Time extensions will not be granted for rain, wind, snow or other natural phenomena of normal intensity for the locality where work is performed. For purpose of determining extent of delay attributable to unusual weather phenomena, a determination shall be made by comparing the weather for the contract period involved with the average of the preceding five (5) year climatic range during the same time interval based on the National Oceanic and Atmospheric Administration National Weather Service statistics for the locality where work is performed and on daily weather logs kept on the job site by the contractor reflecting the effect of the weather on progress of the work and initialed by the designer's representative. No weather delays shall be considered after the building is dried in unless work claimed to be delayed is on the critical path of the baseline schedule or approved updated schedule. Time extensions for weather delays, acts of God, labor disputes, fire, delays in transportation, unavoidable casualties or other delays which are beyond the control of the Owner do not entitle the Contractor to compensable damages for delays. Any contractor claim for compensable damages for delays is limited to delays caused solely by the owner or its agents. Contractor caused delays shall be accounted for before owner or designer caused delays in the case of concurrent delays.

- e. Request for extension of time shall be made in writing to the designer, copies to the owner and SCO, within twenty (20) days following cause of delay. In case of continuing cause for delay, the Contractor shall notify the Designer to the designer, copies to the owner and SCO, of the delay within 20 days of the beginning of the delay and only one claim is necessary.
- f. The contractor shall notify his surety in writing of extension of time granted.
- g. No claim for time extension shall be allowed on account of failure of the designer to furnish drawings or instructions until twenty (20) days after demand for such drawings and/or instructions. See Article 5c. Demand must be in written form clearly stating the potential for delay unless the drawings or instructions are provided. Any delay granted will begin after the twenty (20) day demand period is concluded.

#### **ARTICLE 24 - PARTIAL UTILIZATION/BENEFICIAL OCCUPANCY**

- a. The owner may desire to occupy or utilize all or a portion of the project prior to the completion of the project.
- b. Should the owner request a utilization of a building or portion thereof, the designer shall perform a designer final inspection of area after being notified by the contractor that the area is ready for such. After the contractor has completed designer final inspection punch list and the designer has verified, then the designer shall schedule a beneficial occupancy inspection at a time and date acceptable to the owner, contractor(s) and State Construction Office. If beneficial occupancy is granted by the State Construction Office, in such areas the following will be established:
  - 1. The beginning of guarantees and warranties period for the equipment necessary to support. in the area.
  - 2. The owner assumes all responsibilities for utility costs for entire building.
  - 2. Contractor will obtain consent of surety.
  - 3. Contractor will obtain endorsement from insurance company permitting beneficial occupancy.
- c. The owner shall have the right to exclude the contractor from any part of the project which the designer has so certified to be substantially complete, but the owner will allow the contractor reasonable access to complete or correct work to bring it into compliance with the contract.
- d. Occupancy by the owner under this article will in no way relieve the contractor from his contractual requirement to complete the project within the specified time. The contractor will not be relieved of liquidated damages because of beneficial occupancy. The designer may prorate liquidated damages based on the percentage of project occupied.

#### **ARTICLE 25 - FINAL INSPECTION, ACCEPTANCE, AND PROJECT CLOSEOUT**

- a. Upon notification from the contractor(s) that the project is complete and ready for inspection, the designer shall make a Designer final inspection to verify that the project is complete and ready for SCO final inspection. Prior to SCO final inspection, the contractor(s) shall complete all items requiring corrective measures noted at the Designer

final inspection. The designer shall schedule a SCO final inspection at a time and date acceptable to the owner, contractor(s) and State Construction Office.

- b. At the SCO final inspection, the designer and his consultants shall, if job conditions warrant, record a list of items that are found to be incomplete or not in accordance with the contract documents. At the conclusion of the SCO final inspection, the designer and State Construction Office representative shall make one of the following determinations:
  - 1. That the project is completed and accepted.
  - 2. That the project will be accepted subject to the correction of the list of discrepancies (punch list). All punch list items must be completed within thirty (30) days of SCO final inspection or the owner may invoke Article 28, Owner's Right to Do Work.
  - 4. That the project is not complete and another date for a SCO final inspection will be established.
- c. Within fourteen (14) days of final acceptance per Paragraph b1 or within fourteen (14) days after completion of punch list per Paragraph b2 above, the designer shall certify the work and issue applicable certificate(s) of compliance.
- d. Any discrepancies listed or discovered after the date of SCO final inspection and acceptance under Paragraphs b1 or b2 above shall be handled in accordance with Article 42, Guarantee.
- f. The final acceptance date will establish the following:
  - 1. The beginning of guarantees and warranties period.
  - 2. The date on which the contractor's insurance coverage for public liability, property damage and builder's risk may be terminated.
  - 3. That no liquidated damages (if applicable) shall be assessed after this date.
  - 4. The termination date of utility cost to the contractor.
- g. **Prior to issuance of final acceptance date, the contractor shall have his authorized representatives visit the project and give full instructions to the designated personnel regarding operating, maintenance, care, and adjustment of all equipment and special construction elements. In addition, the contractor shall provide to the owner a complete instructional video (media format acceptable to the owner) on the operation, maintenance, care and adjustment of all equipment and special construction elements.**

#### **ARTICLE 26 - CORRECTION OF WORK BEFORE FINAL PAYMENT**

- a. Any work, materials, fabricated items or other parts of the work which have been condemned or declared not in accordance with the contract by the designer shall be promptly removed from the work site by the contractor, and shall be immediately replaced by new work in accordance with the contract at no additional cost to the owner. Work or property of other contractors or the owner, damaged or destroyed by virtue of such faulty work, shall be made good at the expense of the contractor whose work is faulty.

- b. Correction of condemned work described above shall commence within twenty-four (24) hours after receipt of notice from the designer, and shall make satisfactory progress, as determined by the designer, until completed.
- c. Should the contractor fail to proceed with the required corrections, then the owner may complete the work in accordance with the provisions of Article 28.

#### **ARTICLE 27 - CORRECTION OF WORK AFTER FINAL PAYMENT**

See Article 35, Performance Bond and Payment Bond, and Article 42, Guarantee. Neither the final certificate, final payment, occupancy of the premises by the owner, nor any provision of the contract, nor any other act or instrument of the owner, nor the designer, shall relieve the contractor from responsibility for negligence, or faulty material or workmanship, or failure to comply with the drawings and specifications. Contractor shall correct or make good any defects due thereto and repair any damage resulting there from, which may appear during the guarantee period following final acceptance of the work except as stated otherwise under Article 42, Guarantee. The owner will report any defects as they may appear to the contractor and establish a time limit for completion of corrections by the contractor. The owner will be the judge as to the responsibility for correction of defects.

#### **ARTICLE 28 - OWNER'S RIGHT TO DO WORK**

If, during the progress of the work or during the period of guarantee, the contractor fails to prosecute the work properly or to perform any provision of the contract, the owner, after seven (7) days' written notice sent by certified mail, return receipt requested, to the contractor from the designer, may perform or have performed that portion of the work. The cost of the work may be deducted from any amounts due or to become due to the contractor, such action and cost of same having been first approved by the designer. Should the cost of such action of the owner exceed the amount due or to become due the contractor, then the contractor or his surety, or both, shall be liable for and shall pay to the owner the amount of said excess.

#### **ARTICLE 29 - ANNULMENT OF CONTRACT**

If the contractor fails to begin the work under the contract within the time specified, or the progress of the work is not maintained on schedule, or the work is not completed within the time above specified, or fails to perform the work with sufficient workmen and equipment or with sufficient materials to ensure the prompt completion of said work, or shall perform the work unsuitably or shall discontinue the prosecution of the work, or if the contractor shall become insolvent or be declared bankrupt or commit any act of bankruptcy or insolvency, or allow any final judgment to stand against him unsatisfied for a period of forty-eight (48) hours, or shall make an assignment for the benefit of creditors, or for any other cause whatsoever shall not carry on the work in an acceptable manner, the owner may give notice in writing, sent by certified mail, return receipt requested, to the contractor and his surety of such delay, neglect or default, specifying the same, and if the contractor within a period of seven (7) days after such notice shall not proceed in accordance therewith, then the owner shall, declare this contract in default, and, thereupon, the surety shall promptly take over the work and complete the performance of this contract in the manner and within the time frame specified. In the event the surety shall fail to take over the work to be done under this contract within seven (7) days after being so notified and notify the owner in writing, sent by certified mail, return receipt requested, that he is taking the same over and stating that he will diligently pursue and complete the same, the owner shall have full power and authority, without violating the contract, to take the prosecution of the work out of the hands of said contractor, to appropriate or use any or all contract materials and equipment on the grounds as may be suitable and acceptable and may enter into an agreement, either by public letting or negotiation, for the completion of said contract according to the terms and provisions thereof

or use such other methods as in his opinion shall be required for the completion of said contract in an acceptable manner. All costs and charges incurred by the owner, together with the costs of completing the work under contract, shall be deducted from any monies due or which may become due said contractor and surety. In case the expense so incurred by the owner shall be less than the sum which would have been payable under the contract, if it had been completed by said contractor, then the said contractor and surety shall be entitled to receive the difference, but in case such expense shall exceed the sum which would have been payable under the contract, then the contractor and the surety shall be liable and shall pay to the owner the amount of said excess.

### **ARTICLE 30 - CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE THE CONTRACT**

- a. Should the work be stopped by order of a court having jurisdiction, or by order of any other public authority for a period of three months, due to cause beyond the fault or control of the contractor, or if the owner should fail or refuse to make payment on account of a certificate issued by the designer within forty-five (45) days after receipt of same, then the contractor, after fifteen (15) days' written notice sent by certified mail, return receipt requested, to the owner and the designer, may suspend operations on the work or terminate the contract.
- b. The owner shall be liable to the contractor for the cost of all materials delivered and work performed on this contract plus 10 percent overhead and profit and shall make such payment. The designer shall be the judge as to the correctness of such payment.

### **ARTICLE 31 - REQUEST FOR PAYMENT**

- a. Not later than the fifth day of the month, the contractor shall submit to the designer a request for payment for work done during the previous month. The request shall be in the form agreed upon between the contractor and the designer, but shall show substantially the value of work done and materials delivered to the site during the period since the last payment, and shall sum up the financial status of the contract with the following information:
  1. Total of contract including change orders.
  2. Value of work completed to date.
  3. Less five percent (5%) retainage, provided however, that after fifty percent (50%) of the contractor's work has been satisfactorily completed on schedule, with approval of the owner and the State Construction Office and written consent of the surety, further requirements for retainage will be waived only so long as work continues to be completed satisfactorily and on schedule.
  4. Less previous payments.
  5. Current amount due.
- b. The contractor, upon request of the designer, shall substantiate the request with invoices of vouchers or payrolls or other evidence.
- c. Prior to submitting the first request, the contractor shall prepare for the designer a schedule showing a breakdown of the contract price into values of the various parts of the work, so arranged as to facilitate payments to subcontractors in accordance with Article 17, Contractor and Subcontractor Relationships. The contractor(s) shall list the



value of each subcontractor and supplier, identifying each minority business subcontractor and supplier as listed in Affidavit C, if applicable.

- d. When payment is made on account of stored materials and equipment, such materials must be stored on the owner's property, and the requests for payments shall be accompanied by invoices or bills of sale or other evidence to establish the owner's title to such materials and equipment. Such payments will be made only for materials that have been customized or fabricated specifically for this project. Raw materials or commodity products including but not limited to piping, conduit, CMU, metal studs and gypsum board may not be submitted. Responsibility for such stored materials and equipment shall remain with the contractor regardless of ownership title. Such stored materials and equipment shall not be removed from the owner's property. Should the space for storage on-site be limited, the contractor, at his option, shall be permitted to store such materials and/or equipment in a suitable space off-site. Should the contractor desire to include any such materials or equipment in his application for payment, they must be stored in the name of the owner in an independent, licensed, bonded warehouse approved by the designer, owner and the State Construction Office and located as close to the site as possible. The warehouse selected must be approved by the contractor's bonding and insurance companies; the material to be paid for shall be assigned to the owner and shall be inspected by the designer. Upon approval by the designer, owner and SCO of the storage facilities and materials and equipment, payment therefore will be certified. Responsibility for such stored materials and equipment shall remain with the contractor. Such stored materials and equipment shall not be moved except for transportation to the project site. Under certain conditions, the designer may approve storage of materials at the point of manufacture, which conditions shall be approved by the designer, the owner and the State Construction Office prior to approval for the storage and shall include an agreement by the storing party which unconditionally gives the State absolute right to possession of the materials at anytime. Bond, security and insurance protection shall continue to be the responsibility of the contractor(s).
- e. In the event of beneficial occupancy, retainage of funds due the contractor(s) may be reduced with the approval of the State Construction Office to an equitable amount to cover the list of items to be completed or corrected. Retainage may not be reduced to less than two and one-half (2 1/2) times the estimated value of the work to be completed or corrected. Reduction of retainage must be with the consent and approval of the contractor's bonding company.

## **ARTICLE 32 - CERTIFICATES OF PAYMENT AND FINAL PAYMENT**

- a. Within five (5) days from receipt of request for payment from the contractor, the designer shall issue and forward to the owner a certificate for payment. This certificate shall indicate the amount requested or as approved by the designer. If the certificate is not approved by the designer, he shall state in writing to the contractor and the owner his reasons for withholding payment.
- b. No certificate issued or payment made shall constitute an acceptance of the work or any part thereof. The making and acceptance of final payment shall constitute a waiver of all claims by the owner except:
  - 1. Claims arising from unsettled liens or claims against the contractor.
  - 2. Faulty work or materials appearing after final payment.
  - 3. Failure of the contractor to perform the work in accordance with drawings and specifications, such failure appearing after payment.

4. As conditioned in the performance bond and payment bond.
- c. The making and acceptance of final payment shall constitute a waiver of all claims by the contractor except those claims previously made and remaining unsettled (Article 20(c)).
- d. Prior to submitting request for final payment to the designer for approval, the contractor shall fully comply with all requirements specified in the “project closeout” section of the specifications. These requirements include but not limited to the following:
  1. Submittal of Product and Operating Manuals, Warranties and Bonds, Guarantees, Maintenance Agreements, As-Built Drawings, Certificates of Inspection or Approval from agencies having jurisdiction. (The designer must approve the Manuals prior to delivery to the owner).
  2. Transfer of Required attic stock material and all keys in an organized manner.
  3. Record of Owner’s training.
  4. Resolution of any final inspection discrepancies.
  5. Granting access to Contractor’s records, if Owner’s internal auditors have made a request for such access pursuant to Article 52.
- e. The contractor shall forward to the designer, the final application for payment along with the following documents:
  1. List of minority business subcontractors and material suppliers showing breakdown of contract amounts and total actual payments to subs and material suppliers.
  2. Affidavit of Release of Liens.
  3. Affidavit of contractors of payment to material suppliers and subcontractors. (See Article 36).
  4. Consent of Surety to Final Payment.
  5. Certificates of state agencies required by state law.
- f. The designer will not authorize final payment until the work under contract has been certified by designer, certificates of compliance issued, and the contractor has complied with the closeout requirements. The designer shall forward the contractor’s final application for payment to the owner along with respective certificate(s) of compliance required by law.

### **ARTICLE 33 - PAYMENTS WITHHELD**

- a. The designer with the approval of the State Construction Office may withhold payment for the following reasons:
  1. Faulty work not corrected.

2. The unpaid balance on the contract is insufficient to complete the work in the judgment of the designer.
  3. To provide for sufficient contract balance to cover liquidated damages that will be assessed.
- b. The secretary of the Department of Administration may authorize the withholding of payment for the following reasons:
    1. Claims filed against the contractor or evidence that a claim will be filed.
    2. Evidence that subcontractors have not been paid.
  - c. The Owner may withhold all or a portion of Contractor's general conditions costs set forth in the approved schedule of values, if Contractor has failed to comply with: (1) a request to access its records by Owner's internal auditors pursuant to Article 52; (2) a request for a plan of action and/or recovery schedule under Article 14.j or provide The Owner; (3) a request to provide an electronic copies of Contractor's baseline schedule, updates with all logic used to create the schedules in the original format of the scheduling software; and (4) Contractor's failure to have its Superintendent on the Project full-time; (
  - d. When grounds for withholding payments have been removed, payment will be released. Delay of payment due the contractor without cause will make owner liable for payment of interest to the contractor in accordance with G.S. 143-134.1. As provided in G.S.143-134.1(e) the owner shall not be liable for interest on payments withheld by the owner for unsatisfactory job progress, defective construction not remedied, disputed work, or third-party claims filed against the owner or reasonable evidence that a third-party claim will be filed.

## **ARTICLE 34 - MINIMUM INSURANCE REQUIREMENTS**

The work under this contract shall not commence until the contractor has obtained all required insurance and verifying certificates of insurance have been approved in writing by the owner. These certificates shall document that coverages afforded under the policies will not be cancelled, reduced in amount or coverages eliminated until at least thirty (30) days after mailing written notice, by certified mail, return receipt requested, to the insured and the owner of such alteration or cancellation. If endorsements are needed to comply with the notification or other requirements of this article copies of the endorsements shall be submitted with the certificates.

### **a. Worker's Compensation and Employer's Liability**

The contractor shall provide and maintain, until final acceptance, workmen's compensation insurance, as required by law, as well as employer's liability coverage with minimum limits of \$100,000.

### **b. Public Liability and Property Damage**

The contractor shall provide and maintain, until final acceptance, comprehensive general liability insurance, including coverage for premises operations, independent contractors, completed operations, products and contractual exposures, as shall protect such contractors from claims arising out of any bodily injury, including accidental death, as well as from claims for property damages which may arise from operations under this contract, whether such operations be by the contractor or by any subcontractor, or by

anyone directly or indirectly employed by either of them and the minimum limits of such insurance shall be as follows:

Bodily Injury: \$500,000 per occurrence  
Property Damage: \$100,000 per occurrence / \$300,000 aggregate

In lieu of limits listed above, a \$500,000 combined single limit shall satisfy both conditions.

Such coverage for completed operations must be maintained for at least two (2) years following final acceptance of the work performed under the contract.

**c. Property Insurance (Builder's Risk/Installation Floater)**

The contractor shall purchase and maintain property insurance until final acceptance, upon the entire work at the site to the full insurable value thereof. This insurance shall include the interests of the owner, the contractor, the subcontractors and sub-subcontractors in the work and shall insure against the perils of fire, wind, rain, flood, extended coverage, and vandalism and malicious mischief. If the owner is damaged by failure of the contractor to purchase or maintain such insurance, then the contractor shall bear all reasonable costs properly attributable thereto; the contractor shall effect and maintain similar property insurance on portions of the work stored off the site when request for payment per articles so includes such portions.

**d. Deductible**

Any deductible, if applicable to loss covered by insurance provided, is to be borne by the contractor.

**e. Other Insurance**

The contractor shall obtain such additional insurance as may be required by the owner or by the General Statutes of North Carolina including motor vehicle insurance, in amounts not less than the statutory limits.

**f. Proof of Carriage**

The contractor shall furnish the owner with satisfactory proof of carriage of the insurance required before written approval is granted by the owner.

**ARTICLE 35 - PERFORMANCE BOND AND PAYMENT BOND**

- a. Each contractor shall furnish a performance bond and payment bond executed by a surety company authorized to do business in North Carolina. The bonds shall be in the full contract amount. Bonds shall be executed in the form bound with these specifications.
- b. All bonds shall be countersigned by an authorized agent of the bonding company who is licensed to do business in North Carolina.

**ARTICLE 36 - CONTRACTOR'S AFFIDAVIT**

The final payment of retained amount due the contractor on account of the contract shall not become due until the contractor has furnished to the owner through the designer an affidavit signed, sworn and notarized to the effect that all payments for materials, services or subcontracted work in connection with his contract have been satisfied, and that no claims or

liens exist against the contractor in connection with this contract. In the event that the contractor cannot obtain similar affidavits from subcontractors to protect the contractor and the owner from possible liens or claims against the subcontractor, the contractor shall state in his affidavit that no claims or liens exist against any subcontractor to the best of his (the contractor's) knowledge, and if any appear afterward, the contractor shall save the owner harmless.

#### **ARTICLE 37 - ASSIGNMENTS**

The contractor shall not assign any portion of this contract nor subcontract in its entirety. Except as may be required under terms of the performance bond or payment bond, no funds or sums of money due or become due the contractor under the contract may be assigned.

#### **ARTICLE 38 - USE OF PREMISES**

- a. The contractor(s) shall confine his apparatus, the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the designer and owner and shall not exceed those established limits in his operations.
- b. The contractor(s) shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.
- c. The contractor(s) shall enforce the designer's and owner's instructions regarding signs, advertisements, fires and smoking.
- d. No firearms, any type of alcoholic beverages, or drugs (other than those prescribed by a physician) will be permitted at the job site.

#### **ARTICLE 39 - CUTTING, PATCHING AND DIGGING**

- a. The contractor shall do all cutting, fitting or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors shown upon or reasonably implied by the drawings and specifications for the completed structure, as the designer may direct.
- b. Any cost brought about by defective or ill-timed work shall be borne by the party responsible therefor.
- c. No contractor shall endanger any work of another contractor by cutting, digging or other means. No contractor shall cut or alter the work of any other contractor without the consent of the designer and the affected contractor(s).

#### **ARTICLE 40 - UTILITIES, STRUCTURES, SIGNS**

- a. The contractor shall provide necessary and adequate facilities for water, electricity, gas, oil, sewer and other utility services which maybe necessary and required for completion of the project including all utilities required for testing, cleaning, balancing, and sterilization of designated plumbing, mechanical and electrical systems. Any permanent meters installed shall be listed in the contractor's name until work has a final acceptance. The contractor will be solely responsible for all utility costs prior to final acceptance. Contractor shall contact all affected utility companies prior to bid to determine their requirements to provide temporary and permanent service and include all costs associated with providing those services in their bid. Coordination of the work of the utility companies during construction is the sole responsibility of the contractor.

- b. Meters shall be relisted in the owner's name on the day following final acceptance of the Project Expediter's work, and the owner shall pay for services used after that date.
- c. The owner shall be reimbursed for all metered utility charges after the meter is relisted in the owner's name and prior to completion and acceptance of the work of **all** contractors. Reimbursement shall be made by the contractor whose work has not been completed and accepted. If the work of two or more contractors has not been completed and accepted, reimbursement to the owner shall be paid by the contractors involved on the basis of assessments by the designer.
- d. Prior to the operation of permanent systems, the Project Expediter will provide temporary power, lighting, water, and heat to maintain space temperature above freezing, as required for construction operations.
- e. All contractors shall have the permanent building systems in sufficient readiness for furnishing temporary climatic control at the time a building is enclosed and secured. The HVAC systems shall maintain climatic control throughout the enclosed portion of the building sufficient to allow completion of the interior finishes of the building. A building shall be considered enclosed and secured when windows, doorways (exterior, mechanical, and electrical equipment rooms), and hardware are installed; and other openings have protection which will provide reasonable climatic control. The appropriate time to start the mechanical systems and climatic condition shall be jointly determined by the contractor(s), the designer and owner. Use of the equipment in this manner shall be subject to the approval of the Designer and owner and shall in no way affect the warranty requirements of the contractor(s).
- f. The electrical contractor shall have the building's permanent power wiring distribution system in sufficient readiness to provide power as required by the HVAC contractor for temporary climatic control.
- g. The electrical contractor shall have the building's permanent lighting system ready at the time the general contractor begins interior painting and shall provide adequate lighting in those areas where interior painting and finishing is being performed.
- h. Each prime contractor shall be responsible for his permanently fixed service facilities and systems in use during progress of the work. The following procedures shall be strictly adhered to:
  - 1. Prior to final acceptance of work by the State Construction Office, each contractor shall remove and replace any parts of the permanent building systems damaged through use during construction.
  - 2. Temporary filters as recommended by the equipment manufacturer in order to keep the equipment and ductwork clean and free of dust and debris shall be installed in each of the heating and air conditioning units and at each return grille during construction. New filters shall be installed in each unit prior to the owner's acceptance of the work.
  - 3. Extra effort shall be maintained to keep the building and the site adjacent to the building clean and under no circumstances shall air systems be operated if finishing and site work operations are creating dust in excess of what would be considered normal if the building were occupied.
  - 4. It shall be understood that any warranty on equipment presented to the owner shall extend from the day of final acceptance by the owner. The cost of warranting the

equipment during operation in the finishing stages of construction shall be borne by the contractor whose system is utilized.

5. The electrical contractor shall have all lamps in proper working condition at the time of final project acceptance.
  - i. The Project Expediter shall provide, if required and where directed, a shed for toilet facilities and shall furnish and install in this shed all water closets required for a complete and adequate sanitary arrangement. These facilities will be available to other contractors on the job and shall be kept in a neat and sanitary condition at all times. Chemical toilets are acceptable.
  - j. The Project Expediter shall, if required by the Supplementary General Conditions and where directed, erect a temporary field office, complete with lights, telephone, heat and air conditioning. A portion of this office shall be partitioned off, of sufficient size, for the use of a resident inspector, should the designer so direct.
  - k. On multi-story construction projects, the Project Expediter shall provide temporary elevators, lifts, or other special equipment for the general use of all contractors. The cost for such elevators, lifts or other special equipment and the operation thereof shall be included in the Project Expediter's bid.
  - l. The Project Expediter will erect one sign on the project if required. The sign shall be of sound construction, and shall be neatly lettered with black letters on white background. The sign shall bear the name of the project, and the names of prime contractors on the project, and the name of the designer and consultants. Directional signs may be erected on the owner's property subject to approval of the owner with respect to size, style and location of such directional signs. Such signs may bear the name of the contractor and a directional symbol. No other signs will be permitted except by permission of the owner.

#### **ARTICLE 41 - CLEANING UP**

- a. The contractors shall keep the building and surrounding area reasonably free from rubbish at all times, and shall remove debris from the site on a timely basis or when directed to do so by the designer or Project Expediter. The Project Expediter shall provide an on site refuse container(s) for the use of all contractors. Each contractor shall remove their rubbish and debris from the building on a daily basis. The Project Expediter shall broom clean the building as required to minimize dust and dirt accumulation.
- b. The Project Expediter shall provide and maintain suitable all-weather access to the building.
- c. Before final inspection and acceptance of the building, each contractor shall clean his portion of the work, including glass, hardware, fixtures, masonry, tile and marble (using no acid), clean and wax all floors as specified, and completely prepare the building for use by the owner, with no cleaning required by the owner.

#### **ARTICLE 42 - GUARANTEE**

- a. The contractor shall unconditionally guarantee materials and workmanship against patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve (12) months following the date of final acceptance of the work or beneficial occupancy and shall replace such defective materials or workmanship without cost to the owner.

- b. Where items of equipment or material carry a manufacturer's warranty for any period in excess of twelve (12) months, then the manufacturer's warranty shall apply for that particular piece of equipment or material. The contractor shall replace such defective equipment or materials, without cost to the owner, within the manufacturer's warranty period.
- c. Additionally, the owner may bring an action for latent defects caused by the negligence of the contractor which is hidden or not readily apparent to the owner at the time of beneficial occupancy or final acceptance, whichever occurred first, in accordance with applicable law.
- d. Guarantees for roof, equipment, materials, and supplies shall be stipulated in the specifications sections governing such roof, equipment, materials, or supplies.

#### **ARTICLE 43 - CODES AND STANDARDS**

Wherever reference is given to codes, standard specifications or other data published by regulating agencies including, but not limited to, national electrical codes, North Carolina state building codes, federal specifications, ASTM specifications, various institute specifications, etc., it shall be understood that such reference is to the latest edition including addenda published prior to the date of the contract documents.

#### **ARTICLE 44 - INDEMNIFICATION**

To the fullest extent permitted by law, the contractor shall indemnify and hold harmless the owner, the designer and the agents, consultants and employees of the owner and designer, from and against all claims, damages, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance or failure of performance of the work, provided that any such claim, damage, loss or expense (1) 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 there from, and (2) is caused in whole or in part by any negligent act or omission of the contractor, the contractor's subcontractor, or the agents of either the contractor or the contractor's subcontractor. Such obligation shall not be construed to negate, abridge or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this article.

#### **ARTICLE 45 - TAXES**

- a. Federal excise taxes do not apply to materials entering into state work (Internal Revenue Code, Section 3442(3)).
- b. Federal transportation taxes do not apply to materials entering into state work (Internal Revenue Code, Section 3475(b) as amended).
- c. North Carolina sales tax and use tax, as required by law, do apply to materials entering into state work and such costs shall be included in the bid proposal and contract sum.
- d. Local option sales and use taxes, as required by law, do apply to materials entering into state work as applicable and such costs shall be included in the bid proposal and contract sum.
- e. **Accounting Procedures for Refund of County Sales & Use Tax**

Amount of county sales and use tax paid per contractor's statements:



Contractors performing contracts for state agencies shall give the state agency for whose project the property was purchased a signed statement containing the information listed in G.S. 105-164.14(e).

The Department of Revenue has agreed that in lieu of obtaining copies of sales receipts from contractors, an agency may obtain a certified statement as of April 1, 1991 from the contractor setting forth the date, the type of property and the cost of the property purchased from each vendor, the county in which the vendor made the sale and the amount of local sales and use taxes paid thereon. If the property was purchased out-of-state, the county in which the property was delivered should be listed. The contractor should also be notified that the certified statement may be subject to audit.

In the event the contractors make several purchases from the same vendor, such certified statement must indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices, the counties, and the county sales and use taxes paid thereon.

Name of taxing county: The position of a sale is the retailer's place of business located within a taxing county where the vendor becomes contractually obligated to make the sale. Therefore, it is important that the county tax be reported for the county of sale rather than the county of use.

When property is purchased from out-of-state vendors and the county tax is charged, the county should be identified where delivery is made when reporting the county tax.

Such statement must also include the cost of any tangible personal property withdrawn from the contractor's warehouse stock and the amount of county sales or use tax paid thereon by the contractor.

Similar certified statements by his subcontractors must be obtained by the general contractor and furnished to the claimant.

Contractors are not to include any tax paid on supplies, tools and equipment which they use to perform their contracts and should include only those building materials, supplies, fixtures and equipment which actually become a part of or annexed to the building or structure.

#### **ARTICLE 46 - EQUAL OPPORTUNITY CLAUSE**

The non-discrimination clause contained in Section 202 (Federal) Executive Order 11246, as amended by Executive Order 11375, relative to equal employment opportunity for all persons without regard to race, color, religion, sex or national origin, and the implementing rules and regulations prescribed by the secretary of Labor, are incorporated herein.

#### **ARTICLE 47 - EMPLOYMENT OF INDIVIDUALS WITH DISABILITIES**

The contractor(s) agree not to discriminate against any employee or applicant for employment because of physical or mental disabilities in regard to any position for which the employee or applicant is qualified. The contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified individuals with such disabilities without discrimination based upon their physical or mental disability in all employment practices.

#### **ARTICLE 48 - ASBESTOS-CONTAINING MATERIALS (ACM)**

The State of North Carolina has attempted to address all asbestos-containing materials that are to be disturbed in the project. However, there may be other asbestos-containing materials in the work areas that are not to be disturbed and do not create an exposure hazard.

Contractors are reminded of the requirements of instructions under Instructions to Bidders and General Conditions of the Contract, titled Examination of Conditions. Statute 130A, Article 19, amended August 3, 1989, established the Asbestos Hazard Management Program that controls asbestos abatement in North Carolina. The latest edition of *Guideline Criteria for Asbestos Abatement* from the State Construction Office is to be incorporated in all asbestos abatement projects for the Capital Improvement Program.

#### **ARTICLE 49 - MINORITY BUSINESS PARTICIPATION**

GS 143-128.2 establishes a ten percent (10%) goal for participation by minority businesses in total value of work for each State building project. The document, *Guidelines for Recruitment and Selection of Minority Businesses for Participation in State Construction Contracts* including Affidavits and Appendix E are hereby incorporated into and made a part of this contract.

#### **ARTICLE 50 – CONTRACTOR EVALUATION**

The contractor's overall work performance on the project shall be fairly evaluated in accordance with the State Building Commission policy and procedures, for determining qualifications to bid on future State capital improvement projects. In addition to final evaluation, interim evaluation may be prepared during the progress of project. The document, *Contractor Evaluation Procedures*, is hereby incorporated and made a part of this contract. The owner may request the contractor's comments to evaluate the designer.

#### **ARTICLE 51 – GIFTS**

Pursuant to N.C. Gen. Stat. § 133-32, it is unlawful for any vendor or contractor ( i.e. architect, bidder, contractor, construction manager, design professional, engineer, subcontractor, supplier, vendor, etc.), to make gifts or to give favors to any State employee. This prohibition covers those vendors and contractors who: (1) have a contract with a governmental agency; or (2) have performed under such a contract within the past year; or (3) anticipate bidding on such a contract in the future. For additional information regarding the specific requirements and exemptions, vendors and contractors are encouraged to review G.S. Sec. 133-32.

During the construction of the Project, the Contractor is prohibited from making gifts to any of the Owner's employees, Owner's project representatives (architect, engineers, construction manager and their employees), employees of the State Construction Office and/or any other State employee that may have any involvement, influence, responsibilities, oversight, management and/or duties that pertain to and/or relate to the contract administration, financial administration and/or disposition of claims arising from and/or relating to the Contract and/or Project.

#### **ARTICLE 52 – AUDITING-ACCESS TO PERSONS AND RECORDS**

In accordance with N.C. General Statute 147-64.7, the State Auditor shall have access to Contractor's officers, employees, agents and/or other persons in control of and/or responsible for the Contractor's records that relate to this Contracts for purposes of conducting audits under the referenced statute. The Owner's internal auditors shall also have the right to access and copy the Contractor's records relating to the Contract and Project during the term of the Contract and within two years following the completion of the Project/close-out of the Contract to verify accounts, accuracy, information, calculations and/or data affecting and/or

relating to Contractor's requests for payment, requests for change orders, change orders, claims for extra work, requests for time extensions and related claims for delay/extended general conditions costs, claims for lost productivity, claims for loss efficiency, claims for idle equipment or labor, claims for price/cost escalation, pass-through claims of subcontractors and/or suppliers, and/or any other type of claim for payment or damages from Owner and/or its project representatives.

## **ARTICLE 53 – NORTH CAROLINA FALSE CLAIMS ACT**

The North Carolina False Claims Act ("NCFCA"), N.C. Gen. Stat. § 1-605 through 1-618, applies to this Contract. The Contractor should familiarize itself with the entire NCFCA and should seek the assistance of an attorney if it has any questions regarding the NCFCA and its applicability to any requests, demands and/or claims for payment its submits to the State through the contracting state agency, institution, university or community college.

The purpose of the NCFCA "is to deter persons from knowingly causing or assisting in causing the State to pay claims that are false or fraudulent and to provide remedies in the form of treble damages and civil penalties when money is obtained from the State by reason of a false or fraudulent claim." (Section 1-605(b).) A contractor's liability under the NCFCA may arise from, but is not limited to: requests for payment, invoices, billing, claims for extra work, requests for change orders, requests for time extensions, claims for delay damages/extended general conditions costs, claims for lost productivity, claims for loss efficiency, claims for idle equipment or labor, claims for price/cost escalation, pass-through claims of subcontractors and/or suppliers, documentation used to support any of the foregoing requests or claims, and/or any other request for payment from the State through the contracting state agency, institution, university or community college. The parts of the NCFCA that are most likely to be enforced with respect to this type of contract are as follows:

- A "claim" is "[a]ny request or demand, whether under a contract or otherwise, for money or property and whether or not the State has title to the money or property that (i) is presented to an officer, employee, or agent of the State or (ii) is made to a contractor ... if the money or property is to be spent or used on the State's behalf or to advance a State program or interest and if the State government: (a) provides or has provided any portion of the money or property that is requested or demanded; or (b) will reimburse such contractor ... for any portion of the money or property which is requested or demanded." (Section 1-606(2).)
- "Knowing" and "knowingly." – Whenever a person, with respect to information, does any of the following: (a) Has actual knowledge of the information; (b) Acts in deliberate ignorance of the truth or falsity of the information; and/or (c) Acts in reckless disregard of the truth or falsity of the information. (Section 1-606(4).) Proof of specific intent to defraud is not required. (Section 1-606(4).)
- "Material" means having a natural tendency to influence, or be capable of influencing, the payment or receipt of money or property. (Section 1-606(4).)
- Liability. – "Any person who commits any of the following acts shall be liable to the State for three times the amount of damages that the State sustains because of the act of that person[:]. ... (1) Knowingly presents or causes to be presented a false or fraudulent claim for payment or approval. (2) Knowingly makes, uses, or causes to be made or used, a false record or statement material to a false or fraudulent claim. (3) Conspires to commit a violation of subdivision (1), (2) ..." (Section 1-607(a)(1), (2).)

- The NCFCA shall be interpreted and construed so as to be consistent with the federal False Claims Act, 31 U.S.C. § 3729, et seq., and any subsequent amendments to that act. (Section 1-616(c).)

Finally, the contracting state agency, institution, university or community college may refer any suspected violation of the NCFCA by the Contractor to the Attorney General's Office for investigation. Under Section 1-608(a), the Attorney General is responsible for investigating any violation of NCFCA, and may bring a civil action against the Contractor under the NCFCA. The Attorney General's investigation and any civil action relating thereto are independent and not subject to any dispute resolution provision set forth in this Contract. (See Section 1-608(a).)

#### **ARTICLE 54 – TERMINATION FOR CONVENIENCE**

Owner may at any time and for any reason terminate Contractor's services and work at Owner's convenience. Upon receipt of such notice, Contractor shall, unless the notice directs otherwise, immediately discontinue the work and placing of orders for materials, facilities and supplies in connection with the performance of this Agreement.

Upon such termination, Contractor shall be entitled to payment only as follows: (1) the actual cost of the work completed in conformity with this Agreement; plus, (2) such other costs actually incurred by Contractor as are permitted by the prime contract and approved by Owner; (3) plus ten percent (10%) of the cost of the work referred to in subparagraph (1) above for overhead and profit. There shall be deducted from such sums as provided in this subparagraph the amount of any payments made to Contractor prior to the date of the termination of this Agreement. Contractor shall not be entitled to any claim or claim of lien against Owner for any additional compensation or damages in the event of such termination and payment.

# **SUPPLEMENTARY GENERAL CONDITIONS**

## **ARTICLE 14 - CONSTRUCTION SUPERVISION AND SCHEDULE**

The following revision shall be made to paragraph e:

“The contractor(s) ~~shall~~ is required to employ an engineer or a land surveyor licensed in the State of North Carolina to lay out the work and to establish a bench mark in a location where the same will not be disturbed and where direct instrument sights may be taken.”

## **ARTICLE 23 - TIME OF COMPLETION, DELAYS, EXTENSION OF TIME**

The following is in addition to the information presented in Article 23:

“The Contractor shall commence work to be performed under this Contract on a date to be specified in written order from the Designer and shall fully complete all work hereunder within **180 consecutive calendar days** from the Notice to Proceed for base bid contract. For each day in excess of the above number of days, the Contractor shall pay the Owner the amount of Three Hundred Dollars (\$300.00) as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the Owner should the Contractor fail to complete the Work within the time specified.

If the Contractor is delayed at anytime in the progress of his work by any act or negligence of the Owner, his employees or his separate contractor, by changes ordered in the work; by abnormal weather conditions; by any causes beyond the Contractor's control or by other causes deemed justifiable by Owner, then the contract time may be reasonably extended in a written order from the Owner upon written request from the contractor within the time frame as outlined in the General Conditions.”

## **ARTICLE 34 - MINIMUM INSURANCE REQUIREMENTS**

The following revision shall be made to paragraph c:

“This insurance shall include the interests of the owner, the contractor, the subcontractors and sub-subcontractors in the work and shall insure against the ~~perils of fire, wind, rain, flood, extended coverage, and vandalism and malicious mischief~~ risks of direct physical loss (all perils).”

## **ARTICLE 40 – UTILITIES, STRUCTURES, SIGNS**

The following is an addition to the information presented in Article 23:

Owner will not provide any utilities such as power or water. The use of existing toilets will not be permitted. Parking, access, and staging will need to be approved by the NCDOT staff.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	30000.13.2	1	9

**STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT**

**STRUCTURE  
SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 30000.13.2 F.A. PROJ. N/A  
 COUNTY WAKE  
 PROJECT DESCRIPTION WESTGATE ROAD MODULAR LOCATIONS

**CONTENTS**

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-9	BORE LOGS

PERSONNEL

N.D. MOHS

J.I. MILKOVITS JR.

H.R. CONLEY

J.R. TURNAGE

INVESTIGATED BY N.D. MOHS

CHECKED BY N.T. ROBERSON

SUBMITTED BY N.T. ROBERSON

DATE OCTOBER 2011

RECEIVED

RECEIVED

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 NCDOT  
 GENERAL SERVICES DIVISION

OCT 28 2011  
 NCDOT  
 GENERAL SERVICES DIVISION

**CAUTION NOTICE**

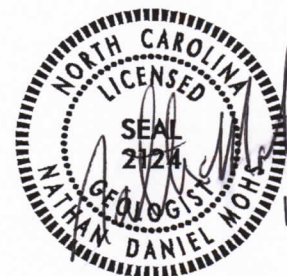
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA, AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.



10/24/11

DRAWN BY: \_\_\_\_\_

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
**GEOTECHNICAL ENGINEERING UNIT**  
**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

<p align="center"><b>SOIL DESCRIPTION</b></p> <p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:  <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>	<p align="center"><b>GRADATION</b></p> <p><u>WELL GRADED</u> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.  <u>UNIFORM</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)  <u>GAP-GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p align="center"><b>ANGULARITY OF GRAINS</b></p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</p>
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<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>										<b>MINERALOGICAL COMPOSITION</b>																															
GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					ORGANIC MATERIALS																														
GROUP CLASS.	A-1-a	A-1-b	A-3	A-2		A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.																											
SYMBOL														<p align="center"><b>COMPRESSIBILITY</b></p> <p>SLIGHTLY COMPRESSIBLE      LIQUID LIMIT LESS THAN 31          MODERATELY COMPRESSIBLE      LIQUID LIMIT EQUAL TO 31-50          HIGHLY COMPRESSIBLE      LIQUID LIMIT GREATER THAN 50</p>																											
% PASSING	GRANULAR MATERIALS					SILT-CLAY MATERIALS					ORGANIC MATERIALS																														
■ 10	50 MX	30 MX	50 MX	5L MN	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	36 MN	<p align="center"><b>PERCENTAGE OF MATERIAL</b></p> <table border="1"> <tr> <td>ORGANIC MATERIAL</td> <td>GRANULAR SOILS</td> <td>SILT - CLAY SOILS</td> <td>OTHER MATERIAL</td> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>&gt;10%</td> <td>&gt;20%</td> <td>HIGHLY</td> </tr> <tr> <td></td> <td></td> <td></td> <td>35% AND ABOVE</td> </tr> </table>				ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY				35% AND ABOVE
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HIGHLY ORGANIC	>10%	>20%	HIGHLY																																						
			35% AND ABOVE																																						
LIQUID LIMIT	GRANULAR MATERIALS					SILT-CLAY MATERIALS					ORGANIC MATERIALS																														
PLASTIC INDEX	6 MX	NP	NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER																											
GROUP INDEX	0	0	0	0	4 MX	8 MX	12 MX	16 MX	No MX	HIGHLY ORGANIC SOILS																															
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND		SILTY SOILS		CLAYEY SOILS		HIGHLY ORGANIC SOILS																															
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD					FAIR TO POOR					FAIR TO POOR	POOR	UNSATURABLE																												


<b>CONSISTENCY OR DENSENESS</b>				<b>MISCELLANEOUS SYMBOLS</b>			
PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/F <sup>2</sup> )		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		TEST BORING W/ CORE
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A		SOIL SYMBOL		AUGER BORING
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4		ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT		CORE BORING
					INFERRED SOIL BOUNDARY		MONITORING WELL
					INFERRED ROCK LINE		PIEZOMETER INSTALLATION
					ALLUVIAL SOIL BOUNDARY		SLOPE INDICATOR INSTALLATION
					DIP & DIP DIRECTION OF ROCK STRUCTURES		CONE PENETROMETER TEST
					SOUNDING ROD		

<b>TEXTURE OR GRAIN SIZE</b>							<b>ABBREVIATIONS</b>					
U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270	AR - AUGER REFUSAL	MED. - MEDIUM	VST - VANE SHEAR TEST			
	4.76	2.00	0.42	0.25	0.075	0.053	BT - BORING TERMINATED	MICA - MICACEOUS	WEA. - WEATHERED			
BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)	CL - CLAY	MOD. - MODERATELY	γ - UNIT WEIGHT			
GRAIN SIZE	MM 305	75	2.0	0.25	0.05	0.005	CPT - CONE PENETRATION TEST	NP - NON PLASTIC	γ <sub>d</sub> - DRY UNIT WEIGHT			
	IN. 12	3					CSE. - COARSE	ORG. - ORGANIC				
							DMT - DILATOMETER TEST	PMT - PRESSUREMETER TEST	SAMPLE ABBREVIATIONS			
							DPT - DYNAMIC PENETRATION TEST	SAP. - SAPROLITIC	S - BULK			
							• - VOID RATIO	SD. - SAND, SANDY	SS - SPLIT SPOON			
							F - FINE	SL. - SILT, SILTY	ST - SHELBY TUBE			
							FOSS. - FOSSILIFEROUS	SL. - SLIGHTLY	RS - ROCK			
							FRAC. - FRACTURED, FRACTURES	TRC - TRICONE REFUSAL	RT - RECOMPACTED TRIAXIAL			
							FRAGS. - FRAGMENTS	• - MOISTURE CONTENT	CBR - CALIFORNIA BEARING RATIO			
							HL - HIGHLY	V - VERY				

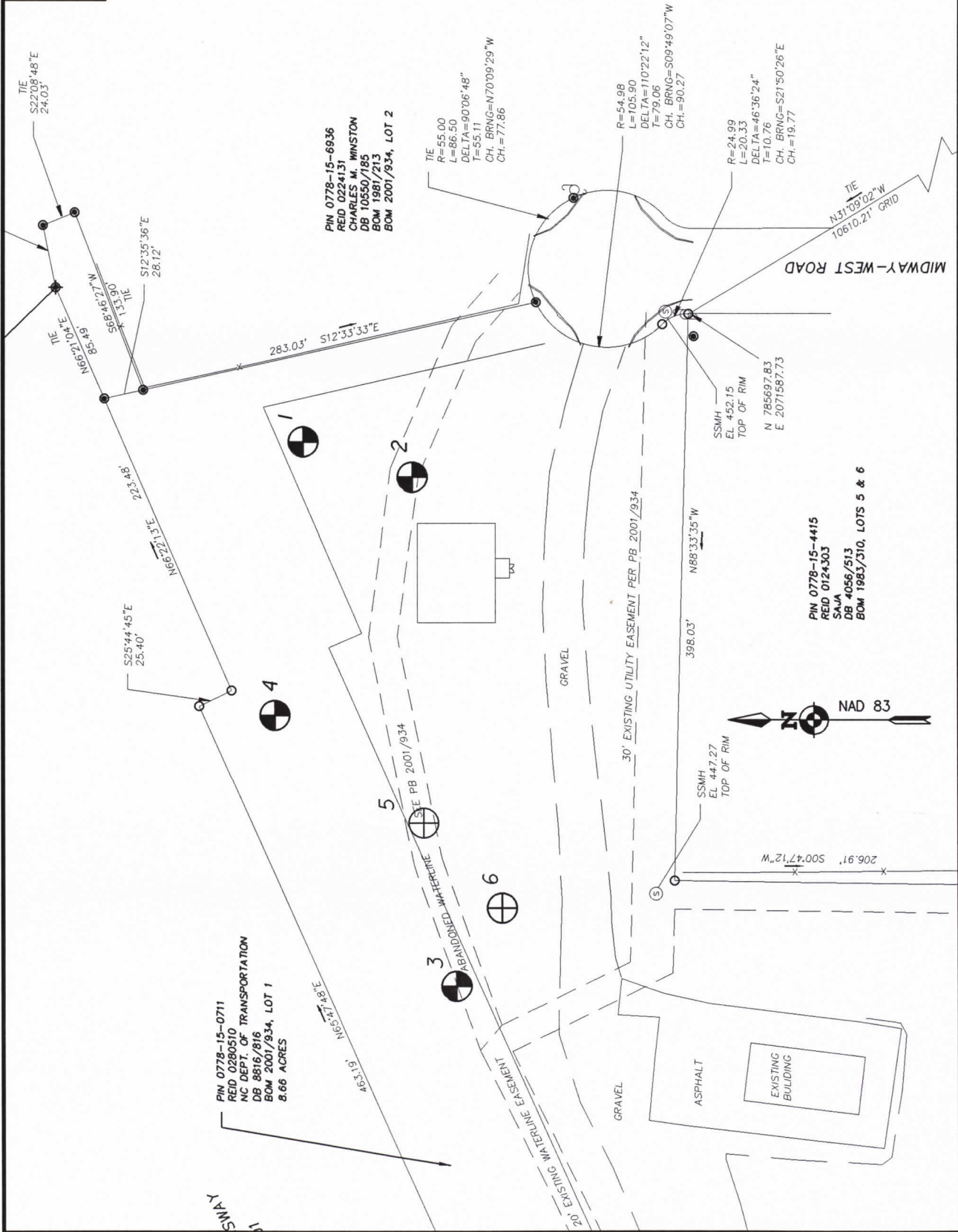
<b>SOIL MOISTURE - CORRELATION OF TERMS</b>			<b>EQUIPMENT USED ON SUBJECT PROJECT</b>		
SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION	DRILL UNITS:	ADVANCING TOOLS:	HAMMER TYPE:
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE	<input type="checkbox"/> MOBILE B- _____	<input type="checkbox"/> CLAY BITS	<input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	<input type="checkbox"/> BK-51	<input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER	CORE SIZE:
	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE	<input type="checkbox"/> CME-45C	<input checked="" type="checkbox"/> 8" HOLLOW AUGERS	<input type="checkbox"/> -B _____
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	<input checked="" type="checkbox"/> CME-550	<input checked="" type="checkbox"/> HARD FACED FINGER BITS	<input type="checkbox"/> -N _____
			<input type="checkbox"/> CME-45C	<input type="checkbox"/> TUNG.-CARBIDE INSERTS	<input type="checkbox"/> -H _____
			<input type="checkbox"/> PORTABLE HOIST	<input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER	HAND TOOLS:
			<input type="checkbox"/> BT	<input type="checkbox"/> TRICONE _____ * STEEL TEETH	<input type="checkbox"/> POST HOLE DIGGER
			<input type="checkbox"/>	<input type="checkbox"/> TRICONE _____ * TUNG.-CARB.	<input checked="" type="checkbox"/> HAND AUGER
			<input type="checkbox"/>	<input type="checkbox"/> CORE BIT	<input type="checkbox"/> SOUNDING ROD
					<input type="checkbox"/> VANE SHEAR TEST

<b>PLASTICITY</b>		<b>COLOR</b>	
NONPLASTIC	0-5	VERY LOW	
LOW PLASTICITY	6-15	SLIGHT	
MED. PLASTICITY	16-25	MEDIUM	
HIGH PLASTICITY	26 OR MORE	HIGH	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.			

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
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**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p><b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.</p> <p><b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.</p> <p><b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p><b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.</p> <p><b>ARTESIAN</b> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.</p> <p><b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p><b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p><b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p><b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p><b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p><b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p><b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p><b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p><b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p><b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p><b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p><b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p><b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p><b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p><b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p><b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p><b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p><b>ROCK QUALITY DESIGNATION (ROQ)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p><b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p><b>SILL</b> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.</p> <p><b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p><b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS IN OR BPF OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.</p> <p><b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p><b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p><b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>	
WEATHERED ROCK (WR)		NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	
CRYSTALLINE ROCK (CR)		FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	
NON-CRYSTALLINE ROCK (NCR)		FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	
COASTAL PLAIN SEDIMENTARY ROCK (CP)		COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	
WEATHERING			
FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.		
VERY SLIGHT (V SLL)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.		
SLIGHT (SLI)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.		
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.		
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i>		
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES &gt; 100 BPF</i>		
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES &lt; 100 BPF</i>		
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.		
ROCK HARDNESS			
VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.		
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.		
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.		
SOFT	CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.		
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.		
FRACTURE SPACING		BEDDING	
TERM	SPACING	TERM	THICKNESS
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	> 4 FEET
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET
CLOSE	0.16 TO 1 FEET	VERY THINLY BEDDED	0.03 - 0.16 FEET
VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET
		THINLY LAMINATED	< 0.008 FEET
INDURATION			
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.			
FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.		
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.		
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.		
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.		
<p><b>BENCH MARK:</b></p> <p style="text-align: right;">ELEVATION: _____ FT.</p> <p><b>NOTES:</b></p>			







# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 30000.13.2	TIP N/A	COUNTY WAKE	GEOLOGIST Mohs, N. D.
SITE DESCRIPTION WESTGATE ROAD MODULAR LOCATION			GROUND WTR (ft)
BORING NO. 1	STATION N/A	OFFSET N/A	ALIGNMENT N/A
COLLAR ELEV. 460.0 ft	TOTAL DEPTH 18.6 ft	NORTHING 785,969	EASTING 2,071,498
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 10/13/11	COMP. DATE 10/11/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			
460	460.0	0.0	2	6	5							M	GROUND SURFACE 0.0
	457.5	2.5	6	5	10	11						M	ARTIFICIAL FILL 0.5 RED-BROWN, SILTY CLAY 2.0
455	455.0	5.0	4	5	7	15						M	TAN, SILTY SAND
	452.5	7.5	5	8	11	12						D	TRIASSIC RESIDUAL
450	450.0	10.0	4	5	7	19						M	RED, BROWN, AND WHITE, SAPROLITIC, SILTY CLAY
	447.5	12.5	3	5	5	12						M	
445	445.0	15.0	5	11	20	10						M	
	442.5	17.5	12	45	55/0.1	31						M	
										100/0.6			WEATHERED ROCK 18.0 (TRIASSIC CONGLOMERATE) 18.6

Boring Terminated at Elevation 441.4 ft IN WEATHERED ROCK (TRIASSIC CONGLOMERATE)

ELEVATION INTERPRETED FROM CONTOUR LINES ON LOCATION MAP PROVIDED BY CRAIG MILLER ON 10/4/2011.



# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 30000.13.2	TIP N/A	COUNTY WAKE	GEOLOGIST Mohs, N. D.
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SITE DESCRIPTION WESTGATE ROAD MODULAR LOCATION			GROUND WTR (ft)
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BORING NO. 2	STATION N/A	OFFSET N/A	ALIGNMENT N/A	0 HR. Dry
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COLLAR ELEV. 459.5 ft	TOTAL DEPTH 16.4 ft	NORTHING 785,892	EASTING 2,071,473	24 HR. Dry
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DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
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DRILLER Conley, H. R.	START DATE 10/13/11	COMP. DATE 10/11/11	SURFACE WATER DEPTH N/A
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ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
460	459.5	0.0												459.5	0.0	GROUND SURFACE
	457.0	2.5	1	2	3	5						M	X	457.5	2.0	ARTIFICIAL FILL RED-BROWN, SANDY CLAY WITH SOME GRAVEL
455	454.5	5.0	3	5	7	12						M				TRIASSIC RESIDUAL TAN, RED, AND WHITE, SAPROLITIC, SILTY CLAY
	452.0	7.5	3	4	9	13						M				
450	449.5	10.0	7	9	11	20						M		450.5	9.0	DARK RED, SAPROLITIC, SANDY CLAY
	444.5	15.0	14	25	35	60						M				
445	444.5	15.0	26	47	53/0.4					100/0.9				444.0	15.5	WEATHERED ROCK (TRIASSIC CONGLOMERATE)
														443.1	16.4	WEATHERED ROCK (TRIASSIC CONGLOMERATE) Boring Terminated at Elevation 443.1 ft IN WEATHERED ROCK (TRIASSIC CONGLOMERATE)
<p>ELEVATION INTERPRETED FROM CONTOUR LINES ON LOCATION MAP PROVIDED BY CRAIG MILLER ON 10/4/2011.</p>																



# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 30000.13.2	TIP N/A	COUNTY WAKE	GEOLOGIST Mohs, N. D.
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SITE DESCRIPTION WESTGATE ROAD MODULAR LOCATION			GROUND WTR (ft)
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BORING NO. 3	STATION N/A	OFFSET N/A	ALIGNMENT N/A	0 HR. Dry
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COLLAR ELEV. 448.0 ft	TOTAL DEPTH 15.8 ft	NORTHING 785,861	EASTING 2,071,116	24 HR. Dry
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DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
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DRILLER Conley, H. R.	START DATE 10/13/11	COMP. DATE 10/11/11	SURFACE WATER DEPTH N/A
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ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
450																	
	448.0	0.0													448.0	GROUND SURFACE	0.0
	445.5	2.5	3	7	5	12								M	446.0	ARTIFICIAL FILL RED-BROWN, SILTY CLAY	2.0
445														M		TRIASSIC RESIDUAL TAN, ORANGE, AND WHITE, SAPROLITIC, SILTY CLAY	
	443.0	5.0	3	5	6	11								M			
440														M			
	440.5	7.5	4	7	10	17								M			
	438.0	10.0	7	26	26									M			
435																	
	433.0	15.0	39	61/0.3											433.5	WEATHERED ROCK (TRIASSIC CONGLOMERATE)	14.5
															432.2	WEATHERED ROCK (TRIASSIC CONGLOMERATE)	15.8
																Boring Terminated at Elevation 432.2 ft IN WEATHERED ROCK (TRIASSIC CONGLOMERATE)	
																ELEVATION INTERPRETED FROM CONTOUR LINES ON LOCATION MAP PROVIDED BY CRAIG MILLER ON 10/4/2011.	

NCDOT BORE SINGLE 092\_GEO\_BH.GPJ NC\_DOT.GDT 10/14/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 30000.13.2	TIP N/A	COUNTY WAKE	GEOLOGIST Mohs, N. D.
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SITE DESCRIPTION WESTGATE ROAD MODULAR LOCATION			GROUND WTR (ft)
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BORING NO. 4	STATION N/A	OFFSET N/A	ALIGNMENT N/A	0 HR. Dry
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COLLAR ELEV. 455.8 ft	TOTAL DEPTH 14.0 ft	NORTHING 785,989	EASTING 2,071,306	24 HR. Dry
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DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
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DRILLER Conley, H. R.	START DATE 10/13/11	COMP. DATE 10/11/11	SURFACE WATER DEPTH N/A
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ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
460																	
455	455.8	0.0	1	4	5										455.8	0.0	
	453.3	2.5	5	7	8	9							M	TRIASSIC RESIDUAL RED-BROWN AND TAN, SAPROLITIC, SILTY CLAY			
450						15							M				
	448.3	7.5	4	6	6								M				
445													M				
	443.3	12.5	3	3	6	9							M		441.8	14.0	
															Boring Terminated at Elevation 441.8 ft IN SILTY CLAY		
															ELEVATION INTERPRETED FROM CONTOUR LINES ON LOCATION MAP PROVIDED BY CRAIG MILLER ON 10/4/2011.		

NCDOT BORE SINGLE 092\_GEO\_BH.GPJ NC\_DOT.GDT 10/14/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 30000.13.2		TIP N/A		COUNTY WAKE		GEOLOGIST Milkovits, J. I.											
SITE DESCRIPTION WESTGATE ROAD MODULAR LOCATION							GROUND WTR (ft)										
BORING NO. 5		STATION N/A		OFFSET N/A		ALIGNMENT N/A											
COLLAR ELEV. 444.9 ft		TOTAL DEPTH 5.0 ft		NORTHING 785,884		EASTING 2,071,230											
DRILL RIG/HAMMER EFF./DATE N/A		DRILL METHOD Hand Auger			HAMMER TYPE N/A												
DRILLER Conley, H. R.		START DATE 10/14/11		COMP. DATE 10/14/11		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT					BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100	ELEV. (ft)	DEPTH (ft)					
445																	444.9 GROUND SURFACE 0.0
																	443.9 ARTIFICIAL FILL 1.0
																	BROWN, SLIGHTLY MICACEOUS, SANDY SILT
440																	439.9 TRIASSIC RESIDUAL 5.0
																	YELLOW, RED, AND WHITE, SILTY CLAY
																	Boring Terminated at Elevation 439.9 ft IN SILTY CLAY
																	ELEVATION INTERPRETED FROM CONTOUR LINES ON LOCATION MAP PROVIDED BY CRAIG MILLER ON 10/4/2011.

NCDOT BORE SINGLE 092\_GEO\_BH.GPJ NC\_DOT.GDT 10/24/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 30000.13.2		TIP N/A		COUNTY WAKE		GEOLOGIST Milkovits, J. I.												
SITE DESCRIPTION WESTGATE ROAD MODULAR LOCATION							GROUND WTR (ft)											
BORING NO. 6		STATION N/A		OFFSET N/A		ALIGNMENT N/A												
COLLAR ELEV. 445.2 ft		TOTAL DEPTH 4.0 ft		NORTHING 785,829		EASTING 2,071,171												
DRILL RIG/HAMMER EFF./DATE N/A		DRILL METHOD Hand Auger			HAMMER TYPE N/A													
DRILLER Conley, H. R.		START DATE 10/14/11		COMP. DATE 10/14/11		SURFACE WATER DEPTH N/A												
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT					BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100	ELEV. (ft)	DEPTH (ft)						
450																		
445																		

GROUND SURFACE 0.0

445.2

444.7

441.2

0.0

0.0

4.0

Boring Terminated at Elevation 441.2 ft IN CLAYEY SILT

ELEVATION INTERPRETED FROM CONTOUR LINES ON LOCATION MAP PROVIDED BY CRAIG MILLER ON 10/4/2011.

NCDOT BORE SINGLE 092\_GEO\_BH.GPJ NC\_DOT.GDT 10/24/11

Section 01100 – SUMMARY

Part 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section includes the following:
  - 1. General project description
  - 2. Project Team
  - 3. Contract documents for a formal contract
  - 4. Owner furnished material, equipment and/or labor
  - 5. Specification formats and conventions

1.3 GENERAL PROJECT DESCRIPTION

- A. This project will be bid and contracted as a Single Prime Contract. The work under this project includes the installation of a modular building with the associated parking, water service utility, sewer service utility and storm drainage to serve the property. Temporary erosion control measures will be installed to serve the project during construction.

- 1. Location: The project is located at 8917 Midway West Road, between Interstate 540 and Westgate Road in Raleigh, Wake County, North Carolina.

1.4 PROJECT TEAM

- A. Owner:
  - 1. North Carolina Department of Transportation  
Facilities Management Division  
1 South Wilmington Street  
Raleigh, NC 27601
- B. Civil Engineer:
  - 1. SEPI Engineering & Construction, Inc.  
1025 Wade Avenue  
Raleigh, NC 27605  
(919) 789-9977  
FAX (919) 789-9591

1.5 CONTRACT DOCUMENTS



- A. The General and Supplementary Conditions, bound herewith.
- B. The Drawings, as listed in the “Index of Drawings”, on the Drawing Cover sheet.
- C. The Specification Sections, as listed in the “Table of Contents”, bound herein.
- D. The Addenda and Modifications (if any) issued during the bid period.

#### 1.6 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC’s “MasterFormat” numbering system.
  - 1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
  - 2. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows.
  - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
  - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjective mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
    - a. The words “shall”, “shall be”, or “shall comply with”, depending on the context, are implied where a colon (;) is used within a sentence or phrase.

PART 2—PRODUCTS (NOT USED)

PART 3—EXECUTION (NOT USED)

END OF SECTION 01100

Section 01310 – PROJECT MANAGEMENT AND COORDINATION

Part 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Administrative and supervisory personnel
  - 2. Project meetings
  - 3. Requests for Information (RFIs)

- B. Related Sections include the following:

- 1. Drawings and general provisions of the Contract Documents, including General and Supplementary General Conditions and other Division 1 Specifications Sections, apply to this section.

1.3 DEFINITIONS

- A. RFI: Request from Contractor seeking information or clarification of the Contract Documents.

1.4 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, which depend on each other for proper installation, connection, and operation.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's Construction Schedule
  - 2. Preparation of the Schedule of Values
  - 3. Installation and removal of temporary facilities and controls
  - 4. Delivery and processing of submittals
  - 5. Progress meetings

6. Preinstallation conference
7. Startup and adjustment of systems
8. Project closeout activities

#### 1.5 SUBMITTALS

- A. Key Personnel Names: Within 15 days prior to start of construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers.

#### 1.6 PROJECT MEETINGS

- A. General: The Engineer will schedule and conduct meetings and conferences at Project site.
1. Attendees: The Engineer will inform the Contractor as to meeting dates and time and which individuals whose presence is required.
  2. Minutes: The Engineer will record significant discussions and agreements achieved and distribute the meeting minutes to everyone in attendance plus the Owner.
- B. Preconstruction Conference: The Engineer will schedule a preconstruction conference before starting construction, at a time convenient to Owner, and Contractor, but no later than 15 days after execution of the Agreement. The conference will be held at Project site or another convenient location. The meeting will review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor's project manager and superintendent; major subcontractors; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Items of significance that could affect progress, including the following will be discussed:
    - a. Tentative construction schedule
    - b. Phasing (if any)
    - c. Critical work sequencing and long-lead items
    - d. Designation of key personnel and their duties
    - e. Procedures for processing field decisions and Change Orders
    - f. Procedures for RFIs
    - g. Procedures for testing and inspecting
    - h. Procedures for processing Applications for Payment
    - i. Distribution of the Contract Documents
    - j. Submittal procedures
    - k. LEED requirements (if any)

- l. Preparation of Record Documents
  - m. Use of the premises
  - n. Work restrictions (if any)
  - o. Owner's occupancy requirements
  - p. Responsibility for temporary facilities and controls
  - q. Construction waste management and recycling
  - r. Parking availability
  - s. Office, work, and storage areas
  - t. Equipment deliveries and priorities
  - u. First aid
  - v. Security
  - w. Progress cleaning
3. Minutes: Engineer will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Engineer of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. The Contract Documents
    - b. Options
    - c. Related RFIs
    - d. Related Change Orders
    - e. Purchases
    - f. Deliveries
    - g. Submittals
    - h. Review of mockups
    - i. Possible conflicts
    - j. Compatibility problems
    - k. Time schedules
    - l. Weather limitations
    - m. Manufacturer's written recommendations
    - n. Warranty requirements
    - o. Compatibility of materials
    - p. Acceptability of substrates
    - q. Temporary facilities and controls
    - r. Space and access limitations
    - s. Regulations of authorities having jurisdiction
    - t. Testing and inspecting requirements
    - u. Installation procedures

- v. Coordination with other work
  - w. Required performance results
  - x. Protection of adjacent work
  - y. Protection of construction and personnel
- 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  - 4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
  - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Progress meetings will be conducted monthly or when scheduled by the Engineer.
- 1. Attendees: In addition to the Owner, and Engineer, the Contractor, critical subcontractors, suppliers, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Review and correct of approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements
      - 2) Sequence of operations
      - 3) Status of submittals
      - 4) Deliveries
      - 5) Off-site fabrication
      - 6) Access
      - 7) Site utilization
      - 8) Temporary facilities and controls

- 9) Progress cleaning
  - 10) Quality and work standards
  - 11) Status of correction of deficient items
  - 12) Field observations
  - 13) RFIs
  - 14) Status of proposal requests
  - 15) Pending changes
  - 16) Status of Change Orders
3. Minutes: Engineer will record and distribute to Contractor the meeting minutes.
  4. Reporting: Engineer will distribute minutes of the meeting to the Contractor and Owner.

#### 1.7 REQUESTS FOR INFORMATION (RFIs)

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
  1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
  1. Project name
  2. Date
  3. Name of Contractor
  4. Name of Engineer
  5. RFI number, numbered sequentially
  6. Specification Section number and title and related paragraphs, as appropriate
  7. Drawing number and detail references, as appropriate
  8. Field dimensions and conditions, as appropriate
  9. Contractor's suggested solution(s): If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  10. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation
- C. Engineer's Action: Engineer will review each RFI, determine action required, and return it. Allow seven working days for Engineer's response for each RFI.
  1. The following RFIs will be returned without action:

- a. Requests for approval of substitutions
  - b. Requests for coordination information already indicated on the Contract Documents
  - c. Requests for adjustments in the Contract Time or the Contract Sum
  - d. Requests for interpretation of Engineer's actions on submittals
  - e. Incomplete RFIs or RFIs with numerous errors
2. Engineer's action may include a request for additional information, in which case Engineer's time for response will start again.
  3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal.
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 10 days of receipt of the RFI response.
- D. On receipt of Engineer's action, review response and notify Engineer within seven days if Contractor disagrees with response.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 01310

Section 01330 – SUBMITTAL PROCEDURES

Part 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract Documents, including General and Supplementary General Conditions and other Division 1 Specifications Sections, apply to this section.
- B. Related Sections include the following:
  - 1. Drawings and general provisions of the Contract Documents, including General and Supplementary General Conditions and other Division 1 Specification Sections, apply to this section.
  - 2. Divisions 2 through 16 Sections for specific requirements for submittals in those Sections

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1.3 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Engineer for Contractor’s use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that required sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Submittals Schedule: Comply with requirements of State Construction Office for delivery of Submittal Log.
- D. Contractor’s Review: Prior to submittal to the Engineer, the Contractor shall check and review shop drawings, product data and samples for conformance with requirements of the Contract Documents. Stamp each submittal to indicate



review or note any deviation from the requirements. Shop drawings submitted to Engineer without Contractor's stamp or incomplete, disorderly, or unbound submittals will be returned without review or comment.

- E. Engineer's Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 20 days from the date of receipt for review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Resubmittal Review: Same as initial review.
- F. Submittal Form: Use a standard form for each submittal. Mark the submittal form with project name, date, contractor/subcontractor, submittal name and other information as required. Package submittal appropriately and ship with transmittal form showing above information, number of copies, and required action. Note any special deadline on review, approval period.
- G. Copies: Submit the following number of copies for each type of submittal:
- |                |   |
|----------------|---|
| Shop Drawings: | Six (6) prints. Three (3) will be returned to the Contractor.   |
| Product Data:  | Six (6) copies. Three (3) will be returned to the Contractor.   |
| Samples:       | One (1) set for Engineer's review and retention.<br>Furnish an additional set if the Contractor desires for one to be returned. |
- Submit additional copies when more than the indicated amount must be returned to the Contractor

## PART 2 – PRODUCTS

### 2.1 ACTION SUBMITTALS

- A. Shop Drawings: Specially-prepared technical data consisting of drawings, diagrams, schedules, and similar information not in standard printed form for application to more than one project.

1. Prepare shop drawings accurately to a scale sufficient to clearly show information pertinent to the submitted item or assembly. Include the following types of information where applicable:
  - a. Working erection dimensions and/or field dimensions. Sectional views and/or arrangement of components. Details including connection to other elements. Types of materials and finishes.
  - b. Project identification including name, date, vendor's job number, drawing number and descriptive title of submitted items.
  
- B. **Project Data:** Includes standard printed information on materials, products and systems; not specifically-prepared for this project, other than the designation of selections from among available choices. Collect data into one submittal for each unit of work or system; mark each copy to show choices or options applicable to project. When submittal contains multiple pages relating to a single area of the project, submit in portfolio binders showing project identification on front cover. Include manufacturer's printed recommendations for application and use, compliance with standards, and special coordination requirements.
  
- C. **Samples:** Furnish actual specimens of materials, products or units of work which accurately represent finishes, patterns, color, textures, and specified characteristics. Large mock-ups or field-constructed samples will be inspected on the job site. Label samples or sample containers with sample name, date, project identification and other pertinent data.

### **PART 3 – EXECUTION**

#### **3.1 CONTRACTOR'S REVIEW**

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
  
- B. **Approval Stamp:** Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

#### **3.2 ENGINEER'S ACTION**

- A. **General:** Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
  
- B. **Action Submittals:** Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. Approved, No Exceptions Noted
  2. Approved, Make Corrections Noted
  3. Revise and Resubmit
  4. Rejected
- C. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.
- E. Approval of shop drawings by the Engineer shall not be construed as relieving the Contractor from responsibility for compliance with the design or terms of the contract documents nor from responsibility of errors of any sort in the shop drawings, unless such lack of compliance or errors first have been called in writing to the attention of the Engineer by the Contractor.

END OF SECTION 01330

Section 01400 – QUALITY REQUIREMENTS

Part 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirement.
  - 1. Specific quality-assurance and –control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor’s other quality-assurance and –control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and –control services required by Engineer, or authorities having jurisdiction are not limited by provisions of this section.
- C. Related Sections include the following:
  - 1. Division 1 Section 01330 – “Submittal Procedures”.
  - 2. Other Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.

- C. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- D. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- E. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Using a term such as “carpentry” does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name such as “carpenter.” It also does not imply that requirements specified apply exclusively to trades people of the corresponding generic name.
- I. Experienced: When used with an entity, “experienced” means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

#### 1.4 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Engineer for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

## 1.5 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specifications Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Testing Agency Qualifications: An NRTL or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
- G. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

## 1.6 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting that are engaged to perform.
  2. Payment for these services will be made by the Owner.
  3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. **Manufacturer’s Field Services:** Where indicated, engage a factory-authorized service representative to inspect field assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section “Submittal Procedures.”
- C. **Testing Agency Responsibilities:** Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of the Contractor.
- D. **Associated Services:** Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspection equipment at Project site.
- E. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and –control services with a minimum of delay and to avoid

necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

## PART 2 – PRODUCTS (Not Used)

## PART 3 – EXECUTION

### 3.1 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
  1. Date test or inspection was conducted.
  2. Description of the Work tested or inspected.
  3. Date test or inspection results were transmitted to Engineer.
  4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Engineer's reference during normal working hours.

### 3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400



Section 01500 – TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract Documents, including General and Supplementary General Conditions and other Division 1 Specifications Sections, apply to this section.
- B. Related Sections include the following:
  - 1. Division 1 Section 01700 - “Execution Requirements” for progress cleaning requirements.

1.2 SUMMARY

- A. This Section includes requirements for the following temporary utilities, support facilities, and security and protection facilities:
  - 1. Types of Temporary Utility Services:
    - a. Water
    - b. Self-contained toilet enclosures
    - c. Electric power
    - d. Telephone and fax machine
    - e. Heat and ventilation
  - 2. Types of Temporary Facilities
    - a. Field office
    - b. Storage Area
    - c. Collection/disposal of waste materials
    - d. Temporary fire protection
    - e. Temporary signage including Project sign
  - 3. Types of Security/Protection Provisions
    - a. Environmental protection
    - b. Erosion and sediment control
    - c. Stormwater control
    - d. Barricades, warning sign and lights

1.3 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each

permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

**PART 2 – PRODUCTS (Not Used)**

**PART 3 – EXECUTION**

**3.1 INSTALLATION, GENERAL**

**A. Temporary Facilities and Controls**

1. Regulations: The Contractor shall comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to, the following:
  - a. Building Code requirements.
  - b. Health and safety regulations.
  - c. Utility company regulations.
  - d. Police, Fire Department and Rescue Squad rules.
  - e. Environment Protection regulations.
2. Standards: The Contractor shall comply with NFPA Code 241, "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."
  - a. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70, "National Electric Code."
3. Inspections: The contractor shall arrange for authorities having jurisdiction to inspect and test each temporary utility before use and obtain required certifications and permits.
4. Conditions of Use: The Contractor shall keep temporary services and facilities clean and neat in appearance and operate in safe and efficient manner. Contractor shall relocate temporary services and facilities as Work progresses so as not to overload facilities or permit them to interfere with progress. Contractor shall take necessary fire prevention measures and must not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on site.
5. Equipment: The Contractor shall provide new equipment or, if acceptable to Engineer, undamaged, previously used equipment in serviceable condition that is suitable for the use intended.
6. Location: The Contractor may locate temporary facilities within the confines of the Project site and use the site for the purpose of material lay down.

**3.2 TEMPORARY UTILITY INSTALLATION**

- A. Water Service: Provide and maintain water service as required for construction purposes. All hoses, valves, and other items of distribution are the responsibility of the General Contractor.
  - 1. Drinking Water: Provide suitable drinking water, adequate for all personnel at Project site. Furnish paper cups and waste receptacles.
- B. Sanitary Facilities: Provide temporary toilets for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- C. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- D. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- E. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations, including machinery, tools and equipment, and initial testing of various permanent and electrical systems.
- F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
  - 1. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion.
- B. Storage Sheds: Provide sheds sized, furnished and quipped to accommodate materials and equipment needed for construction purposes.
- C. Collection/Disposal of Waste Materials: Contractor shall establish and maintain a system for his personnel and the personnel of the subcontractors to collect and store waste materials until their removal from the site. Storage facilities should be a container or fenced yard designed to contain various types of waste materials and be constructed in such a manner to prevent material from being

blown across site. Removal of waste material from the site is to be on a weekly basis (minimum). Burning or burying material on site is not permitted.

- D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
  - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
  - 2. Remove snow and ice as required to minimize accumulation.
- E. Parking: Shall be limited to areas approved by the Owner. Parking areas may change at the discretion of the Owner.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Erosion and Sedimentation Control During Construction
  - 1. In accepting the terms of this contract, the Contractor agrees to pursue a vigorous program of temporary erosion and sedimentation control measures as indicated in the drawings and as directed by the Engineer. Erosion and sedimentation control features shall be in place prior to earth disturbing activities and must be maintained continually throughout the life of the project.
  - 2. The project site is subject to periodic inspections by the North Carolina DENR to ensure conformance with erosion control regulations. The Contractor will cooperate to the fullest extent in maintaining devices for erosion and sedimentation control and immediately make additions, corrections, and modifications to these devices as directed by the Engineer. The costs for installation and maintenance of erosion and sedimentation control devices shall be included in the lump sum bid.
- C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

- E. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonable predictable and controllable fire losses. Comply with NFPA 241.
1. Prohibit smoking in construction areas.
  2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  3. Develop and supervise an overall fire-prevention and –protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion or as otherwise dictated by the Engineer.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section “Closeout Procedures.”

END OF SECTION 01500

Section 01524 – CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes requirements for the following:
  - 1. Disposing of non-hazardous construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Develop waste management plan that results to waste material and debris being promptly removed from the site and the Owner's property.
  - 1. Construction Waste: Building and site improvements and other solid waste resulting from construction, remodeling, renovation or repair operations includes:
    - a. Site-clearing waste.
    - b. Masonry and CMU.
    - c. Lumber.
    - d. Plywood.
    - e. Metals.
    - f. Roofing.
    - g. Insulation.
    - h. Carpet.
    - i. Gypsum board.
    - j. Piping.
    - k. Electrical conduit.

1. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100% of the following uncontaminated packaging materials:
  - 1) Paper.
  - 2) Cardboard.
  - 3) Boxes.
  - 4) Plastic sheet and film.
  - 5) Polystyrene packaging.
  - 6) Wood crates.
  - 7) Plastic pails.

#### PART 2 – PRODUCTS (Not Used)

#### PART 3 – EXECUTION

##### 3.1 PLAN IMPLEMENTATION

- A. General: Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

##### 3.2 DISPOSAL OF WASTE

- A. General: Remove waste materials from Project site and legally dispose of them in an off-site landfill acceptable to authorities having jurisdiction.
  1. Drinking Water: Provide suitable drinking water, adequate for all personnel at Project site. Furnish paper cups and waste receptacles.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  3. The Contractor shall be responsible for the procurement of all permits or rights as governed by local ordinances for disposal of materials at said landfill or disposal site.
  4. The Contractor shall take appropriate measures, while hauling waste materials to a landfill or disposal site, to prevent demolition debris from spilling and thus affecting the safe use of public roads. Debris control during the course of disposal and removal from the project site on public and/or haul roads will be considered incidental to the Work covered under the Contract Documents.
- B. Burning: Do not burn waste materials.

- C. Off-Site Disposal: Transport waste materials off Owner's property and legally dispose of them, except as otherwise specified.

3.3 DUST, DEBRIS AND SMOKE CONTROL

- A. The Contractor shall control dust, debris and smoke throughout the life of the project within the Project site. Dust, debris and smoke control shall not be considered effective where the amount of dust, debris or smoke creates a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property.

END OF SECTION 01524



## SECTION 01700 – EXECUTION REQUIREMENTS

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract Documents, including General and Supplementary General Conditions and other Division 1 Specifications Sections, apply to this section.
- B. Related Sections include the following:
  - 1. Drawings and general provisions of the Contract Documents, including General and Supplementary General Conditions and other Division 1 Specifications Sections, apply to this section.

#### 1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Site availability and access.
  - 2. Site information and examination of conditions.
  - 3. Construction layout.
  - 4. Field engineering and surveying.
  - 5. General installation of products.
  - 6. Coordination of Owner-installed products.
  - 7. Progress cleaning.
  - 8. Starting and adjusting.
  - 9. Protection of installed construction.
  - 10. Correction of the Work.

### PART 2 – PRODUCTS (Not Used)

### PART 3 – EXECUTION

#### 3.1 SITE INFORMATION AND EXAMINATION

- A. Existing Conditions: The existence and location of site improvements and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of existing items which may affect the Work.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction which may affect the Work.

1. Before construction, verify the location and invert elevation at points of connection or sanitary sewer, storm sewer, and water-service piping; and underground electrical services to avoid any conflicts.

### 3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Engineer. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

### 3.3 CONSTRUCTION LAYOUT

- A. Control Points: The Contractor shall lay out all work and make all surveys necessary for the satisfactory completion of the work in accordance with the Contract Documents. The Contractor shall be responsible for all measurements required for the execution of the work.
- B. Tools and Equipment: The Contractor shall furnish, at its expense, such stakes, templates, platforms, equipment, tools, and materials, and all labor as may be required in layout of any part of the work.
- C. The Contractor shall provide competent and experience personnel for all layout work. Copies of all field notes, field computations, and other records taken in the field by the Contractor for the purpose of layout, progress, initial and final surveys shall be furnished to the Engineer by the Contractor if requested. All surveys made by the Contractor shall be made under the supervision of a licensed Professional Surveyor registered in the State of North Carolina.

### 3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
  1. Do not change or relocate existing benchmarks or control points without prior written approval of Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Engineer before proceeding.

2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points.

### 3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
- G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas weekly. Enforce requirements strictly. Dispose of materials lawfully.
- B. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  1. Remove liquid spills promptly.
  2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

- C. **Installed Work:** Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- D. **Concealed Spaces:** Remove debris from concealed spaces before enclosing the space.
- E. **Exposed Surfaces in Finished Areas:** Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- F. **Waste Disposal:** Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- G. **During handling and installation,** clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- H. **Clean and provide maintenance on completed construction** as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- I. **Limiting Exposures:** Supervise construction operations to assure that not part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.7 STARTING AND ADJUSTMENT

- A. **Start equipment and operating components to confirm proper operation.** Remove malfunctioning units, replace with new units, and retest.
- B. **Adjust operating components for proper operation without binding.** Adjust equipment for proper operation.
- C. **Test each piece of equipment to verify proper operation.** Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. **Manufacture's Field Service:** If a factory-authorized service representative is required to inspect field-assembled components and equipment installation.

### 3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. **Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.**

- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700

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SECTION 02200 - EARTHWORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:

1. Preparing and grading sub-grades for pavements.
2. Excavating and backfilling for underground utilities.

- B. Related Sections: Related sections include the following:

1. Division 2 Section 02210 – "Site Clearing" for site stripping, grubbing, topsoil removal, and tree protection.
2. Division 2 Section 02250 – "Erosion and Sediment Control" for erosion and sediment control requirements.

1.3 GEOTECHNICAL REPORT

- A. Report:

1. The geotechnical report was performed by the North Carolina Department of Transportation Geotechnical Engineering Unit on October 24, 2011 and signed by Nathan D. Mohs. The project reference number is 30000.13.2.

- B. Site Maintenance

1. Site Maintenance: In addition, the nature of the soils, both surface and near surface, will require discing and drying after normal rain events in order to keep the site accessible and in a condition conducive to construction activities. The *Contractor shall be responsible to take whatever measures are necessary to insure reasonable accessibility to and on the construction site so that undue delays are avoided under normal weather conditions. These measures shall include, but no be limited to, the following:*
  - a. Maintaining the surface of the soils in a manner to promote drainage runoff and avoid ponding of water, especially prior to predicted rain events.
  - b. Avoiding operation of temporary water sources or hoses in a manner that will cause unnecessary and repeated wetting of the site.
  - c. Filling severely rutted areas that are ponding water during the construction activities or after rain events with drainage fill material to

- d. assist drying and allow construction activities to continue. Providing discing and drying of surface soils and soils intended for filling or backfilling as required to promote accelerated drying of those materials. After successful drying efforts or prior to predicted rain events, grade the disced areas back to a smooth condition to promote drainage runoff.
- e. Controlling vehicular traffic, both construction and personal on the site in a manner to prevent undue damage to soils whenever possible and practical.
- f. Providing temporary construction access roads and staging areas of crushed stone or other materials around the construction site which will better withstand the weather and traffic and keep the site accessible immediately or shortly after rain events.
- g. Maintaining on-site a stockpile of suitable drainage fill material available to fill severely wetted and rutted areas which occur either during construction activities or after rain events and which hamper construction activities.
- h. Any claims for weather related delays considered shall be considered with particular attention paid to the Contractor's efforts in regard to the above requirements.

#### 1.4 DEFINITIONS

- A. Excavation consists of the removal of material encountered to sub-grade elevations and the reuse or disposal of materials removed.
- B. Sub-grade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below sub-base, drainage fill, or topsoil materials.
- C. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.
- D. Base Course: The layer placed between the sub-base and surface pavement in a paving system. Base Course shall be CABC stone. Base Course shall be installed under exterior asphalt paving and concrete paving.
- E. Drainage Fill: Course of washed granular material supporting slab-on-grade placed to cut off upward capillary flow of pore water. Drainage Fill shall be # 57 stone. Drainage Fill shall be installed under all interior concrete slabs on grade.
  - 1. *Sand is not considered an acceptable substitute for drainage fill.*
- F. Unauthorized excavation consists of removing materials beyond indicated sub-grade elevations or dimensions without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be at the Contractor's expense.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.

- H. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.

#### 1.5 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division I Specification Sections.
- B. Product data for the following:
1. Filter fabric.
- C. Samples of the following:
1. 20-lb samples, sealed in air-tight containers, of each proposed fill and backfill soil material from on-site or borrow sources.
  2. 12-by- 12-inch sample of filter fabric.
- D. Test Reports: In addition to test reports required under field quality control, submit the following:
1. Laboratory analysis of each soil material proposed for fill and backfill from on-site and borrow sources.
  2. One optimum moisture-maximum density curve for each soil material.
  3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.

#### 1.6 QUALITY ASSURANCE

- A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.
- B. Testing and Inspection Service: Owner will employ a qualified independent geo-technical engineering testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing.
- C. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division I Section "Project Meetings."
1. Before commencing earthwork, meet with representatives of the governing authorities, Owner, Engineer, consultants, Geo-technical Engineer, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

#### 1.7 PROJECT CONDITIONS



- A. Site Information: Conditions are not intended as representations or warranties of accuracy or continuity between soil borings. The Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.
1. Additional test borings and other exploratory operations may be performed by Contractor, at the Contractor's option; however, no change in the Contract Sum will be authorized for such additional exploration.
- B. Existing Utilities: Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult Utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
  2. Do not interrupt existing utilities serving facilities occupied by Owner or others, during occupied hours, except when permitted in writing by Engineer and utility company and then only after acceptable temporary utility services have been provided.
  3. Provide minimum of 48-hour notice to Engineer, and receive written notice to proceed before interrupting any utility.
  4. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff of services if lines are active.
  5. Use of Explosives: Do not bring explosives onto site.
- C. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.
1. Operate warning lights as recommended by authorities having jurisdiction.
  2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
  3. Perform excavation by hand within drip line of large trees to remain. Protect root systems from damage or dry out to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with moistened burlap.

## PART 2 – PRODUCTS

### 2.1 SOIL MATERIALS

- A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.
- B. Satisfactory Soil Materials: Any low plasticity sand, silt or clay having Unified Soil Classifications of SP, SM, SC, ML, OR CL, free of rock or gravel larger than 2 inches in

any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.

1. Suitable materials containing excessive moisture will not be deemed unsuitable due the excess moisture, but shall be moisture conditioned as required to allow compaction. Refer to moisture control requirements later in this Section.
- C. Unsatisfactory Soil Materials: Highly plastic and organic soils including highly plastic clays, silts and peats with Unified Soil Classifications of CH, 1~111, OH and OL, as well as soils containing in excess of 5% organics by weight will be deemed unsuitable and will be disposed of or stockpiled for use in non-structural areas as directed by the Engineer.
1. Exceptions to the classification of unsuitable soils will be highly plastic soils which are demonstrated not to have objectionable shrink and swell properties or highly plastic soils which can be placed in such a manner as to not adversely affect the performance of the completed structure. These soils are limited to soils having a liquid limit less than 60 and a plastic index less than 25.
  2. With the Engineer's approval, highly plastic soils can be left in-place and can be reused in deep fill sections provided the materials can be properly re-compacted and be covered with a minimum of 3 feet of low plasticity material selected by the Engineer.
  3. The Contractor shall notify the Engineer prior to undercutting or wasting of unsuitable soils as defined by this section so that classification of the unsuitable material can be confirmed.
- D. Backfill and Fill Materials: Satisfactory soil materials.
1. Sub-base and Base Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand, ASTM D 2940, with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
  2. Engineered Fill: Sub-base or base materials.
  3. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2-inch sieve and not more than 5 percent passing a No. 8 sieve.
  4. Filtering Material: Evenly graded mixture of natural or crushed gravel or crushed stone and natural sand, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 50 sieve.
  5. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.
- E. Bedding Material: Sub-base or base materials with 100 percent passing a 1 -inch sieve and not more than 8 percent passing a No. 200 sieve.

## 2.2 EARTH FILL

Earth used as fill material shall be obtained on site as required to bring the site to final grade. If insufficient quantities of suitable earth are available on site, the Contractor shall

obtain elsewhere at his expense. If excess material is excavated than cannot be properly placed on the site, then the Contractor shall remove from the site at his expense. All such material, regardless of where obtained, must be suitable for structural fill unless otherwise authorized by the Engineer or Geotechnical firm. To be suitable for structural fill, the earth must be free of organic matter (stumps, roots, sod, topsoil, and the like), frozen material, rocks larger than 2 inches, and any trash or debris. The top 12 inches of fill shall be free of any material that will not pass a 3 inch sieve. The fill material shall have a maximum dry density of at least 90 pounds per cubic foot. Also, the earth must be near the optimum moisture content, as determined by the independent testing agency, to achieve satisfactory compaction (generally within 5% of optimum). The Contractor shall add water if material is too dry. Material that is too wet shall not be used until it dries out to acceptable moisture content. The Contractor shall spread and disc material, or use other techniques, to facilitate drying as may be necessary to achieve the optimum moisture content.

### 2.3 EXCAVATION CLASSIFICATION

Earth excavation shall be classified into the following three categories unless otherwise specified elsewhere in the Contract Documents:

- A. Normal Excavation: All excavation not classified as “rock excavation” or “undercutting” shall be classified as “normal excavation.”
- B. Rock Excavation: Material which requires explosives or other unusual means to be excavated shall be classified as “rock excavation.”
- C. Undercutting: Material that must be removed in order to reach suitable material (up to 3 feet below subgrade) shall be classified as “undercutting.” This generally will be excessively wet soil, organic soil, or expansive clay. Any other material deemed unsuitable by the Engineer or by the independent testing agency shall also be undercut and removed. Only material that must be removed in order to support foundations, pavements, embankments, and the like shall be classified as “undercutting.” Material which is to be removed as part of the grading plan and which happens to also be “unsuitable” shall not be classified as “undercutting.” All material the Contractor desires to be paid for as “undercutting” must be reviewed and approved by the Architect, Engineer or independent testing agency prior to excavation in order to qualify for payment. It is the Contractor’s responsibility to notify the Architect or Engineer for this purpose. The unit price bid for undercutting shall be for removal of unsuitable material to not greater than 3 feet below design subgrade, and shall include all costs associated with disposal, finding suitable material and placing suitable material.

Unless earthwork has been bid under classifications, then no separate payment will be made for “rock excavation” or undercutting.”

## PART 3 – EXECUTION

### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage

caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

- B. Protect sub-grades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- D. Tree protection is specified in the Division 2 Section "Site Clearing."

### 3.2 DEWATERING

- A. Prevent surface water and subsurface or groundwater from entering excavations, from ponding on prepared sub-grades, and from flooding Project site and surrounding area.
- B. Protect sub-grades and foundation soils from softening and damage by rain or water accumulation.
- C. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of sub-grades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
- D. Establish and maintain temporary drainage ditches and other outside excavation limits to convey rainwater and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

### 3.3 EXCAVATION

- A. Stability of Excavations: Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.
  - 1. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- B. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good serviceable condition. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.
  - 1. Provide permanent steel sheet piling or pressure-creosoted timber sheet piling wherever subsequent removal of sheet piling might permit lateral movement of soil under adjacent structures. Cut off tops a minimum of 2'-6" below final grade

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and leave permanently in place.

- C. Excavation for Walks and Pavements: Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.
- D. Excavation for Utility Trenches: Excavate trenches to indicated slopes, lines, depths, and invert elevations.
  - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
  - 2. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
  - 3. Clearance: 12 inches each side of pipe or conduit.
- E. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape sub-grade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove stones and sharp objects to avoid point loading.
  - 1. For pipes or conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand excavate trench bottoms and support pipe and conduit on an undisturbed sub-grade.
  - 2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
  - 3. Where encountering rock or another unyielding bearing surface, carry trench excavation 6 inches below invert elevation to receive bedding course.
- F. Approval of Sub-grade: Notify Engineer when excavations have reached required sub-grade.
  - 1. When Engineer determines that unforeseen unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
  - 2. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.
  - 3. Reconstruct sub-grades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Engineer.
- G. Unauthorized Excavation: Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the Engineer.
  - 1. Fill unauthorized excavations under other construction as directed by the Engineer.
  - 2. Where indicated widths of utility trenches are exceeded, provide stronger pipe, or special installation procedures, as required by the Engineer.

- H. Storage of Soil Materials: Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent wind-blown dust.
  - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
- I. Backfill: Backfill excavations promptly, but not before completing the following:
  - 1. Acceptance of construction below finish grade including, where applicable, damp proofing, water proofing, and perimeter insulation.
  - 2. Surveying locations of underground utilities for record documents.
  - 3. Testing, inspecting, and approval of underground utilities.
  - 4. Concrete formwork removal.
  - 5. Removal of trash and debris from excavation.
  - 6. Removal of temporary shoring and bracing, and sheeting.
  - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

### 3.4 FILL

- A. Preparation: Remove vegetation, topsoil, debris, wet, and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills.
  - 1. Plow strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface.
  - 2. When sub-grade or existing ground surface to receive fill has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture-condition or aerate soil and re-compact to required density.
  - 3. Place fill material in layers to required elevations for each location listed below.
  - 4. Under grass, use satisfactory excavated or borrow soil material.
  - 5. Under walks and pavements, use sub-base or base material, or satisfactory excavated or borrow soil material.
  - 6. Under steps and ramps, use sub-base material.
- B. Moisture Control: Uniformly moisten or aerate sub-grade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
  - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air-dry satisfactory soil material that is too wet to compact to specified density.
  - 3. Drying excessively wet materials may require discing every 30 to 60 minutes, as necessary to lower moisture content to acceptable levels to allow compaction. Actual means and methods for achieving proper moisture conditioning and compaction are the sole responsibility of the Contractor and neither additional time nor payment shall be allowed for moisture conditioning required.

4. Stockpile or spread and dry removed wet satisfactory soil material.
- C. Compaction: Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
1. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.
  2. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density (Standard Proctor) according to ASTM D 698:
  3. Under structures, building slabs, steps, and pavements, compact the top 18 inches below sub-grade and each layer of backfill or fill material at 95 percent maximum dry density, except compact final 12" below pavements and floor slabs to 98 percent maximum dry density.
  4. Under walkways, compact the top 12 inches below sub-grade and each layer of backfill or fill material at 95 percent maximum dry density.
  5. Under lawn or unpaved areas, compact the top 12 inches below sub-grade and each layer of backfill or fill material at 90 percent maximum dry density.

### 3.5 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
1. Provide a smooth transition between existing adjacent grades and new grades.
  2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish sub-grades to required elevations within the following tolerances:
1. Lawn or Unpaved Areas: Plus or minus 0. 10 foot.
  2. Walks: Plus or minus 0. 10 foot.
  3. Pavements: Plus or minus 1/2 inch.
- C. Sub-base and Base Courses: Under pavements and walks, place sub-base course material on prepared sub-grades. Place base course material over sub-bases to pavements. Base shall be installed per NCDOT standard specifications.
1. Compact sub-base and base courses at optimum moisture content to required grades, lines, cross sections and thickness to not less than 95 percent of ASTM D 4254 relative density.
  2. Shape sub-base and base to required crown elevations and cross-slope grades.
  3. When thickness of compacted sub-base or base course is 6 inches or less, place materials in a single layer.
  4. When thickness of compacted sub-base or base course exceeds 6 inches, place

materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

- D. Pavement Shoulders: Place shoulders along edges of sub-base and base course to prevent lateral movement. Construct shoulders at least 12 inches wide of acceptable soil materials and compact simultaneously with each sub-base and base layer.
- E. Drainage Fill: Under slabs-on-grade, place drainage fill course on prepared sub-grade.
  - 1. Compact drainage fill to required cross sections and thickness.
  - 2. When compacted thickness of drainage fill is 6 inches or less, place materials in a single layer.
  - 3. When compacted thickness of drainage fill exceeds 6 inches thick place materials in equal layers, with no layer more than 6 inches thick nor less than 3 inches thick when compacted.

### 3.6 FIELD QUALITY CONTROL:

- A. Testing Agency Services: Allow testing agency to inspect and test each sub-grade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.
- B. Perform field in-place density tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2937 (drive cylinder method), as applicable.
- C. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves finished with the moisture gages according to ASTM D 3017.
- D. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Engineer.
- E. Paved Areas: At sub-grade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2,000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
- F. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in-place density test for each 150 feet or less of trench, but no fewer than two tests.
- G. When testing agency reports that sub-grades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, re-compact and retest until required density is obtained.

### 3.7 PROTECTION



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- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
1. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.
  2. Scarify or remove and replace material to depth directed by the Engineer; reshape and re-compact at optimum moisture content to the required density.
  3. Maintain graded areas as frequently as required to avoid standing water on the site in construction areas. Maintain equipment on site capable of dressing the damaged areas on a regular basis to prevent ponding of water caused by either inclement weather or construction activities.
- B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.
1. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.
  2. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

### 3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION 02200

SECTION 02210 - SITE CLEARING

PART 1-GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:

1. Protection of existing trees indicated to remain.
2. Removal of trees and other vegetation.
3. Topsoil stripping.
4. Clearing and grubbing.
5. Removing above-grade improvements.
6. Removing below-grade improvements.

- B. Related Sections:

1. Division 2 Section 02250 – "Erosion and Sediment Control" for erosion and sediment control requirements.

1.3 PROJECT CONDITIONS

- A. Traffic: Conduct site-clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.
- B. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements indicated to remain in place.
1. Protect improvements on adjoining properties and on Owner's property.
  2. Restore damaged improvements to their original condition, as acceptable to property owners at no additional cost to the project.
- C. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line.
1. Provide temporary guards to protect trees and vegetation to be left standing.
  2. No trees or vegetation outside the construction areas, or indicated not to be disturbed, are to be disturbed.

3. Water trees and other vegetation to remain within limits of contract work as required to maintain their health during course of construction operations.
4. Provide protection for roots over 1-1/2 inch in diameter that are cut during construction operations. Coat cut faces with an emulsified asphalt or other acceptable coating formulated to use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.
5. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations in a manner acceptable to Engineer. Employ a licensed arborist to repair damage to trees and shrubs.
6. Replace trees that cannot be repaired and restored to full-growth status, as determined by arborist.

#### 1.4 EXISTING SERVICES

- A. General: Indicated locations are approximate; determine exact locations before commencing Work.
  1. Arrange and pay for disconnecting, removing, capping, and plugging utility services. Notify affected utility companies in advance and obtain approval before starting this Work.
  2. Place markers to indicate location of disconnected services. Identify service lines and capping locations on Project Record Documents.

#### PART 2 – PRODUCTS (Not Applicable)

#### PART 3 – EXECUTION

##### 3.1 SITE CLEARING

- A. General: Remove trees, shrubs, grass, and other vegetation, improvements, or obstructions, as required, to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots.
  1. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
- B. Topsoil: Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, and without weeds, roots, and other objectionable material.
  1. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping.
  2. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
  3. Stockpile topsoil in storage piles in areas indicated or directed. Construct storage

- piles to provide free drainage of surface water.
4. Dispose of unsuitable or excess topsoil on site as specified or directed by Engineer for disposal of waste material.
- C. Clearing and Grubbing: Clear site of trees, shrubs, and other vegetation, except for those indicated to be left standing.
1. Completely remove stumps, roots, and other debris protruding through ground surface.
  2. Use only hand methods for grubbing inside drip line of trees indicated to remain.
  3. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
  4. Place fill material in horizontal layers not exceeding 6 inches loose depth, and thoroughly compact each layer to a density equal to adjacent original ground.
- D. Removal of Improvements: Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction.
1. Removing abandoned underground piping or conduits interfering with construction is included under this Section.
- 3.2 DISPOSAL OF WASTE MATERIALS
- A. Burning on Owner's Property: Burning is not permitted on Owner's property.
- B. Removal from Owner's Property: Owner shall have first right of refusal for all items. Owner shall direct where to place all savaged items. Unwanted items shall become the property of the contractor and shall be removed from the owner's property and legally disposed of off site.

END OF SECTION 02210

**SECTION 02250 - EROSION AND SEDIMENT CONTROL**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division I Specification sections, apply to work of this section.

**1.2 SUMMARY**

- A. The extent of erosion and sediment control work is indicated on the drawings and specified herein.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
  - 1. Division 2 Section 02200 – "Earthwork" for sub-grade preparation, grading, and placement operations.
  - 2. Division 2 Section 02210 – "Site Clearing" for site stripping, grubbing, topsoil removal, and tree protection.

**1.3 CODES AND STANDARDS**

- A. Comply with the rules and regulations for erosion and sediment control as adopted by the State of North Carolina and appropriate local authorities.
- B. Refer to the North Carolina Erosion and Sediment Control Planning and Design Manual (E&S Manual), latest edition, and any subsequent amendments for details, procedures and practices expected for compliance with these requirements. Contractor shall purchase and maintain a copy of the manual on site.
- C. Approvals: The approving authority for Erosion Control shall be the North Carolina Department of Transportation.

**1.4 CONTRACTOR'S RESPONSIBILITIES**

- A. The extent of major requirements is indicated on the drawings. The Contractor shall be responsible for monitoring the effectiveness of the erosion control measures, and for maintaining, repairing, replacing or modifying the control measures as required to effectively control siltation and erosion, including the protection of public rights-of-way and points of storm water discharge.
- B. No change orders or modifications to the Contract amount will be allowed for relocation, re-adjustments, or minor modifications required by the Engineer to erosion control measures indicated. Major changes in the control measures or any additional control measures required by the Engineer to contain the erosion and sediment on the site shall be paid for as changes in the work in accordance with the requirements of the Contract.
- C. Additional measures required as a result of the Contractor's failure to correctly follow the

approved construction sequence, maintain the installed measures, or properly repair the installed measures shall be the Contractor's responsibility; such additional measures shall be paid for by the Contractor.

- D. Violations: It shall be the Contractor's responsibility to provide the erosion and sediment control measures as shown on the drawings and as otherwise required and/or as directed by governing authorities. Citations, penalties or fines issued by the N.C. Department of Environment, Health and Natural Resources or other governing authorities due to the failure or negligence on the part of the Contractor to implement and/or maintain these control measures will be the sole responsibility of the Contractor, and the Contractor shall hold the Owner and Engineer harmless from any resulting damages or fines.

## **PART 2 – PRODUCTS**

### **2.1 MATERIALS**

- A. Refer to the E&S Manual for materials permitted with details required. Contractor's proposed use of materials not meeting the requirements of the E&S Manual must be approved in writing by the Engineer.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION OF CONTROLS**

- A. The control measures indicated or additionally required shall be maintained in good working condition through the duration of construction, including removal of silt build-up from areas and structures where the build-up interferes with the functioning of those control devices or structures, and installation of temporary grassing.
- B. The Contractor shall schedule all vegetative stabilization work in such a manner that will provide the Owner with reasonable stabilization compliance with the rules and regulations referred to above.
- C. Obtain an inspection and approval of installed measures from Engineer prior to beginning any grading operations.

### **3.2 REMOVAL OF TEMPORARY CONTROL MEASURES**

- A. Remove all temporary erosion and sediment control measures when approved by the North Carolina Department of Transportation and the Engineer at the end of the project. Repair, redress and reseed all areas disturbed as a result of the removal of control measures in a manner acceptable to Engineer.

END OF SECTION 02250

SECTION 02510 - WATER DISTRIBUTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Piping and specialties for combined potable-water and fire-protection water service.
- B. Related Sections include the following:
  - 1. Section 02200 – Earthwork

1.3 DEFINITIONS

- A. The following are industry abbreviations for plastic and rubber materials:
  - 1. NP: Nylon
  - 2. PE: Polyethylene
  - 3. PP: Polypropylene
  - 4. PTFE: Polytetrafluoroethylene
  - 5. PVC: Polyvinyl chloride.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

- A. MINIMUM WORKING PRESSURES
  - 1. Combined Potable-Water and Fire-Protection Water Service 160 psig (1100kPa)

1.5 SUBMITTALS

- A. PRODUCT DATA
  - 1. Water meters
  - 2. Backflow preventers
  - 3. Pipe and fittings
  - 4. Valves
  - 5. Fire hydrants
- B. SHOP DRAWINGS

1. Precast concrete structures
2. Frames and covers
3. Drains

**C. COORDINATION DRAWINGS**

1. For piping and specialties including relation to other services in same area. Show piping and specialty sizes and valves, meter and specialty locations, and elevations.

**D. RECORD DRAWINGS**

1. At Project closeout of installed water-service piping

**E. TEST REPORTS**

1. As specified in "Field Quality Control" Article in Part 3.

**F. PURGING AND DISINFECTING REPORTS**

1. As specified in "Cleaning" Article in Part 3

**G. MAINTENANCE DATA**

1. Water meters
2. Backflow preventers
3. Valves
4. Fire hydrants

**1.6 QUALITY ASSURANCE**

- A. Drawings indicate size, profiles, and dimensional requirements of water-service piping specialties and are based on specific types and models indicated. Other manufacturers' products with equal performance characteristics may be considered. Refer to Division I Section "Substitutions."
- B. Comply with requirements of the City of Raleigh, the NC Plumbing Code, and the NCSU Fire Marshal's office. Include tapping of water mains and backflow prevention.
- C. Comply with standards of the City of Raleigh, NC Plumbing Code, and the NCSU Fire Marshal's office. Include materials, installation, testing, and disinfection.
- D. Comply with NSF 61, "Drinking Water System Components--Health Effects," for materials for potable water.



- E. Comply with standards of the NCSU Fire Marshal's Office and NC Plumbing Code for fire-protection water-service piping. Include materials, hose threads, installation, and testing. Provide written verification of compliance with the NCSU Fire Marshal's standards for fire hydrants and hose threads.
- F. Provide listing/approval stamp, label, or other marking on piping and specialties made to specified standards.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

##### A. Preparation for Transport

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

##### B. During Storage

- 1. Use precautions for valves, including fire hydrants, according to the following:
  - a. Do not remove end protectors, unless necessary for inspection; then reinstall for storage
  - b. Protect from weather
  - c. Store indoors and maintain temperature higher than ambient dew-point temperature.
  - d. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

##### C. Handling

- 1. Use sling to handle valves and fire hydrants whose size requires handling by crane or lift.
- 2. Rig valves to avoid damage to exposed valve parts.
- 3. Do not use hand wheels or stems as lifting or rigging points.
- 4. Deliver piping with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.
- 5. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- 6. Protect flanges, fittings, and specialties from moisture and dirt.
- 7. Store plastic piping protected from direct sunlight.
- 8. Support to prevent sagging and bending.

1.8 PROJECT CONDITIONS

- A. Perform site survey, research public utility records, and verify existing utility locations.
- B. Contact utility-locating service for area where Project is located.
- C. Verify that water-service piping may be installed to comply with original design and referenced standards.

1.9 SITE INFORMATION

A. REPORTS

- 1. Reports on subsurface condition investigations made during design of Project are available for informational purposes only; data in reports are not intended as representations or warranties of accuracy or continuity of conditions between soil borings. Owner assumes no responsibility for interpretations or conclusions drawn from this information.

1.10 SEQUENCING AND SCHEDULING

- A. Coordinate connection to water main with the City of Raleigh
- B. Coordinate piping materials, sizes, entry locations, and pressure requirements with building water distribution piping.
- C. Coordinate with other utility work.

**PART 2 – PRODUCTS**

2.1 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

A. GATE VALVES

- 1. American
- 2. AVK Co.
- 3. Mueller
- 4. Kennedy
- 5. Clow
- 6. M & H
- 7. Waterous

**B. DRY-BARREL, POST FIRE HYDRANTS**

1. Kennedy
2. Mueller
3. Clow
4. American Darling
5. M & H
6. AVK
7. East Jordan Iron Works
8. US Pipe
9. Waterous

**C. WATER METERS**

1. All water meters shall be provided and installed by the City of Raleigh Public Utilities Department Meters Division.

**D. BACKFLOW PREVENTERS**

1. Shall be of the type and kind required by the City of Raleigh. Items not listed on the City of Raleigh's approved backflow list will not be accepted.

**E. PROTECTIVE ENCLOSURES**

1. Hot Box
2. HydroCowl, Inc.

**2.2 PIPES AND TUBES**

**A. DUCTILE-IRON, PUSH-ON-JOINT PIPE**

1. AWWA C-151, with cement-mortar lining and seal coat according to AWWA C104.
2. Rubber compression gasket according to AWWA C-111.

**B. DUCTILE-IRON, MECHANICAL-JOINT PIPE**

1. AWWA C151, with cement-mortar lining and seal coat according to AWWA C104.
2. Gland, rubber gasket, and bolts and nuts according to AWWA C-111.

**2.3 PIPE AND TUBE FITTINGS**

**A. DUCTILE-IRON, PUSH-ON-JOINT FITTINGS**

1. AWWA C-110, ductile-iron or cast-iron; or AWWA C-153, ductile-iron, compact type.
2. Cement-mortar lining and seal coat according to AWWA C-104
3. Rubber compression gaskets according to AWWA C-111.

**B. DUCTILE-IRON FITTINGS FOR PVC PIPE**

1. AWWA C110, ductile-iron or cast-iron; or AWWA C-153, ductile-iron, compact type; push-on- or mechanical-joint type.
2. Dimensions matching PVC pipe, cement-mortar lining and seal coat according to AWWA C-104.
3. Rubber compression gaskets according to AWWA C-111.

**2.4 JOINING MATERIALS**

**A. DUCTILE-IRON PIPING**

1. Mechanical Joints: AWWA C1 11 ductile-iron or gray-iron glands, high-strength steel bolts and nuts, and rubber gaskets.
2. Flanged Joints: AWWA C-115 ductile-iron or gray-iron pipe flanges, rubber gaskets, and high-strength steel bolts and nuts.
3. Gaskets: Rubber, flat face, 1/8 inch (3 mm) thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
4. Flange Bolts and Nuts: ASME B 18.2. 1, carbon steel, unless otherwise indicated.

**2.5 VALVES**

**A. NONRISING-STEM, RESILIENT-SEATED GATE VALVES, 3-INCH NPS (DN80) AND LARGER**

1. AWWA C509, gray- or ductile-iron body and bonnet
2. Bronze or gray- or ductile-iron gate
3. Resilient seats
4. Bronze stem, and stem nut
5. 200-psig (1380-kPa) minimum working-pressure design
6. Interior coating according to AWWA C-550
7. Push-on- or mechanical-joint ends

**B. NON-RISING-STEM GATE VALVES, 2-INCH NPS (DN50) AND SMALLER**

1. MSS SP-80
2. Body and screw bonnet of ASTM B 62 cast bronze
3. Class 125 threaded ends
4. Solid wedge, non-rising copper-silicon-alloy stem
5. Brass packing gland
6. PTFE impregnated packing

7. Malleable-iron hand wheel

## 2.5 VALVE BOXES

### A. CAST-IRON

1. Box with top section and cover with lettering "WATER"
2. Bottom section with base of size to fit over valve and barrel approximately 5 inches (125 mm) in diameter
3. Adjustable cast-iron extension of length required for depth of bury of valve.
4. Provide steel tee-handle operating wrench with each valve box. Include tee handle with one pointed end, stem of length to operate valve, and socket-fitting valve-operating nut.

## 2.6 VALVE PIT

### A. PRECAST CONCRETE

1. Precast, reinforced-concrete pit, as indicated on Drawings.

## 2.7 PROTECTIVE ENCLOSURES

### A. MANUFACTURED, WEATHER-RESISTANT ENCLOSURE

1. Housing: Reinforced-fiberglass construction
2. Drain opening for units with drain connection
3. Access doors with locking devices
4. Insulation inside housing
5. Precast concrete base of dimensions required to extend at least 6 inches (150 mm) beyond edges of housing
6. Anchoring devices to attach housing to base

## 2.8 FIRE HYDRANTS

### A. CAST-IRON BODY, COMPRESSION-TYPE VALVE

1. Opening against pressure and closing with pressure
2. 6-inch (DN150) mechanical-joint inlet
3. 150-psig (1035-kPa) minimum working-pressure design
4. City of Raleigh Fire Department standard threads and nozzles (National Standard Threads)
5. Two 2 ½ inch nozzles
6. One 5 inch Storz connection nozzle
  - i. Brass hydrant nozzle connection
  - ii. Hard anodized aluminum Storz ramps and lug
  - iii. Require a high torque Storz spanner wrench to remove the cap
7. All nozzles shall have cap and cap retaining chain

8. Hydrant valve opening shall be 5 ¼ inches
9. Bronze to bronze threads shall be provided between the hydrant seat or seat ring and the seating attaching assembly
10. Cast or ductile epoxy lined shoe, rubber drain seals and positive protective valve stop device
11. Shall be open left type
12. Shall have 6 inch hub end or mechanical joint elbow
13. Barrel shall have sufficient length to provide a minimum bury depth of 3 ½ feet
14. Barrel shall be of the breakaway impact type

## 2.9 ANCHORAGES

### A. CLAMPS, STRAPS, AND WASHERS

1. ASTM A 506, steel

### B. RODS

1. ASTM A 575, steel

### C. ROD COUPLINGS

1. ASTM A 197 (ASTM A 197M), malleable iron

### D. BOLTS

1. ASTM A 307, steel

### E. CAST IRON WASHERS

1. ASTM A 126, gray iron

### F. CONCRETE REACTION BACKING

1. Portland cement concrete mix, 3000 psig (20.7 Mpa)
2. Cement: ASTM C 150, Type 1
3. Fine Aggregate: ASTM C 33, sand
4. Coarse Aggregate: ASTM C 33, crushed gravel
5. Water: Potable

## 2.10 IDENTIFICATION

### A. WARNING TAPE

1. Refer to Division 2 Section 02200 – "Earthwork" for underground warning tape materials.
2. Arrange for detectable warning tapes made of solid blue film with metallic core and continuously printed black-letter caption

"CAUTION--WATER LINE BURIED BELOW."

### PART 3 - EXECUTION

#### 3.1 EARTHWORK

##### A. EXCAVATION, TRENCHING AND BACKFILLING

1. Refer to Division 2 Section 02200 – "Earthwork" for excavation, trenching, and backfilling.

#### 3.2 PIPING APPLICATIONS

##### A. GENERAL

1. Do not use flanges for underground piping.
2. Piping in boxes and structures, but not buried, may be joined with flanges instead of joints indicated.
3. Flanges may be used on aboveground piping.

##### B. POTABLE WATER SERVICE PIPING

1. 2-Inch NPS (DN100): PVC plastic, AWWA C-900, Class 150
2. Elastomeric seal according to ASTM F-177
3. Ductile iron fittings for PVC plastic pipe

##### C. FIRE-PROTECTION WATER PIPING

1. 8-Inch NPS (DN200): Ductile-iron, push-on-joint pipe
2. Ductile-iron, push-on-joint fittings
3. Gasketed joints
4. 8-Inch NPS (DN200): Ductile-iron, mechanical-joint pipe
5. Ductile-iron, mechanical-joint fittings

#### 3.3 VALVE APPLICATIONS

1. Drawings indicate valve types to be used.

#### 3.4 JOINT CONSTRUCTION

##### A. DUCTILE-IRON PIPING

1. Gasketed Joints: According to AWWA C600.
2. Gasketed Joints for Fire-Service Piping: According to UL 194 and AWWA C600.
3. Flanged Joints: Align flanges and install gaskets. Assemble joints by sequencing bolt tightening. Use lubricant on bolt threads.

#### 3.5 PIPING SYSTEMS - COMMON REQUIREMENTS

**A. GENERAL LOCATIONS AND ARRANGEMENTS**

1. Drawings indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated, unless deviations to layout are approved on Coordination Drawings.
2. Install piping at indicated slope.
3. Install components with pressure rating equal to or greater than system operating pressure.
4. Install piping free of sags and bends.
5. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
6. Install fittings for changes in direction and branch connections.

**B. PIPING CONNECTIONS**

1. Install flanges, in piping 2-1/2-inch NPS (DN65) and larger, adjacent to flanged valves and at final connection to each piece of equipment with flanged pipe connection.

**C. WATER SERVICE PIPING**

1. Extend water-service piping and connect to water-supply source at location and pipe size indicated.
2. Terminate piping with caps, plugs, or flanges as required for piping material.
3. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use thrust blocks, anchors, tie-rods and clamps, and other supports.

**3.6 PIPING INSTALLATION**

**A. WATER-MAIN CONNECTION**

1. Tap water main with size and in location as indicated according to requirements of the City of Raleigh.
2. Make connections larger than 2-inch NPS (DN50) with tapping machine according to the following:
  - i. Install tapping sleeve and tapping valve according to manufacturer's written instructions.
  - ii. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.
  - iii. Install gate valve onto tapping sleeve. Comply with AWWA C600.
  - iv. Install valve with stem pointing up and with cast-iron valve box.
  - v. Use tapping machine compatible with valve and tapping



- sleeve; cut hole in main.
- vi. Remove tapping machine and connect water-service piping.

**B. DUCTILE IRON PIPE**

1. Install ductile-iron piping according to AWWA C600.
2. Bury piping with depth of cover over top at least 36 inches (750 mm), with top at least 12 inches (300 nun) below level of maximum frost penetration.
3. Install piping under streets and other obstructions that cannot be disturbed, by tunneling, jacking, or combination of both.

**3.7 ANCHORAGE INSTALLATION**

**A. ANCHORAGES FOR TEES, PLUGS AND CAPS, BENDS, CROSSES, VALVES, AND HYDRANT BRANCHES**

1. Gasketed-Joint, Ductile-Iron, Potable-Water Piping: According to AWWA C600.
2. Gasketed-Joint, PVC Potable-Water Piping: According to AWWA M23.
3. Apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of installed ferrous anchorage devices.

**3.8 VALVE INSTALLATION**

**A. GENERAL**

1. Use mechanical-joint-end valves for 3-inch NPS (DN80) and larger underground installation.
2. Use threaded- and flanged-end valves for installation in pits.

**B. GATE VALVES**

1. Comply with AWWA C600.
2. Install underground valves with stem pointing up and with cast iron valve box.

**3.9 FIRE HYDRANT INSTALLATION**

**A. GENERAL**

1. Install each fire hydrant with separate gate valve in supply pipe, anchor with thrust blocks, and support in upright position.
2. AWWA-Type Fire Hydrants: Comply with AWWA MIT
3. NCSU Fire Marshal or representative to witness all thrust block installs, rodding supports, flushing, and pressure testing.

3.10 WATER-METER INSTALLATION:

All water meters shall be installed by the City of Raleigh Public Utilities Department Meters Division.

3.11 SLAB CONSTRUCTION AND INSTALLATION

A. CONCRETE

1. Install precast concrete slab according to ASTM C 891.

3.12 BACKFLOW PREVENTER INSTALLATION

A. BACKFLOW PREVENTER

1. Install backflow preventers of type, size, and capacity indicated.
2. Include valves and test cocks.
3. Install according to plumbing and health department authorities having jurisdiction.
4. Support backflow preventers, valves, and piping on brick or concrete piers.

3.13 IDENTIFICATION INSTALLATION

A. WARNING TAPE

1. Install continuous plastic underground warning tape during back-filling of trench for underground water-service piping.
2. Locate 6 to 8 inches (150 to 200 mm) below finished grade, directly over piping.

3.14 FIELD QUALITY CONTROL

A. PIPING TESTS

1. Conduct piping tests before joints are covered and after thrust blocks have hardened sufficiently.
2. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
3. Hydrostatic Tests: Test at 150 psig for 2 hours. Allowable leakage rate is 10 gallons/day/inch diameter/mile of pipe.
4. Prepare reports for testing activities and submit to Engineer and Owner.

3.15 CLEANING

A. CLEANING AND DISINFECTION

1. Purge new water distribution piping systems and parts of existing

systems that have been altered, extended, or repaired before use.

2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities, use procedure described in AWWA C651.
3. Prepare reports for purging and disinfecting activities and submit to Engineer and Owner.

END OF SECTION 02510

SECTION 02530 – SANITARY SEWERAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes sanitary sewerage systems outside the building. Systems include the following:

- 1. Sanitary sewerage

1.3 DEFINITIONS

- A. Sewerage Piping: System of sewer pipe, fittings, and appurtenances for gravity flow of sanitary sewage.
- B. Flexible pipe: Pipe that is not capable of supporting structural loading on its own. Examples include PVC and HDPE pipe.
- C. Rigid Pipe: Pipe that can support structural loading on its own. Examples include concrete pipe, reinforced concrete pipe, and ductile iron pipe.

1.4 PERFORMANCE REQUIREMENTS

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

1.5 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division I Specification Sections.
- B. Product data for the following, including pressure rating and rated capacity:
  - 1. Piping materials and fittings
- C. Shop drawings for:
  - 1. Pre-cast concrete manholes
  - 2. Cast-in-place concrete
  - 3. Field-erected masonry manholes and other structures
  - 4. Frames, covers, and grates

- D. Reports and calculations for:
  - 1. Design mixes for each class of cast-in-place concrete
- E. Coordination drawings showing:
  - 1. Manholes and other structures
  - 2. Pipe sizes, locations, and elevations
  - 3. Details of underground structures and connections
  - 4. Piping in same trench and clearances from sewerage piping
  - 5. Interface and spatial relationship between piping and structures
- F. Inspection and test reports
  - 1. As required by local, state, or federal authorities having jurisdiction

#### 1.6 QUALITY ASSURANCE

- A. **Environmental Agency Compliance:** Comply with regulations pertaining to sanitary sewerage systems.
  - 1. All building drain and sewer systems shall be in accordance with the N.C. Building Code, Plumbing, Latest Edition. Local Building inspector required inspections.
  - 2. All sewer mains shall be permitted and constructed in accordance with the Division of Water Quality and/or Division of Environmental Health regulations, latest edition. Local County Utilities and Engineer require site visits prior to backfilling.
- B. **Utility Compliance:** Comply with regulations pertaining to sanitary sewerage systems. Include standards of water and other utilities where appropriate.
  - 1. The City of Raleigh utility standards and specifications apply. Where the provisions of the codes and standards conflict with the City of Raleigh standards and specifications, the more stringent provisions shall apply.
- C. **Product Options:** Drawings indicate sizes, profiles, connections, and dimensional requirements of system components and are based on specific manufacturer types indicated. Other manufacturers' products with equal performance characteristics may be considered. Refer to Division I Section "Product Substitutions."
- D. **Delivery, Storage, and Handling:**
  - 1. Do not store plastic structures in direct sunlight.
  - 2. Do not store plastic pipe or fittings in direct sunlight.
  - 3. Protect pipe, pipe fittings, and seals from dirt and damage.
  - 4. Handle pre-cast concrete manholes and other structures according to manufacturer's rigging instructions.

1.7 PROJECT CONDITIONS

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.
- B. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the Owner or others except when permitted under the following conditions and then only after arranging to provide acceptable temporary utility services.
  - 1. Notify Engineer not less than 48 hours in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without receiving Architect's written permission.
- C. Sequencing and Scheduling
  - 1. Coordinate sanitary sewerage system connections to utility's sanitary sewer.
  - 2. Coordinate with other utility work.

PART 2-PRODUCTS

2.1 PIPES AND FITTINGS

- A. Polyvinyl Chloride (PVC) Sewer Pipe and Fittings
  - 1. ASTM D 3034, SDR 35, bell and spigot for gasketed joints
  - 2. Pipe shall be manufactured from material meeting requirements of Cell Class 12454-B, (with a minimum tensile modulus of 500,000 psi) as defined by ASTM D 1784.
  - 3. Primer: ASTM F 656.
  - 4. Solvent Cement: ASTM D 2564.
  - 5. Gaskets: ASTM F 477, elastomeric seal

Pipe Standards:

Size	O.D.	Min. Wall
4"	4.516"	0.120"
6"	6.275"	0.180"
8"	8.400"	0.240"
10"	10.500"	0.300"
12"	12.500"	0.360"

- B. DUCTILE IRON PIPE (DIP) AND FITTINGS

- 1. Ductile iron pipe shall conform to ASTM A 746, Thickness Class 50.
- 2. Fittings shall conform to AWWA C110/A21.10 or AWWA C153/A21.53.
- 3. Fittings with push-on joint ends shall conform to the same requirements as fittings with mechanical-joint ends. Fittings shall have strength at least

- equivalent to that of the pipe.
4. Pipe and fittings shall have cement-mortar lining conforming to AWWA C104/A21.4, standard thickness

## 2.2 SPECIAL PIPE COUPLINGS AND FITTINGS

### A. Gasket-Type Pipe Couplings

1. Rubber or elastomeric compression gasket, made to match outside diameter of smaller pipe and inside diameter or hub of adjoining larger pipe, for non-pressure joints.
2. Gaskets for Plastic Pipe: ASTM F 477, elastomeric seal
3. Gaskets for Dissimilar Pipes: Compatible with pipe materials being joined.

## 2.3 MANHOLES

### A. Pre-cast Concrete Manholes

1. ASTM C 478 (ASTM C 478M), pre-cast, reinforced concrete, of depth indicated, with provision for rubber gasket joints
2. Ballast: Increase thickness of pre-cast concrete sections or add concrete to base section, as required to prevent floatation.
3. Base Section: 6-inch (150-mm) minimum thickness for floor slab and 4-inch (100-mm) minimum thickness for walls and base riser section, and having a separate base slab or base section with integral floor.
4. Riser Sections: 4-inch (100-mm) minimum thickness, 48-inch (1220-mm) diameter, and lengths to provide depth indicated.
5. Top Section: Eccentric cone type, unless concentric cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
6. Gaskets: ASTM C 443 (ASTM C 443M), rubber.
7. Grade Rings: Include 2 or 3 reinforced-concrete rings, of 6- to 9-inch (152- to 229-mm) total thickness, that match a 24-inch- (610-mm-) diameter frame and cover.
8. Steps: Fiberglass, individual steps or ladder. Include a width that allows a worker to place both feet on one step and is designed to prevent lateral slippage off the step. Cast steps or anchor ladder into base, riser, and top section sidewalls at 12- to 16-inch (300- to 400-mm) intervals. Omit steps for manholes less than 60 inches (1500 mm) deep.
9. Pipe Connectors: ASTM C 923 (ASTM C 923M), resilient, of size required, for each pipe connecting to base section.

### B. Brick Manholes

1. Brick and mortar, of depth indicated
2. Base, Channel, and Bench: Concrete
3. Ballast: Increase thickness of or add concrete to base, as required to prevent floatation.
4. Wall: ASTM C 32, Grade MS, manhole brick; 8-inch (200-mm) minimum thickness and an inside diameter of 48 inches (1220 mm) with tapered top

for a 24-inch (610-mm) frame and cover. Include 12-inch (305-mm) minimum wall thickness for section of manhole deeper than 96 inches (2400 mm). Option: ASTM C 139, concrete masonry units may be used instead of brick.

5. Mortar and Parging: ASTM C 270, Type S, using ASTM C 150, Type 11, Portland cement, 1/2-inch (13-mm) minimum thickness on exterior surface.
6. Steps: Fiberglass, individual steps or ladder. Include a width that allows a worker to place both feet on one step and is designed to prevent lateral slippage off the step. Cast steps or anchor ladder into sidewalls at 12- to 16-inch (300 to 400-mm) intervals. Omit steps for manholes less than 60 inches (1500 mm) deep.

#### C. Manhole Frames and Covers

ASTM A 536, Grade 60-40-18, heavy-duty ductile iron. Include 24-inch (610-mm) inside diameter by 7- to 9-inch (178- to 229-mm) riser with 4-inch (100-mm) minimum width flange, and 26-inch- (660-mm-) diameter cover. Include indented top design with lettering, equivalent to the following, cast into cover: SANITARY SEWER.

### 2.4 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350R
- B. Cement: ASTM C 150, Type II
- C. Fine Aggregate: ASTM C 33, sand
- D. Coarse Aggregate: ASTM C 33, crushed gravel
- E. Water: Potable

### 2.5 STRUCTURES

- A. Portland-cement design mix, 4000 psi (27.6 MPa) minimum, with 0.45 maximum water-cement ratio
- B. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain
- C. Reinforcement Bars: ASTM A 615, Grade 60 (ASTM A 615M, Grade 400), deformed steel

### 2.6 BALLAST AND PIPE SUPPORTS

- A. Portland-cement design mix, 3000-psi (20.7 MPa) minimum, with 0.58 maximum water-cement ratio
- B. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain
- C. Reinforcement Bars: ASTM A 615, Grade 60 (ASTM A 615M, Grade 400), deformed steel

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. GENERAL LOCATIONS AND ARRANGEMENTS



1. Drawings (plans and details) indicate the general location and arrangement of underground sewerage and drainage systems piping. Location and arrangement of piping layout take into account many design considerations. Install piping as indicated to the extent practical.
2. Installation of water and wastewater lines shall conform to the latest Water Line/New Wastewater Line Separation guidelines as published by the State of North Carolina Division of Environmental Health and Division of Environmental Management regulations.
3. When the wastewater lines are installed, they shall be no closer to water lines than 10 feet in all directions and parallel wastewater lines and water lines must be installed in separate trenches. When the 10-foot separation distance cannot be achieved, the following procedures shall be used:
  - a. Where a new gravity wastewater sewer parallels a new water main, the wastewater main shall be constructed of cast or ductile iron meeting AWWA Specifications for the use as potable water pipe, with a pressure rating for both the pipe and joints of greater than or equal to 150 psi. The wastewater line may be placed no closer than 1.5 feet vertically from the water main, with the separation distances measured between the nearest outside pipe diameters. The wastewater line shall be installed at a lower elevation than the water line.
4. Where a new wastewater line crosses a water line and that portion of the wastewater line is within 10 feet of the water main, it shall be constructed of ductile iron pipe as follows:
  - a. The wastewater line may be placed no closer than 18 inches from the water line vertically. The separation distance must be measured between the nearest outside pipe diameters. The wastewater line shall be located at a lower elevation than the water line wherever possible and the complete reach of the wastewater line must be ductile iron pipe.
5. When the Contractor installs a pipe that crosses under a utility structure or storm sewer, and the top of the pipe is 18 inches or less from the bottom of the utility structure, the pipe shall be encased with concrete for a distance of at least one foot on either side of the ditch line of the utility structure or the storm sewer. Unless specified on the drawings, concrete encasement will not be required for ductile iron pipe. When the Contractor installs a pipe that crosses over a utility structure or storm sewer and the top of the utility structure or storm sewer within 18 inches of the bottom of the pipe the pipe shall be ductile iron.
6. Prior to construction, locate the existing sanitary sewer lines and verify elevations. Contact the Design Engineer if actual location interferes with ability of the system to function.
7. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.
8. Use manholes for changes in direction, except where fittings are indicated. Use fittings for branch connections, except where direct tap into existing sewer is indicated.

9. Use proper size increasers, reducers, and couplings, where different sizes or materials of pipes and fittings are connected. Reduction of the size of piping in the direction of flow is prohibited.
10. Install gravity-flow-systems piping at constant slope between points and elevations indicated. Install straight piping runs at constant slope, not less than that specified, where slope is not indicated.
11. Extend sewerage piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.
12. Install sewerage piping pitched down in direction of flow, at minimum slope of 2 percent (1:50) and 36-inch (1000-mm) minimum cover, except where otherwise indicated.

## **B. EARTHWORK**

1. Pipe Trenching: The trench shall be excavated so that the pipe can be laid to the alignment, grade and depth shown on the drawings, and it shall be excavated only so far in advance of pipe laying as permitted by the Engineer. Remove existing foundations, slabs, abandoned utilities, etc. that interfere with construction.
2. Dewatering: The trench shall be braced and drained that the workers may work in it safely and efficiently. It is essential that the discharge of the trench dewatering be conducted to a natural drainage channel, drain, or sewer.
3. The trench shall be excavated to the depth required so as to provide a uniform and continuous bearing and support for the pipe.
4. Subgrade: If any part of the bottom of the trench is excavated below the specified grade, the over excavation shall be backfilled with the specified bedding material and thoroughly compacted as directed by the Engineer. Where trenching in an existing paved area, no open cut shall result in a remaining slab width of less than five (5) feet from patch to an existing joint. The cut shall be made by sawing a minimum depth of 2-inches. Cuts in concrete shall be as above except that the patch width shall be a minimum of 3 feet.
5. Where it is necessary to support the sides of the trench or to limit undercut on the sides, the Contractor shall be responsible for the design and installation of the entire shoring, bracing and sheeting structural system or other methods to support the sides of the trench.
6. Removal of the support sheeting shall be at the discretion of the Contractor, except sheeting shall not be withdrawn until trench is sufficiently filled to prevent injury to banks, road surfaces, adjacent utilities, sidewalks and other property.
7. Sheeting and supports shall not removed below where it could cause damage to the pipe, such as loss of side support of the bedding, or side support of foundation where the undercut is in displaceable material.

## **C. BACKFILLING**

1. Contractor shall notify the Engineer prior to backfilling to give ample time to schedule inspections. Backfill operations shall not begin until all the construction below finished grades has been approved.

2. In and around drainage structures and underground utilities the backfill material shall be hand placed in 6-inch lifts to an elevation two feet above the pipe and shall be compacted as specified using hand tampers. Proper care shall be exercised during this operation so as not to disturb the pipe or utilities. Remaining backfill shall be placed in 6 inch lifts.
3. Pipe bedding and select backfill material shall be Class II – type 1 or Class III – type 1 according to NC DOT standard specification section 1016. Backfill shall be compacted to at least 98% for areas under pavement, and 90% for areas under grass of the laboratory maximum dry density as determined by the Standard Proctor Density Test (ASTM D-298).

#### **D. IDENTIFICATION**

1. Arrange for installation of green warning tapes directly over piping and at outside edges of underground structures. Use warning tape or detectable tape over non-ferrous piping.

### **3.2 PIPE JOINT CONSTRUCTION AND INSTALLATION**

#### **A. POLYVINYL CHLORIDE (PVC) PLASTIC PIPE AND FITTINGS**

1. Join solvent-cement-joint pipe and fittings with solvent cement according to ASTM D-2855 and ASTM F-402.
2. Join pipe and gasketed fittings with elastomeric seals according to ASTM D-2321.
3. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and fit both systems' materials and dimensions.

#### **B. DUCTILE IRON PIPE (DIP) AND FITTINGS**

1. Install pipe and associated fittings in accordance with the requirements of AWWA C600 for pipe installation and joint assembly.
2. Make push-on joints with the gaskets and lubricant specified for this type joint and assemble in accordance with the applicable requirements of AWWA C600 for joint assembly. Make mechanical-joints with the gaskets, glands, bolts, and nuts specified for this type joint and assemble in accordance with the applicable requirements of AWWA C600 for joint assembly and the recommendations of Appendix A to AWWA C111/A21.11.

### **3.3 MANHOLE INSTALLATION**

#### **A. GENERAL**

1. Undercut below all manhole footings and/or precast bases to a depth of not less than 6 inches nor greater than 12 inches. Backfill this area with clean washed stone.
2. Form continuous concrete channels and benches between inlets and outlet. Invert channels shall be smooth and semicircular in shape conforming to the

inside of the adjacent sewer section. Changes in direction of flow shall be made with a smooth curve of as large a radius in size as the manhole will permit. Changes in size and grade of channels shall be formed directly in the concrete of the manhole base, or shall be up with brick and mortar, or shall be half tile laid in concrete, or shall be constructed by laying full-section sewer pipe through the manhole and breaking out the top half after surrounding concrete has hardened. The floor of the manhole outside the channels shall be smooth and shall slope toward the channels not less than 1 inch per foot nor more than 2 inches per foot.

3. Set tops of frames and covers flush with finished surface where manholes occur in pavements. Set tops 3 inches (76 mm) above finished surface elsewhere, except where otherwise indicated.
4. Manhole rings in roadways shall be incased in concrete collars 18" x 6" of 3000 psi concrete beneath the asphalt with cover flush with the top of pavement.
5. Place precast concrete manhole sections as indicated, and install according to ASTM C 891.
6. Provide rubber joint gasket complying with ASTM C 443 (ASTM C 443M), at joints of sections.
7. Apply bituminous mastic coating at joints of sections.
8. Construct brick manholes as indicated.
9. Place cast-in-place concrete according to ACI 318, ACI 350R, and as indicated.
10. Make connections to existing piping and underground structures so finished work conforms as nearly as practical to requirements specified for new work.

### 3.4 WYE AND BRANCH CONNECTIONS

#### A. WYES

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye fitting plus 6-inch (150-mm) overlap, with not less than 6 inches (150 mm) of 3000-psi (20.7-MPa), 28-day, compressive-strength concrete.
2. Make branch connections from side into existing piping, sizes 4 to 20 inches (100 to 500 mm) by removing a section of existing pipe and installing a wye fitting into existing piping. Encase entire wye with not less than 6 inches (150 mm) of 3000-psi (20.7-MPa), 28-day, compressive-strength concrete.
3. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

### 3.5 CLOSING ABANDONED SEWERAGE SYSTEMS

#### A. ABANDONED PIPING

1. Close open ends of abandoned underground piping that is indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth

pressures that may result after ends of abandoned piping have been closed. Use either of the following procedures: Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

B. ABANDONED STRUCTURES

1. Excavate around structure as required and use either of the following procedures:
2. Remove structure and close open ends of remaining piping

3.5 FIELD QUALITY CONTROL

A. CLEANING PIPE

1. Clear interior of piping and structures of dirt and superfluous material as the work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.
2. In large, accessible piping, brushes and brooms may be used for cleaning.
3. Place plug in end of incomplete piping at end of day and whenever work stops.
4. Flush piping between manholes and other structures to remove collected debris.
5. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches (600 mm) of backfill is in place, and again at completion of the Project.

B. REPORTS

1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:
3. Alignment: Less than full diameter of inside of pipe is visual between structures.
4. Visual Test: Each section of the sewer main shall be visually inspected from every manhole by the use of mirrors to determine that the lines exhibit a fully circular pattern when viewed from one manhole to the next. Lines which do not exhibit a true line and grade or have structural defects shall be corrected to meet these specifications at the Contractor's expense.
5. Deflection: Flexible piping with deflection that prevents passage of a ball or cylinder of a size not less than 92.5 percent of piping diameter.
6. Deflection Test: For sewers larger than 6 inches: No sooner than 30 days after final backfilling installation, a deflection test shall be executed on the sewer mains. The maximum allowable deflection shall be 5 percent for PVC pipe. The test shall use a nine pronged mandrel pulled through the pipe. The mandrel shall be 7.28 inches for 8-inch gravity sewer and the contact length of the mandrel shall be at least 2 inches. All lines not meeting this testing requirement shall be corrected and retested at the Contractor's expense.
7. Crushed, broken, cracked, or otherwise damaged piping.

B. INFILTRATION/EXFILTRATION

1. Infiltration/Inflow Test: The maximum infiltration/inflow rate shall be 100 gallons per day per inch of pipe diameter per mile of pipe. This maximum rate shall be tested by conducting a low-pressure test in accordance with ASTM C-828. For all gravity sewer, this test shall be conducted for 1.2 minutes per 100 feet of pipe and the pressure will begin at 3.5 psi and may drop no lower than 2.5 psi after the calculated time period. If the pressure test stays between 3.5 psi and 2.5 psi, the pipe is acceptable, if not, the section is not properly installed and corrections will be necessary at the Contractor's expense.
2. Ex-filtration: Water leakage from or around piping.
3. Replace defective piping using new materials and repeat inspections until defects are within allowances specified.
4. Re-inspect and repeat procedure until results are satisfactory.
5. Test new piping systems and parts of existing systems that have been altered, extended, or repaired for leaks and defects.
6. Do not enclose, cover, or put into service before inspection and approval of both Engineer and local utility authority having jurisdiction.
7. Test completed piping systems according to authorities having jurisdiction.
8. Schedule tests, and their inspections by authorities having jurisdiction, with at least 24 hours' advance notice.
9. Submit separate reports for each test.
10. Where authorities having jurisdiction do not have published procedures, perform tests as follows:
  - i. Sanitary Sewerage: Perform hydrostatic test.
  - ii. Allowable leakage is a maximum of 50 gallons per inch nominal pipe size, for every mile of pipe, during a 24-hour period.
  - iii. Close openings in system and fill with water to 10 feet above invert.
  - iv. Purge air and refill with water.
  - v. Disconnect water supply.
  - vi. Test and inspect joints for leaks.
  - vii. Manholes: Perform hydraulic test according to ASTM C 969 (ASTM C-969M).
  - viii. Leaks and loss in test pressure constitute defects that must be repaired.
  - ix. Replace leaking piping using new materials and repeat testing until leakage is within allowances specified.

C. INSPECTION

1. Prior to backfilling, contact the Local governmental agency having jurisdiction and the Design Engineer for inspection of grades and bedding.

END OF SECTION 02530

SECTION 02700 – STORM DRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes sewerage systems. Systems include the following:

- 1. Storm drainage

1.3 DEFINITIONS:

- A. Drainage Piping: System of sewer pipe, fittings, and appurtenances for gravity flow of storm drainage.
- B. Flexible pipe: Pipe that is not capable of supporting structural loading on its own. Examples include PVC and HDPE pipe.
- C. Rigid Pipe: Pipe that can support structural loading on its own. Examples include concrete pipe, reinforced concrete pipe, and ductile iron pipe.

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division II Specification Sections.
- B. Product data for the following, including pressure rating and rated capacity:
  - 1. Piping materials and fittings.
- C. Shop drawings: For the following:
  - 1. Pre-cast concrete manholes, catch basins, and flared end sections
  - 2. Cast-in place concrete or field-erected masonry manholes and other structures.
  - 3. Frames, covers, and grates.
- D. Reports and calculations for design mixes for each class of cast-in-place concrete.
- E. Coordination drawings: Showing the following:
  - 1. Catch basins and other structures, pipe sizes, locations, and elevations.

2. Include details of underground structures and connections.
  3. Show other piping in same trench and clearances from sewerage system piping.
  4. Indicate interface and spatial relationship between piping and proximate structures.
- F. Inspection and test reports specified in the "Field Quality Control" Article 3.11.
- 1.4 QUALITY ASSURANCE
- A. Environmental Agency Compliance: Comply with regulations pertaining to storm drainage systems.
  - B. Product Options: Drawings indicate sizes, profiles, connections, and dimensional requirements of system components and are based on specific manufacturer types indicated. Other manufacturers' products with equal performance characteristics may be considered.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Do not store plastic structures in direct sunlight.
  - B. Do not store plastic pipe or fittings in direct sunlight.
  - C. Protect pipe, pipe fittings, and seals from dirt and damage.
  - D. Handle pre-cast concrete catch basins and other structures according to manufacturer's rigging instructions.
- 1.6 PROJECT CONDITIONS
- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.
  - B. Locate existing structures and piping to be closed and abandoned.
  - C. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the Owner or others except when permitted under the following conditions and then only after arranging to provide acceptable temporary utility services.
  - D. Notify Engineer and Owner not less than 48 hours in advance of proposed utility interruptions.
  - E. Do not proceed with utility interruptions without receiving Engineer's written permission.
- 1.7 SEQUENCING AND SCHEDULING
- A. Coordinate storm drainage system connections to other on-site storm sewer.



- B. Coordinate with other project work.

## PART 2 – PRODUCTS

### 2.1 PIPES AND FITTINGS

- A. Polyvinyl Chloride (PVC) Pipe and Fittings: ASTM D 3034, SDR 35, bell and spigot for gasketed joints. Pipe shall be manufactured from material meeting requirements of Cell Class 12454-B, (with a minimum tensile modulus of 500,000 psi) as defined by ASTM D 1784.

1. Primer: ASTM F 656.
2. Solvent Cement: ASTM D 2564.
3. Gaskets: ASTM F 477, elastomeric seal
4. Pipe Standards:

Size	O.D.	Min. Wall
4"	4.516"	0.120"
6"	6.275"	0.180"
8"	8.400"	0.240"
10"	10.500"	0.300"
12"	12.500"	0.360"

- B. Reinforced-Concrete Pipe and Fittings: ASTM C 76 (ASTM C 76M), Class III, Wall B, for gasketed joints.

1. Gaskets: ASTM C-443 (ASTM C-443M), asphaltic.

- C. High Density Polyethylene Pipe (HDPE) and Fittings:

1. For 4-inch to 10-inch: AASHTO M252, Type S
2. For 12-inch to 60-inch: AASHTO M294, Type S or ASTM F-2306
3. Joints shall be soil tight and gaskets shall meet ASTM F-477

### 2.2 SPECIAL PIPE COUPLINGS AND FITTINGS

- A. Gasket-Type Pipe Couplings: Rubber or elastomeric compression gasket, made to match outside diameter of smaller pipe and inside diameter or hub of adjoining larger pipe, for non-pressure joints.

1. Gaskets for Plastic Pipe: ASTM F 477, elastomeric seal.
2. Gaskets for Dissimilar Pipes: Compatible with pipe materials being joined.

### 2.3 CATCH BASINS

- A. Brick Catch Basins: Brick and mortar, of depth, shape, and dimensions indicated.
1. Base, Channel, and Bench: Concrete.
  2. Wall: ASTM C 32, Grade MS, manhole brick; 8-inch (200-mm) minimum thickness with tapered top for a 24-inch (610-mm) frame and cover.
  3. Option: ASTM C 139, concrete masonry units may be used instead of brick.
  4. Mortar: ASTM C 270, Type S, using ASTM C 150, Type II, Portland cement.
  5. Steps: Fiberglass, individual steps or ladder. Include a width that allows a worker to place both feet on one step and is designed to prevent lateral slippage off the step. Cast steps or anchor ladder into sidewalls at 12- to 16-inch (300to 400-mm) intervals. Omit steps for catch basins less than 60 inches (1500 mm) deep.
- B. Cast-in-Place Concrete Catch Basins: Construct of reinforced-concrete, designed according to ASTM C 857 for structural loading. Include depth, shape, dimensions, and appurtenances indicated.
1. Bottom, Walls, and Top: Reinforced concrete.
  2. Channels and Benches: Concrete.
  3. Steps: Fiberglass, individual steps or ladder. Include a width that allows a worker to place both feet on one step and is designed to prevent lateral slippage off the step. Cast steps or anchor ladder into sidewalls at 12- to 16-inch (300to 400-mm) intervals. Omit steps for catch basins less than 60 inches (1500 mm) deep.
- C. Frames and Grates: Grey cast iron, ANSI/ASTM A-48, Class 30 B.
1. Provide types and duty classifications indicated on the drawings, or if not indicated provide classifications as required for indicated locations and exposures, as approved by Engineer.

## 2.4 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
1. Cement: ASTM C 150, Type II.
  2. Fine Aggregate: ASTM C 33, sand.
  3. Coarse Aggregate: ASTM C 33, crushed gravel.
  4. Water: Potable.
- B. Structures: Portland-cement design mix, 4000 psi (27.6 MPa) minimum, with 0.45 maximum water-cement ratio.
1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.

2. Reinforcement Bars: ASTM A 615, Grade 60 (ASTM A 615M, Grade 400), deformed steel.
- C. Ballast and Pipe Supports: Portland-cement design mix, 3000-psi (20.7 MPa) minimum, with 0.58 maximum water-cement ratio.
1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  2. Reinforcement Bars: ASTM A 615, Grade 60 (ASTM A 615M, Grade 400), deformed steel.

### PART 3 - EXECUTION

#### 3.1 EARTHWORK

- A. Pipe Trenching: The trench shall be excavated so that the pipe can be laid to the alignment, grade and depth shown on the drawings, and it shall be excavated only so far in advance of pipe laying as permitted by the Engineer. Remove existing foundations, slabs, abandoned utilities, etc. that interfere with construction.
- B. Dewatering: The trench shall be braced and drained that the workers may work in it safely and efficiently. It is essential that the discharge of the trench dewatering be conducted to a natural drainage channel, drain, or sewer.
- C. The trench shall be excavated to the depth required so as to provide a uniform and continuous bearing and support for the pipe.
- D. Subgrade: If any part of the bottom of the trench is excavated below the specified grade, the over excavation shall be backfilled with the specified bedding material and thoroughly compacted as directed by the Engineer. Where trenching in an existing paved area, no open cut shall result in a remaining slab width of less than five (5) feet from patch to an existing joint. The cut shall be made by sawing a minimum depth of 2-inches. Cuts in concrete shall be as above except that the patch width shall be a minimum of 3 feet.
- E. Where it is necessary to support the sides of the trench or to limit undercut on the sides, the Contractor shall be responsible for the design and installation of the entire shoring, bracing and sheeting structural system or other methods to support the sides of the trench.
- F. Removal of the support sheeting shall be at the discretion of the Contractor, except sheeting shall not be withdrawn until trench is sufficiently filled to prevent injury to banks, road surfaces, adjacent utilities, sidewalks and other property.
- G. Sheeting and supports shall not removed below where it could cause damage to the pipe, such as loss of side support of the bedding, or side support of foundation where the undercut is in displaceable material.

### 3.2 BACKFILLING

- A. Contractor shall notify the Engineer prior to backfilling to give ample time to schedule inspections. Backfill operations shall not begin until all the construction below finished grades has been approved.
- B. In and around drainage structures and underground utilities the backfill material shall be hand placed in 6-inch lifts to an elevation two feet above the pipe and shall be compacted as specified using hand tampers. Proper care shall be exercised during this operation so as not to disturb the pipe or utilities. Remaining backfill shall be placed in 6 inch lifts.
- C. Pipe bedding and select backfill material shall be Class II – type 1 or Class III – type 1 according to NC DOT standard specification section 1016.
- D. Backfill shall be compacted to at least 98% for areas under pavement, and 90% for areas under grass of the laboratory maximum dry density as determined by the Standard Proctor Density Test (ASTM D-298).

### 3.3 IDENTIFICATION

- A. Arrange for installation of green warning tapes directly over piping and at outside edges of underground structures.
  - 1. Use warning tape or detectable tape over non-ferrous piping.

### 3.4 DRAINAGE PIPING APPLICATION

- A. General: Include watertight, silt tight or soil tight joints except where water tight or silt tight joints are indicated.
- B. Refer to Part 2 of this section for detailed specifications for pipe and fitting products listed below. Use pipe, fittings and joining methods according to the following applications.
- C. Pipe Sizes 4 to 12 inches (100 to 300 mm): ASTM D 3034, SDR 35 polyvinyl chloride (PVC) pipe, bell and spigot for gasketed joints except where reinforced concrete pipe is indicated.

### 3.5 INSTALLATION, GENERAL

- A. General locations and Arrangements: Drawings (plans and details) indicate the general location and arrangement of underground drainage systems piping. Location and arrangement of piping layout take into account many design considerations. Install piping as indicated to the extent practical.
- B. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing

upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.

- C. Use proper size increasers, reducers, and couplings, where different sizes or materials of pipes and fittings are connected. Reduction of the size of piping in the direction of flow is prohibited.
- D. Install gravity-flow-systems piping at constant slope between points and elevations indicated. Install straight piping runs at constant slope, not less than that specified, where slope is not indicated.
- E. Extend drainage piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.
- F. Install drainage piping pitched down in direction of flow, at minimum slope of 1 percent (1: 100) and 36-inch (1000-mm) minimum cover, except where otherwise indicated.

### 3.6 PIPE JOINT CONSTRUCTION AND INSTALLATION

- A. General: Join and install pipe and fittings according to the following.
- B. Polyvinyl Chloride (PVC) Plastic Pipe and Fittings: As follows:
  - 1. Join solvent-cement-joint pipe and fittings with solvent cement according to ASTM D 2855 and ASTM F 402.
  - 2. Join pipe and gasketed fittings with elastomeric seals according to ASTM D 232 1.
- C. Reinforced Concrete Pipe and Fittings: Install according to ACPA "Concrete Pipe Handbook." Use the following seals:
  - 1. Round Pipe and Fittings: ASTM C 443 (ASTM C 443M), rubber gaskets.
- D. System Piping Joints: Make joints using system manufacturer's couplings, except where otherwise specified.
- E. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and fit both systems' materials and dimensions.

### 3.7 CATCH BASIN INSTALLATION

- A. Construct catch basins to sizes and shapes indicated. Set frames and grates to elevations indicated.

### 3.8 CONCRETE PLACEMENT

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

### 3.9 CLOSING ABANDONED DRAINAGE SYSTEMS

- A. Abandoned Piping: Close open ends of abandoned underground piping that is indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either of the following procedures:
1. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.
- B. Abandoned Structures: Excavate around structure as required and use either of the following procedures:
1. Remove structure and close open ends of remaining piping,
  2. Backfill to grade according to Division 2 Section 02200 – "Earthwork."

### 3.10 FIELD QUALITY CONTROL

- A. Clear interior of piping and structures of dirt and superfluous material as the work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.
- B. In large, accessible piping, brushes and brooms may be used for cleaning.
- C. Place plug in end of incomplete piping at end of day and whenever work stops.
- D. Flush piping between manholes and other structures to remove collected debris.
- E. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches (600 mm) of backfill is in place, and again at completion of the Project.
- F. Submit separate reports for each system inspection.
- G. Defects requiring correction include the following:
1. Alignment: Less than full diameter of inside of pipe is visual between structures.
  2. Crushed, broken, cracked, or otherwise damaged piping.
  3. Exfiltration: Water leakage from or around piping.
  4. Infiltration: Water leakage into piping
  5. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
- H. Replace defective piping using new materials and repeat inspections until defects

are within allowances specified.

- I. Re-inspect and repeat procedure until results are satisfactory.
- J. Test new piping systems and parts of existing systems that have been altered, extended, or repaired for leaks and defects.
- K. Do not enclose, cover, or put into service before inspection and approval of both Engineer and local utility authority having jurisdiction.
- L. Test completed piping systems according to authorities having jurisdiction.
- M. Schedule tests, and their inspections by authorities having jurisdiction, with at least 24 hours' advance notice.
- N. Submit separate reports for each test.
- O. Where authorities having jurisdiction do not have published procedures, perform tests as required by Engineer.

### 3.11 INSPECTION

- A. Prior to backfilling, contact the Design Engineer for inspection of grades and bedding.

END OF SECTION 02700

## SECTION 02740 - FLEXIBLE PAVEMENT

### PART I GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Asphaltic concrete paving.
2. Aggregate subbase course.

B. Related Sections:

1. Section 02200 - Earthwork: Preparation of site for paving and base.

#### 1.2 REFERENCES

A. Asphalt Institute:

1. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot- Mix Types.
2. AI MS-1 9 - Basic Asphalt Emulsion Manual.

B. American Society for Testing and Materials:

1. ASTM D-946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction. -
2. ASTM D-3381 -Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.

C. North Carolina Department of Transportation (NCDOT) "Standard Specifications for Roads and Structures", most current Edition.

#### 1.3 SUBMITTALS

A. Product Data: Submit product information and mix design.

B. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

#### 1.4 QUALITY ASSURANCE

A. Perform Work in accordance with NCDOT "Standard Specifications for Roads and Structures", most current Edition.

B. Mixing Plant: Conform to NCDOT "Standard Specifications for Roads and Structures", Sections 610-5 and 610-6.

C. Obtain materials from same source throughout.



- D. Bituminous plant mix pavements shall conform to NCDOT "Standard Specifications for Roads and Structures", Section 610.
- E. Asphalt Cement: Shall conform to NCDOT "Standard Specifications for Roads and Structures", Section 620.

### 1.5 QUALIFICATIONS

- A. Installer: Company specializing in performing work of this section with minimum 3 years documented experience.

### 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.
- B. Do not place aggregate base when atmospheric temperature falls below 36 degrees F.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Asphalt Cement: Shall be viscosity graded asphalt cement at 140 degrees F, AC 20 and shall meet NCDOT "Standard Specifications for Roads and Structures," Section 1020-2.
- B. Proportioning and Mixing of Asphaltic Concrete: The bituminous concrete surface coarse material shall conform to the NCDOT "Standard Specifications for Roads and Structures," Section 610 for material and mix.
- C. Asphalt Aggregate: Fine aggregates, coarse aggregates and mineral filler shall conform to NCDOT Standard Specifications for Roads and Structures", Section 1012, including latest revisions.
- D. Aggregate Base Coarse: Base course materials shall conform to NCDOT "Standard Specifications for Roads and Structures", Section 1006 AND 1010.

## PART 3 EXECUTION

### 3.1 AGGREGATE BASE COURSE

- A. Haul, place and construct aggregate base course in accordance with NCDOT "Standard Specifications for Roads and Structures", Section 520-5.

### 3.2 PROOFROLLING

- A. Immediately prior to placement of asphalt, the aggregate base is to be proofrolled as specified in Section 520-5 to identify local areas of deterioration and require repair.

### 3.3 INSPECTION

- A. Verify compacted granular base is dry and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Beginning of installation means acceptance of substrate.

### 3.4 PREPARATION

- A. Remove loose materials from compacted subgrade before applying paving.
- B. Maintain and protect the base surfaces from damage until asphalt placement.
- C. Coat surfaces of concrete curb, concrete slab, catch basin and manholes frames with tack coat of emulsified asphalts to provide bond with asphalt paving.

### 3.5 PLACING ASPHALT PAVEMENT - SINGLE COURSE

- A. Place asphalt wearing course thickness identified in schedule at end of section.
- B. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- C. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

### 3.6 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

- A. Place asphalt binder course within 24 hours of applying primer or tack coat.
- B. Place binder course to thickness identified in schedule at end of section.
- C. Place wearing course within 24 hours of placing and compacting binder course. When binder course is placed more than 24 hours before placing wearing course, clean surface and apply tack coat before placing wearing course.
- D. Place wearing course to thickness identified in schedule at end of section.
- E. Compact each course by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- F. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.7 TOLERANCES

- A. Flatness: Maximum variation of 1/8 inch measured with 10 foot straight edge.
- B. Scheduled Compacted Thickness: Within 10%/ inch.
- C. Variation from Indicated Elevation: Within 1 inch.

3.8 FIELD QUALITY CONTROL

- A. Field inspection, sampling and testing to be performed under Sections 500 and 600.  
  
Base course to be compacted to 100% density of AASHTO T180.  
  
Frequency of tests on base course: one test every 7,500 sq.ft per lift.

3.9 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury for 6 hours after final rolling or until asphaltic concrete has cured, whichever is longer.

3.10 SCHEDULE

- A. Refer to the paving section on the drawings.

END OF SECTION 02740

## SECTION 03300 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture.
- C. Shop Drawings: For steel reinforcement.

#### 1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
  - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- C. Preinstallation Conference: Conduct conference at Project site.

### PART 2 - PRODUCTS

#### 2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

## 2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, **Grade 60**, deformed.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

## 2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement: ASTM C 150, Type I or II. Supplement with the following:
    - a. Fly Ash: ASTM C 618, Class C or F.
    - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33, graded, **3/4-inch** nominal maximum coarse-aggregate size.
  - 1. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
  - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
  - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

## 2.4 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.

## 2.5 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

## 2.6 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Proportion normal-weight concrete mixture as follows:
  - 1. Minimum Compressive Strength: 3000 psi at 28 days.
  - 2. Maximum Water-Cementitious Materials Ratio: 0.45.
  - 3. Slump Limit: 5 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
  - 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery.

## 2.7 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## 2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116, and furnish batch ticket information.
  - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

**PART 3 - EXECUTION**

**3.1 FORMWORK**

- A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Chamfer exterior corners and edges of permanently exposed concrete.

**3.2 EMBEDDED ITEMS**

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

**3.3 STEEL REINFORCEMENT**

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

**3.4 JOINTS**

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.

**3.5 CONCRETE PLACEMENT**

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- C. Cold-Weather Placement: Comply with ACI 306.1.

- D. Hot-Weather Placement: Comply with ACI 301.

### 3.6 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces exposed to public view.
- C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
  2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
  3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### 3.7 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.



3.8 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 1 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
    - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mix, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
  3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
  4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
  5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
  6. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.
    - a. Cast and field cure one set of four standard cylinder specimens for each composite sample.
  7. Compressive-Strength Tests: ASTM C 39; test two laboratory-cured specimens at 7 days and two at 28 days.
    - a. Test two field-cured specimens at 7 days and two at 28 days.
    - b. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.

- C. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- D. Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
- E. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-and 28-day tests.
- F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
- G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Engineer.

END OF SECTION 03300

## SECTION 06 1000

### ROUGH CARPENTRY

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Structural dimension lumber framing.
- B. Preservative treated wood materials.

##### 1.02 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011
- C. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2010.
- D. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.
- E. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2002.

##### 1.03 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

#### PART 2 PRODUCTS

##### 2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
  - 1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
  - 2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee ([www.alsc.org](http://www.alsc.org)) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

##### 2.02 EXPOSED DIMENSION LUMBER

- A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.
- B. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).
- C. Sizes: Nominal sizes as indicated on drawings.
- D. Surfacing: S4S.
- E. Moisture Content: S-dry or MC19.

##### 2.03 ACCESSORIES

- A. Fasteners and Anchors:
  - 1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

- B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
  - 1. For contact with preservative treated wood in exposed locations, provide minimum G185 (Z550) galvanizing per ASTM A653/A653M.
- C. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions.

#### **2.04 FACTORY WOOD TREATMENT**

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
  - 1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
- B. Preservative Treatment:

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION - GENERAL**

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

#### **3.02 FRAMING INSTALLATION**

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- C. Install structural members full length without splices unless otherwise specifically detailed.
- D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes.

**END OF SECTION**

**FORM OF BID BOND**

KNOW ALL MEN BY THESE PRESENTS THAT \_\_\_\_\_

\_\_\_\_\_ as principal, and \_\_\_\_\_, as surety, who is duly licensed to act as surety in North Carolina, are held and firmly bound unto the State of North Carolina\* through NCDOT Facilities Management Design Division as obligee, in the penal sum of \_\_\_\_\_ DOLLARS, lawful money of the United States of America, for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Signed, sealed and dated this \_\_\_\_ day of \_\_\_\_ 20\_\_

WHEREAS, the said principal is herewith submitting proposal for and the principal desires to file this bid bond in lieu of making the cash deposit as required by G.S. 143-129.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION is such, that if the principal shall be awarded the contract for which the bid is submitted and shall execute the contract and give bond for the faithful performance thereof within ten days after the award of same to the principal, then this obligation shall be null and void; but if the principal fails to so execute such contract and give performance bond as required by G.S. 143-129, the surety shall, upon demand, forthwith pay to the obligee the amount set forth in the first paragraph hereof. Provided further, that the bid may be withdrawn as provided by G.S. 143-129.1

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)



# FORM OF PROPOSAL

Westgate Road Modular Site

Contract: \_\_\_\_\_

Facilities Management Division of the

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

NC Department of Transportation

SCO-ID #12-09486-01A

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

The undersigned, as bidder, hereby declares that the only person or persons interested in this proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this proposal or in the contract to be entered into; that this proposal is made without connection with any other person, company or parties making a bid or proposal; and that it is in all respects fair and in good faith without collusion or fraud. The bidder further declares that he has examined the site of the work and the contract documents relative thereto, and has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work to be performed. The bidder further declares that he and his subcontractors have fully complied with NCGS 64, Article 2 in regards to E-Verification as required by Section 2.(c) of Session Law 2013-418, codified as N.C. Gen. Stat. § 143-129(j).

The Bidder proposes and agrees if this proposal is accepted to contract with the

***State of North Carolina through the North Carolina Department of Transportation***

in the form of contract specified below, to furnish all necessary materials, equipment, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of

***Westgate Road Modular Site***

in full in complete accordance with the plans, specifications and contract documents, to the full and entire satisfaction of the State of North Carolina, and the

***North Carolina Department of Transportation and SEPI Engineering and Construction, Inc.***

with a definite understanding that no money will be allowed for extra work except as set forth in the General Conditions and the contract documents, for the sum of:

**SINGLE PRIME CONTRACT:**

**GENERAL CONSTRUCTION:**

Base Bid:

\_\_\_\_\_ Dollars(\$)

General Subcontractor:

\_\_\_\_\_ Lic \_\_\_\_\_

GS143-128(d) requires all single prime bidders to identify their subcontractors for the above subdivisions of work. A contractor whose bid is accepted shall not substitute any person as subcontractor in the place of the subcontractor listed in the original bid, except (i) if the listed subcontractor's bid is later determined by the contractor to be non-responsible or non-responsive or the listed subcontractor refuses to enter into a contract for the complete performance of the bid work, or (ii) with the approval of the awarding authority for good cause shown by the contractor.

The bidder further proposes and agrees hereby to commence work under this contract on a date to be specified in a written order of the designer and shall fully complete all work thereunder within the time specified in the Supplementary General Conditions Article 23. Applicable liquidated damages amount is also stated in the Supplementary General Conditions Article 23.





## **MINORITY BUSINESS PARTICIPATION REQUIREMENTS**

*Provide with the bid* - Under GS 143-128.2(c) the undersigned bidder shall identify **on its bid** (Identification of Minority Business Participation Form) the minority businesses that it will use on the project with the total dollar value of the bids that will be performed by the minority businesses. **Also** list the good faith efforts (Affidavit **A**) made to solicit minority participation in the bid effort.

**NOTE:** A contractor that performs all of the work with its own workforce may submit an Affidavit (**B**) to that effect in lieu of Affidavit (**A**) required above. The MB Participation Form must still be submitted even if there is zero participation.

*After the bid opening* - The Owner will consider all bids and alternates and determine the lowest responsible, responsive bidder. Upon notification of being the apparent low bidder, the bidder shall then file within 72 hours of the notification of being the apparent lowest bidder, the following:

An Affidavit (**C**) that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the 10% goal established. This affidavit shall give rise to the presumption that the bidder has made the required good faith effort and Affidavit **D** is not necessary;

**\* OR \***

If less than the 10% goal, Affidavit (**D**) of its good faith effort to meet the goal shall be provided. The document must include evidence of all good faith efforts that were implemented, including any advertisements, solicitations and other specific actions demonstrating recruitment and selection of minority businesses for participation in the contract.

**Note:** Bidders must always submit **with their bid** the Identification of Minority Business Participation Form listing all MB contractors, vendors and suppliers that will be used. If there is no MB participation, then enter none or zero on the form. Affidavit **A** **or** Affidavit **B**, as applicable, also must be submitted with the bid. Failure to file a required affidavit or documentation with the bid or after being notified apparent low bidder is grounds for rejection of the bid.



## Proposal Signature Page

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The undersigned further agrees that in the case of failure on his part to execute the said contract and the bonds within ten (10) consecutive calendar days after being given written notice of the award of contract, the certified check, cash or bid bond accompanying this bid shall be paid into the funds of the owner's account set aside for the project, as liquidated damages for such failure; otherwise the certified check, cash or bid bond accompanying this proposal shall be returned to the undersigned.

Respectfully submitted this day of \_\_\_\_\_

\_\_\_\_\_  
(Name of firm or corporation making bid)

WITNESS:

\_\_\_\_\_  
(Proprietorship or Partnership)

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

Name: \_\_\_\_\_  
Print or type

Title \_\_\_\_\_  
(Owner/Partner/Pres./V.Pres)

Address \_\_\_\_\_

ATTEST:

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

Title: \_\_\_\_\_  
(Corp. Sec. or Asst. Sec. only)

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

Federal I.D. No. \_\_\_\_\_

Email Address: \_\_\_\_\_

(CORPORATE SEAL)

Addendum received and used in computing bid:

Addendum No. 1 \_\_\_\_\_ Addendum No. 3 \_\_\_\_\_ Addendum No. 5 \_\_\_\_\_ Addendum No. 6 \_\_\_\_\_

Addendum No. 2 \_\_\_\_\_ Addendum No. 4 \_\_\_\_\_ Addendum No. 6 \_\_\_\_\_ Addendum No. 7 \_\_\_\_\_



**FORM OF CONSTRUCTION CONTRACT**

(ALL PRIME CONTRACTS)

THIS AGREEMENT, made the \_\_\_\_\_ day of \_\_\_\_\_ in the year of 2013 by and between \_\_\_\_\_

hereinafter called the Party of the First Part and the State of North Carolina, through the Facilities Management Design Division of the North Carolina Department of Transportation hereinafter called the Party of the Second Part.

**WITNESSETH:**

That the Party of the First Part and the Party of the Second Part for the consideration herein named agree as follows:

1. Scope of Work: The Party of the First Part shall furnish and deliver all of the materials, and perform all of the work in the manner and form as provided by the following enumerated plans, specifications and documents, which are attached hereto and made a part thereof as if fully contained herein: advertisement; Instructions to Bidders; General Conditions; Supplementary General Conditions; specifications; accepted proposal; contract; performance bond; payment bond; power of attorney; workmen's compensation; public liability; property damage and builder's risk insurance certificates; approval of attorney general; certificate by the Office of State Budget and Management, and drawings, titled:

Westgate Road Modular Site — SCO ID # 12-09486-01A \_\_\_\_\_

Consisting of the following sheets: C-1.0 through C-9.0, E1-E2, S1-S2 and 13-0011A

Dated: 05/28/2014

and the following addenda:

Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_ Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_

Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_ Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_

Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_ Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_

Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_ Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_

2. That the Party of the First Part shall commence work to be performed under this agreement on a date to be specified in a written order of the Party of the Second Part and shall fully complete all work hereunder within 180 consecutive calendar days from said date. For each day in excess thereof, liquidated damages shall be as stated in Supplementary General Conditions. The Party of the First Part, as one of the considerations for the awarding of this contract, shall furnish to the Party of the Second Part a construction schedule setting forth planned progress of the project broken down by the various divisions or part of the work and by calendar days. If the Party of the First Part fails to begin the work under the contract within the time specified, or the progress of the



work is not maintained on schedule, or the work is not completed within the time above specified, or fails to perform the work with sufficient workmen and equipment or with sufficient materials to ensure the prompt completion of said work, or shall perform the work unsuitably or shall discontinue the prosecution of the work, or if the Party of the First Part shall become insolvent or be declared bankrupt or commit any act of bankruptcy or insolvency, or allow any final judgment to stand against him unsatisfied for a period of forty-eight (48) hours, or shall make an assignment for the benefit of creditors, or for any other cause whatsoever shall not carry on the work in an acceptable manner, the Party of the Second Part may give notice in writing, sent by certified mail, return receipt requested, to the Party of the First Part and his surety of such delay, neglect or default, specifying the same, and if the Party of the First Part within a period of fifteen (15) days after such notice shall not proceed in accordance therewith, then the Party of the Second Part shall, declare this contract in default, and, thereupon, the surety shall promptly take over the work and complete the performance of this contract in the manner and within the time frame specified. In the event the surety shall fail to take over the work to be done under this contract within fifteen (15) days after being so notified and notify the Party of the Second Part in writing, sent by certified mail, return receipt requested, that he is taking the same over and stating that he will diligently pursue and complete the same, the Party of the Second Part shall have full power and authority, without violating the contract, to take the prosecution of the work out of the hands of said Party of the First Part, to appropriate or use any or all contract materials and equipment on the grounds as may be suitable and acceptable and may enter into an agreement, either by public letting or negotiation, for the completion of said contract according to the terms and provisions thereof or use such other methods as in his opinion shall be required for the completion of said contract in an acceptable manner. All costs and charges incurred by the Party of the Second Part, together with the costs of completing the work under contract, shall be deducted from any monies due or which may become due said Party of the First Part and surety. In case the expense so incurred by the Party of the Second Part shall be less than the sum which would have been payable under the contract, if it had been completed by said Party of the First Part, then the said Party of the First Part and surety shall be entitled to receive the difference, but in case such expense shall exceed the sum which would have been payable under the contract, then the Party of the First Part and the surety shall be liable and shall pay to the Party of the Second Part the amount of said excess.

3. The Party of the Second Part hereby agrees to pay to the Party of the First Part for the faithful performance of this agreement, subject to additions and deductions as provided in the specifications or proposal, in lawful money of the United States as follows:

\_\_\_\_\_

\_\_\_\_\_ ( \$ \_\_\_\_\_ ) .

Summary of Contract Award:

4. On or before the 20th day of each calendar month, the Party of the Second Part shall make payments to the Party of the First Part on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the First Party, less five percent (5%) of the amount of such estimate which is to be retained by the Second Party until all work has been performed strictly in accordance with this agreement and until such work has been accepted by the Second Party. The Second Party may elect to waive retainage requirements after 50 percent of the work has been satisfactorily completed on schedule as referred to in Article 31 of the General Conditions.





5. Upon submission by the First Party of evidence satisfactory to the Second Party that all payrolls, material bills and other costs incurred by the First Party in connection with the construction of the work have been paid in full, final payment on account of this agreement shall be made within thirty (30) days after the completion by the First Party of all work covered by this agreement and the acceptance of such work by the Second Party.

6. It is further mutually agreed between the parties hereto that if at any time after the execution of this agreement and the surety bonds hereto attached for its faithful performance, the Second Party shall deem the surety or sureties upon such bonds to be unsatisfactory, or if, for any reason, such bonds cease to be adequate to cover the performance of the work, the First Party shall, at its expense, within five (5) days after the receipt of notice from the Second Party so to do, furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to the Second Party. In such event no further payment to the First Party shall be deemed to be due under this agreement until such new or additional security for the faithful performance of the work shall be furnished in manner and form satisfactory to the Second Party.

IN WITNESS WHEREOF, the Parties hereto have executed this agreement on the day and date first above written in \_\_\_\_\_ counterparts, each of which shall without proof or accounting for other counterparts, be deemed an original contract.

Witness:

\_\_\_\_\_  
Contractor: (Trade or Corporate Name)

\_\_\_\_\_  
(Proprietorship or Partnership)

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

Title: \_\_\_\_\_  
(Owner, Partner, or Corp. Pres. or Vice Pres. only)

Attest: (Corporation )

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

Title: \_\_\_\_\_  
(Corp. Sec. or Asst. Sec. only)

The State of North Carolina through\*

(CORPORATE SEAL)

NCDOT Facilities Management Design Division  
(Agency, Department or Institution)

Witness:

\_\_\_\_\_

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

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



**FORM OF PERFORMANCE BOND**

Date of Contract: \_\_\_\_\_

Date of Execution: \_\_\_\_\_

Name of Principal  
(Contractor) \_\_\_\_\_

Name of Surety: \_\_\_\_\_

Name of Contracting  
Body: \_\_\_\_\_

Amount of Bond: \_\_\_\_\_

Project: Westgate Road Modular Site  
SCO ID # 12-09486-01A

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety above named, are held and firmly bound unto the above named contracting body, hereinafter called the contracting body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind, ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the contracting body, identified as shown above and hereto attached:

NOW, THEREFORE, if the principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the contracting body, with or without notice to the surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Executed in \_\_\_\_\_ counterparts .



Witness :

\_\_\_\_\_  
(Proprietorship or Partnership)

Attest: (Corporation)

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

Title : \_\_\_\_\_  
(Corp. Sec. or Asst. Sec.. only)

(Corporate Seal)

\_\_\_\_\_  
Contractor: (Trade or Corporate Name)

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

Title : \_\_\_\_\_  
(Owner, Partner, or Corp. Pres. or Vice Pres. only)

\_\_\_\_\_  
(Surety Company)

Witness :

\_\_\_\_\_

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

Title : \_\_\_\_\_  
(Attorney in Fact)

Countersigned :

\_\_\_\_\_

(Surety Corporate Seal)

\_\_\_\_\_  
(N.C. Licensed Resident Agent)

\_\_\_\_\_

\_\_\_\_\_  
Name and Address-Surety Agency

\_\_\_\_\_

\_\_\_\_\_  
Surety Company Name and N.C.  
Regional or Branch Office Address



**FORM OF PAYMENT BOND**

Date of Contract: \_\_\_\_\_  
Date of Execution: \_\_\_\_\_  
Name of Principal  
(Contractor) \_\_\_\_\_  
Name of Surety : \_\_\_\_\_  
Name of Contracting  
Body : \_\_\_\_\_  
Amount of Bond : \_\_\_\_\_  
Project Westgate Road Modular Site (SCO ID # 12-09486-01A)

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety above named, are held and firmly bound unto the above named contracting body, hereinafter called the contracting body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the contracting body identified as shown above and hereto attached:

NOW, THEREFORE, if the principal shall promptly make payment to all persons supplying labor/material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Executed in \_\_\_\_\_ counterparts .





Witness :

\_\_\_\_\_  
(Proprietorship or Partnership)

Attest: (Corporation)

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

Title : \_\_\_\_\_  
(Corp. Sec. or Asst. Sec.. only)

(Corporate Seal)

\_\_\_\_\_  
Contractor: (Trade or Corporate Name )

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

Title : \_\_\_\_\_  
(Owner, Partner, or Corp. Pres. or Vice Pres. only)

\_\_\_\_\_  
(Surety Company)

Witness :

\_\_\_\_\_

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

Title : \_\_\_\_\_  
(Attorney in Fact)

Countersigned :

\_\_\_\_\_

\_\_\_\_\_  
(N.C. Licensed Resident Agent)

\_\_\_\_\_

\_\_\_\_\_  
Name and Address-Surety Agency

\_\_\_\_\_

\_\_\_\_\_  
Surety Company Name and N.C.  
Regional or Branch Office Address

(Surety Corporate Seal)



# Sheet for Attaching Power of Attorney



# Sheet for Attaching Insurance Certificates



# APPROVAL OF THE ATTORNEY GENERAL





**CERTIFICATION BY THE OFFICE OF STATE  
BUDGET AND MANAGEMENT**

Provision for the payment of money to fall due and payable by the

---

under this agreement has been provided for by allocation made and is available for the purpose of carrying out this agreement.

This \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

Signed \_\_\_\_\_  
Budget Officer



## **GUIDELINES FOR RECRUITMENT AND SELECTION OF MINORITY BUSINESSES FOR PARTICIPATION IN STATE CONSTRUCTION CONTRACTS**

In accordance with G.S. 143-128.2 (effective January 1, 2002) these guidelines establish goals for minority participation in single-prime bidding, separate-prime bidding, construction manager at risk, and alternative contracting methods, on State construction projects in the amount of \$300,000 or more. The legislation provides that the State shall have a verifiable ten percent (10%) goal for participation by minority businesses in the total value of work for each project for which a contract or contracts are awarded. These requirements are published to accomplish that end.

### **SECTION A: INTENT**

It is the intent of these guidelines that the State of North Carolina, as awarding authority for construction projects, and the contractors and subcontractors performing the construction contracts awarded shall cooperate and in good faith do all things legal, proper and reasonable to achieve the statutory goal of ten percent (10%) for participation by minority businesses in each construction project as mandated by GS 143-128.2. Nothing in these guidelines shall be construed to require contractors or awarding authorities to award contracts or subcontracts to or to make purchases of materials or equipment from minority-business contractors or minority-business subcontractors who do not submit the lowest responsible, responsive bid or bids.

### **SECTION B: DEFINITIONS**

1. Minority - a person who is a citizen or lawful permanent resident of the United States and who is:
  - a. Black, that is, a person having origins in any of the black racial groups in Africa;
  - b. Hispanic, that is, a person of Spanish or Portuguese culture with origins in Mexico, South or Central America, or the Caribbean Islands, regardless of race;
  - c. Asian American, that is, a person having origins in any of the original peoples of the Far East, Southeast Asia and Asia, the Indian subcontinent, the Pacific Islands;
  - d. American Indian, that is, a person having origins in any of the original peoples of North America; or
  - e. Female
2. Minority Business - means a business:
  - a. In which at least fifty-one percent (51%) is owned by one or more minority persons, or in the case of a corporation, in which at least fifty-one percent (51%) of the stock is owned by one or more minority persons or socially and economically disadvantaged individuals; and
  - b. Of which the management and daily business operations are controlled by one or more of the minority persons or socially and economically disadvantaged individuals who own it.
3. Socially and economically disadvantaged individual - means the same as defined in 15 U.S.C. 637. "Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities". "Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business area who are not socially disadvantaged".
4. Public Entity - means State and all public subdivisions and local governmental units.
5. Owner - The State of North Carolina, through the Agency/Institution named in the contract.
6. Designer – Any person, firm, partnership, or corporation, which has contracted with the State of North Carolina to perform architectural or engineering, work.
7. Bidder - Any person, firm, partnership, corporation, association, or joint venture seeking to be awarded a public contract or subcontract.

8. Contract - A mutually binding legal relationship or any modification thereof obligating the seller to furnish equipment, materials or services, including construction, and obligating the buyer to pay for them.
9. Contractor - Any person, firm, partnership, corporation, association, or joint venture which has contracted with the State of North Carolina to perform construction work or repair.
10. Subcontractor - A firm under contract with the prime contractor or construction manager at risk for supplying materials or labor and materials and/or installation. The subcontractor may or may not provide materials in his subcontract.

## **SECTION C: RESPONSIBILITIES**

1. Office for Historically Underutilized Businesses, Department of Administration (hereinafter referred to as HUB Office).

The HUB Office has established a program, which allows interested persons or businesses qualifying as a minority business under G.S. 143-128.2, to obtain certification in the State of North Carolina procurement system. The information provided by the minority businesses will be used by the HUB Office to:

- a. Identify those areas of work for which there are minority businesses, as requested.
- b. Make available to interested parties a list of prospective minority business contractors and subcontractors.
- c. Assist in the determination of technical assistance needed by minority business contractors.

In addition to being responsible for the certification/verification of minority businesses that want to participate in the State construction program, the HUB Office will:

- (1) Maintain a current list of minority businesses. The list shall include the areas of work in which each minority business is interested.
- (2) Inform minority businesses on how to identify and obtain contracting and subcontracting opportunities through the State Construction Office and other public entities.
- (3) Inform minority businesses of the contracting and subcontracting process for public construction building projects.
- (4) Work with the North Carolina trade and professional organizations to improve the ability of minority businesses to compete in the State construction projects.
- (5) The HUB Office also oversees the minority business program by:
  - a. Monitoring compliance with the program requirements.
  - b. Assisting in the implementation of training and technical assistance programs.
  - c. Identifying and implementing outreach efforts to increase the utilization of minority businesses.
  - d. Reporting the results of minority business utilization to the Secretary of the Department of Administration, the Governor, and the General Assembly.

2. State Construction Office

The State Construction Office will be responsible for the following:

- a. Furnish to the HUB Office a minimum of twenty-one days prior to the bid opening the following:
  - (1) Project description and location;
  - (2) Locations where bidding documents may be reviewed;
  - (3) Name of a representative of the owner who can be contacted during the advertising period to advise who the prospective bidders are;
  - (4) Date, time and location of the bid opening.
  - (5) Date, time and location of prebid conference, if scheduled.
- b. Attending scheduled prebid conference, if necessary, to clarify requirements of the general statutes regarding minority-business participation, including the bidders' responsibilities.

- c. Reviewing the apparent low bidders' statutory compliance with the requirements listed in the proposal, that must be complied with, if the bid is to be considered as responsive, prior to award of contracts. The State reserves the right to reject any or all bids and to waive informalities.
- d. Reviewing of minority business requirements at Preconstruction conference.
- e. Monitoring of contractors' compliance with minority business requirements in the contract documents during construction.
- f. Provide statistical data and required reports to the HUB Office.
- g. Resolve any protest and disputes arising after implementation of the plan, in conjunction with the HUB Office.

### 3. Owner

Before awarding a contract, owner shall do the following:

- a. Develop and implement a minority business participation outreach plan to identify minority businesses that can perform public building projects and to implement outreach efforts to encourage minority business participation in these projects to include education, recruitment, and interaction between minority businesses and non-minority businesses.
- b. Attend the scheduled prebid conference.
- c. At least 10 days prior to the scheduled day of bid opening, notify minority businesses that have requested notices from the public entity for public construction or repair work and minority businesses that otherwise indicated to the Office for Historically Underutilized Businesses an interest in the type of work being bid or the potential contracting opportunities listed in the proposal. The notification shall include the following:
  - 1. A description of the work for which the bid is being solicited.
  - 2. The date, time, and location where bids are to be submitted.
  - 3. The name of the individual within the owner's organization who will be available to answer questions about the project.
  - 4. Where bid documents may be reviewed.
  - 5. Any special requirements that may exist.
- d. Utilize other media, as appropriate, likely to inform potential minority businesses of the bid being sought.
- e. Maintain documentation of any contacts, correspondence, or conversation with minority business firms made in an attempt to meet the goals.
- f. Review, jointly with the designer, all requirements of G.S. 143-128.2(c) and G.S. 143-128.2(f) – (i.e. bidders' proposals for identification of the minority businesses that will be utilized with corresponding total dollar value of the bid and affidavit listing good faith efforts, or affidavit of self-performance of work, if the contractor will perform work under contract by its own workforce) - prior to recommendation of award to the State Construction Office.
- g. Evaluate documentation to determine good faith effort has been achieved for minority business utilization prior to recommendation of award to State Construction Office.
- h. Review prime contractors' pay applications for compliance with minority business utilization commitments prior to payment.
- i. Make documentation showing evidence of implementation of Owner's responsibilities available for review by State Construction Office and HUB Office, upon request

### 4. Designer

Under the single-prime bidding, separate prime bidding, construction manager at risk, or alternative contracting method, the designer will:

- a. Attend the scheduled prebid conference to explain minority business requirements to the prospective bidders.
- b. Assist the owner to identify and notify prospective minority business prime and subcontractors of potential contracting opportunities.
- c. Maintain documentation of any contacts, correspondence, or conversation with minority business firms made in an attempt to meet the goals.
- d. Review jointly with the owner, all requirements of G.S. 143-128.2(c) and G.S.143-128.2(f) – (i.e. bidders' proposals for identification of the minority businesses that will be utilized with

corresponding total dollar value of the bid and affidavit listing Good Faith Efforts, or affidavit of self-performance of work, if the contractor will perform work under contract by its own workforce) - prior to recommendation of award.

- e. During construction phase of the project, review “MBE Documentation for Contract Payment” – (Appendix E) for compliance with minority business utilization commitments. Submit Appendix E form with monthly pay applications to the owner and forward copies to the State Construction Office.
- f. Make documentation showing evidence of implementation of Designer’s responsibilities available for review by State Construction Office and HUB Office, upon request.

5. Prime Contractor(s), CM at Risk, and Its First-Tier Subcontractors

Under the single-prime bidding, the separate-prime bidding, construction manager at risk and alternative contracting methods, contractor(s) will:

- a. Attend the scheduled prebid conference.
- b. Identify or determine those work areas of a subcontract where minority businesses may have an interest in performing subcontract work.
- c. At least ten (10) days prior to the scheduled day of bid opening, notify minority businesses of potential subcontracting opportunities listed in the proposal. The notification will include the following:
  - (1) A description of the work for which the subbid is being solicited.
  - (2) The date, time and location where subbids are to be submitted.
  - (3) The name of the individual within the company who will be available to answer questions about the project.
  - (4) Where bid documents may be reviewed.
  - (5) Any special requirements that may exist, such as insurance, licenses, bonds and financial arrangements.

If there are more than three (3) minority businesses in the general locality of the project who offer similar contracting or subcontracting services in the specific trade, the contractor(s) shall notify three (3), but may contact more, if the contractor(s) so desires.

- d. During the bidding process, comply with the contractor(s) requirements listed in the proposal for minority participation.
- e. Identify on the bid, the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit listing good faith efforts as required by G.S. 143-128.2(c) and G.S. 143-128.2(f).
- f. Make documentation showing evidence of implementation of PM, CM-at-Risk and First-Tier Subcontractor responsibilities available for review by State Construction Office and HUB Office, upon request.
- g. Upon being named the apparent low bidder, the Bidder shall provide one of the following: (1) an affidavit (Affidavit C) that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the applicable goal; (2) if the percentage is not equal to the applicable goal, then documentation of all good faith efforts taken to meet the goal. Failure to comply with these requirements is grounds for rejection of the bid and award to the next lowest responsible and responsive bidder.
- h. The contractor(s) shall identify the name(s) of minority business subcontractor(s) and corresponding dollar amount of work on the schedule of values. The schedule of values shall be provided as required in Article 31 of the General Conditions of the Contract to facilitate payments to the subcontractors.
- i. The contractor(s) shall submit with each monthly pay request(s) and final payment(s), “MBE Documentation for Contract Payment” – (Appendix E), for designer’s review.
- j. During the construction of a project, at any time, if it becomes necessary to replace a minority business subcontractor, immediately advise the owner, State Construction Office, and the Director of the HUB Office in writing, of the circumstances involved. The prime contractor shall make a good faith effort to replace a minority business subcontractor with another minority business subcontractor.

- k. If during the construction of a project additional subcontracting opportunities become available, make a good faith effort to solicit subbids from minority businesses.
- l. It is the intent of these requirements apply to all contractors performing as prime contractor and first tier subcontractor under construction manager at risk on state projects.

6. Minority Business Responsibilities

While minority businesses are not required to become certified in order to participate in the State construction projects, it is recommended that they become certified and should take advantage of the appropriate technical assistance that is made available. In addition, minority businesses who are contacted by owners or bidders must respond promptly whether or not they wish to submit a bid.

**SECTION 4: DISPUTE PROCEDURES**

It is the policy of this state that disputes that involves a person's rights, duties or privileges, should be settled through informal procedures. To that end, minority business disputes arising under these guidelines should be resolved as governed under G.S. 143-128(g).

**SECTION 5:** These guidelines shall apply upon promulgation on state construction projects. Copies of these guidelines may be obtained from the Department of Administration, State Construction Office, (physical address) 301 North Wilmington Street, Suite 450, NC Education Building, Raleigh, North Carolina, 27601-2827, (mail address) 1307 Mail Service Center, Raleigh, North Carolina, 27699-1307, phone (919) 807-4100, Website: [www.nc-sco.com](http://www.nc-sco.com)

**SECTION 6:** In addition to these guidelines, there will be issued with each construction bid package provisions for contractual compliance providing minority business participation in the state construction program.

## MINORITY BUSINESS CONTRACT PROVISIONS (CONSTRUCTION)

### APPLICATION:

The **Guidelines for Recruitment and Selection of Minority Businesses for Participation in State Construction Contracts** are hereby made a part of these contract documents. These guidelines shall apply to all contractors regardless of ownership. Copies of these guidelines may be obtained from the Department of Administration, State Construction Office, (physical address) 301 North Wilmington Street, Suite 450, NC Education Building, Raleigh, North Carolina, 27601-2827, (mail address) 1307 Mail Service Center, Raleigh, North Carolina, 27699-1307, phone (919) 807-4100, Website: <http://www.nc-sco.com>

### MINORITY BUSINESS SUBCONTRACT GOALS:

The goals for participation by minority firms as subcontractors on this project have been set at 10%.

The bidder must identify on its bid, the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit (Affidavit A) listing good faith efforts **or** affidavit (Affidavit B) of self-performance of work, if the bidder will perform work under contract by its own workforce, as required by G.S. 143-128.2(c) and G.S. 143-128.2(f).

The lowest responsible, responsive bidder must provide Affidavit C, that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the applicable goal.

**OR**

Provide Affidavit D, that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, **with documentation of Good Faith Effort, if the percentage is not equal to the applicable goal.**

**OR**

Provide Affidavit B, which includes sufficient information for the State to determine that the bidder does not customarily subcontract work on this type project.

**The above information must be provided as required. Failure to submit these documents is grounds for rejection of the bid.**



## **MINIMUM COMPLIANCE REQUIREMENTS:**

All written statements, affidavits or intentions made by the Bidder shall become a part of the agreement between the Contractor and the State for performance of this contract. Failure to comply with any of these statements, affidavits or intentions, or with the minority business Guidelines shall constitute a breach of the contract. A finding by the State that any information submitted either prior to award of the contract or during the performance of the contract is inaccurate, false or incomplete, shall also constitute a breach of the contract. Any such breach may result in termination of the contract in accordance with the termination provisions contained in the contract. It shall be solely at the option of the State whether to terminate the contract for breach.

In determining whether a contractor has made Good Faith Efforts, the State will evaluate all efforts made by the Contractor and will determine compliance in regard to quantity, intensity, and results of these efforts. Good Faith Efforts include:

- (1) Contacting minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor or available on State or local government maintained lists at least 10 days before the bid or proposal date and notifying them of the nature and scope of the work to be performed.
- (2) Making the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bid or proposals are due.
- (3) Breaking down or combining elements of work into economically feasible units to facilitate minority participation.
- (4) Working with minority trade, community, or contractor organizations identified by the Office for Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
- (5) Attending any prebid meetings scheduled by the public owner.
- (6) Providing assistance in getting required bonding or insurance or providing alternatives to bonding or insurance for subcontractors.
- (7) Negotiating in good faith with interested minority businesses and not rejecting them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
- (8) Providing assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisting minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.
- (9) Negotiating joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.
- (10) Providing quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.



**APPENDIX E**

**MBE DOCUMENTATION FOR CONTRACT PAYMENTS**

Prime Contractor/Architect: \_\_\_\_\_

Address & Phone: \_\_\_\_\_

Project Name: \_\_\_\_\_

Pay Application #: \_\_\_\_\_ Period: \_\_\_\_\_

The following is a list of payments made to Minority Business Enterprises on this project for the above-mentioned period.

MBE FIRM NAME	* INDICATE TYPE OF MBE	AMOUNT PAID THIS MONTH	TOTAL PAYMENTS TO DATE	TOTAL AMOUNT COMMITTED

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

Date: \_\_\_\_\_ Approved/Certified By: \_\_\_\_\_

Name

\_\_\_\_\_

Title

\_\_\_\_\_

Signature

**SUBMIT WITH EACH PAY REQUEST & FINAL PAYMENT**







# 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:

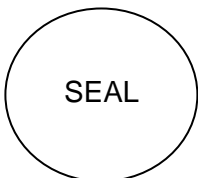
**Bidders must earn at least 50 points from the good faith efforts listed for their bid to be considered responsive.** (1 NC Administrative Code 30 I.0101)

- 1 – (10 pts)** Contacted minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.
- 2 --(10 pts)** Made the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bids are due.
- 3 – (15 pts)** Broken down or combined elements of work into economically feasible units to facilitate minority participation.
- 4 – (10 pts)** Worked with minority trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
- 5 – (10 pts)** Attended prebid meetings scheduled by the public owner.
- 6 – (20 pts)** Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.
- 7 – (15 pts)** Negotiated in good faith with interested minority businesses and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
- 8 – (25 pts)** Provided assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.
- 9 – (20 pts)** Negotiated joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.
- 10 - (20 pts)** Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

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. Substitution of contractors must be in accordance with GS143-128.2(d) Failure to abide by this statutory provision will constitute a breach of the contract.

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 expires \_\_\_\_\_





# 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 \_\_\_\_\_

Westgate Road Modular Building \_\_\_\_\_ contract.

(Name of Project)

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

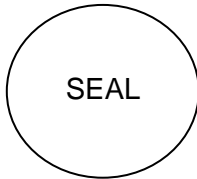
The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement. The Bidder agrees to make a Good Faith Effort to utilize minority suppliers where possible.

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)

Westgate Road Modular  
 (Project Name)

Project ID# 12-09486-01A Amount of Bid \$ \_\_\_\_\_

I will expend a minimum of \_\_\_\_\_% of the total dollar amount of the contract with 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.**

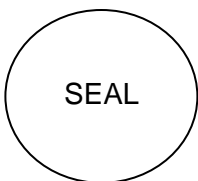
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

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)

Westgate Road Modular Building  
 (Project Name)

Project ID# 12-09486-01A 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.**

**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.

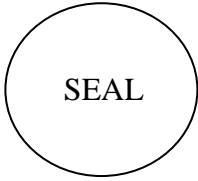


The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

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 \_\_\_\_\_