



WithersRavenel
Our People. Your Success.

PROJECT MANUAL

PART 1 OF 1

FOR

LEE COUNTY

KIWANIS CHILDREN'S PARK, PH2

February 26, 2024

WithersRavenel License No. F-1479

WithersRavenel Project No. 09220249.00

LEE COUNTY PARKS AND RECREATION DEPARTMENT
SANFORD, NORTH CAROLINA
Architect's Project No: 09220249.00

INVITATION TO BID

Lee County Bid Request No. 4844-01R-24
Sanford, North Carolina

Date Issued: **February 26, 2024**

Bid Opening Date: **Thursday, March 21, 2024, at 10:10 AM ET**

Lee County, North Carolina is **soliciting Sealed Bids for 4844-01R-24 – Kiwanis Children's Park Phase 2 Improvements** from qualified contractors. The project consists of park renovations at Kiwanis Children's Park, located at 101 Park Avenue, Sanford, North Carolina, and in support of the Lee County Department of Parks and Recreation. **Contractors are required to submit base bid pricing for the entire project.** The project drawings are compiled into one (1) set with one (1) set of specifications.

Scope of the project is to include all labor, materials, equipment, supervision, insurance, permits, inspections, taxes, disposal, and all other items necessary for the successful completion of the project. The Work generally consists of Park & Site improvements to include, but not limited to: earthwork/grading for a new playground (equipment and surfacing by others), concrete paving, fencing, site furnishings, and utilities for a pre-fabricated/engineered restroom building (by others).

Beginning on **February 26, 2024**, Bidders may obtain, and/or examine electronic bidding documents by visiting the Bid Opportunities page of Lee County's Development Services Website at https://leecountync.gov/departments/development_services/bid_opportunities/. You may download the digital documents from the website.

Attendance to an onsite pre-bid meeting is **mandatory** for new bidders and part of the prequalification process. Those who attended the first pre-bid meeting are not required to attend the second pre-bid meeting. Any bid received by a Contractor not on the attendance sheet for this meeting will be rejected.

One meeting will be conducted for two similar projects: O.T. Sloan Park Accessible Playground and Kiwanis Children's Park Phase 2 improvements. Interested contractors are encouraged to attend both site visits and bid on both projects.

- A Mandatory (for new bidders) Pre-bid meeting will be held on **Tuesday, March 5, 2024, at 2:00 pm**. We will start at **O.T. Sloan Park (1425 Bragg Street Sanford, NC)** where we will meet in the main parking lot, and then move to **Kiwanis Children's Park (101 Park Ave., Sanford, NC)** meeting near the existing playground. This meeting will provide an opportunity for potential bidders to ask initial project bid questions for both projects.
- All final questions and requests for information are due by the **close of business on Tuesday, March 12, 2024**. An addendum will be released no later than March 15, 2024.

LEE COUNTY PARKS AND RECREATION DEPARTMENT
SANFORD, NORTH CAROLINA

Architect's Project No: 09220249.00

Submit all questions in writing to WithersRavenel. Questions shall be submitted via email to the following:

- Jacob Smith jsmith2@withersravenel.com
- Julie Musso jmusso@withersravenel.com

Responses will be in the form of addendum if required.

Bids will be received at the location listed below until the date and time listed:

LEE COUNTY FINANCE OFFICE
C/O PURCHASING AGENT
115 Chatham Street, Suite 301
SANFORD, NORTH CAROLINA, 27330
Phone: 919 718-4600 – Finance Office
Phone: 919-718-4605 – County Managers Office
E-mail: jkeel@leecountync.gov

10:10 AM, Thursday, March 21, 2024

All bids must be submitted in an opaque sealed envelope and plainly labeled on the outer most package "Sealed Bid for **(Request #4844-01R-24)** – Kiwanis Children's Park Phase 2 Improvements" and addressed as listed above. Proposals must be made on the blank forms provided in the Contract Documents. Plainly Identify the Envelope with:

- (1) The project name/description,
- (2) The name and address of the bidder, and
- (3) General Contractor License number; inside and outside.

Due to the need to send original copies to the design team, two (2) original copies will be required to be submitted.

It is the responsibility of all Bidders to select shipping/delivery that will ensure the bids arrive by the deadline.

Bidders are encouraged to ship their bids to the above address via UPS, FedEx or DHL to facilitate tracking. Bidders may alternatively hand deliver their bids to the above address. Please contact Lee County by phone or e-mail at the addresses above, so staff can be alerted to anticipate your arrival.

Bids received after the announced time and date for submittal, whether by mail or otherwise, will be rejected. Bidders are responsible for ensuring their Bid is received before the deadline indicated. Bids submitted by telephone, email, text message, or facsimile shall not be accepted.

Lee County will conduct the bid opening after the bid deadline has passed.

- A blank bid tab summary will be distributed to all that attend the bid meeting.

LEE COUNTY PARKS AND RECREATION DEPARTMENT
SANFORD, NORTH CAROLINA
Architect's Project No: 09220249.00

- During the bid opening, Lee County will have no less than two (2) staff members present in the room.

Lee County Government reserves the right to reject any or all bids, any part of a bid, and to waive informalities, minor irregularities and technicalities in the bidding procedure. No bid may be withdrawn for a period of thirty (30) days from the date of opening.

Bids received after the announced time and date for submittal, whether by mail or otherwise, will be rejected. Bidders are responsible for ensuring their Bid is received before the deadline indicated. Bids submitted by telephone, email, text message, or facsimile shall not be accepted.

Contractors are required to submit base bid pricing for the entire project along with detailed pricing for each alternate, if any. Non-Compliance by any Prime Contractor shall be grounds for declaring their submitted bid as “nonresponsive”, the above information must be provided as required. Failure to submit these documents is grounds for rejection of the bid.

**Lee County Specific Minority Business / HUB forms.
Lee County Purchasing and Contracting Policy**

**MINORITY BUSINESS CONSTRUCTION CONTRACT
PROVISIONS INSTRUCTIONS FOR BIDDING PACKETS**

APPLICATION:

The Outreach Plan and Guidelines for Recruitment and Selection of Minority Owned Businesses for participation in Lee County contracts are hereby made a part of these contract documents.

MINORITY BUSINESS SUBCONTRACT GOALS:

The goal for participation by minority firms as subcontractors on this project has 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 N.C.G.S. 143-128.2(c) and 143-128.2(f).

In addition, the lowest responsible, responsive bidder must do one of the following:

1. 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

LEE COUNTY PARKS AND RECREATION DEPARTMENT
SANFORD, NORTH CAROLINA

Architect's Project No: 09220249.00

2. If the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, is less than the applicable goal, provide Affidavit D as well as documentation of good faith efforts.

Or

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

Non-Compliance by any Prime Contractor shall be grounds for declaring their submitted bid as “nonresponsive”, the above information must be provided as required. Failure to submit these documents is grounds for rejection of the bid.

LEE COUNTY FINANCE OFFICE
C/O PURCHASING AGENT
115 Chatham Street, Suite 301
SANFORD, NORTH CAROLINA, 27330
Phone: 919 718-4600 – Finance Office
Phone: 919-718-4605 – County Managers Office
E-mail: jkeel@leecountync.gov

10:10 AM, Thursday, March 21, 2024



LEE COUNTY PARKS MASTER PLAN
SANFORD, NORTH CAROLINA

BID REQUEST No. 4844-01R-24
Architect's Project No: 09220249.00

DATE: _____

TO: LEE COUNTY GOVERNMENT FINANCE OFFICE
ATTN: PURCHASING AGENT
115 CHATHAM ST, SANFORD, NORTH CAROLINA, 27330
PHONE: 919-718-4600
EMAIL: jkeel@leecountync.gov

FROM: _____
Bidder's Name

Bidder's Address

Bidder's Address

FOR: LEE COUNTY KIWANIS CHILDREN'S PARK – PHASE II

Having carefully examined the site and all of the Bidding and Contract Documents, and in compliance with the "Notice to Bid". "Instruction to Bidders" and Supplementary Instruction to Bidders" the undersigned proposes to provide all labor, materials, supplies, equipment, services, and perform all work necessary for the project in accordance with the Bid Documents, dated January 2024, as prepared by WithersRavenel.

Complete this Bid Form in Blue, Black ink or by typewriter. Discrepancies in the multiplication of units of work and the unit prices will be resolved in favor of the correct multiplication of the unit prices. Discrepancies between the indicated sum amount of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.



LEE COUNTY PARKS MASTER PLAN
SANFORD, NORTH CAROLINA

BID REQUEST No. 4844-01R-24
Architect's Project No: 09220249.00

THIS IS A LUMP SUM BASE BID PROJECT

Bidder has included all cost and items necessary to complete the project as detailed in the plans and specifications in the Bid Amount indicated below. **(Does not include allowances or deducts.)**

Kiwanis Children's Park: \$ _____ (Figures Only)

Lump Sum Allowances	
Owner's Contingency	\$7,000
Testing	\$5,000

TOTAL BASE BID PRICE

(Inclusive of bid for work noted above + all Lump Sum Allowances)

\$ _____ (Figures Only)

BID AMOUNT IN WORDS

UNIT PRICES

Unit prices quoted and accepted shall apply throughout the life of the contract, except as otherwise specifically noted. Unit prices shall be applied, as appropriate, to compute the total value of changes to the base bid quantity of the work all in accordance with the contract documents. Refer to Section 012000-Price and Payment Procedures.

ITEM	UNIT	UNIT PRICE
No. 1 Removal of Unsatisfactory soil	CY	Unit Price (\$) _____
No. 2 Replacement of Unsuitable soil with ABC	CY	Unit Price (\$) _____
No. 3 Concrete Sidewalk, per details	SY	Unit Price (\$) _____



LEE COUNTY PARKS MASTER PLAN
SANFORD, NORTH CAROLINA

BID REQUEST No. 4844-01R-24
Architect's Project No: 09220249.00

SUB-CONTRACTOR LIST

Bidders submitting a Single prime Contract are required to list the names of sub-contractors used in the determining their bid. List the names of sub-contractors below. (If using separate sub-contractors for the combined bid, list both subs and identify the project they are to construct.)

- Plumbing: _____
- Electrical: _____
- Sports Surfacing: _____
- Landscape: _____
- Playground: _____
- Sports Lighting: _____
- Other: _____
- Other: _____
- Other: _____

RECEIPT OF ADDENDA

We acknowledge the receipt of the following addenda:

- Addendum Number and Date _____
- Addendum Number and Date _____
- Addendum Number and Date _____
- Addendum Number and Date _____
- Addendum Number and Date _____

TIME OF COMPLETION

Based upon a Notice to Proceed within SIXTY (60) calendar days from the opening of the bid, Work included in this contract shall be substantially completed no later than TWO HUNDRED FORTY (240) calendar days and finally complete no later than thirty (30) calendar days thereafter.

LIQUIDATED DAMAGES

Liquidated Damages (refer to General Conditions for additional information): \$1000 per calendar day that the undersigned together with the undersigned's surety shall pay the owner for each calendar day or part thereof that expires after the date specified for the Substantial completion of the work and until the work is Substantially complete. By bidding, the undersigned hereby agrees to be responsible for such liquidated damages.

ACKNOWLEDGEMENT AND REPRESENTATIONS

- If notice acceptance of this bid is given to the undersigned within Sixty (60) days after the date of the opening of bid, or any time thereafter before this bid is withdrawn, the undersigned will execute and deliver the Owner's prescribed Contract Agreement promptly after it has been presented to him for signature. Evidence of Insurance pursuant to General Conditions as well as Performance and



LEE COUNTY PARKS MASTER PLAN
SANFORD, NORTH CAROLINA

BID REQUEST No. 4844-01R-24
Architect's Project No: 09220249.00

Payment bonds shall be furnished to the Owner at the execution of this agreement.

Provide initials beside each of the following statements indicating that the bidder agrees to these and other criteria specified in the Instruction to Bidders.

_____ A bid bond, cash deposit or certified check is being provided as specified in the Instructions to Bidders in the amount equal to not less than five percent (5%) of the Total Base Bid specified herein must be attached with this proposal. Performance and payment bonds of 100% of the contract price will be required from the winning bidder.

_____ We recognize and agree that failure to complete the proposed park improvements within the specified time frame will invoke Liquidated Damages of \$1,000.00 per calendar day until such work is complete.

- Upon request of the Owner, the undersigned bidder agrees to submit evidence in affidavit form of applicable experience, adequate financial resources, work in hand capacity, adequate organization, and acceptable past performance. Bidders qualification information shall be considered privileged and confidential.
 - 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 (c) shall constitute a basis for disqualification of the bid.
 - Should the owner adjudge that the apparent low bidder is the not the lowest responsible, responsive bidder by virtue of the above information, said apparent bidder will be notified and his bid security shall be returned to him.
- The undersigned bidder certifies that neither he/ she, nor official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with this bid. The person signing this bid form represents that he/ she has full authority and representative capacity to execute this Bid Form in the capacity indicated below.
- The undersigned Bidder is a licensed General Contractor in accordance with applicable North Carolina state statues and regulations, as amended.
- By submitting this bid, Bidder warrants and represents that Contractor and Sub-contractors comply with E-Verify System requirements for confirmation of employment status of employees per Article 2 of Chapter 64 of North Carolina General Statues.



LEE COUNTY PARKS MASTER PLAN
SANFORD, NORTH CAROLINA

BID REQUEST No. 4844-01R-24
Architect's Project No: 09220249.00

CERTIFICATION

I certify that the firm given name below is the true and complete name of the Bidder and that the Bidder is legally qualified and licensed to perform all work included in the scope of the Contract.

Legal Name of Bidder (Company): _____

Bidder's (Company) Address: _____

Affix Corporate Seal (If applicable):

Signature: _____
(Signature of person (s) legally authorized to bind Bidder (Company) to this contract)

By: _____
(Typed or printer Name (s) of Person (s) Signing)

Title: _____
(Typed or printer Title (s) of Person (s) Signing)

Telephone Number: _____ E-mail: _____
(include Area Code) (of person indicated above)

North Carolina General Contractor License: _____

(This form may be reproduced in exact detail)
END OF BID FORM

**LEE COUNTY'S MINORITY BUSINESS/HISTORICALLY
UNDERUTILIZED BUSINESS
PARTICIPATION OUTREACH PLAN AND GUIDELINES**

- SECTION A. INTENT
- SECTION B. DEFINITIONS
- SECTION C. MINORITY OUTREACH PLAN AND GUIDELINES
- SECTION D. MINIMUM COMPLIANCE REQUIREMENTS
- SECTION E. DISPUTE RESOLUTION PROCEDURES
- SECTION F. BID PACKET PROVISIONS
- SECTION G. INFORMAL BIDDING STATUTE
- SECTION H. AFFIDAVITS FOR BIDDERS
- SECTION I. BID PACKET COVERSHEET

**OUTREACH PLAN AND GUIDELINES FOR RECRUITMENT AND SELECTION OF MINORITY
BUSINESSES FOR PARTICIPATION IN LEE COUNTY
BUILDING CONSTRUCTION OR REPAIR CONTRACTS**

N.C.G.S. 143-128.2 requires that a local government unit or other public or private entity that receives State appropriations for a building project or other State grant funds for a building project, including a building project done by a private entity on a facility to be leased or purchased by the local government unit, where the project cost is one hundred thousand dollars (\$100,000) or more, shall have a verifiable ten percent (10%) goal for participation by minority businesses in the total value of the work. A verifiable goal is also required for building projects costing three hundred thousand dollars (\$300,000) or more when no state funds are involved. The outreach plan shall also be applicable to the selection process of architectural, engineering, and Construction Manager-at-Risk services, unless otherwise exempted.

Lee County has a current verifiable goal of 10% percent for minority participation for building construction or repair projects. The goal will be reviewed annually or as soon as relevant data is available.

SECTION A: INTENT

It is the intent of these guidelines that Lee County, as awarding authority for building construction or repair 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 goal of 10% percent for participation by minority businesses in each building construction or repair project as required 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. Lee County wants to provide historically underutilized businesses opportunities to participate in bidding opportunities.

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
 - f. Disabled, that is, a person with a disability as defined in N.C.G.S. 168-1 or N.C.G.S. 168A-3
 - g. Disadvantaged, that is, a person who is socially and economically disadvantaged as defined in 15 U.S.C. Section 637

2. Minority Business (MBE) – According to N.C.G.S. 143-128.4, minority business or historically underutilized business is a business that meets the following conditions:
 - a. In which at least fifty-one percent (51%) is owned by one or more persons who are members of at least one of the groups set above, 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.

4. Economically disadvantaged individuals -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.

5. Disability- according to N.C.G.S. 168A-3 is a person who has a physical or mental impairment which substantially limits one or more major life activities, has a record of such an impairment or is regarded as having such an impairment. As used, the term:

- a. Physical or mental impairment means (i) any physiological disorder or abnormal condition, cosmetic disfigurement, or anatomical loss, caused by bodily injury, birth defect or illness, affecting one or more of the following body systems: neurological; musculoskeletal; special sense organs; respiratory, including speech organs; cardiovascular; reproductive; digestive; genitourinary; hemic; and lymphatic; skin; and endocrine; or (ii) any mental disorder, such as mental retardation, organic brain syndrome, mental illness, specific learning disabilities, and other developmental disabilities, but (iii) excludes (A) sexual preferences; (B) active alcoholism or drug addiction or abuse; and (C) any disorder, condition or disfigurement which is temporary in nature leaving no residual impairment.
- b. Major life activities means functions such as caring for one's self, performing manual tasks, walking, seeing, hearing, speaking, breathing, learning, and working
- c. Has a record of such an impairment means has a history of, or has been misclassified as having, a mental or physical impairment that substantially limits major life activities
- d. Is regarded as having an impairment means (i) has a physical or mental impairment that does not substantially limit major life activities but that is treated as constituting such a limitation, (ii) has a physical or mental impairment that substantially limits major life activities because of the attitudes of others, or (iii) has none of the impairments defined above, but is treated as having an impairment.

4. Owner – Lee County.

5. Designer – Any person, firm, partnership, or corporation which has contracted with Lee County to perform architectural or engineering work.

6. Bidder - Any person, firm, partnership, corporation, association, or joint venture seeking to be awarded a public contract or subcontract.

7. 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.

8. Contractor - Any person, firm, partnership, corporation, association, or joint venture which has contracted with Lee County to perform building construction or repair work.

9. 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: MINORITY OUTREACH PLAN AND GUIDELINES

Owner

Lee County will employ the following strategies to encourage participation from MBEs.

1. Place emphasis on the importance of soliciting certified MBE firms for subcontracting opportunities at pre-bid conferences and in the bid documents. Examine specifications to identify special subcontracting opportunities and strongly encourage prime contractors to solicit bids for subcontracts from MBE firms.
2. Provide detailed information to majority contractors concerning the bidding and good faith efforts requirements by holding meetings with the contractors.
3. Assess the effectiveness of the MBE program, and identify opportunities to enhance it by evaluating MBE participation and compliance and reviewing the good faith efforts provided in bid packages.
4. Build new and strengthen existing business relationships through networking. Continue communicating with other North Carolina public agencies to find out how their MBE outreach programs are working and to share "best practices" and ideas to improve programs.
5. Participate in educational opportunities throughout the community as they become available and offer training sessions to share Lee County's outreach plan with interested businesses and organizations
6. Enhance Lee County's web page by including the outreach plan and guidelines, listing good faith efforts, creating links to MBE resources, and creating awareness of specific subcontracting opportunities.
7. Maintain or continue to maintain a database specifically for MBE firms and majority contractors to ensure those firms wishing to do business with Lee County have access to up-to-date information.
8. Advertise upcoming bid opportunities on the State HUB website.
9. Work with architects and engineers to make subcontracting opportunities more noticeable and more easily understood by potential contractors and subcontractors.

Designer

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

1. Attend the scheduled pre-bid conference to explain minority business requirements to the prospective bidders.
2. Assist the owner to identify and notify prospective minority business prime and subcontractors of potential contracting opportunities.
3. Maintain documentation of any contacts, correspondence, or conversation with minority business firms made in an attempt to meet the goals.
4. 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.

5. During construction phase of the project, review documentation for contract payment to MBEs (e.g. state form "Appendix E: MBE Documentation for Contract Payment") for compliance with minority business utilization commitments. Submit this form with monthly pay applications to the Owner.

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:

1. Attend the scheduled pre-bid conference.
2. Identify or determine those work areas of a subcontract where minority businesses may have an interest in performing subcontract work.
3. During the bidding process, comply with the owner's requirements listed in the proposal for minority participation.
4. 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).
5. Make documentation showing evidence of implementation of Prime Contractor, CM-at-Risk and First-Tier Subcontractor responsibilities available for review by Lee County, upon request.
6. Upon being named the apparent low bidder, the bidder shall provide one of the following: (1) an affidavit 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 (2) if the percentage is not equal to the applicable goal, then documentation of all good faith efforts taken to meet the goal. The documentation must include evidence of all good faith efforts that were implemented including any advertisements, solicitations, and evidence of other specific actions demonstrating recruitment and selection of minority businesses for participation in the contract. Failure to comply with these requirements is grounds for rejection of the bid and award to the next lowest responsible and responsive bidder.
7. The contractor(s) shall identify the name(s) of minority business subcontractor(s) and corresponding dollar amount of work on the schedule of values.
8. The contractor(s) shall submit with each monthly pay request(s) and final payment(s) documentation for contract payment to MBEs (e.g. state form "Appendix E: MBE Documentation for Contract Payment" for designer's review.
9. During the construction of a project, at any time, if it becomes necessary to replace a minority business subcontractor, immediately advise the owner 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.
10. If during the construction of a project additional subcontracting opportunities become available, the contractor shall make a good faith effort to solicit sub-bids from minority businesses.

Minority Business Responsibilities

Certification

Lee County does not certify minority businesses. Lee County requires certification for minority, disadvantaged or women-owned businesses. Any business that desires to participate as an MBE will be required to complete and submit for certification, documents required by any of the agencies listed below. Only those firms holding current certification through at least one of the following agencies will be considered eligible for inclusion in meeting the MBE participation percentage goals:

North Carolina Department of Administration Historically Underutilized Business (HUB) certification
North Carolina Department of Transportation Disadvantaged Business Enterprise (DBE)
North Carolina Department of Transportation Minority Business Enterprise (MBE)
North Carolina Department of Transportation Women Business Enterprise (WBE) Business Certification
Small Business Administration 8(a) certification
Other governmental agencies on a case-by-case basis

Other Responsibilities

Minority businesses that are contacted by owners or bidders must respond promptly whether or not they wish to submit a bid.

SECTION D: MINIMUM COMPLIANCE REQUIREMENTS

All written statements or affidavits made by the bidder shall become a part of the agreement between the Contractor and Lee County for performance of the contract. Failure to comply with any of these statements, affidavits, or with the minority business guidelines shall constitute a breach of the contract. A finding by Lee County 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 Lee County whether to terminate the contract for breach.

In determining whether a contractor has made good faith efforts, Lee County will evaluate all efforts made by the Contractor and will determine compliance in regard to quantity, diligence, and results of these efforts. Contractors are required to earn at least 50 points for good faith efforts. Failure to file a required affidavit or documentation demonstrating that the contractor made the required good faith effort, is grounds for rejection of the bid. 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. (10 points)
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. (10 points)
3. Breaking down or combining elements of work into economically feasible units to facilitate minority participation. (15 points)
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. (10 points)
5. Attending any pre-bid meetings scheduled by the public owner. (10 points)
6. Providing assistance in getting required bonding or insurance or providing alternatives to bonding or insurance for subcontractors. (20 points)

7. Negotiating in good faith with interested minority businesses and not rejecting them as unqualified without sound reasons based on their capabilities. Reasons for rejection of a minority business based on lack of qualification should be documented in writing. (15 points)
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. (25 points)
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. (20 points)
10. Providing quick pay agreements and policies to enable minority contractors and suppliers to meet cash flow demands. (20 points)

SECTION E: DISPUTE RESOLUTION PROCEDURES

Pursuant to G.S. 143-128 (f1), all disputes involving contractors on a building construction or repair project with Lee County shall be resolved pursuant to Lee County's Dispute Resolution Policy (Exhibit E).

SECTION F: In addition to these guidelines, there will be issued with each construction bid package provisions for providing minority business participation in the Lee County projects.

SECTION G: INFORMAL BIDDING STATUTE

All public entities shall solicit minority participation in contracts for the erection, construction, alteration or repair of any building awarded pursuant to this section. The public entity shall maintain a record of contractors solicited and shall document efforts to recruit minority business participation in these contracts. Nothing in this section shall be construed to require formal advertisement of bids. All data, including the type of project, total dollar value of the project, dollar value of minority business participation on each project, and documentation of efforts to recruit minority participation shall be reported to the Department of Administration, Office of Historically Underutilized Business, upon the completion of the project. Department Heads must work with the Development Services Director who will report the MWBE information to the Office of Historically Underutilized Business.

County of Lee - AFFIDAVIT A - Listing of Good Faith Efforts

Affidavit of _____
(Name of Bidder)

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.

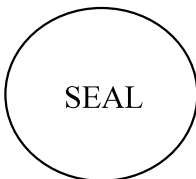
The undersigned, if apparent low bidder, will enter into a formal agreement with the firms listed in the Identification of Minority Business Participation schedule conditional upon scope of contract to be executed with the Owner. Substitution of contractors must be in accordance with GS143-128.2(d) Failure 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 _____

**County of Lee -AFFIDAVIT B- Intent to Perform Contract
With Own Workforce.**

Affidavit of _____
(Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the _____
_____ 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

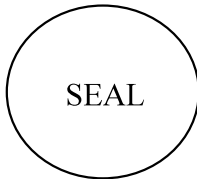
The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement. The Bidder agrees to make a Good Faith Effort to utilize minority suppliers where possible.

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 _____

County of Lee - AFFIDAVIT C - Portion of the Work to be Performed by HUB Certified/Minority Businesses

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

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

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

_____ (Project Name)

Project ID# _____ Amount of Bid \$ _____

I will expend a minimum of _____% of the total dollar amount of the contract with 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.**

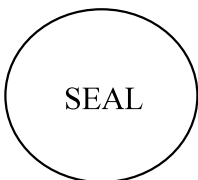
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

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 _____

County of Lee - AFFIDAVIT D – Good Faith Efforts

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

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

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

Project ID# _____ (Project Name) 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.

*Exhibit D – Minority Business/Historically Underutilized Business Participation
Outreach Plan and Guidelines*

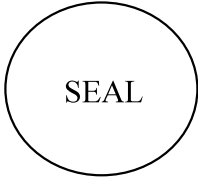
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

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 _____

SECTION I

MINORITY BUSINESS CONSTRUCTION CONTRACT PROVISIONS INSTRUCTIONS FOR BIDDING PACKETS

APPLICATION:

The Outreach Plan and Guidelines for Recruitment and Selection of Minority Owned Businesses for Participation in Lee County contracts are hereby made a part of these contract documents.

MINORITY BUSINESS SUBCONTRACT GOALS:

The goal for participation by minority firms as subcontractors on this project has 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 N.C.G.S. 143-128.2(c) and 143-128.2(f).

In addition, the lowest responsible, responsive bidder must do one of the following:

1) 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

2) If the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, is less than the applicable goal, provide Affidavit D as well as documentation of good faith efforts.

OR

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

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

Initial Here: _____

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

Table of Contents

ARTICLE 1. DEFINITIONS.....	2
ARTICLE 2. CORRELATION, INTERPRETATION AND INTENT OF CONTRACT DOCUMENTS.....	5
ARTICLE 3. FAMILIARITY WITH WORK, CONDITIONS AND LAWS.....	7
ARTICLE 4. BONDS.....	8
ARTICLE 5. INSURANCE AND INDEMNITY.....	8
ARTICLE 6. OTHER DOCUMENTS AND SUBMITTALS.....	14
ARTICLE 7. CONTRACTOR.....	14
ARTICLE 8. OWNER.....	22
ARTICLE 9. CONSTRUCTION MANAGER.....	22
ARTICLE 10. DESIGNER.....	23
ARTICLE 11. CONTRACT TIME.....	23
ARTICLE 12. CHANGES IN THE WORK.....	27
ARTICLE 13. CHANGE OF THE CONTRACT PRICE.....	28
ARTICLE 14. UNFORESEEN CONDITIONS.....	30
ARTICLE 15. CORRECTION OF WORK BEFORE FINAL PAYMENT.....	30
ARTICLE 16. CORRECTION OF WORK AFTER SUBSTANTIAL COMPLETION; WARRANTIES AND GUARANTIES.....	31
ARTICLE 17. OWNER’S RIGHT TO DO WORK.....	32
ARTICLE 18. PARTIAL PAYMENTS.....	32
ARTICLE 19. FINAL PAYMENT.....	34
ARTICLE 20. CONTRACTOR, SUBCONTRACTOR AND SUPPLIER AFFIDAVIT.....	35
ARTICLE 21. ASSIGNMENTS AND SUBCONTRACTS.....	35
ARTICLE 22. MEASUREMENTS.....	36
ARTICLE 23. CONTRACTOR AND SUBCONTRACTOR RELATIONSHIPS.....	36
ARTICLE 24. USE OF PREMISES.....	36
ARTICLE 25. DISPUTE RESOLUTION.....	37

ARTICLE 26. TAXES37
ARTICLE 27. OPERATION OF OWNER’S FACILITIES38
ARTICLE 29. TERMINATION OR SUSPENSION BY THE OWNER FOR CAUSE38
ARTICLE 29. TERMINATION OR SUSPENSION BY THE OWNER FOR CONVENIENCE

ARTICLE 1. DEFINITIONS

- 1.1 Agreement- the Contract Agreement, these general conditions, and any supplementary conditions, advertisement, instructions to bidders, specifications, drawings, bonds, addendums, drawings.
- 1.2 Beneficial Occupancy- the point at which the Project can be occupied by the Owner for its intended purpose, upon achievement of Substantial Completion, as defined in 1.35.
- 1.3 Change Order- a written order to the Contractor signed by the Owner and the Designer authorizing an addition, deletion, or revision in the Work and/or an adjustment in the Contract Price and/or the Contract Time issued after execution of the Contract Agreement.
- 1.4 Completion Date- those dates identified as completion dates in the Contract Construction Schedule or elsewhere in the Contract Documents.
- 1.5 Contract Agreement- the document executed by the Contractor and Owner to formally memorialize their consent to the terms of the Agreement.
- 1.6 Construction Change Directive- a written order to the Contractor signed by the Owner and the Designer directing an addition, deletion, or revision in the Work after execution of the Contract Agreement, in circumstances when the parties have been unable to agree on an adjustment to the Contract Price or the Contract Time, but the Owner requests that the Contractor proceed with said Work subject to adjustment of the Contract Price and/or Contract Time under the procedures described herein.
- 1.7 Construction Manager- the person or firm designated as the Construction Manger in the Contract Documents, or their authorized representatives. The Construction Manager, as referred to herein, will be referred to hereinafter as if each were of the singular number, masculine gender.
- 1.8 Contract Construction Schedule- that schedule identified as the Contract Construction Schedule.
- 1.9 Contract Documents- all of the documents that make up the Agreement, plus the Drawings and Specifications that describe the scope of the work, plus allowable modifications to the contract documents.

Initial Here: _____

- 1.10 Contract Price- the total monies payable to the Contractor under the Contract Documents.
- 1.11 Contract Time- the number of calendar days stated in, or computed from, the Contract Documents for the completion of the Work, or any portion thereof. Time of completion is of the essence. The time used and referred to on the Project will be that time which is observed in Sanford, Lee County, North Carolina, being Eastern Daylight Savings Time, Eastern Standard Time, or other as designated by the Designer.
- 1.12 Contractor- the Contractor shall be that party identified in the Agreement.
- 1.13 Days- unless otherwise indicated, the term “days” shall mean consecutive calendar days.
- 1.14 Daylight Hours- the hours or portion of hours between sunrise and sunset local time.
- 1.15 Designer- the person or firm designated as the Designer, in the Contract Documents, or their authorized representatives. The Designer(s), as referred to herein, shall mean architect, landscape architect, and/or engineer. They will be referred to hereinafter as if each were of the singular number, masculine gender.
- 1.16 Drawings- the drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location, and dimensions of the Work, and generally including plans, elevations, sections, details, schedules and diagrams. A list of the Drawings is contained in the Supplemental General Conditions.
- 1.17 Field Order- a written order issued by the Designer which clarifies or interprets the Contract Documents or orders minor changes in the Work in accordance with the Contract Documents.
- 1.18 Final Completion- the point at which the Contractor has, as determined by the Designer, completed the Work, with the exception of guaranty and warranty obligations, and becomes entitled, upon the recommendation of the Designer and determination by the Owner, to final payment.
- 1.19 Liquidated Damages- An amount, as stated in the Contract Agreement, 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.
- 1.20 Modification- a written amendment to the Contract Documents signed by the Owner and the Contractor and identified therein as such, or a Change Order, or a Construction Change Directive, or a Field Order.
- 1.21 Notice to Proceed- see Article 11.3.

Initial Here: _____

- 1.22 Owner- the Owner is the person designated as such in the Agreement.
- 1.23 Owner's Authorized Representative- a person or persons, employed by the Owner and designated from time to time by written notice to the Contractor to administer the Contract Documents, and to observe and monitor the Work on behalf of the Owner with authority and responsibility as herein specified.
- 1.24 Notice- the term "notice" or "written notice" as used herein shall mean and include all written notices, demands, instructions and claims, approvals and disapprovals furnished by the Owner or the Designer to obtain compliance with the requirements of the Contract Documents as well as all written notices, demands, instructions and claims furnished by the Contractor as required by the Contract Documents. Where notice is required under the terms of the Contract Documents, written notice shall always be required, and oral or "constructive" notice shall be insufficient and ineffective as notice unless specifically allowed by the Supplementary Conditions or a Modification to the Agreement. Written notice shall be deemed to have been duly served on the date that it is delivered in person to the individual or to a member of the firm, to an officer of the corporation for whom it is intended, to an authorized representative of such individual, firm, or corporation, or on the date that it is mailed by registered or certified mail, return receipt requested, addressed to the last business address of such individual, firm, or corporation. Written notice may also be given by facsimile transmission, provided that proof of delivery is obtained. In the case of delivery in person, such delivery shall not be effective unless and until a written and signed receipt showing the date and time of deliver is obtained.
- 1.25 Project- the total construction of which the Work performed under the Contract Documents may be the whole or a part.
- 1.26 Project Expediter- As used herein, is an entity stated in the Contract Documents, designated to effectively facilitate scheduling and coordination of Work activities. For the purpose of a single prime contract, the single prime contractor is designated as the Project Expediter.
- 1.27 Project Manager- that person designated by the Contractor who shall be in general charge of the Work and its performance.
- 1.28 Request for Information- a written communication from the Contractor to the Designer for any interpretation of, or information needed, required, or desired under the Contract Documents. The Owner reserves the right to determine the reasonable format and contents required for a Request for Information. In any Request for Information, the Contractor shall state a reasonable date by which a response is necessary in order to avoid delay in progress of the Work and shall make such request sufficiently in advance of such date as to avoid any such delay.
- 1.29 Request for Payment- document approved by Owner, which is to be used by the Contractor in requesting progress payments and which is to include a Schedule of Values as required by the Contract Documents and an affidavit of the Contractor that progress

Initial Here: _____

payments theretofore received from the Owner on account of the Work have been applied by the Contractor to discharge in full all the Contractor's obligations incurred in connection with Work covered by all prior applications for payment.

- 1.30 Superintendent- that person designated by the Contractor who has day-to-day responsibility for the prosecution of the Work and the obtaining of proper materials and equipment, and adequate labor.
- 1.31 Schedule of Values- any breakdown of the Contract Price which may be required by the Contract Documents and designated as such.
- 1.32 Specifications- the portion of the Contract Documents consisting generally of the written requirements for materials, equipment, construction systems, standards, and workmanship for the Work and performance of related services.
- 1.33 Subcontractor- a person, firm, or corporation who has entered into a direct contract with the Contractor to perform any of the Work of the Project.
- 1.34 Submittal- shop drawings, product data, samples, and other documents required by the Contract Documents to be submitted by the Contractor to the Designer.
- 1.35 Substantial Completion- the point at which the Work, and Work by other Contractors on or in connection with the Project, as determined by the Designer, is sufficiently complete in accordance with the Contract Documents that it can be beneficially occupied by the Owner, and the Work can be utilized by the Owner for its intended use, and all necessary permits and permissions for Beneficial Occupancy and utilization having been obtained by the Contractor. All operations and maintenance manuals, Owner training, and as-built drawings must be submitted prior to Substantial Completion being achieved.
- 1.36 Work- the construction and services required by the Contract Documents, including all labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations.

ARTICLE 2. CORRELATION, INTERPRETATION AND INTENT OF CONTRACT DOCUMENTS

- 2.1 It is the intent of the Specifications and Drawings and other Contract Documents to describe a complete Project in accordance with the Contract Documents.
- 2.2 The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If the Contractor finds a conflict, error or discrepancy in the Contract Documents, the Contractor shall notify the Designer in writing before proceeding with the Work affected thereby. In resolving such conflicts, errors and discrepancies, the Contract Documents shall be given preference in the following order: Contract Agreement, Modifications, Addenda, Supplemental Conditions, General Conditions, Specifications, and Drawings. Figure dimensions on Drawings shall govern over scale dimensions, and detailed Drawings shall govern over

general Drawings. Any Work that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials or equipment described in words which, so applied, have a well known technical trade meaning shall be deemed to refer to such meaning and to incorporate any recognized standards which are a part of such meaning.

2.3 Miscellaneous items, accessories and work which are not specifically mentioned, but which are essential to produce a complete and properly operating installation, or useable structure or plant providing the indicated function shall be furnished and installed without change in the Contract Price. Such miscellaneous items and accessories shall be of the same quality standards, including material, style, finish, strength, class, weight and other applicable characteristics, as specified for the major component of which the miscellaneous item or accessory is an essential part, and shall be approved by the Designer before installation. This requirement is not intended to include major components not covered by or inferable from the Contract Documents.

2.4 The Work of all trades under the Contract Documents shall be coordinated by the Contractor in such a manner as to obtain the best workmanship possible for the entire Project and all components of the Work shall be installed or erected in accordance with the best practices of the particular trade.

2.5 The Contractor shall fully complete the Work and shall be responsible for all of the Work under the Contract Documents to which the Construction Agreement applies. If the Contractor is prevented from doing so by any limitation of the Contract Documents, the Contractor shall immediately give notice thereof to the Designer and the Owner in writing before proceeding with the construction in the area where the problem or limitation exists.

2.6 Standard specifications or manufacturers' literature, when referenced, shall be of the latest revision or printing unless otherwise stated and is intended to establish the minimum requirements acceptable.

2.7 For those materials specified without the use of brand names, the Contractor shall submit within thirty (30) days after his receiving the Contract Agreement for signatures, any product that meets the express requirements of the Specifications.

Such Submittal shall include manufacturer's data, test reports, performance data and certifications, samples, erection details, and other applicable information as required to permit determination by the Designer whether such proposed products are suitable. The Designer shall be the sole judge as to the suitability of any proposed product. The burden of proof of quality rests with the Contractor.

2.8 The Contractor is required to examine and read the complete set of Contract Documents for information concerning the Work, because some of the Work for which the Contractor will be responsible may be indicated on or in documentation applying primarily to the Work of one or more other separate prime contractors. No allowance will be made for the Contractor's failure to become familiar with the complete set of project documents.

Initial Here: _____

2.9 Contractor's requests for clarification or information shall clearly define the cause(s) of Contractor's request and, as appropriate, shall include Contractor's interpretation and Contractor's proposed solution.

ARTICLE 3. FAMILIARITY WITH WORK, CONDITIONS AND LAWS

3.1 The Contractor has investigated prior to bidding and is satisfied with all conditions affecting the Work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electrical power, roads and uncertainties of weather, or similar physical conditions at the Project site, and the character of equipment and facilities needed prior to and during prosecution of the Work. The Contractor is satisfied as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from inspection of the Project site, including all exploratory work done by the Owner, as well as from information presented by the Contract Documents, or any other information made available to the Contractor prior to receipt of bids. Any failure by the Contractor to become acquainted with the available information shall not relieve the Contractor from the responsibility for estimating properly the difficulty or cost of successfully performing the Work.

3.2 The Contractor shall be entitled to rely upon all information furnished to the Contractor in writing by the Owner with respect to the Project site and to make all inferences from it that would reasonably be made by a contractor having knowledge and experience with similar work; however, the Contractor shall not be entitled to infer from Owner-supplied information any fact or condition which would not be inferred by a contractor having knowledge and experience with similar work and, if the Owner-supplied information is inadequate or insufficient in any respect, the Contractor shall be required to obtain independently such other information as a knowledgeable and experienced contractor would prudently obtain in order to evaluate any such condition.

3.3 The Contractor specifically acknowledges familiarity with all Federal, State, and local laws, ordinances, rules and regulations which may in any manner affect those engaged or employed in the Work, or the materials or equipment in or about the Work, or in any way affect the conduct of the Work and agrees that the Contractor and the Contractor's employees, subcontractors, and suppliers will, at all times, comply with same. If the Contractor shall discover any provisions in the Contract Documents which are contrary to or inconsistent with any such law, ordinance, rule, or regulation, the Contractor shall immediately give notice thereof to the Designer and the Owner in writing, identifying any items of Work affected, and the Contractor shall not proceed until the Contractor has received written direction from the Designer with respect to these items. If the Contractor performs contrary to or inconsistently with any such law, ordinance, rule, or regulation without giving such notice, the Contractor shall bear all costs which are a consequence of such performance.

3.4 At times selected by the Designer after execution by the Contractor of the Construction Agreement, a pre-construction conference shall be scheduled and conducted for the benefit of the Project.

ARTICLE 4. BONDS

4.1 A performance bond in the full amount of the Contract Price shall be required of the Contractor to guarantee the faithful performance of the Work in compliance with the Contract Documents, in such form as may be required by law and approved by the Owner. The bond shall be dated the same date as the Construction Agreement and must be accompanied by a current copy of the power of attorney for the attorney-in-fact executing such bond on behalf of a surety company licensed to do business in the state of North Carolina.

4.2 A payment bond in the full amount of the Contract Price shall be required of the Contractor to guarantee the payment of all labor and material costs or claims in connection with compliance with the Contract. The payment bond shall be in such form as may be required by law and approved by the Owner. Said bond shall be dated and executed in the same manner as the performance bond in paragraph 4.1.

ARTICLE 5. INSURANCE AND INDEMNITY

5.1 CONTRACTOR PROVIDED INSURANCE

The Contractor shall, without limiting its obligations or liabilities, procure, pay for and maintain such insurance as is required by law and as is required by this Agreement to protect the Contractor and the Owner from claims for damages for bodily injury, including death, and from claims for property damage which may arise from the Contractor's or its representatives', consultants', Subcontractors', agents', or employees' operations under this Agreement. Such insurance shall be of the kinds and have limits of liability and coverages not less than the minimum limits hereinafter specified or required by law, whichever is greater. The Owner makes no representation as to the adequacy or sufficiency of such coverages. The following requirements shall in no way be construed to limit or eliminate the liability of the Contractor, which arises from performance of Work under the Agreement. The Contractor is strictly responsible for any losses, claims, and costs of any kind which exceed the Contractor's limits of liability, or which may be outside the coverage scope of the policies.

The insurance specified shall be provided by an insurer approved by the Owner authorized to do such business in the State of North Carolina, and on terms approved by the Owner. Insurance companies utilized shall have a minimum rating of A- and Class VII as evaluated by the most current A.M. Best Rating Guide. If the insurer has a Best Rating less than A-and Class VII, the Contractor must receive specific written approval from the Owner prior to proceeding with any Work under the Agreement. All agents and brokers shall hold valid licenses from the State of North Carolina. Before commencing mobilization to the Project site and not later than 7 days after the receipt of the Construction Agreement by the Contractor for signatures, the Contractor shall furnish to the Owner a certificate or certificates of insurance in a form satisfactory to the Owner. Upon request of the Owner, the Contractor shall provide the Owner with certified copies of the insurance policies required by this Article, including without limitation declaration pages, conditions, exclusions and endorsements, and confirmation that each policy premium has been paid for the required term of this Agreement. A copy of the umbrella policy shall be provided to the Lee County Finance Department. Certificates shall be signed by a person authorized by that insurer to bind coverage on its behalf. In the event of any such cancellation, non-renewal, reduction, restriction, or change in any insurance, the Contractor is obligated to replace such

Initial Here: _____

insurance within 7 days without a gap in coverage and file accordingly such notice with the Owner, and other interested parties. Failing immediate receipt of evidence of such replacement of insurance the Owner reserves the right to procure such insurance as the Owner considers desirable and the Contractor shall pay or reimburse the cost of the premium in respect thereof. It is expressly provided, however, that any action or inaction on the part of the Owner in this respect shall in no way change or reduce the Contractor's responsibilities and liabilities under this Agreement. Self-funded, policy fronting, or other non-risk transfer insurance mechanisms are not acceptable without prior written approval of the Owner. Full disclosure of such a program must be made prior to commencing mobilization to the Project site. Failure to make a full disclosure constitutes a material breach of the Agreement, justifying termination for default.

The Contractor shall name the Owner and Designer as additional insureds under all its insurance contracts (except workers' compensation) with respect to and including without limitation liability arising out of activities performed by or on behalf of the Contractor, products and completed operations of the Contractor, and automobiles owned, hired, leased, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to additional insureds.

For any claims related to this Project, the Contractor's insurance or self-insurance shall be primary and noncontributory with respect to the Owner's insurance. Any insurance or self-insurance maintained by the Owner shall be excess and noncontributory with respect to the Contractor's insurance.

All policies of insurance shall contain a clause waiving rights of subrogation against the Owner, unless the Owner approves otherwise in writing.

Limits of coverage are not to be amended by deductible clauses of any nature without the express written consent of the Owner. The Contractor shall be solely responsible for any deductible assumptions that may exist in any insurance policies required under this Agreement. In addition, the Contractor shall be responsible and shall not be reimbursed for any losses arising from any risk or exposure not insured as required herein, or not covered as a result of a normal policy extension or that falls within the self insured retention, if Contractor is self insured.

The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

The claim provisions in the Contractor's insurance policies must specifically state the insurance company or Contractor's Third Party Administrator, if self insured, has both the right and duty to adjust a claim and provide defense.

The policies shall not contain any provision or definition which would serve to exclude or eliminate from coverage third party claims, including exclusions of claims for bodily or other injury to shareholders, partners, officers, directors, or employees of the insured, the premises owner, real estate manager, or the insured's Subcontractor, or any family relative of such persons.

Initial Here: ____

If the policies contain any warranty stating that coverage is null and void (or words to that effect) if the Contractor does not comply with the most stringent regulations governing the Work, it shall be modified so that coverage shall be afforded in all cases except for the Contractor's willful or intentional noncompliance with applicable government regulations.

Any failure by any person to comply with reporting or other provisions of the policy including breach of warranties, shall not affect coverage provided to the Owner and its representatives, officials, and employees.

The insolvency or bankruptcy of the Insured or of the Insured's estate shall not relieve the insurance companies of their obligations under these policies. Any clauses to the contrary are unacceptable and must be stricken.

Failure to comply with these requirements shall be a material breach of this Agreement justifying termination for default.

5.2 CONTRACTOR PROVIDED WORKER'S COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE

The Contractor and its Subcontractors shall procure and maintain Workers' Compensation Insurance in the amount and type required by the State of North Carolina and federal law for all employees employed under the Agreement who may come within the protection of Workers' Compensation Laws and covering all operations under the Agreement whether performed by the Contractor or by his Subcontractors. In jurisdictions not providing complete Workers' Compensation protection, the Contractor and his Subcontractors shall maintain employers' liability insurance in an amount, form, company, and agency satisfactory to the State of North Carolina and the Owner for the benefit of all employees not protected by Workers' Compensation Laws and covering all operations under the Agreement whether performed by the Contractor or by his Subcontractors.

The Contractor shall pay such assessments as will protect the Contractor and the Owner from claims under the Workers' Compensation laws, workers' or workmen's' compensation disability benefits, and other similar employee benefit acts. The current Experience Modification Factor shall be indicated on the Certificate of Insurance.

Coverage under this section shall be as required by federal and state Workers' Compensation and Occupational Disease Statutes, and shall have minimum limits as follows:

Coverage A:	Statutory, State of North Carolina
Employers' Liability:	Each Accident \$1,000,000
	Disease - Policy Limit \$1,000,000
	Disease - Each Employee \$1,000,000

Such insurance shall include Voluntary Compensation coverage, a Waiver of Subrogation in favor of the Owner as well as other endorsements that may be required by applicable jurisdictions, i.e. United States Longshoremen and Harbor Workers Act and maritime coverage (Jones Act).

5.3 CONTRACTOR PROVIDED AUTOMOBILE LIABILITY INSURANCE

The Contractor shall procure and maintain automobile insurance against liability for bodily injury and property damage as described below, that may arise with respect to the Work being performed under the Agreement, and as will provide protection from claims which may arise out of or result from the Contractor's performance of the Work and the Contractor's other obligations under the Agreement, whether such performance of the Work is by the Contractor, by any representative or Subcontractor, by anyone, both officially and personally, directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

This policy of insurance shall carry the following minimum Limit of Liability:

Combined Single Limit \$1,000,000

The policy of insurance shall contain or be endorsed to include the following:

- a) owned, hired, and non-owned automobile liability.
- b) If the policy contains a warranty stating that coverage is null and void (or words to that effect) if the transporter does not comply with the most stringent regulations governing the Work, it shall be modified so that coverage shall be afforded in all cases except for the transporter's willful or intentional noncompliance with applicable government regulations.

Any failure by any party to comply with reporting or other provisions of the policy including breach of warranties, shall not affect coverage provided to the Owner and its representatives, officials, and employees.

No subcontracting of waste hauling shall be permitted without prior, written approval of the Owner.

5.4 CONTRACTOR PROVIDED GENERAL LIABILITY

This policy must be written on an Occurrence basis, with the following minimum Limits of Liability:

General Aggregate per project	\$2,000,000.00
Products/Completed Operations Aggregate	\$2,000,000.00
Bodily Injury and Property Damage csl/each occurrence	\$1,000,000.00
Personal Injury and Advertising Injury	\$2,000,000.00

The policy of insurance shall contain or be endorsed to include the following:

- a) Blanket Contractual Liability covering Contractor's indemnification obligations under this Agreement, in accordance with ISO policy form CG 00 01. Modifications to the standard provision will not be acceptable if they serve to reduce coverage.

Initial Here: ____

- b) Premises/Operations Liability.
- c) Explosion, collapse, and underground fault.
- d) Independent Contractors and Independent Subcontractors coverage.
- e) Broad Form Property Damage.
- f) Personal Injury
- g) Cross Liability/Severability of Interest clause.
- h) Employer's Stop-Gap Liability endorsement, if applicable.
- i) Amendment of the Pollution Exclusion Endorsement to allow coverage for bodily injury or property damage caused by heat, smoke, or fumes from a hostile fire.
- j) Designated General Aggregate Limit Endorsement if required by the Supplemental General Conditions.

5.5 CONTRACTOR PROVIDED PROPERTY INSURANCE

The Contractor shall purchase All Risk Property Insurance on a Completed Value Form in the names of the Owner, Contractor, Subcontractors, and sub-subcontractors as their interests may appear with limits as follows:

- a) Full insurance value of the Work, or
- b) Amount equal to the Contract Price for the Work, whichever is higher.

The Contractor is responsible for all physical damage to owned or rented machinery, tools, equipment, forms, and other items owned, rented or used by the Contractor and/or Subcontractor(s) in the performance of the Work. The insurance coverage evidencing such shall include a waiver of subrogation in favor of the Owner.

5.6 CLAIMS

The Contractor shall notify the Owner within 24 hours of any claims or alleged claims received by the Contractor covered by any of the policies of insurance required in this Agreement. The Contractor shall provide a written copy of the claim or alleged claim to the Owner within 3 days of the Contractor's receipt of the claim or alleged claim. If a claim is settled to the satisfaction of the claimant, the Contractor shall submit a copy of the claimant's release to the Owner.

If a claim or alleged claim is rejected by the Contractor and/or its insurance company, the Contractor shall immediately report this fact to the Owner.

Initial Here: _____

Should 30 days elapse after the claim or alleged claim has been received by the Contractor, and the Contractor is not able to report a settlement or rejection of the claim, it shall report to the Owner the steps being taken with respect to the claim.

Without limiting the foregoing, the Contractor shall notify in writing the County risk manager of any paid or incurred claims which may impair annual aggregate or general liability.

5.7 CONTRACTOR'S DEDUCTIBLES AND SELF-INSURED RETENTIONS

Any deductibles or self-insured retentions must be declared to and approved by the Owner. At the option of the Owner, either: the insurer shall reduce to a maximum of \$250,000 or eliminate such deductibles or self-insured retentions with respect to the Owner, or the Contractor shall provide evidence of collateral provided to insurers or procure a bond guaranteeing payment of losses and related investigations, claim administration, and defense expenses within the deductible or self-insured retention amount. Any self-insured retention or deductible amount on the policy shall not reduce the amount of collectible limits or liability.

5.8 CONTRACTOR'S SUBCONTRACTORS

The Contractor shall include all Subcontractors as Insureds under its policies, or shall furnish separate certificates, policies, and endorsements for each Subcontractor the Contractor intends to use. If a Subcontractor does not take out insurance in his own name and the Contractor wishes to provide insurance protection for such Subcontractor and such Subcontractor's employees, the Contractor shall either (a) procure appropriate policies in the name of the Subcontractor, or (b) cause a rider or riders to be attached to the Contractor's policies which shall identify the Subcontractor thereby covered; provided, however, in the case of the latter option, such a rider need not be attached to the Contractor's workers' compensation policy if such policy by its terms is sufficiently broad to cover the employees of all Subcontractors performing Work under the Contract Documents. Except as otherwise approved by the Owner in writing, Limits of Liability and coverage scope must be at a minimum as stringent as required of the Contractor by the Contract Documents. All Work performed for the Contractor by any Subcontractor shall be pursuant to an appropriate agreement between the Contractor and the Subcontractor which shall contain provisions that waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by insurance as provided herein. Insurance monies received from any loss shall be divided as the respective interest of the parties affected shall appear.

5.9 INDEMNIFICATION

To the fullest extent provided 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 expense, 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 therefrom, and 2) is caused in whole or in part by any

Initial Here: ____

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.

The provisions of this paragraph shall survive the termination or cancellation or completion of this Agreement.

ARTICLE 6. OTHER DOCUMENTS AND SUBMITTALS

The Contractor acknowledges that the processing of shop drawings and other submittals is directly impacted by the clarity, completeness, and accuracy of said documents and that it is the Contractor's responsibility to (i) review and coordinate each submittal with all other related or affected Work and (ii) approve each submittal before submitting same to the Designer for approval.

No substitutions and no deviations from any requirement of the Contract Documents shall be deemed allowed unless the Contractor has specifically informed the Designer and the Owner in writing of such deviations at the time of submittal and the Designer and the Owner have given written and specific approval to the substitutions or deviations. In proposing a deviation or substitution the Contractor warrants to the Owner, notwithstanding any review, allowance or approval by the Designer or the Owner that the deviation or substitution is at least equal to or better in quality and for the purpose intended, and that Contractor shall not by reason of any such review, allowance or approval be relieved from any obligation or responsibility contained in the Contract Documents.

ARTICLE 7. CONTRACTOR

7.1 The Contractor shall supervise and direct the Work efficiently and with the Contractor's best skill and attention. Except as may be set forth specifically in the Contract Documents, the Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs in connection with the Work. The Contractor shall be responsible to see that the finished Work complies accurately with the Contract Documents.

7.2 The Contractor shall appoint a Project Manager and shall keep on the Project at all times during its progress a competent Resident Superintendent and necessary assistants who shall not be replaced without prior written approval by the Owner except under extraordinary circumstances, in which event immediate written notice shall be given to the Designer and the Owner. The Project Manager and the Resident Superintendent may be the same person or different persons. At any time, the Owner, in its sole and absolute discretion, may require the Contractor to replace the Project Manager or Resident Superintendent with an experienced and competent person or persons upon seven (7) days written notice from the Owner to the Contractor. Such replacement shall be at the Contractor's expense and at no cost to the Owner.

Initial Here: ____

Both the Project Manager and the Resident Superintendent shall have authority to act on behalf of the Contractor, and instructions, directions or notices given to either of them shall be as binding as if given to the Contractor.

7.3 The Contractor shall provide sufficient competent and suitably qualified personnel, equipment, and supplies to lay out the Work and perform construction as required by the Contract Documents. The Contractor will at all times maintain good discipline and order at the site, and will comply with all applicable OSHA standards.

Any person employed by the Contractor, any Subcontractor, or any sub-subcontractor who, in the opinion of the Designer or the Owner, does not perform his Work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the Owner or Designer, be removed forthwith by the Contractor, Subcontractor, or sub-subcontractor employing such person without cost to the Owner, and shall not be employed again in any portion of the Work without the written approval of the Owner or Designer.

Should the Contractor fail to remove such person or persons or fail to furnish suitable and sufficient personnel for the proper prosecution of the Work within three (3) days after written order, the Owner may withhold further payment by written notice until compliance with such order.

7.4 If, in the opinion of the Designer or the Owner, any Subcontractor on the Project is incompetent or otherwise unsatisfactory, he shall be replaced by the Contractor with no increase in the Contract Price if and when directed by the Designer or the Owner in writing.

7.5 The Contractor shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools appliances, fuel, light, heat, and all other facilities and incidentals necessary for the execution, maintenance, initial operation, and completion of the Work, other than those specifically excluded by the Contract Documents and to be furnished by the Owner or others. When use or storage of hazardous materials or equipment or methods of more than ordinary risk are necessary in accomplishing the Work, the Contractor shall give the Owner and Designer reasonable advance notice.

All equipment which is proposed to be used in the Work shall be of sufficient size and in such mechanical condition as to meet the requirements of the Work and produce a satisfactory quality of work. Equipment used on any portion of the Work shall be such that no injury to previously completed Work, adjacent property, or existing facilities shall result from its use.

When the methods and equipment to be used by the Contractor accomplishing the Work are not prescribed in the Contract Documents, the Contractor shall be free to use any methods or equipment that will accomplish the Work in conformity with the requirements of the Contract Documents.

When the Contract Documents specify the use of certain methods and equipment, such methods and equipment shall be used unless others are authorized by the Designer. If the Contractor desires to use a method or type of equipment other than specified in the Contract Documents, the Contractor may request authority from the Designer to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed and of

Initial Here: _____

the reasons for desiring to make the change. If approval is given, it shall be on the condition that the Contractor shall be fully responsible for producing Work in conformity with the requirements of the Contract Documents. If, after trial use of the substituted methods or equipment, the Designer determines that the Work produced does not meet the requirements of the Contract Documents, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining Work with the specified methods and equipment at no additional cost to the Owner. The Contractor shall remove any deficient Work and replace it with Work of specified quality, or take such other corrective action as the Designer may direct. No change in the Contract Price or in Contract Time shall be made as a result of authorizing a change in methods or equipment under this paragraph.

7.6 All materials and equipment shall be new, except as otherwise provided in the Contract Documents. When special makes or grades of material which are normally packaged by the supplier or manufacturer are specified or approved, such materials shall be delivered to the Project site in their original packages or containers with seals unbroken and labels intact.

Materials shall be so stored as to assure the preservation of their quantity, quality and fitness for the Work. Stored materials, even though approved before storage, may again be inspected by the Designer or Owner prior to their use in the Work and shall meet the requirements of the Contract Documents at the time they are incorporated into the Work. Stored materials shall be located so as to facilitate their prompt inspection. The Contractor shall coordinate the storage of all materials with the Designer and the Owner. Materials to be stored at the Project or on the Owner's property shall not create an obstruction to the Owner's or other contractor's reasonable activities. Private property shall not be used for storage purposes without written permission of the owner or lessee of such property. The Contractor shall make all arrangements and bear all expenses for the storage of materials on private property. Upon request, the Contractor shall furnish the Owner a copy of the property owner's permission. All storage sites on private or the Owner's property shall be restored to their original condition by the Contractor at his entire expense, except as otherwise agreed to (in writing) by the owner or lessee of the property.

7.7 All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, or processor, except as otherwise provided in the Contract Documents.

7.8 The Contractor will be fully responsible for all acts and omissions of his Subcontractors and of persons directly or indirectly employed by them and of persons for whose acts any of them may be liable to the same extent that the Contractor is responsible for the acts and omissions of the Contractor's own employees. Nothing in the Contract Documents shall create any contractual relationship between any Subcontractor or supplier and the Owner or the Designer, or any obligation on the part of the Owner or the Designer to pay or see to the payment of any money due any such Subcontractor or material furnisher except as may otherwise be required by law. The Owner or the Designer may furnish to any Subcontractor or supplier, to the extent practicable, evidence of amounts paid to the Contractor on account of specific Work done.

7.9 The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor in dividing the Work among Subcontractors.

Initial Here: _____

7.10 The Contractor agrees to bind specifically every Subcontractor to the terms and conditions of the Contract Documents for the benefit of the Owner and to furnish written evidence thereof to the Designer and the Owner.

7.11 The Contractor shall attend job progress conferences and all other meetings or conferences as directed by the Designer. The Contractor shall be represented at these job progress conferences by a representative having the authority of the Project Manager and by such other representatives as the Designer may direct. Job progress conferences shall be open to Subcontractors, suppliers and any others who may contribute beneficially toward maintaining required job progress, and such personnel shall be encouraged by the Contractor to attend. It shall be the principal purpose of job progress 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 Work and the Project by the specified Completion Dates. The Contractor shall be prepared to assess progress of the Work as required in the Contract Documents and to recommend remedial measures for correction of progress as may be appropriate. The Designer shall preside as chairman and arrange for minutes to be taken and circulated.

In the event that the prosecution of the Work is discontinued for any reason, the Contractor shall notify the Designer and the Owner at least forty-eight (48) hours in advance of resuming operations.

Should the terms of the Contract Documents require completion of one or more portions of the Work for the Beneficial Occupancy of the Owner prior to completion of the entire Work, the Contractor shall complete such portion(s) of the Work on or before the date specified. Such completion shall include the obtaining of all government or other permits, permission, and/or approvals necessary to occupancy. The Contractor shall independently estimate the difficulties involved in arranging the Work to permit such Beneficial Occupancy and shall not claim any additional compensation or time extension by reason of any delay or increased cost due to completing such portion(s) of the Work. The Owner's possession and use of such portion(s) of the Work shall not be deemed an acceptance of any Work not completed in accordance with the Contract Documents. The Owner shall be responsible for the security, maintenance, utilities, and insurance of all portions of the Work completed and beneficially occupied by the Owner.

7.12 The Contractor shall pay all license fees and royalties, and assume all costs incident to the use of any invention, design process, or device which is the subject of patent rights or copyrights held by others, except for inventions, design processes, or devices specified by the Designer in the Contract Documents. The Contractor shall indemnify and hold harmless the Owner, the Designer, and anyone directly employed by either of them, from and against all claims, damages, losses and expenses, including attorney's fees and costs of defense, arising out of any infringement or alleged infringement of such rights during or after completion of the Work, and shall defend all such claims in connection with any actual or alleged infringement of such rights.

7.13 The Contractor shall secure and pay for all permits, including without limitation construction permits and licenses, and will pay all governmental charges and inspection fees necessary for the prosecution of the Work.

Initial Here: _____

7.14 The Contractor shall give all notices and comply with all laws, ordinances, rules, and regulations applicable to the Work and shall protect and indemnify the Owner and the Owner's officers, agents, or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or by the Contractor's employees, Subcontractors, sub-subcontractors

7.15 The Contractor shall be responsible for the entire site of the Project and for its reasonable and necessary protection and security, as required by laws or ordinances governing such conditions, or by custom or sound construction practices, and shall share such responsibilities as may be agreed upon among them, or in the absence of such agreement, as may be directed by the Contract Documents, Owner, or Designer. The Contractor shall be responsible for any damage to the Owner's property, or that of others, by the Contractor or the Contractor's employees, Subcontractors, sub-subcontractors, or their employees or agents, and shall make good such damages. The Contractor shall be responsible for and pay for any such claims against the Owner.

7.16 The Contractor shall protect all landscaping designated to remain in the vicinity of the operations and barricade all walks, roads, and areas as necessary to keep the public away from the construction.

7.17 The Contractor shall provide cover and/or protect all portions of the Work and provide all materials necessary to protect the Work whether performed by the Contractor or any of the Subcontractors or sub-subcontractors. Any Work damaged through the lack of proper protection, or from any other cause, including theft of materials from the work site, shall be repaired or replaced without extra cost to the Owner or extension to the Contract Time.

The Contractor shall maintain the Work during construction and until the Work is accepted. This maintenance shall constitute continuous and effective effort prosecuted day by day, with adequate equipment and forces so that the Work is maintained in satisfactory condition at all times. All costs of maintenance shall be included in the Contract Price and the Contractor will not be paid an additional amount for such effort. Should the Owner or Designer observe that the Contractor at any time has failed to maintain the Work as provided herein, the Designer may immediately notify the Contractor of such noncompliance. Such notification shall specify a reasonable time within which the Contractor shall be required to remedy such unsatisfactory maintenance condition. Should the Contractor fail to properly respond to the Designer's notification, the Owner may, at the Contractor's expense, take such action as it may deem appropriate to remedy the defective maintenance, including suspension of the Contractor's Work or any part thereof. Any such expense incurred by the Owner shall be deducted from monies due or to become due the Contractor.

Parking lots, streets, and walks connecting to the Project area shall be protected by the Contractor from deposits of mud, sand, stone, litter, or debris in any form.

Pedestrian traffic areas around the construction limits must be maintained in a clean and safe condition at all times with required barricades and covered walkways. When excavation or other operations outside the Project limits is required, the Contractor shall, immediately following that work, return the area to its original condition.

Initial Here: _____

All catch basins and storm drain lines in the vicinity of the Project site shall be protected at all times from entry of dirt, rubble and other debris. The residue from the cleaning of trucks, wheelbarrows, concrete buggies, etc. must be prevented from entering the drainage system, and if cleaning is done, the residue must be contained and removed from the Project site with other refuse.

7.18 No burning of refuse or debris shall be allowed inside or around the Project during the course of construction without written authority from authorities having jurisdiction and the Owner.

7.19 The Contractor shall provide for and maintain necessary safety measures and safety programs for the protection of all persons involved with the Work. Such measures and programs shall include the requirements of the most current edition of the CAGC Safety and Health Manual [or the AGC Accident Prevention Manual in Construction], or equivalent requirements, and shall fully comply with all Federal, State, and local laws, rules, regulations, and building code requirements relating to the prevention of accidents or injuries to persons on or about the location of the Work.

All trenches, excavations, or other hazards in the vicinity of the Work shall be well barricaded, and properly lighted at night. When Work requires closing of an area normally used by the Owner or the public, the Contractor shall furnish, erect, and maintain temporary barricades, and properly light the area. The Contractor shall comply with any directions and public authorities in this respect.

Any unforeseen hazards, including but not limited to environmental, biological, chemical, physical, geological, natural or man-made, that are discovered by the Contractor or any of its subcontractors, must immediately be disclosed to the Owner in writing within twenty-four hours.

7.20 The Contractor shall designate a responsible officer or employee as safety inspector, whose duties shall include accident prevention on the Project as well as implementation of the Contractor's safety measures and safety programs on the Project. The name of the safety inspector shall be made known to the Designer and the Owner at the pre-construction conference.

7.21 In emergencies affecting the safety of persons, the Work, or property at the Project site or adjacent thereto, the Contractor is obligated to act in the Contractor's discretion to prevent threatened damage, injury, or loss. As soon as practicable, the Contractor shall notify the Designer and Owner of such emergency. The Contractor shall give the Designer and the Owner prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused by such emergency. If the Contractor believes that additional work done in an emergency entitles the Contractor to an increase in the Contract Price or an extension of the Contract Time, the Contractor may make a claim therefore as provided in Articles 14 and/or 15.

7.22 The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by the Work. At least weekly and at the completion of the Work, the Contractor shall remove all waste materials and rubbish from and about the Project. At the completion of the Work, the Contractor shall remove all tools, construction equipment, machinery, and surplus materials. The Contractor shall leave the Work in condition for occupancy by the Owner such that no cleaning or other operations are required. Material cleared

Initial Here: _____

from the Project and deposited on adjacent property shall not be considered as having been disposed of satisfactorily. If the Contractor fails to keep the Project clean of waste materials or

Initial Here: _____

rubbish, fails to satisfactorily clean-up weekly or at the completion of the Work, the Owner may do so and the costs thereof may be deducted from any amounts due the Contractor.

7.23 Utilities, temporary facilities, and signs shall be provided as described in the Contract Documents. Absent a contrary direction in the Supplementary Conditions, the Contractor shall pay all bills for water, electricity, or other public utility service to the Project site.

7.24 The Contractor shall indemnify and hold the Owner, the Designer, the Designer's consultants, and their officers, agents, and employees harmless against all costs, damages, and expenses, including attorney's fees and costs of defense, arising out of claims by any separate contractor or by any Subcontractor, sub-subcontractor, or supplier engaged by or employed by the Contractor or employed by any of the Subcontractors claiming through him, including without limitation damages, losses, and expenses arising out of or relating to any inconvenience, delay, interference, or other action or non-action of the Contractor or the Contractor's Subcontractors on the Project.

Nothing contained herein or appearing anywhere in the Contract Documents shall obligate or require the Owner to exercise any right or privilege, or to take any action or to refrain from taking any action under any contract it may have with any other prime contractor or party to the Project for the benefit of the Contractor or any Subcontractor, sub-Subcontractor, or supplier claiming through the Contractor.

7.25 Prior to completion of the Work and Final Payment of the Contract Price, excepting only those portions of the Work deemed accepted in accordance with the Contract Documents, the Contractor shall have charge and care of the Work, and shall take every precaution against injury or damage to any part due to the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the Work. The Contractor shall as required by the Owner replace, rebuild, repair, restore, and make good all injury or damage to any portion of the Work occasioned by any of the above causes before Final Completion and shall bear the expenses thereof.

7.26 In the event that the Work, or any portion thereof, is suspended at any time pursuant to an order of the Owner, the Contractor shall obey all instructions of the Owner regarding storage of materials, drainage, protection of the Work, and erection of temporary structures during the suspension period.

7.27 If there is a Project Expediter assigned to the Project, that person shall be responsible for the coordination of the Work of itself and any other separate contractors, both as to space and time. The Project Expediter shall coordinate the implementation of the Contract Construction Schedule, all construction activities and close-out of the Project, including but not limited to all testing, inspection, certifications, and approvals required by public agencies. If there is not a Project Expediter, then the Construction Manager will be responsible for these duties.

The Contractor and the Project Expediter shall each be required to notify the Designer and the Owner promptly of any event or condition which could affect the conduct or progress of the Work and shall cooperate fully with all other contractors on the Project site.

Initial Here: ____

7.28 The Owner hereby delegates to the Project Expediter all of its duties to coordinate and to expedite the Work not expressly reserved to the Owner by other provisions of the Contract Documents.

7.29 All Work performed pursuant to the Contract Documents shall conform in all respects to the North Carolina State Building Code and all other state, local, and national codes in effect at the time of and applicable to this Work.

7.30 The Contractor shall provide for and maintain necessary safety measures and safety programs for the protection of all persons at the Project site, and shall comply at all times with the requirements of the most current edition of the CAGC Safety and Health Manual [or the AGC Accident Prevention Manual in Construction], or the equivalent requirements of the Contractor's safety program, and shall fully comply with all Federal, State, and local laws, rules, regulations, and building code requirements so as to prevent accidents or injuries to persons on or about the Project site. The Contractor shall clearly mark or post signs warning of existing hazards, and shall barricade excavations, elevator shafts, stairways, and similar hazards. The Contractor shall protect against damage or injury resulting from falling materials, and shall maintain all protective devices and signs throughout the progress of the Work.

7.31 The Contractor shall adhere to the rules, regulations, and interpretations of the North Carolina Department of Labor's Occupational Safety and Health Standards for the Construction Industry (29 CFR Part 1926 as adopted in 13 NCAC 07F.0201, including 29 CFR Part 1910 General Industry Safety and Health Standards applicable to construction) and N.C. Gen. Stat. §95-126 through 155 (Occupational Safety and Health) as well as all revisions and amendments to such standards or statutes as may occur throughout the performance of the Work.

7.32 Any land disturbing activity performed by the Contractor 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 NCAC 4A, 4B, and 4C), and as may be revised or amended in the future. Upon receipt of notice that a land-disturbing activity is in violation of said Act, the Contractor shall be responsible for ensuring that all steps or actions necessary to bring the Project in compliance with said Act are promptly taken. The Contractor shall be responsible for all penalties assessed pursuant to N.C. Gen. Stat. 113A-64 with respect to its Work, and shall indemnify and hold harmless the Owner from all costs and expenses, including attorney's fees and costs of defense arising out of or related to the enforcement of the Act against any party or person described in this Article.

7.33 Any mechanical or electrical work such as sleeves, inserts, chases, etc. located in the Work of the Contractor for general work shall be built in by that Contractor. On multiple prime projects, the mechanical and electrical contractors shall set all sleeves, inserts, and other devices built into the structure in cooperation and under the supervision of the Contractor for general work. The responsibility for exact location of such items shall be that of the mechanical, plumbing, or electrical prime contractor.

Initial Here: ____

7.34 The Contractor shall be responsible for permanently fixed service facilities and systems in use during progress of the Work and shall strictly adhere to the following procedures:

- a) Prior to acceptance of the Work by the Owner, the Contractor shall remove and replace any part of the permanent building systems damaged through use during construction.
- b) Temporary filters shall be installed in each of the heating and air conditioning units, return air grilles, and other locations to prevent intrusion of dust, dirt, and debris during construction. Temporary filters shall be removed and replaced with new filters immediately prior to Substantial Completion.
- c) Extra effort shall be maintained to keep the building clean and under no circumstances shall air systems be operated if finishing operations are creating dust in excess of what would be considered normal if the building were occupied.
- d) When the permanent lighting system is used during construction, lamps shall be replaced and shall be new on the date of Substantial Completion.

ARTICLE 8. OWNER

8.1 The Owner shall issue communications and notices to the Contractor through the Designer to the extent contemplated by the Contract Documents.

8.2 In case of termination of the employment of the Designer, the Owner shall appoint as Designer a qualified person who shall have and assume all rights and duties held by the original Designer.

8.3 The Owner shall have the right to take possession of and use any portion of the Work notwithstanding the fact that the time for completion of such portion of the Work may not have expired, but such taking possession and use shall not be deemed an acceptance of any Work not completed in accordance with the Contract Documents.

8.4 A waiver on the part of the Owner of any breach of any part of the Contractor shall not be held to be a waiver of any other or subsequent breach.

8.5 The Owner shall pay all permanent acreage fees, governmental impact fees, and meter deposits for permanent utilities.

ARTICLE 9. CONSTRUCTION MANAGER

9.1 The Owner may employ one or more Construction Managers for the purpose of assisting the Owner, Designer, and Contractor in developing and administering budgets and cost controls, in evaluating constructability and value engineering proposals, in establishing and maintaining a critical path method (CPM) schedule, in coordinating and/or expediting the Work with other projects being constructed by the Owner or others adjacent or near the Work, or for such other purposes as the Owner may deem appropriate. From time to time the Owner may identify such

Initial Here: _____

Construction Managers(s) to the Contractor in writing identifying any tasks assigned to such Construction Managers(s).

ARTICLE 10. DESIGNER

10.1 The Designer is charged with the responsibility of interpretation of the Contract Documents. The Designer's decisions relating to aesthetic matters shall be final.

10.2 All Work completed under the Contract Documents shall be subject to review by the Designer. No Work is to be covered without the Designer's review or prior authorization. Any Work so covered without the Designer's review or prior authorization shall be uncovered at the Contractor's expense. The Contractor shall notify the Designer in writing at least twenty-four (24) hours in advance of covering any Work.

10.3 The Designer shall not be responsible for the construction means, methods, techniques, sequences, procedures, or the safety precautions and programs incident thereto, and shall not be responsible for the Contractor's failure to perform the Work in accordance with the Contract Documents, but shall be entitled to enforce any requirements in the Contract Documents specifying particular means, methods, techniques, sequences, or procedures.

10.4 The Designer shall be an Owner's representative during the construction period. The duties, responsibilities and authority of the Designer as the Owner's representative during construction are as set forth in the Contract Documents.

ARTICLE 11. CONTRACT TIME

11.1 Within fourteen (14) days, or within a time set by mutual consent of the Parties, after execution of the Contract Agreement by the parties, the Contractor shall prepare and submit to the Designer and Owner for review and approval a preliminary progress schedule for the Work pursuant to the requirements stated in the Contract Documents.

11.2 Within fourteen (14) days after execution of the Contract Agreement by the parties, or within the time set by mutual consent of the Parties, the Contractor shall submit to the Designer a Submittal Register listing all Submittals the Contractor is required to make or proposes to make under the Contract Documents, the dates on which the Contractor proposes to make such Submittals and the dates by which the Contractor reasonably requires a response from the Designer with respect to each Submittal. The dates submitted shall be incorporated into the Contract Construction Schedule as Completion Dates when they have been approved or modified by the Owner. The Designer shall not be required to review any Submittal from the Contractor until a Submittal Register acceptable to and approved by the Owner has been submitted by the Contractor.

11.3 Not later than thirty (30) days following execution and delivery of the Contract Agreement by Owner to Contractor, or upon a date agreed to by mutual consent of the Parties, the Owner shall deliver to the Contractor a Notice to Proceed. The Notice to Proceed shall state a commencement date on which the Contractor will begin the Work to be performed under the

Initial Here: _____

Agreement. The Contract Time shall be measured from said specified commencement date. The commencement date stated in the Notice to Proceed shall not be earlier than three (3) days after the Notice to Proceed is served on the Contractor.

If, other than by mutual agreement, said specified commencement date is more than thirty (30) days after the date of execution and delivery of the Agreement from Owner to Contractor and the Contractor believes said delay justifies an increase in Contract Price and/or an extension of Contract Time, the Contractor may make a claim therefore as provided in Article 14 and/or Article 15.

No Work shall be done prior to the date specified in the Notice to Proceed.

A final Contract Construction Schedule shall be submitted for approval by the Contractor, Designer, and Owner no later than thirty (30) days after Notice to Proceed. No payments shall be due the Contractor until this schedule is approved by all parties.

11.4 The Contract Construction Schedule is a Contract Document. The Contractor represents that the Contract Construction Schedule has been reviewed in detail, that the Contractor participated in its preparation, that all of the activities which impact, limit, or otherwise affect the time of completion of the Work are shown in the Contract Construction Schedule and that all of the activities of others which impact, limit, or otherwise affect the start, duration, or completion of the Contractor's activities are also shown. The Contractor further represents that the Contractor can and will complete each activity within the time shown for that activity. Time is of the essence with respect to each such activity and Completion Date.

11.5 If the Contractor submits a construction schedule, progress report, or any other document that indicates or otherwise expresses an intention to achieve completion of the Work prior to any Completion Date required by the Contract Documents or prior to expiration of the Contract Time, no liability of the Owner to the Contractor for any failure of the Contractor to so complete the Work shall be created or implied.

11.6 If the Contractor, for reasons beyond the Contractor's control, is delayed in beginning any activity, the Contractor shall, nevertheless, have the same number of days as is shown in the Contract Construction Schedule for the activity, and the affected activity and any succeeding activity that is dependent upon that activity shall be adjusted accordingly; provided that at any time the Owner, by means of a Change Order, may require the Contractor to work overtime, to increase labor forces or to take any necessary or appropriate action to decrease the time required for any activity, and the Contractor shall be entitled to an adjustment in the Contract Price computed in accordance with Article 15 of these General Conditions.

11.7 At any time, the Owner may order the Contractor, on seven (7) days written notice, to begin any activity earlier than the starting date shown on the Contract Construction Schedule.

11.8 Should the Contractor fail to start any activity on the start date shown in the Contract Construction Schedule or as it may have been adjusted, or become delayed, the Contractor shall, without being entitled to any increase in the Contract Price or other compensation, work overtime, increase labor forces or take such other action as may be necessary or appropriate to complete the

Initial Here: _____

activity by the Completion Date shown on the Contract Construction Schedule, or as such Completion Date may have been adjusted.

11.9 The Designer and Owner or his Construction Consultant shall monitor progress of the Work at all times and the Contractor shall cooperate with such monitoring and provide any and all information with respect to the progress of the Work and scheduling as the Owner may reasonably require.

11.10 On a monthly basis, the Contractor shall revise the Contract Construction Schedule, showing any adjustments made by any Change Order, the progress of the Work, and any days gained or days lost with respect to any activity, and shall furnish copies thereof to the Owner and Designer.

11.11 Should any monthly revision of any Contract Construction Schedule show that the Contractor is behind on any activity, the late completion of which could delay Substantial Completion of the Work, the Owner shall be entitled to withhold from the next Progress Payment due the Contractor an amount not exceeding the amount the Owner would be entitled to in Liquidated Damages, should Substantial Completion be delayed by the same number of days that the Contractor is currently behind schedule. If, subsequently, the Contractor's progress, as shown by any succeeding monthly revision to the Contract Construction Schedule, is such that the anticipated delay no longer exists, the Owner shall pay with the Progress Payment next due to the Contractor such amounts as have been withheld in accordance with this paragraph.

11.12 The Owner shall have the right to perform Work, hire and employ labor and craftsmen, rent equipment, subcontract with other parties, or do anything that the Owner deems necessary or appropriate to remedy or cure any delay by the Contractor in the progress of the Work. Such action by the Owner shall not, in any way, affect, void or limit any warranty, guaranty or other responsibility of the Contractor under the Contract Documents. Such action may be taken by the Owner only after three (3) days written notice to the Contractor. All costs incurred by the Owner in taking any such action shall be charged to the Contractor and deducted from any amounts remaining due under the Agreement.

11.13 The Contractor may be entitled to an extension of the Contract Time (but no increase in the Contract Sum) for delays arising from unforeseen causes beyond the control and without the fault or negligence of the Owner, the Contractor or the Contractor's Subcontractors as follows:

- a) Labor disputes and strikes that directly impact the critical path activities of the Contract Construction Schedule;
- b) Acts of God, tornado, fire, hurricane, blizzard, earthquake, typhoon, or flood that damage completed Work or stored materials.
- c) Acts of the public enemy; acts of the State, Federal, or local government in their sovereign capacities.
- d) Abnormal inclement weather.

11.14 On any day that the Contractor considers that the Project is delayed by adverse weather conditions, the Contractor shall identify in writing to the Designer and the Owner the adverse weather conditions affecting each activity, the specific nature of the activity affected, the number of hours lost, and the number of and identity (by responsibility or trade) of workers affected and shall obtain from the Designer written recognition of the delay. The time for performance of this Contract includes an allowance for a number of calendar days which may not be suitable for construction Work by reason of adverse weather. The Contract Time will be extended if the Owner and Designer agree with the adverse weather delay.

11.15 If the Contractor believes that the progress of the Work has been adversely affected by adverse weather recognized by the Designer during a particular month, the Contractor shall submit a written request for extension of time to the Designer. Such a request for time extension of the Contract Time shall be submitted in writing to the Designer, copies to the Owner, within twenty days following the cause for delay. In case of continuing cause for delay, the Contractor shall notify the Designer, with copies to the Owner, within twenty days of the beginning of the delay and only one claim is necessary. The request shall include, but is not limited to, the following information:

- a) Detailed description of weather's effect on scheduled activities and its net effect on the critical path of the Project, and
- b) Weather records from the official weather station nearest the Project site and records of actual observation as contained in daily reports, correspondence, or other documentation.

11.16 The Contractor specifically recognizes that a delay by the Contractor in achieving any Completion Date can have the effect of delaying the Substantial Completion of the Project, that such delay in Substantial Completion of the Project will necessarily cause damages, losses, and expenses to the Owner, including, but not limited to and by way of illustration only, increased capitalized costs and interests for the Project, increased and extended Project overhead, Designer's and Consultant's fees, increased costs of construction, increased and extended operation costs of other facilities, and inefficiency and loss of productivity, and that such damages, losses, and expenses may not be readily identifiable or ascertainable at the time they are incurred or at any time. Therefore, and in recognition of these factors and the likelihood that actual damages from his delay will not be readily ascertainable, the Contractor agrees to pay to the Owner \$1,000.00 one thousand dollars, as Liquidated Damages per Day, for each day by which the failure to meet any Completion Date shown in the Contract Construction Schedule, adjusted in accordance with this Article, delays the Substantial Completion of the Project.

11.17 The Contractor shall not be entitled to any adjustment in the Contract Price or other compensation from the Owner for any delay in the completion of or progress on the Work that is caused by a force majeure condition or is otherwise not caused by the sole and direct act or omission of the Owner and the Owner's employees or agents.

11.18 The sum for Liquidated Damages is the amount stipulated in the Contract Agreement per day 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 of the essence of this Contract Agreement and a material consideration thereof.

ARTICLE 12. CHANGES IN THE WORK

12.1 Without invalidating the Contract Documents, the Owner may, at any time, or from time to time order additions, deletions, or revisions in the Work. Said additions, deletions, or revisions shall be authorized only by written Change Orders, Construction Change Directives or Field Orders. Upon receipt of a Change Order, Construction Change Directive or Field Order, the Contractor shall proceed with the Work involved. All such Work shall be executed under the applicable conditions of the Contract Documents. If any change causes an increase or decrease in the Contract Price and/or an extension or shortening of the Contract Time, adjustments shall be made as provided in Article 11 and/or Article 13.

In order to expedite the Work and avoid or minimize delay in the Work that might affect the Contract Price or Contract Time, the Designer may issue a Change Order in the form of a Construction Change Directive which when signed by the Owner and Designer, directs the Contractor to proceed promptly with the Work involved. Any claim for an adjustment in Contract Price or Time, if not defined in the Construction Change Directive, shall be promptly made in writing.

12.2 The Designer may authorize minor changes or alterations in the Work not involving change in the Contract Price or in the Contract Time and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order. Such alterations shall not invalidate the Contract Documents nor release the surety. If the Contractor believes that any minor change or alteration authorized by the Designer entitles him to an increase in the Contract Price and/or an extension of Contract Time, he may make a claim therefore as provided in Article 11 and/or Article 13.

12.3 Except in an emergency endangering life or property, no change shall be made by the Contractor except upon prior written Change Order, Directive or Field Order authorizing such Change.

12.4 Increases in the Contract Price and/or extensions of the Contract Time for additional Work performed by the Contractor shall only be in accordance with a written Change Order signed by the Owner and Designer. The Contractor shall not be entitled to additional time or to additional compensation for any Work performed or material supplied which is claimed to have been authorized or settled by an "oral" change, or by a "constructive" or "implied" change, or by a course of conduct, or by any action or non-action by the Owner, Designer, or any other persons, or by any means whatsoever other than by a written Change Order for such Work or material signed by the Owner and the Designer.

12.5 Changes in the Work resulting from emergency shall not invalidate the Contract Documents nor release the surety.

12.6 Neither the Owner nor the Designer shall be responsible for verbal instructions which have not been confirmed in writing, and in no case shall such instructions be interpreted as permitting a departure from the Contract Documents unless such instruction is confirmed in writing and supported by a proper Change Order, Construction Change Directive or Field Order, whether or not the cost is affected.

12.7 The Owner, in its sole discretion, may require that the Contractor notify the Contractor's sureties of any changes affecting the general scope of the Work or change in the Contract Price, and that the amount of applicable bonds shall be adjusted accordingly. If this requirement is exercised, the Contractor shall furnish proof of such adjustment to the Designer and the Owner.

Initial Here: _____

If this requirement is exercised, the Change Orders shall require written consent of the Contractor's surety. At the time of signing a Change Order, the Contractor shall be required to certify as follows:

"I certify that all sureties have been notified that my contract has been altered by the amount of this Change Order, and that a copy of the approved Change Order will be mailed to all sureties upon its receipt by me."

If this requirement is exercised, no payment to the Contractor on account of any Change Order shall become due or payable until written evidence of the surety's consent to the Change Order has been furnished to the Designer and to the Owner, and the furnishing of such written consent is a condition precedent to such payment.

12.8 The Contractor shall support all requests for Change Orders with a detailed cost breakdown showing cost of materials, labor, equipment, transportation, other items, Contractor's overhead and profit, and total cost, in accordance with methods defined in this Article, and, if the request seeks an extension of the Contract Time, with a time-related diagram which demonstrates specifically why an increase in construction time is needed.

12.9 When a request for a Change Order involves a Subcontractor, the Contractor shall provide quotation from same on Subcontractor's letterhead. The Subcontractor's quote shall list materials, equipment, and labor separately, and show overhead and profit.

ARTICLE 13. CHANGE OF THE CONTRACT PRICE

13.1 The Contract Price constitutes the total compensation payable to the Contractor for performing all Work under the Contract Documents. All duties, responsibilities, and obligations assigned to or undertaken by the Contractor shall be at his expense without change in the Contract Price. The Contract Price may only be changed by a Change Order.

13.2 Any claim for an adjustment in the Contract Price shall be in writing and written notice of any event, action, or non-action which may become the basis of a claim shall be delivered to the Owner and the Designer within three (3) days of the occurrence, or the beginning of the occurrence, of any such event, action or non-action giving rise to the claim. Such written notice is a condition precedent to the making of a claim, and such notice shall describe the basis of the potential claim with reasonable detail and clarity.

A claim shall be made in writing and shall be delivered to the Designer and the Owner no later than fourteen (14) days after such notice. The claim shall describe in detail the basis for the claim, with specific reference to any provisions of the Contract Documents, by paragraph, drawing number, or other specific identification, and shall state the amount claimed and how it is calculated. If the Contractor, at the time the claim is made, is unable to state the amount claimed with accuracy, the Contractor shall so state and provide the estimated amount and the basis on which the amount is to be calculated. At the earliest date practicable, but in no event more than thirty (30) days after Contractor's notice of claim, the Contractor shall supplement the claim with an accurate statement of the amount claimed and how it has been calculated. The Contractor shall provide, in writing, in support of the claim all such explanations, arguments, data, receipts, expert opinions, or other documents or information as the Contractor deems appropriate to be considered in support of the claim. A claim may properly be rejected by the Owner by reason of the Contractor's failure to submit adequate or accurate documentation or information, except that within seven (7) days after being given notice that the claim has been rejected on this basis, the Contractor may submit additional documentation or information. No claim for a change of the Contract Price shall be considered or granted (except solely at the discretion of the Owner) unless a claim is so made, nor shall the

Initial Here: _____

Contractor be entitled to any increase in the Contract Price unless the Contractor has given notice and made such a written claim within the times required. The Owner shall decide, after obtaining the advice of the Designer, whether an increase in Contract Price is warranted, and the amount of such increase shall be determined. Any change in the Contract Price resulting from any such claim shall be incorporated in a Change Order. Any change in the Contract Price or on a Change Order must be approved by the Board of County Commissioners or the County Manager and any decision by the Board or the Manager will be relayed to the Contractor within seven days after the Board's consideration. Any claim on which the Owner has not provided its decision to the Contractor within the applicable time period shall be deemed denied.

The Owner shall advise the Contractor of its decision with respect to the claim within fourteen (14) days of its receipt, or of the receipt of additional documentation or information if the absence of such has previously been the basis of rejection of the claim; provided, however, that if, in its sole discretion, the Owner deems that review or consideration of any part of the claim or any matter related thereto by its governing Board is necessary or appropriate, it shall so advise the Contractor and shall provide its decision to the Contractor within seven (7) days after such Board consideration, review or action. Any claim on which the Owner has not provided its decision to the Contractor within the applicable time period shall be deemed denied.

If the Contractor is not satisfied with the decision of the Owner, the Contractor may within seven (7) days of receipt of the Owner's decision initiate the mediation process as described in Appendix A to the General Conditions of the Contract for Construction.

13.3 In determining the amount of a Contract Price adjustment, the parties shall apply the following methods, as appropriate:

(A) Change in Work: The Owner and Contractor shall negotiate in good faith and attempt to agree upon the value of any change (extra or decrease) in Work prior to the issuance of a Change Order covering said Work. Such Change Order shall set forth the corresponding adjustment to the Contract Price. In the event the Owner and the Contractor are unable to agree, the Owner shall grant an equitable adjustment in the Contract Price.

(B) Emergency Work: In the event of emergency endangering life or property, the Contractor may be directed by the Designer to proceed on a time and material basis, whereupon the Contractor shall so proceed and keep accurately, in such form as may be required by the Designer, a correct account of costs together with all proper invoices, payrolls, and supporting data therefore.

13.4 Where the Contract Price is to be adjusted, the following limitations shall apply in determining the amount of adjustment:

(A) In the case of extra or emergency work, the Contract Price shall not be increased by more than the reasonable, actual, and documented net cost of the extra or emergency work plus ten percent (10%) of such net cost on Work performed by the Contractor and five percent (5%) thereof on any subcontracted Work for overhead and profit combined.

(B) In the case of a decrease in Work, the Contract Price shall not be decreased by less than the net cost of the deleted Work plus five percent (5%) of such direct net cost for profit and overhead.

The term 'net cost' as used herein shall include, as applicable, and shall be limited to, all direct labor, direct material, direct equipment, labor burden, sales taxes, shipping and handling charges, permits and fees, and insurance and bond premium adjustments, if any, attributable to

Initial Here: ____

the change. All other items of cost shall be considered as overhead and covered by the percentages allowed in sections A and B of this paragraph.

The Contractor shall provide worksheets or tabulations describing the method by which the direct net cost was calculated, and shall provide all data needed to support the calculation of the direct net cost, all in a form acceptable to the Owner.

13.5 Where the Contract Price is to be adjusted by negotiation, the Owner may authorize and designate the Designer to negotiate with the Contractor on behalf of the Owner; provided, however, any agreement reached between the Contractor and Designer shall be subject to approval by the Owner

ARTICLE 14. UNFORESEEN CONDITIONS

14.1 Should the Contractor encounter unforeseen conditions at the Project site materially differing from those shown on the Drawings or indicated in the Specifications or differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Agreement, the Contractor shall immediately, and in no event more than three days later, give notice to the Owner of such conditions before they are disturbed. The Owner and the Designer shall thereupon promptly investigate the conditions and if they find that they materially differ from those shown on the Drawings and/or Specifications, they shall at once make such changes in the Drawings and/or Specifications as they may find necessary. Any increase or decrease in the Contract Price resulting from such changes shall be adjusted in the manner provided herein for adjustments as to extra and/or additional Work and changes. However, neither the Owner nor the Designer shall be liable or responsible for additional work, costs, or changes to the Work that could have been reasonably determined from any reports, surveys, and analyses made available for the Contractor's review or that could have been discovered by the Contractor through the performance of its obligations pursuant to the Contract Documents.

ARTICLE 15. CORRECTION OF WORK BEFORE FINAL PAYMENT

15.1 The Owner has the authority to stop or suspend work, and the Designer has the authority to order Work removed or to order corrections of defective Work or Work not in compliance with the Contract Documents where such action may be necessary to ensure successful completion of the Work.

Any work, materials, fabricated items, or other parts of the Work which have been found by the Designer to be defective or not in accordance with the Contract Documents shall be condemned and shall be removed from the Project by the Contractor, and immediately replaced by new Work in accordance with the Contract Documents at no additional cost to the Owner. Work or property of the Owner or others damaged or destroyed by virtue of such condemned Work shall be made good at the expense of the Contractor.

Correction of condemned Work described above shall be commenced by the Contractor within twenty-four (24) hours after receipt of notice from the Designer and shall make satisfactory progress, as determined by the Designer, until completed. Should contractor fail to proceed with required corrections, the owner may complete the work in accordance with Article 17.

Condemned Work removed shall be the property of the Contractor and shall be removed from the Project by him within ten (10) days after notice to remove it, and if not then removed, thereafter may be disposed of by the Owner without compensation to the Contractor and the cost of such disposal shall be deducted from amounts due or to become due to the Contractor.

Initial Here: _____

Should the cost of correction of the Work and, if applicable, disposal of the condemned Work by the Owner exceed amounts due or to become due the Contractor, then the Contractor and the Contractor's sureties shall be liable for and shall pay to the Owner the amount of such excess.

ARTICLE 16. CORRECTION OF WORK AFTER SUBSTANTIAL COMPLETION; WARRANTIES AND GUARANTIES

16.1 Neither the final certificate, Final Payment, occupation of the premises by the Owner, nor any provision of the Contract Documents, nor any other act or instrument of the Owner or the Designer shall relieve the Contractor from responsibility for negligence, defective material or workmanship, or failure to comply with the Contract Documents.

16.2 The Contractor shall, at the Contractor's sole cost and expense, make all necessary repairs, replacements, and corrections of any nature or description, interior or exterior, structural or non-structural, that shall become necessary by reason of defective workmanship or materials which appear within a period of one (1) year from the date of Substantial Completion; provided, however that notwithstanding the preceding, if any longer guarantee period is specified for any particular materials or workmanship under the Contract Documents, or under any subcontract, or in connection with any manufactured unit which is installed in the Project, or under the laws of the State of North Carolina, the longer guarantee period shall govern.

16.3 If, within any guarantee period, repairs or changes are required in connection with the Work, which are rendered necessary as the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract Documents, the Contractor shall, promptly upon receipt of notice from the Designer and without expense to the Owner:

- a) Completely repair or replace the Work so that it conforms to the Contract Documents;
- b) Correct all defects therein;
- c) Make good all damage which, in the opinion of the Designer, is the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract Documents; and
- d) Make good any Work or material, or any equipment or contents disturbed in fulfilling any such guarantee.

If, in fulfilling the requirements of the Contract Documents or of any guarantee embraced therein or required thereby, the Contractor disturbs any work, facility, premises, or construction belonging to the Owner, the Contractor shall restore such disturbed work to a condition satisfactory to the Owner, and shall guarantee such restored work to the same extent as if it were Work under the Contract Documents.

If the Contractor, after notice, fails to proceed promptly to comply with the terms of the guarantee, the Owner may have the defects corrected, and the Contractor and the Contractor's sureties shall be liable for all expenses incurred. "Promptly" is defined as within twenty-four (24) hours for systems necessary to normal operation of the building and within seventy-two (72) hours for all other items. All special guarantees applicable to definite parts of the Work that may be shown in or required by Contract Documents shall be subject to the terms of this paragraph during the first year of the life of such special guarantee. Manufacturer's standard guarantees or warranties which do not comply with the time limit specified herein shall be extended by the Contractor automatically without further action on the part of the Owner or the Designer.

Initial Here: _____

16.4 In and before the expiration of the eleventh calendar month after the date of Substantial Completion, and at the request of the Owner, the Contractor, the Owner and the Designer shall make an inspection of the Work for the purpose of identifying defective workmanship and/or materials. If the Contractor, having been requested to do so by the Owner, fails to participate in such inspection, the Contractor shall be conclusively bound by any decision or ruling by the Designer as to any defective workmanship or material and as to the Contractor's responsibility for its repair or replacement.

ARTICLE 17. OWNER'S RIGHT TO DO WORK

17.1 If, during the progress of the Work or during any period of guarantee, the Contractor fails to prosecute the Work properly or to perform any provision of the Contract Documents, the Owner, after three (3) days written notice to the Contractor from the Designer, or from the Owner after Final Payment, may perform or have performed that portion of the Work and may deduct the cost thereof from any amounts due or to become due the Contractor. Notwithstanding any action by the Owner under this paragraph, all warranties and bonds given or to be given by the Contractor shall remain in effect or shall be given by the Contractor.

17.2 Should the cost of such action by the Owner exceed the amount due or to become due the Contractor, the Contractor and his sureties shall be liable for and shall pay to the Owner the amount of such excess.

ARTICLE 18. PARTIAL PAYMENTS

18.1 Within thirty (30) days after his initial receipt of the Construction Agreement for signatures, or on the date agreed to by mutual consent of both Parties, the Contractor shall submit to the Designer a Schedule of Values. The Schedule of Values shall indicate the value of the Work, including applicable overhead and profit, for each Division and section of the Project Specifications. The Designer and Owner shall be provided with the Contractor's estimate papers, Subcontractor agreements, supplier quotes, or other documents substantiating these values if so requested in writing by the Designer. The Contractor shall provide the requested documentation within seven (7) days after receipt of the Designer's written request. The Schedule of Values shall be subject to approval by the Owner, and if the Owner and the Contractor cannot agree upon the Schedule of Values, the Designer shall prepare it, and the Schedule of Values as prepared by the Designer shall be binding on the Owner and the Contractor. No Request for Payment shall be certified by the Designer until the Designer has issued approval of said Schedule of Values.

18.2 During the initial meeting between Owner, Designer and Contractor, a date will be provided to the Contractor by the Owner which will set forth the date each month a Request for Payment for Work done will be submitted. The Request for Payment for Work done will be provided to the Contractor by the Designer. The Request for Payment will show substantially the value of Work done (including the value of material delivered to the Project or stored by the Contractor at another site, subject to the conditions hereinafter set forth) during the previous calendar month, and shall sum up the financial status of the Work with the following information:

- a) Total Contract Price, including any adjustment thereto made pursuant to the Contract Documents.
- b) Value of Work completed and materials properly stored to date.
- c) Less amount retained.
- d) Less previous payments.

Initial Here: ____

- e) Current amount due.
- f) Balance remaining.

The Contractor, upon request of the Designer, shall substantiate the request with invoices, vouchers, payrolls, or other evidence.

18.3 When payment is requested or made on an account of stored materials, such materials must be stored on the Owner's property at such places and in such a manner as may be designated by the Designer. However, in the sole discretion of the Owner, with permission in writing from the Designer and Owner and under such circumstances as may be determined by the Owner, such materials may be stored in a bonded warehouse. The location and conditions for storage of such materials away from the Owner's property in a bonded warehouse shall be within the sole discretion of the Owner. Requests for Payment on account of stored materials shall be accompanied by paid invoices, bills of sale, warehouse receipts, or other documentary evidence establishing Owner's title to such materials, evidence that the stored materials are insured against loss and damage, and such other documentation as required by the Designer. Responsibility for the quantity, quality, and condition of such stored materials, whether stored on the Owner's property or away from the Owner's property, shall remain with the Contractor regardless of ownership or title. No payment shall be made on account of materials stored in a bonded warehouse unless the Contractor has acquired written permission from the Designer for such storage of materials and has complied with all conditions set forth in such permission regarding such storage of materials in a bonded warehouse.

18.4 Any Request for Payment received by the Designer on or before the date provided to the Contractor at the initial meeting by the Owner of each calendar month shall be certified for payment or returned for re-submission to the Contractor on or before ten days following the submission. The Designer's certification shall be for the amount which was requested or that which the Designer has decided was justly due, and shall state in writing to the Contractor and Owner the reasons for withholding payment of any or all of the amount requested.

18.5 The Designer may fail to certify all or part of any payment requested for any of the following reasons:

- a) Defective Work not corrected.
- b) Suits, actions, or claims of any character filed against the Contractor, or due to the operations of the Contractor, or information or notice that a suit, action, or claim will be filed or has been made.
- c) Information or notice that a Subcontractor or a supplier has not received payment.
- d) The balance unpaid of the Contract Price is insufficient to complete the Work in the judgment of the Designer or Owner.
- e) Damage to the Owner or another contractor.
- f) Inability of the Contractor to meet a Completion Date, including an anticipated failure to meet a Completion Date entitling the Owner to withhold anticipated Liquidated Damages.

Initial Here: _____

- g) Failure to furnish Submittal as required by the Contract Documents on a timely basis in accordance with the Submittal Register.
- h) Such other reason as to the Designer may appear prudent, proper, or equitable.

When grounds for withholding certification have been corrected, the Designer shall so certify to the Owner and the Owner shall make any payment due with respect to such certification as a part of his next payment after such certification.

18.6 No certificate issued or progress payment made shall constitute an acceptance of the Work or any part thereof.

18.7 The amount certified by the Designer for payment shall be ninety-five percent (95%) of the value of Work completed and materials stored since the Designer's last certification as shown on the Request for Payment, less any amounts not certified in accordance with paragraph 18.4, and this amount shall be paid by the Owner on or before the last business day of the month, but payment shall not be past due until not paid within fifteen (15) days thereafter.

18.8 After certification by the Designer that the Work is fifty percent (50%) complete, based on a determination that the Contractor's gross project invoices, excluding the value of materials stored off-site, equal or exceed fifty percent (50%) of the value of the Contract, (except the value of materials stored on-site shall not exceed twenty percent (20%) of the Contractor's gross project invoices for the purpose of determining whether the Project is fifty percent (50%) complete) and the Contractor has provided to the Owner the written consent of its sureties to the cessation of further percentage retention, the amount certified for payment with respect to subsequent Requests for Payment shall be one hundred percent (100%) of the value of Work completed and materials stored since the Designer's last certification as shown on the Request for Payment, less any amounts not certified; provided, however, that the aggregate of periodic payments shall not exceed ninety-seven and one half percent (97.5%) of the Contract Price. If the Owner determines that the Contractor's performance under the Contract is unsatisfactory, the Owner may resume withholding percentage retention from each subsequent periodic payment application up to the maximum amount of five percent (5%) of the Contract Price.

ARTICLE 19. FINAL PAYMENT

19.2 Except as set forth in paragraph 19.1, within forty-five days after Substantial Completion of the Project, the remaining unpaid balance of the Contract Price shall be paid to the Contractor, less an amount equal to two and one-half times the value of punch list work or other work remaining to be completed or corrected, as reasonably estimated by the Owner.

19.3 Upon Substantial Completion, the Designer shall prepare and submit to the Contractor a deficiency list identifying all portions of the Work which are known by the Designer at that time to be incomplete or defective. Within thirty (30) days of receipt of this deficiency list, the Contractor shall complete and correct all items on that list along with all other Work required to achieve Final Completion of the Work. At any time prior to completion of the period of warranty, the Designer may submit to the Contractor a supplemental deficiency list, in which case the Contractor shall complete or correct any and all new items identified on the Supplemental deficiency list within the time period stipulated in Article 15.

19.4 Final Payment of any remaining balance of the Contract Price shall not be due to the Contractor until the Contractor achieves Final Completion of the Project.

19.5 The making and acceptance of Final Payment shall constitute a waiver of all claims by the Owner except:

Initial Here: _____

- a) Claims arising from unsettled liens or claims against the Contractor.
- b) Incomplete or faulty work or material existing at the time of Final Payment for which a deficiency list has been given to the Contractor.
- c) Faulty Work or materials appearing after Final Payment.
- d) Failure of the Contractor to perform the Work in accordance with the Contract Documents, appearing after Final Payment.
- e) As conditioned in the Performance Bond and Payment Bond.
- f) Claims made prior to Final Payment which remain unsettled.

19.6 The making and acceptance of Final Payment shall constitute a waiver of all claims by the Contractor except those claims previously made in writing and not finally resolved, except as noted in Paragraph 19.5.

19.7 The Designer shall not authorize Final Payment until all of the Work under the Contract Documents has been certified by the Designer as completed, proper and suitable for occupancy and use, and has been approved by all federal, state and local agencies having jurisdiction.

19.8 The final Request for Payment shall be identified on its face as such and shall be presented by the Contractor to the Designer within thirty (30) days of completion of the Work. Final payment of the retained amount due the Contractor shall be made by the Owner within thirty (30) days after the later of (i) full and Final Completion of all Work required by the Contract Documents, and certification of such Work as provided in 18.4; (ii) submission of the affidavits of other documentation required by Article 20; (iii) submission by the Contractor of a Request for Payment identified on its face as final and including the Designer's certification.

ARTICLE 20. CONTRACTOR, SUBCONTRACTOR AND SUPPLIER AFFIDAVIT

The Final Payment due the Contractor on account of the Contract Documents shall not become due until the Contractor has furnished to the Owner through the Designer: (A) an affidavit by the Contractor signed, sworn, and notarized to the effect that all payments for materials, services, or for any other reason in connection with the Work or performance of the Contract Documents have been satisfied and that no claims or liens exist against the Contractor in connection with the same; (B) affidavits from each Subcontractor and supplier signed, sworn, and notarized to the effect that (i) each such Subcontractor or supplier has been paid in full by the Contractor for all Work performed and/or materials supplied by him in connection with the Project, and (ii) that all payments for materials, services, and for any other reason in connection with the subcontract or supply contract have been satisfied and that no claims or liens exist against the Subcontractor or supplier in connection therewith; and (C) the written consent of the Contractor's sureties to Final Payment. In the event that the Contractor cannot obtain an affidavit, as required above, from any Subcontractor or supplier, the Contractor shall state in the Contractor's affidavit that no claims or liens exist against such Subcontractor or supplier to the best of the Contractor's knowledge, and that if any appear afterwards, the Contractor shall save the Owner harmless for all costs and expenses, including attorney's fees, on account thereof.

ARTICLE 21. ASSIGNMENTS AND SUBCONTRACTS

The Contractor shall not assign any portion of this Agreement nor subcontract the Work in its entirety without the prior written consent of the Owner. Except as may be required under terms

Initial Here: _____

Initial Here: _____

of the bonds required by the Contract Documents, no funds or sums of money due or to become due to the Contractor under the Contract Documents may be assigned.

ARTICLE 22. MEASUREMENTS

Before ordering material or doing Work which is dependent for proper size or installation upon coordination with building conditions, the Contractor shall verify all dimensions and shall be responsible for the correctness of same. No consideration will be given for any claim based on differences between the actual dimensions and those indicated in the Contract Documents. Any discrepancies between the Contract Documents and the existing conditions shall be referred to the Designer for adjustment before any Work affected thereby is begun.

ARTICLE 23. CONTRACTOR AND SUBCONTRACTOR RELATIONSHIPS

23.1 Within thirty (30) days after initial receipt of the Contract Agreement for signatures the Contractor shall submit to the Designer and Owner for acceptance a current list of the names of Subcontractors and such other persons and organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for any and all portions of the Work. The Contractor shall provide this list at this time even if the Contractor was required to submit a list of proposed Subcontractors with the Contractor's bid. The Designer shall promptly reply to the Contractor in writing stating whether or not the Owner or the Designer, after due investigation, has objection to any such proposed person or entity or if it needs additional information to evaluate the persons on the list. Failure of the Designer to reply within ten (10) days after the Contractor has furnished all required information shall constitute notice of no objection.

The Contractor shall not contract with any such proposed person or entity to whom the Owner or the Designer has made reasonable objection. If the Designer or Owner has reasonable objection to any such proposed person or entity, the Contractor shall submit a substitute to whom the Owner and the Designer have no reasonable objection. The Contractor shall make no substitution for any Subcontractor, person, or entity previously allowed without first notifying the Designer and Owner in writing and no substitution may be made if the Owner or Designer makes a reasonable objection to such substitution.

23.2 The Contractor agrees that the terms of the Contract Documents, including all portions thereof, shall apply to all Subcontractors of the Contractor as if they were the Contractor, and that the Subcontractors of the Contractor shall, by means of their subcontracts, be bound by all the terms of the Contract Documents.

23.3 Payments to Subcontractors shall be made in accordance with the provisions of N.C. Gen. Stat. §143-134.1.

ARTICLE 24. USE OF PREMISES

24.1 The Contractor shall confine apparatus, the storage of materials, the operations of workers, and the disposal of material to limits indicated by law, ordinances, permits, and directions of the Designer, if any.

24.2 The Contractor shall not load or permit any part of the Work to be loaded with a weight that will endanger its safety, intended performance, or configuration.

24.3 The Contractor shall enforce all of the Designer's instructions, including but not limited to, those regarding signs, advertisements, fires, and smoking.

ARTICLE 25. DISPUTE RESOLUTION

25.1 The laws of the State of North Carolina shall apply to the interpretation and enforcement of this Agreement. Any and all suits or actions to enforce, interpret, or seek damages with respect to any provision of, or the performance or nonperformance of, this Agreement shall be brought in the General Court of Justice of North Carolina sitting in Lee County, North Carolina, and it is agreed by the parties that no other court shall have venue with respect to such suits or actions. Appendix A shall be a part of the Contract Documents. Prior to initiating an action under this Article, any party to this Agreement shall initiate the mediation process as provided in Appendix A to these General Conditions of the Contract for Construction.

25.2 Any person or firm that expressly or impliedly agrees to perform labor or services or to provide material, supplies, equipment, work, performance or payment bonds, insurance or indemnification for the construction of the Project or the Work shall be deemed a party to this Agreement solely for the purpose of this Article 25. The Contractor, by means of its subcontracts, shall specifically require its Subcontractors to be bound by this Article.

ARTICLE 26. TAXES

26.1 The Contractor has included in the Contract Price and shall pay all taxes assessed by any authority on the Work or the labor and materials used therein. The Contractor shall maintain all tax records during the life of the Project and furnish the Owner with a complete listing of all taxes paid by taxing authority, invoice number, date, amount, etc. in a form acceptable to the Owner. The Contractor is required to maintain a file showing taxes paid on the Project for three (3) years after Final Payment or turn said documents over to the Owner for his files.

26.2 The following is a list of requirements to be followed by the Contractor in maintaining proper records and reporting the North Carolina Sales and Use Tax and Local Sales and Use Tax. The Contractor shall comply fully with the requirements outlined below, in order that the Owner may recover the amount of the tax permitted under the law.

- a) It shall be the Contractor's responsibility to furnish the Owner documentary evidence showing the materials used and sales and use tax paid by the Contractor and each of his Subcontractors. Such evidence shall be transmitted to the Owner with each pay request irregardless of whether taxes were paid in that period.
- b) The documentary evidence shall consist of a certified statement by the Contractor and each of the Contractor's Subcontractors individually, showing total purchases of materials from each separate vendor and total sales and use taxes paid to each vendor. Certified statements must show the invoice number, or numbers, covered, and inclusive dates of such invoices.
- c) Materials used from Contractor's or Subcontractor's warehouse stock shall be shown in a certified statement at warehouse stock prices.
- d) The Contractor shall not be required to certify the Subcontractor's statements.

ARTICLE 27. OPERATION OF OWNER'S FACILITIES

The Contractor agrees that all Work done under the Contract Documents shall be carried on in such a manner so as to ensure the regular and continuous operation of the adjoining or adjacent facilities. The Contractor further agrees that the sequence of operations under the Contract Documents shall be scheduled and carried out so as to ensure said regular and continuous operation. The Contractor shall not close any areas of construction until so authorized by the Designer. The Contractor shall control operations to assure the least inconvenience to the public. Under all circumstances, safety shall be the most important consideration.

ARTICLE 29. TERMINATION OR SUSPENSION BY THE OWNER FOR CAUSE

If the Contractor fails to begin or complete the work under the Contract Documents within the time specified, or fails to perform the work with sufficient labor and equipment or with sufficient materials to insure the prompt completion of said work, or shall perform the work unsuitably or shall discontinue the prosecution of the work for three days or if the Contractor shall become insolvent, be declared bankrupt, commit any act of bankruptcy or insolvency, commit any illegal act, or allow any final judgment to stand against the Contractor or its affiliated companies for a period of forty-eight hours, or for any cause whatsoever shall not carry on the work in an acceptable manner, the Owner may give notice in writing to the Contractor and the Contractor's sureties of such delay, neglect or default, specifying the same, and if the Contractor within a period of three (3) days after such notice shall not proceed in good faith and with reasonable speed to correct such delay, neglect, or default in accordance with such notice, the Owner shall have the full power and authority, to the extent permitted by law, without violating the Contract Documents, to take the prosecution of the work out of the hands of the Contractor, to appropriate or use any or all materials and equipment at the project as may be suitable and acceptable, and may enter into an agreement for the completion of the work or pursue such other methods as in the Owner's opinion shall be necessary or appropriate for the completion of the work in an acceptable manner. All costs and charges incurred by the Owner in proceeding in accordance with the preceding sentence, including attorneys' fees, and all costs incurred by the Owner in completing the work shall be deducted from any money due or which becomes due the Contractor. If such costs and expense incurred by the Owner shall be less than the sum which would have been payable under the Contract Documents if it had been completed by the Contractor, then the Contractor shall be entitled to receive the difference, but if such costs and expenses shall exceed the sum which would have been payable under the Contract Documents, the Contractor and the Contractor's surety shall be liable to the Owner for and shall pay to the Owner the amount of such excess.

ARTICLE 29. TERMINATION OR SUSPENSION BY THE OWNER FOR CONVENIENCE

29.1 The Owner may, without cause, and 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.

29.2 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; plus, 3) ten percent of the cost of the work referred to Article 29.1 for overhead and profit. There shall be deducted from such sums as provided in this subparagraph the amount of payments made to Contractor prior to the date of the termination of this Agreement. Contractor shall not

Initial Here: _____

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.

EXHIBIT A
COUNTY OF LEE
RULES FOR IMPLEMENTING MEDIATED SETTLEMENT CONFERENCES
IN NORTH CAROLINA PUBLIC BUILDING CONTRACTS

Table of Rules

1. Initiating Mediated Settlement Conferences
 - A. Purpose of mandatory settlement conferences
 - B. Initiating the dispute resolution process

2. Selection of Mediator
 - A. Selection of certified mediator by agreement of the parties
 - B. Nomination and court approval of a non-certified mediator
 - C. Appointment of mediator by the County of Lee
 - D. Mediator information directory
 - E. Disqualification of Mediator

3. The Mediated Settlement Conference
 - A. Where conference is to be held
 - B. When conference is to be held
 - C. Request to extend deadline for completion
 - D. Recesses
 - E. The mediated settlement conference shall not be cause for the delay of the construction project, which is the focus of the dispute

4. Duties of Parties and Other Participants

5. Authority and Duties of Mediators
 - A. Authority of mediator
 - B. Duties of mediator

6. Compensation of the Mediator
 - A. By agreement
 - B. By appointment

7. Mediator Certification

8. Rule Amendments

9. Time Limits

RULE 1. INITIATING MEDIATED SETTLEMENT CONFERENCES

A. Purpose of Mandatory Settlement Conferences. Pursuant to N.C.G.S. 143-128(f1) and (g), these Rules are promulgated to implement a system of settlement events, which are designated to focus the parties' attention on settlement rather than on claim preparation and to provide a structured opportunity for settlement negotiations to take place. Nothing herein is intended to limit or prevent the

parties from engaging in settlement procedures voluntarily at any time to or during commencement of the dispute resolution process.

B. Initiating the Dispute Resolution Process

1. The County reserves the right to require mediation as a precondition to litigation. The County also encourages all disputes to be resolved through good faith efforts of discussion by submitting a dispute to the Project Designer or Prime Contractor and working with the County before a party requests mediation.
2. Any party to a public building contract governed by Article 8, Chapter 143 of the NC General Statutes and identified in N.C.G.S. 143-128(f1) and (g) and who is a party to a dispute arising out of the building process in which the amount in controversy is at least \$15,000 may submit a written request to the County of Lee owner, notice to the Lee County Manager, for mediation of the dispute.
3. Prior to submission of a written request for mediation to the County of Lee owner, the parties requesting mediation:
 - a. If a prime contractor, must have first submitted its claim to the Project Designer for review. If the dispute is not resolved through the Project Designer's instructions, then the dispute is eligible for mediation in the Formal Dispute Resolution Process and the party may submit their written request for mediation to Lee County.
 - b. If the party requesting mediation is a subcontractor, it must first have submitted its claim for mediation to the prime contractor with whom it has a contract. If the dispute is not resolved through the Prime Contractor's involvement, then the dispute is eligible for mediation in the Formal Dispute Resolution Process, and the party may submit its written request for mediation to the County of Lee.
 - c. If the party requesting mediation is the Project Designer, then it must first submit its claim to the County of Lee to resolve. If the dispute is not resolved with the County of Lee's involvement, then the Project Designers' dispute is eligible for mediation in the Formal Dispute Resolution Process, and the Project Designer may submit its written request to the County of Lee for mediation.

RULE 2. SELECTION OF MEDIATOR

A. Selection of Certified Mediator by Agreement of the Parties. The parties may select a certified mediator pursuant to the Rules by agreement within 21 days of requesting mediation. The requesting party shall file with the County of Lee a Notice of Selection of Mediator by Agreement within 10 days of the request; however, any party may file the notice. Such notice shall state the name, address, and telephone number of the selected mediator, state the rate of compensation of the mediator, state that the mediator and opposing counsel have agreed upon the selection and rate of compensation, and state that the mediator is certified pursuant to these Rules.

B. Nomination and the County of Lee Approval of a Non-Certified Mediator. The parties may select a mediator who does not meet the certification requirements of these Rules, but who, in the opinion of the parties and the County of Lee, is otherwise qualified by training or experience to mediate the action.

If the parties select a non-certified mediator, the requesting party shall file with Lee County a Nomination of Non-Certified Mediator within 10 days of the request. Such nomination shall state the name, address and telephone number of the mediator, state the training, experience or other qualifications

of the mediator, state the rate of compensation of the mediator, and state that the mediator and opposing counsel have agreed upon the selection and rate of compensation.

Lee County shall rule on said nomination, shall approve or disapprove of the parties' nomination and shall notify the parties of its decision.

C. Appointment of Mediator by Lee County. If the parties cannot agree upon the selection of a mediator, the party or party's attorney shall notify Lee County and request, on behalf of the parties, that Lee County appoint a mediator. The request for appointment must be filed within 10 days after request to mediate and shall state that the parties have had a full and frank discussion concerning the selection of a mediator and have been unable to agree. The request shall state whether any party prefers a certified attorney mediator, and if so, Lee County shall appoint a certified attorney mediator. If no preference is expressed, Lee County may appoint a certified attorney or a certified non-attorney mediator.

D. Mediator Information Directory. To assist the parties in the selection of a mediator by agreement, the parties are free to utilize the list of certified mediators maintained in any county participating in the Superior Court Mediation Settlement Conference Program.

E. Disqualification of Mediator. Any party may request replacement of the mediator by Lee County for good cause. Nothing in this provision shall preclude mediators from disqualifying themselves.

RULE 3. THE MEDIATED SETTLEMENT CONFERENCE

A. Where Conference is to be Held. Unless all parties and the mediator otherwise agree, the mediated settlement conference shall be held in Lee County. The mediator shall be responsible for reserving a place and making arrangements for the conference and for giving timely notice of the time and location of the conference to all attorneys, unrepresented parties and other persons or entities required to attend.

B. When Conference is to be Held. The deadline for completion of the mediation shall be not less than 30 days nor more than 60 days after naming the mediator.

C. Request to Extend Deadline for Completion. A party, or the mediator, may request Lee County to extend the deadline for completion of the conference. Such request shall state the reasons the extension is sought and shall be served by the moving party upon the other parties and the mediator. If any party does not consent to the request, said party shall promptly communication its objection to Lee County.

Lee County may grant the request by setting a new deadline for completion of the conference.

D. Recesses. The mediator may recess the conference at any time and may set times for reconvening. If the time for reconvening is set before the conference is recessed, no further notification is required for persons present at the conference.

E. The mediated settlement conference shall not be cause for the delay of the building project which is the focus of the dispute.

RULE 4. DUTIES OF PARTIES AND OTHER PARTICIPANTS IN FORMAL DISPUTE RESOLUTION PROCESS

A. Attendance.

1. All parties to the dispute originally presented to the Designer or Prime Contractor for initial resolution must attend the mediation. Failure of a party to a construction contract to attend the mediation may result in Lee County's withholding of monthly payment to that party until such party attends the mediation.

2. Attendance shall constitute physical attendance, not by telephone or other electronic means. Any attendee on behalf of a party must have authority from that party to bind it to any agreement reached as a result of the mediation.

3. Attorneys on behalf of parties may attend the mediation but are not required to do so.

4. Sureties or insurance company representatives are not required to attend the mediation unless any monies paid or to be paid as a result of mediation require their presence or acquiescence. If such agreement or presence is required, then authorized representatives of the surety or insurance company must attend the mediation.

B. Finalizing Agreement. If an agreement is reached in the conference, parties to the agreement shall reduce the terms to writing and sign it along with their counsel.

C. Mediation Fee. The mediation fee shall be decided amongst the parties at the time mediation is requested.

D. Failure to Compensate Mediator. Any party's failure to compensate the mediators in accordance with N.C.G.S. 143-128(f1) and (g) may subject that party to a withholding of said amount of money from the party's monthly payment by Lee County.

RULE 5. AUTHORITY AND DUTIES OF MEDIATORS

A. Authority of Mediator.

1. Control of Conference. The mediator shall at all times be in control of the conference and the procedures to be followed.

2. Private Consultation. The mediator may communicate privately with any participant or counsel prior to and during the conference. The fact that private communications have occurred with a participant shall be disclosed to all other participants at the beginning of the conference.

3. Scheduling the Conference. The mediator shall make a good faith effort to schedule the conference at a time that is convenient with the participants, attorneys and mediator. In the absence of agreement, the mediator shall select the date for the conference.

B. Duties of Mediator.

1. The mediator shall define and describe the following at the beginning of the conference:

- a. The process of mediation;
- b. The difference between mediation and other forms of conflict resolution;
- c. The costs of the mediated settlement conference;
- d. That the mediated settlement conference is not a trial, the mediator is not a judge, and the parties retain their legal rights if they do not reach settlement;

- e. The circumstances under which the mediator may meet and communicate privately with any of the parties or with any other person;
 - f. Whether and under what circumstances communications with the mediator will be held in confidence during the conference;
 - g. The inadmissibility of conduct and statements as provided by N.C.G.S. 7A-38.1;
 - h. The duties and responsibilities of the mediator and the participants; and
 - i. That any agreement reached will be reached by mutual consent.
2. Disclosure. The mediator has a duty to be impartial and to advise all participants of any circumstance bearing on possible bias, prejudice or partiality.
 3. Declaring Impasse. It is the duty of the mediator to timely determine that an impasse exists and that the conference should end.
 4. Reporting Results of Conference. The mediator shall report to Lee County within 10 days of the conference whether or not an agreement was reached by the parties. If an agreement was reached, the report shall state the nature of the agreement. The mediator's report shall inform Lee County of the absence of any party known to the mediator to have been absent from the mediated settlement conference without permission. Lee County may require the mediator to provide statistical data for evaluation of the mediated settlement conference program.
 5. Scheduling and Holding the Conference. It is the duty of the mediator to schedule the conference and conduct it prior to the deadline of completion set by the Rules. Deadlines for completion of the conference shall be strictly observed by the mediator unless said time limit is changed by a written order from Lee County.

RULE 6. COMPENSATION OF THE MEDIATOR

A. By Agreement. When the mediator is stipulated by the parties, compensation shall be as agreed upon by the parties and the mediator provided that the provisions of N.C.G.S. 7A-38.1(k) are observed.

B. By Appointment. When the mediator is appointed by Lee County, the parties shall compensate the mediator for mediation services at the rate in accordance with the rate charged for Superior Court mediation. The parties shall also pay to the mediator a one time per case administrative rate in accordance with the rate charged for Superior Court mediation, which is due upon appointment.

RULE 7. MEDIATOR CERTIFICATION

All mediators certified in the Formal Dispute Resolution Program shall be properly certified in accordance with the rules certifying mediators in Superior Court in North Carolina, except when otherwise allowed by Lee County upon the request of the parties to the mediation. When selecting mediators, the parties may designate a preference for mediators with a background in construction law or public construction contracting. Such requirements, while preferred, are not mandatory under these Rules.

All mediators chosen must either demonstrate they are certified in accordance with the Rules Implementing Scheduled Mediated Settlement Conference in Superior Court or must gain the consent of Lee County to mediate any dispute in accordance with these Rules.

RULE 8. RULE MAKING

These Rules are subject to amendment by Lee County at any time the County deems it appropriate.

RULE 9. TIME LIMITS

Any time limit provided for by these Rules may be waived or extended by the mediator it appoints for good cause shown. If the mediator has not yet been appointed, the Designer of Record shall decide all waivers or extensions of time for good cause shown.

Contract Agreement Between _____ and Lee County Government

THIS AGREEMENT, made the _____ day of ___ month ___ 202__ by and between _____ (hereinafter referred to as the “Contractor”) and Lee County Government (hereinafter referred to as the “Owner”) agree as follows:

1. **Scope of Work:** The Contractor shall furnish and deliver all of the materials, and perform all of the work in the manner and form as provided by the 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 proposals, contract, performance bond, payment bond, power of attorney, worker’s compensation, public liability, Exhibit A – Lee County Dispute Resolution Policy, any and all addendums, and all drawings.
2. The Contractor shall commence work to be performed under this agreement on a date to be specified in a written order of the Owner and shall fully complete all work hereunder within _____ consecutive calendar days from said date. For each day in excess thereof, liquidated damages shall be as stated in as \$1,000.00 per day. The Contractor, as one of the considerations for the awarding of this contract, shall furnish to the Owner a construction schedule setting forth the project broken down by various divisions of the work and by the calendar days, as described in the General Conditions.
3. The Owner agrees to pay to the Contractor for the faithful performance of this agreement, subject to additions and deductions as provided in the specifications or proposal, in lawful money in the amount of \$ _____.

4. **Alternates.** Alternates, if any, included in the Contract Sum are as follows:

Item	Price
Alt. #1	
a. _____	\$ _____
b. _____	
Alt. #2	\$ _____
a. _____	
b. _____	

5. **Allowances.** Allowances, if any, included in the Contract Sum are as follows:

Item	Price
------	-------

6. Unit Prices. Unit prices, if any, are as follows:

Item	Units and limitations	Price per Unit
------	-----------------------	----------------

7. Liquidated Damages. Liquidated damages will be \$1,000.00 per day, after the date specified for substantial completion.

8. Binding Dispute Resolution. For any claim subject to, but not resolved by mediation, the method of binding dispute resolution shall be litigation in a court of competent jurisdiction.

9. The Owner's Representative is:

Lisa Minter, County Manager
408 Summit Drive
Sanford, NC 27330
lminter@leecountync.gov

The Contractor's Representative is:

10. It is further mutually agreed between the Parties that if at any time after the execution of this agreement and the surety bonds hereto attached for its faithful performance, the Owner 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 Contractor, at its own expense, within five (5) days after the receipt of notice from the Owner 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 Owner. In such event, no further payment to the Contractor 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 a manner and form satisfactory to the Owner.

11. **Compliance with E-Verify requirements:** The Contractor and any of its subcontractors must comply with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes, if applicable, which requires certain employers to verify the work authorization of each newly hired employee through the federal E-Verify program operated by the United States Department of Homeland Security and other federal agencies.

12. **Divestment from companies that boycott Israel:** Contractor certifies that (a) it is not identified on the Israel Boycott List or any other list created by the NC State Treasurer pursuant to N.C.G.S. 147—86.80 et al and (b) it will not take any action causing it to appear on any such list during the term of the contract agreement.
13. **Iran Divestment Act Certification.** The Contractor certifies that the Contractor is not listed on the Final Divestment List created by the State Treasurer pursuant to N.C.G.S. 147-86.58 (the Final Divestment List) and the Contractor will not utilize any subcontractors performing work under this Contract which is listed on the Final Divestment List. The Final Divestment List can be found on the State Treasurer’s website at the address and should be updated every 180 days.
14. **Non-Discrimination in Employment.** The Contractor will not discriminate again any employee or applicant for employment because of age, sex, race, creed, national origin or disability. In the event Contractor is determined by the final order of an appropriate agency or court to be in violation of this provision or any non-discrimination provision of federal, state or local law, this Contract may be suspended or terminated, in whole or in part by the County. In addition, the Contractor may be declared ineligible for further contracts with the County.
15. **Drug-Free Workplace.** During the performance of this agreement, the Contractor agrees to (i) provide a drug-free workplace for its employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees of the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in its workplace and specifying the actions that will be taken against employees for violations of such prohibitions, (iii) state in all solicitations or advertisements for employees placed by or on its behalf that it maintains a drug-free workplace; (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000.00 so that the provisions will be binding upon each subcontractor or vendor.
16. This agreement becomes effective upon the last signature of both parties.

IN WITNESS WHEREOF, the Parties hereto have executed this agreement on this the _____ day of _____, _____.

_____ **CONTRACTOR / FIRM**

By: _____

Witness:

Title: _____

Date: _____

LEE COUNTY GOVERNMENT

By: _____

Witness:

Title: _____

Date: _____

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

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:

Contractor: (Trade or Corporate Name)

By: _____

(Proprietorship or Partnership)

Attest: (Corporation)

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

By: _____

Title: _____
(Corp. Sec. or Asst. Sec. only)

(Corporate Seal)

(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 _____

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)

Witness:

Countersigned:

(N.C. Licensed Resident Agent)

Name and Address-Surety Agency

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

Contractor: (Trade or Corporate Name)

By: _____

Title _____
(Owner, Partner, or Corp. Pres. or Vice
Pres. only)

(Surety Company)

By: _____

Title: _____
(Attorney in Fact)

(Surety Corporate Seal)

Sheet for Attaching Power of Attorney

Sheet for Attaching Insurance Certificates

TABLE OF CONTENTS	
SECTION	SUBJECT
SECTION 01 04 00	Construction Surveying
SECTION 01 20 00	Price and Payment Requirements
SECTION 01 30 00	Administrative Requirements
SECTION 01 33 00	Submittal Procedures
SECTION 01 40 00	Quality Requirements
SECTION 01 50 00	Temporary Facilities and Controls
SECTION 01 60 00	Product Requirements
SECTION 01 70 00	Execution and Closeout Requirements
SECTION 02 41 00	Demolition
SECTION 03 10 00	Concrete Forming and Accessories
SECTION 03 20 00	Concrete Reinforcing
SECTION 03 30 00	Cast-in-Place Concrete
SECTION 07 90 00	Joint Protection
SECTION 31 10 00	Site Clearing
SECTION 31 22 13	Rough Grading
SECTION 31 23 16	Excavation
SECTION 31 23 16.13	Trenching
SECTION 31 23 23	Fill
SECTION 31 25 00	Erosion and Sedimentation Controls
SECTION 32 13 13	Concrete Paving
SECTION 32 92 19	Seeding
SECTION 33 14 17	Site Water Service Utility Laterals
SECTION 33 31 00	Sanitary Sewerage Piping

SECTION 010400.00 - CONSTRUCTION SURVEYING

PART 1 - GENERAL

1.1 THE REQUIREMENT

- A. Provide construction surveying required in execution of the Project.
- B. Provide surveying to be used for documenting construction and for the preparation of Record Drawings.
- C. The CONTRACTOR shall retain the services of a Professional Land Surveyor licensed in the state in which the survey will be performed.

1.2 SUBMITTALS

- A. Submit name and address of Professional Land Surveyor to be used on this project to the ENGINEER within 5 days of the Notice to Proceed.
- B. On request of the ENGINEER, submit documentation to verify accuracy of surveying work.
- C. Hard Copy of Construction Record
 - 1. Submit construction record of items required to be surveyed. The Drawing must be sealed by a Professional Land Surveyor as required in 1.1.C above.
- D. Electronic Documents
 - 1. An electronic file, compatible with the DXF (Drawing Exchange Format) format, containing survey points of both horizontal (X, Y) and vertical (tops and inverts, or Z) information shall be provided on a USB Drive or other acceptable method.

1.3 DATUM

- A. The CONTRACTOR shall be responsible for correctly locating all lines and grades and for performing all measuring as required for the construction and completion of the Work from established reference points and information as shown on the Contract Drawings.
- B. All horizontal data shall be tied to State Plane Coordinate System in which the project is constructed, NAD 83. These drawings shall constitute the project record documents.
- C. All vertical data shall be tied to State Plane Coordinate System in which the project is constructed, NAVD 88 coordinates.

1.4 SURVEY REFERENCE POINTS

- A. Only such primary control lines, monuments, and benchmarks (if any) will be set by the OWNER as the OWNER determines to be necessary to control establishment of the lines and grades required for completion of the Work. In general, these will consist of the primary horizontal and vertical control points indicated on the Contract Drawings. All other stakes or markers required to establish the lines and grades required for the completion of the Work shall be the responsibility of the CONTRACTOR.
- B. Primary control monuments set by the OWNER shall be carefully preserved by the CONTRACTOR. In case such monuments are destroyed or damaged, they shall be replaced at the CONTRACTOR's expense.

1.5 SURVEYS FOR LAYOUT AND PERFORMANCE

- A. Surveying Requirements
 - 1. Perform all surveys for layout and performance of the Work, reduce the field notes, and make all calculations and drawings necessary to carry out such work. The CONTRACTOR shall check the relative positions of all monuments and benchmarks to be used and shall report any damaged or out-of-position monuments to the ENGINEER at once. The CONTRACTOR shall check such relative positions each time the CONTRACTOR uses such monument or benchmark.
- B. Equipment and Personnel
 - 1. The CONTRACTOR's instruments and other survey equipment shall be accurate, suitable for the surveys required in accordance with recognized professional standards, and in proper condition and adjustment at all times. Perform all surveys under the direct supervision of Professional Land Surveyor or ENGINEER currently licensed or registered in the state of which the project is constructed.
- C. Field Notes and Records
 - 1. Furnish the original pages of all survey records to the ENGINEER at intervals required by the ENGINEER. Furnish each field notebook to the ENGINEER when filled or completed.
- D. Use by the ENGINEER
 - 1. The ENGINEER may at any time use line and grade points and markers established by the CONTRACTOR. The CONTRACTOR's surveys are a part of the work and may be checked by the ENGINEER at any time. The CONTRACTOR shall be responsible for any lines, grades, or measurements which do not comply with specified or proper tolerances, or which are otherwise defective, and for any resultant defects in the work. The CONTRACTOR shall conduct resurveys or check surveys at no additional costs to correct errors indicated by review of the field notebooks or by check surveys performed by the ENGINEER.

1.6 SURVEYING FOR PREPARATION OF RECORD DRAWINGS

- A. Requirement of record drawings shall be in accordance with the Authorities Having Jurisdiction.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements specifies requirements for installation examination.

3.2 SURVEYING ACCURACY AND TOLERANCES IN SETTING SURVEY STAKES

- A. Surveying Accuracy

- 1. Control

Control traverse field surveys and computations, including surveys of main control lines to determine horizontal and vertical alignment of major structure components, shall meet the accuracy requirements for 21 NCAC 56.1603 (1) Local Control Network Surveys (Class AA). Local control network surveys are traverse networks utilizing permanent points for the purpose of establishing local horizontal control networks for future use by local surveyors. For Class AA boundary surveys in North Carolina, the angular error of closure shall not exceed ten seconds times the square root of the number of angles turned. The ratio of precision shall not exceed an error of closure of one foot per 20,000 feet of perimeter of the parcel of land (1:20,000). When using positional accuracy standards for Class AA control and boundary surveys, neither axis of the 95 percent confidence level error ellipse for any control point or property corner shall exceed 0.05 feet or 0.015 meters plus 30 ppm measured relative to the position(s) of the horizontal control points used and referenced on the survey. Vertical control shall meet 21 NCAC 56.1605 (a)(1) Class A vertical control surveys in North Carolina.

- 2. Staking

- a. Staking for construction or equipment installations shall meet or exceed the accuracy requirements for 21 NCAC 56.1603 (2) Urban Land Surveys (Class A). Urban surveys include lands that normally lie within a town or city. For Class A boundary surveys in North Carolina, the angular error of closure shall not exceed 20 seconds times the square root of the number of angles turned. The ratio of precision shall not exceed an error of closure of one foot per 10,000 feet of perimeter of the parcel of land (1:10,000). When using positional accuracy standards for Class A control and boundary surveys, neither axis of the 95 percent confidence level error ellipse for any control point or property corner shall exceed 0.10 feet or 0.030 meters plus 50 ppm measured relative to the position(s) of the horizontal control points or property corners used and referenced on the survey.

- b.

- 3. Record Drawing Documentation

- a. Surveying to be used for the preparation of Record Documents shall meet the accuracy requirements for 21 NCAC 56.1603 (1) Local Control Network Surveys (Class AA). Local control network surveys are traverse networks utilizing permanent points for the purpose of establishing local horizontal control networks for future use by local surveyors. For Class AA boundary surveys in North Carolina, the angular error of closure shall not exceed ten seconds times the square root of the

number of angles turned. The ratio of precision shall not exceed an error of closure of one foot per 20,000 feet of perimeter of the parcel of land (1:20,000). When using positional accuracy standards for Class AA control and boundary surveys, neither axis of the 95 percent confidence level error ellipse for any control point or property corner shall exceed 0.05 feet or 0.015 meters plus 30 ppm measured relative to the position(s) of the horizontal control points used and referenced on the survey. Vertical control shall meet 21 NCAC 56.1605 (a)(1) Class A vertical control surveys in North Carolina Tolerances

4. The tolerances generally applicable in setting survey stakes shall be as set forth above. Such tolerances shall not supersede stricter tolerances required by the Contract Drawings or Specifications and shall not otherwise relieve the CONTRACTOR of responsibility for measurements in compliance therewith.

END OF SECTION

SECTION 012000 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quantity allowances.
- B. Contingency allowances.
- C. Schedule of Values.
- D. Application for Payment.
- E. Change procedures.
- F. Defect assessment.
- G. Unit prices.

1.2 CONTINGENCY ALLOWANCES

- A. Include in Contract a stipulated sum/price of **7,000.00** for use upon Owner's instruction as a contingency allowance.
- B. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead, and profit will be included in Change Orders authorizing expenditure of funds from this contingency allowance.
- C. Funds will be drawn from contingency allowance only by Change Order.
- D. At closeout of Contract, funds remaining in contingency allowance will be credited to Owner by Change Order.

1.3 TESTING AND INSPECTION ALLOWANCES

- A. Costs Included in Testing and Inspecting Allowances:
 - 1. Cost of engaging testing and inspecting agency.
 - 2. Execution of tests and inspecting.
 - 3. Reporting results.
- B. Costs Not Included in Testing and Inspecting Allowance but Included in Contract Sum/Price:
 - 1. Costs of incidental labor and facilities required to assist testing or inspecting agency.
 - 2. Costs of testing services used by Contractor separate from Contract Document requirements.

3. Costs of retesting upon failure of previous tests as determined by Architect/Engineer.

C. Payment Procedures:

1. Submit one copy of inspecting or testing firm's invoice with next Application for Payment.
2. Pay invoice upon approval by Architect/Engineer.

D. Testing and Inspecting Allowance Schedule:

1. Include sum of **\$5,000** for payment of testing laboratory services specified in Section 014000 - Quality Requirements.

E. Differences in cost will be adjusted by Change Order.

1.4 SCHEDULE OF VALUES

- A. Submit electronic file schedule on **AIA G703 - Continuation Sheet for G702** for review and approval by Owner and/or Project Architect/Engineer.
- B. Schedule of Values shall be approved by the Owner and/or Architect/Engineer prior to the Contractor submitting their first application for payment.
- C. Format: Identify each line item with number and description of major item of work. Also identify Site mobilization, bonds and insurance, Allowances, and Closeout Items.
- D. Include in each line item amount of allowances as specified in this Section. For unit cost allowances, identify quantities taken from Contract Documents multiplied by unit cost to achieve total for each item.
- E. Include within each line item, direct proportional amount of Contractor's overhead and profit.
- F. Revise schedule to list approved Change Orders with each Application for Payment.

1.5 APPLICATION FOR PAYMENT

- A. Submit (1) one digital copy of each Application for Payment on **AIA G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet for G702** for review by Owner and/or Architect/Engineer. Once approved, submit notarized and signed copies to Owner and/or Architect for certification and final approval.
- B. Content and Format: Use Schedule of Values for listing items in Application for Payment.
- C. Submit updated construction schedule with each Application for Payment.
- D. Payment Period: Submit at intervals stipulated in the Agreement.
- E. Submit submittals with transmittal letter as specified in Section 013300 - Submittal Procedures.

- F. Substantiating Data: When Architect/Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:
 - 1. Current construction photographs specified in Section 013300 - Submittal Procedures.
 - 2. Partial release of liens from major Subcontractors and vendors.
 - 3. Record Documents as specified in Section 017000 - Execution and Closeout Requirements, for review by Owner, which will be returned to Contractor.
 - 4. Affidavits attesting to off-Site stored products.
 - 5. Construction Progress Schedule, revised and current as specified in Section 013300 - Submittal Procedures.

1.6 CHANGE PROCEDURES

- A. Submittals: Submit name of individual who is authorized to receive change documents and is responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.
- B. Carefully study and compare Contract Documents before proceeding with fabrication and installation of Work. Promptly advise Architect/Engineer of any error, inconsistency, omission, or apparent discrepancy.
- C. Requests for Interpretation (RFI) and Clarifications: Allot time in construction scheduling for liaison with Architect/Engineer; establish procedures for handling queries and clarifications.
 - 1. Use AIA G716 - Request for Information or similar for requesting interpretations.
 - 2. Architect/Engineer may respond with a direct answer on the Request for Interpretation form, or AIA G709 - Work Changes Proposal Request.
- D. Architect/Engineer will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions on AIA G710 or similar.
- E. Architect/Engineer may issue Proposal Request on form AIA G709 or similar including a detailed description of proposed change with supplementary or revised Drawings and Specifications, a change in Contract Time for executing the change. Contractor will prepare and submit estimate within 7 days.
- F. Contractor may propose changes by submitting a request for change to Architect/Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change and the effect on Contract Sum/Price and Contract Time with full documentation and a statement describing effect on the Work by separate or other Contractors.
- G. Stipulated Sum/Price Change Order: Based on Proposal Request form AIA G709 and Contractor's fixed price quotation or Contractor's request for Change Order as approved by Architect/Engineer.
- H. Unit Price Change Order: For Contract unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of that which are not predetermined, execute Work under Construction Change Directive. Changes in Contract Sum/Price or Contract Time will be computed as specified for [Force Account Change Order.

- I. Construction Change Directive: Architect/Engineer may issue directive, on AIA G714 - Construction Change Directive or similar signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change.
 - J. Force Account Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract. Architect/Engineer will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.
 - K. Maintain detailed records of Work done on force account basis. Provide full information required for evaluation of proposed changes and to substantiate costs for changes in the Work.
 - L. Document each quotation for change in Project Cost or Time with sufficient data to allow evaluation of quotation.
 - M. Change Order Forms: **AIA G701 - Change Order**
 - N. Execution of Change Orders: Architect/Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.
 - O. Correlation of Contractor Submittals:
 - 1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
 - 2. Promptly revise Progress Schedules to reflect change in Contract Time, revise subschedules to adjust times for other items of Work affected by the change, and resubmit.
 - 3. Promptly enter changes in Record Documents.
- 1.7 DEFECT ASSESSMENT
- A. Replace the Work, or portions of the Work, not conforming to specified requirements.
 - B. If, in the opinion of Architect/Engineer or Owner, it is not practical to remove and replace the Work, Architect/Engineer or Owner will direct appropriate remedy or adjust payment.
 - C. The defective Work may remain, but unit sum/price will be adjusted to new sum/price at discretion of Architect/Engineer and/or Owner.
 - D. Defective Work will be partially repaired according to instructions of Architect/Engineer] and/or Owner, and unit sum/price will be adjusted to new sum/price at discretion of Architect/Engineer and/or Owner.
 - E. Individual Specification Sections may modify these options or may identify specific formula or percentage sum/price reduction.
 - F. Authority of Architect/Engineer and/or Owner to assess defects and identify payment adjustments is final.

- G. Nonpayment for Rejected Products: Payment will not be made for rejected products for any of the following reasons:
1. Products wasted or disposed of in a manner that is not acceptable.
 2. Products determined as unacceptable before or after placement.
 3. Products not completely unloaded from transporting vehicle.
 4. Products placed beyond lines and levels of the required Work.
 5. Products remaining on hand after completion of the Work.
 6. Loading, hauling, and disposing of rejected products.

1.8 UNIT PRICES

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.
- B. Authority: Measurement methods are delineated in individual Specification Sections.
- C. Measurement methods delineated in individual Specification Sections complement criteria of this Section.
- D. Take measurements and compute quantities. Architect/Engineer and/or Owner will verify measurements and quantities.
- E. Unit Quantities: Quantities and measurements indicated on Bid Form are for Contract purposes only. Actual quantities provided shall determine payment.
- F. Payment Includes: Full compensation for required labor (including supervision), products, tools, equipment, plant and facilities, transportation, services and incidentals; erection, application, or installation of item of the Work; overhead and profit.
- G. Final payment for Work governed by unit prices will be made on basis of actual measurements and quantities accepted by Architect/Engineer and/or Owner multiplied by unit sum/price for Work incorporated in or made necessary by the Work.
- H. Measurement of Quantities:
1. Weigh Scales: Inspected, tested, and certified by applicable State of North Carolina weights and measures department within past year.
 2. Platform Scales: Of sufficient size and capacity to accommodate conveying vehicle.
 3. Metering Devices: Inspected, tested, and certified by applicable State of North Carolina department within past year.
 4. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel, or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
 5. Measurement by Volume: Measured by cubic dimension using mean length, width, and height or thickness.

6. Measurement by Area: Measured by square dimension using mean length and width or radius.
7. Linear Measurement: Measured by linear dimension, at item centerline or mean chord.
8. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as completed item or unit of the Work.

I. Unit Price Schedule:

1. Item: Removal of Unsatisfactory Soil; Section 312316 "Excavation".
 - a. Description: Unsatisfactory soil excavation and disposal off site, as required and directed by geotechnical engineer
 - b. Unit of Measurement: Cubic yard (CY) of soil excavated, based on survey of volume removed.
2. Item: Replacement of Unsuitable Soil with off-site aggregate base course (ABC) stone; Section 312323 Fill
 - a. Description: Unsuitable soil excavation to be replaced with ABC.
 - b. Unit of Measurement: Cubic yard (CY)
3. Item: Standard concrete paving.
 - a. Description: Additional concrete paving according to Section 321313 - Concrete Paving not otherwise indicated in the Contract Documents. Also refer to details.
 - b. Unit of Measurement: Square Foot (SF)

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 012000

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Coordination and Project conditions.
- B. Preconstruction meeting.
- C. Progress meetings.
- D. Preinstallation meetings.
- E. Closeout meeting.

1.2 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various Sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing operating equipment in service.
- C. Coordinate space requirements, supports, and installation of utilities. Use spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
 - 1. Coordination Drawings: Prepare as required to coordinate all portions of Work. Show relationship and integration of different construction elements that require coordination during fabrication or installation to fit in space provided or to function as intended. Indicate locations where space is limited for installation and access. Also, indicate locations where sequencing and coordination of installations are important.
- D. Coordination Meetings: In addition to other meetings specified in this Section, hold coordination meetings with personnel and subcontractors to ensure coordination of Work.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of Work of separate Sections in preparation for Substantial Completion and for portions of Work designated for OWNER's partial occupancy.
- G. After OWNER's occupancy of premises, coordinate access to Site for correction of defective Work and Work not complying with Contract Documents, to minimize disruption of OWNER's activities.

1.3 PRECONSTRUCTION MEETING

- A. ENGINEER will schedule and preside over meeting after Notice of Award.
- B. Attendance Required: ENGINEER, OWNER, Resident Project Representative, Construction Manager, major subcontractors, and CONTRACTOR.
- C. Minimum Agenda:
 - 1. Scope and understanding of work.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of subcontractors, list of products, schedule of values, and Progress Schedule.
 - 5. Designation of personnel representing parties in Contract, and ENGINEER.
 - 6. Communication procedures:
 - a. Contact List and emergency contact number with parties' information including cell numbers, emails, and names.
 - b. Prior to beginning work, the CONTRACTOR shall notify the WithersRavenel (WR) representative.
 - 7. Procedures and processing of requests for interpretations, field decisions, field orders, submittals, substitutions, Applications for Payments, proposal request, Change Orders, and Contract closeout procedures.
 - 8. Scheduling.
 - 9. Critical Work sequencing.
 - 10. Scheduling activities of Geotechnical Engineer, if applicable.

1.4 PROGRESS MEETINGS

- A. ENGINEER will make arrangements for meetings, prepare agenda with copies for participants, and preside over meetings.
- B. Attendance Required: Job superintendent, major subcontractors, CONTRACTOR and suppliers, and ENGINEER, OWNER, as appropriate to agenda topics for each meeting.
- C. Minimum Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress
 - 3. Field observations and decisions.
 - 4. Identification of problems impeding planned progress.
 - 5. Review of submittal schedule and status of submittals.
 - 6. Review of off-Site fabrication and delivery schedules.
 - 7. Maintenance of Progress Schedule
 - 8. Corrective measures to regain projected schedules
 - 9. Planned progress during succeeding work period
 - 10. Coordination of projected progress
 - 11. Maintenance of quality and work standards
 - 12. Effect of proposed changes on Progress Schedule and coordination
 - 13. Other business relating to Work.

1.5 PREINSTALLATION MEETINGS

- A. When required in individual Specification Sections, convene preinstallation meetings at Project Site before starting Work of specific Section.
- B. Require attendance of parties directly affecting, or affected by, Work of specific Section.
- C. Notify ENGINEER four days in advance of meeting date.
- D. Prepare agenda and preside over meeting:
 - 1. Review conditions of installation, preparation, and procedures.
 - 2. Review coordination with related Work.
- E. Record minutes and distribute copies to participants within two days after meeting, to ENGINEER, OWNER, and those affected by decisions made.

1.6 CLOSEOUT MEETING

- A. Schedule Project closeout meeting with sufficient time to prepare for requesting Substantial Completion. Preside over meeting and be responsible for minutes.
- B. Attendance Required: CONTRACTOR, Construction Manager, major subcontractors, ENGINEER, OWNER, and others appropriate to agenda.
- C. Notify ENGINEER four days in advance of meeting date.
- D. Minimum Agenda:
 - 1. Start-up of facilities and systems.
 - 2. Operations and maintenance manuals.
 - 3. Testing, adjusting, and balancing.
 - 4. System demonstration and observation.
 - 5. Operation and maintenance instructions for OWNER's personnel.
 - 6. CONTRACTOR's inspection of Work.
 - 7. CONTRACTOR's preparation of an initial "punch list."
 - 8. Procedure to request ENGINEER inspection to determine date of Substantial Completion.
 - 9. Completion time for correcting deficiencies.
 - 10. Inspections by authorities having jurisdiction.
 - 11. Certificate of Occupancy and transfer of insurance responsibilities.
 - 12. Partial release of retainage.
 - 13. Final cleaning.
 - 14. Preparation for final inspection.
 - 15. Closeout Submittals:
 - a. Project record documents.
 - b. Operating and maintenance documents.
 - c. Operating and maintenance materials.
 - d. Affidavits.

16. Final Application for Payment.
 17. Lien Release documentation.
 18. Warranty Information.
 19. CONTRACTOR's demobilization of Site.
 20. Maintenance.
- E. Record minutes and distribute copies to participants within two days after meeting, to ENGINEER, OWNER, and those affected by decisions made.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

END OF SECTION 013000

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Definitions.
- B. Submittal procedures.
- C. Proposed product list.
- D. Product data.
- E. Use of electronic CAD files of Project Drawings.
- F. Progress Schedule
- G. Shop Drawing Register
- H. Shop Drawings.
- I. Samples.
- J. Design data.
- K. Certified Shop Test reports.
- L. Certificates.
- M. Manufacturer's instructions.
- N. Manufacturer's field reports.
- O. Erection Drawings.
- P. Construction photographs.
- Q. CONTRACTOR review.
- R. ENGINEER review.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require ENGINEER's responsive action.

- B. Informational Submittals: Written and graphic information and physical Samples that do not require ENGINEER's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

- A. Transmit each submittal with ENGINEER-accepted form.
- B. CONTRACTOR shall be required to keep and publish a submittal log for reference by interested parties.
- C. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- D. Identify: Project, CONTRACTOR, Subcontractor and supplier, pertinent Drawing and detail number, and Specification Section number appropriate to submittal.
- E. Apply CONTRACTOR's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is according to requirements of the Work and Contract Documents.
- F. Schedule submittals to expedite Project, and submit electronic submittals via email as PDF electronic files. Coordinate submission of related items.
- G. For each submittal for review, allow 15 calendar days excluding delivery time to and from CONTRACTOR.
- H. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.
- I. Allow space on submittals for CONTRACTOR and ENGINEER review stamps.
- J. When revised for resubmission, identify changes made since previous submission.
- K. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- L. Incomplete Submittals: ENGINEER will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of ENGINEER.

1.4 PROPOSED PRODUCT LIST

- A. Within 15 calendar days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

1.5 PRODUCT DATA

- A. Product Data: Action Submittal: Submit to ENGINEER for review for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Submit electronic submittals via email as PDF electronic files.
- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. After review, produce copies and distribute.

1.6 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

- A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
- B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
 - 1. Use of files is solely at receiver's risk and by opening/using transmitted information, user accepts terms of ENGINEER's end user license agreement. ENGINEER does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify ENGINEER of discrepancy and use information in hard-copy Drawings and Specifications.
 - 2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
 - 3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
 - 4. Receiver shall not hold ENGINEER responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
 - 5. Receiver shall understand that even though ENGINEER has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
 - 6. Receiver shall not hold ENGINEER responsible for such viruses or their consequences and shall hold ENGINEER harmless against costs, losses, or damage caused by presence of computer virus in files or media.
 - 7. Receiver shall not distribute drawings to unauthorized third parties without the written permission of ENGINEER. Drawings shall remain the property of the ENGINEER under Common Copyright Laws.

1.7 PROGRESS SCHEDULE

- A. Within 15 days after issuance of the Notice to Proceed, the CONTRACTOR shall prepare and submit an electronic copy of his proposed progress schedule to the ENGINEER for review and approval.
- B. If so required, the schedule shall be revised until it is approved by the ENGINEER.
- C. Schedule shall be updated monthly, depicting progress to the last day of the month.
- D. An electronic copy of the updated schedule shall be submitted to the ENGINEER not later than the fifth day of the month with the application for progress payment.
- E. The application for progress payment shall be considered incomplete until the updated schedule is received.
- F. Schedule shall be prepared in the form of a horizontal bar chart showing the proposed sequence of the work in sufficient detail and identifying construction activities consistent with the CONTRACTOR's schedule of values in the application for progress payment.
- G. Schedule shall be time scaled, identifying the first day of each week, with the estimated start and complete date of each stage of the work to complete the Project within the Contract time.
- H. Updated schedule shall show all changes since the previous schedule.
- I. All revisions to the schedule must have the prior approval of the ENGINEER.

1.8 SHOP DRAWING REGISTER

- A. CONTRACTOR shall prepare and submit an electronic copy of his schedule of shop drawings or shop drawing register to the ENGINEER for review and approval. The shop drawing register shall include all items and information that the CONTRACTOR is required to submit for the ENGINEER to review throughout the course of the project. This shall include all equipment and materials for the project, required CONTRACTOR, subcontractor, or manufacturer qualifications, warranty submittals, etc.
- B. If so required, the schedule shall be revised until it is approved by the ENGINEER.
- C. Schedule shall be updated monthly.
- D. CONTRACTOR shall prepare and submit an electronic copy of the updated schedule to the ENGINEER not later than the fifth day of every month with the application for progress payment.
- E. The application for progress payment shall be considered incomplete until the updated schedule is received.
- F. The updated schedule shall be based on the Progress Schedule developed under the requirements of Section 1.7 of this Section.

- G. Schedule shall be in tabular form with appropriate spaces to insert the following information for principal items of equipment and materials:
1. Date on which Shop Drawings and other information are requested and received from the manufacturer or other appropriate source.
 2. Date on which certification/information is received from the manufacturer or other appropriate source and transmitted to the ENGINEER.
 3. Date on which Shop Drawings and other information are submitted to the ENGINEER and returned by the ENGINEER for revision.
 4. Date on which Shop Drawings and other information are revised by manufacturer and resubmitted to the ENGINEER.
 5. Date on which Shop Drawings and other information are returned by ENGINEER annotated in accordance with ENGINEER review.
 6. Date on which accepted Shop Drawings and other information are transmitted to manufacturer or other appropriate recipient.
 7. Date of manufacturer's scheduled delivery.
 8. Date on which delivery is made.

1.9 SHOP DRAWINGS

- A. Shop Drawings: Action Submittal: Submit to ENGINEER for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a Professional Engineer registered in the state of North Carolina responsible for designing components shown on Shop Drawings.
1. Include signed and sealed calculations to support design.
 2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
 3. Make revisions and provide additional information when required by authorities having jurisdiction.
- D. Submit electronic submittals via email as PDF electronic files.
- E. After review, produce copies and distribute.

1.10 SAMPLES

- A. Samples: Action Submittal: Submit to ENGINEER for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Samples for Selection as Specified in Product Sections:
1. Submit to ENGINEER for aesthetic, color, and finish selection.
 2. Submit Samples of finishes, textures, and patterns for ENGINEER selection.

- C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.
- D. Include identification on each Sample, with full Project information.
- E. Submit number of Samples specified in individual Specification Sections; ENGINEER will retain one Sample.
- F. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.
- G. After review, produce copies and distribute.

1.11 DESIGN DATA

- A. Informational Submittal: Submit data for ENGINEER's knowledge as Contract administrator or for OWNER.
- B. Submit information for assessing conformance with information given and design concept expressed in Contract Documents.

1.12 CERTIFIED SHOP TEST REPORTS

- A. Each piece of equipment for which pressure, head, capacity, rating, efficiency, performance, function, or special requirements are specified or implied shall be tested in the shop of the manufacturer in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents and applicable test codes and standards.
- B. The CONTRACTOR shall secure from the manufacturers legible electronic copies of the actual test data, the interpreted results and a complete description of the testing facilities and testing setup, all accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company and notarized.
- C. These reports shall be forwarded to the ENGINEER for review.
- D. In the event any equipment fails to meet the test requirements, the manufacturer shall make all necessary changes, adjustments or replacements and the tests shall be repeated, at no additional cost to the OWNER or ENGINEER, until the equipment test requirements are acceptable to the ENGINEER.
- E. No equipment shall be shipped to the Project until the ENGINEER notifies the CONTRACTOR, in writing, that the shop test reports are acceptable.
- F. Copies of certified test data shall be incorporated into the Record Working Drawings.

1.13 CERTIFICATES

- A. Informational Submittal: Submit certification by manufacturer, installation/application Subcontractor, or CONTRACTOR to ENGINEER, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product but must be acceptable to ENGINEER.

1.14 MANUFACTURER'S INSTRUCTIONS

- A. Informational Submittal: Submit manufacturer's installation instructions for ENGINEER's knowledge as Contract administrator or for OWNER.
- B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to ENGINEER in quantities specified for Product Data.
- C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.15 MANUFACTURER'S FIELD REPORTS

- A. Informational Submittal: Submit reports for ENGINEER's knowledge as Contract administrator or for OWNER.
- B. Submit report in duplicate within 5 days of observation to ENGINEER for information.
- C. Submit reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.16 ERECTION DRAWINGS

- A. Informational Submittal: Submit Drawings for ENGINEER's knowledge as Contract administrator or for OWNER.
- B. Submit Drawings for information assessing conformance with information given and design concept expressed in Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by ENGINEER or OWNER.

1.17 CONSTRUCTION PHOTOGRAPHS

- A. Provide photographs of Site and construction throughout progress of Work produced by an experienced photographer acceptable to ENGINEER.

- B. Each month submit photographs with Application for Payment.
- C. Take photographs as evidence of existing Project conditions.
- D. Digital Images: Deliver complete set of digital image electronic files on USB-Drive or other acceptable method to OWNER with Project record documents. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as sensor, uncropped.
 - 1. Digital Images: Uncompressed JPG format, produced by digital camera with minimum sensor size of 4.0 megapixels, and image resolution of not less than 1024 by 768 pixels.
 - 2. Date and Time: Include date and time in filename for each image.

1.18 CONTRACTOR REVIEW

- A. Review for compliance with Contract Documents and approve submittals before transmitting to ENGINEER.
- B. CONTRACTOR: Responsible for:
 - 1. Determination and verification of materials including manufacturer's catalog numbers.
 - 2. Determination and verification of field measurements and field construction criteria.
 - 3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
 - 4. Determination of accuracy and completeness of dimensions and quantities.
 - 5. Confirmation and coordination of dimensions and field conditions at Site.
 - 6. Construction means, techniques, sequences, and procedures.
 - 7. Safety precautions.
 - 8. Coordination and performance of Work of all trades.
 - 9. Reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.
 - 10. Determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto.
 - 11. Determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work.
 - 12. Determined and verified all information relative to CONTRACTOR's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
- C. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents.
- D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from ENGINEER.
- E. No Work shall be approved that is not in accordance with standard manufacturer's installation instructions without the manufacturer's certification of an alternate method.

1.19 ENGINEER REVIEW

- A. Do not make "mass submittals" to ENGINEER. "Mass submittals" are defined as six or more submittals or items in one day or 20 or more submittals or items in one week. If "mass submittals" are received, ENGINEER's review time stated above will be extended as necessary to perform proper review. ENGINEER will review "mass submittals" based on priority determined by ENGINEER after consultation with OWNER and CONTRACTOR.
- B. Informational submittals and other similar data are for ENGINEER's information, do not require ENGINEER's responsive action, and may not be reviewed or returned with comment.
- C. Submittals made by CONTRACTOR that are not required by Contract Documents may be returned without action.
- D. Submittal approval does not authorize changes to Contract requirements unless accompanied by written Change Order or Construction Change Directive.
- E. OWNER may withhold monies due to CONTRACTOR to cover additional costs beyond the second submittal review.
- F. ENGINEER's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
- G. ENGINEER's review shall in no way relieve the CONTRACTOR of any of their responsibilities under the Contract.
- H. An acceptance of a submittal shall be interpreted to mean that the ENGINEER has no specific objections to the submitted material, subject to conformance with the Contract Drawings and Specifications.
- I. ENGINEER's review will be confined to general arrangement and compliance with the Contract Drawings and Specifications only, and will not be for the purpose of checking dimensions, weights, clearances, fittings, tolerances, interferences, coordination of trades, etc.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality control.
- B. Tolerances.
- C. References.
- D. Labeling.
- E. Mockup requirements.
- F. Testing and inspection services.
- G. Manufacturers' field services.

1.2 QUALITY CONTROL

- A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- C. Perform Work using persons qualified to produce required and specified quality.
- D. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerance errors to accumulate.
- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from ENGINEER before proceeding.

1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes or authorities having jurisdiction.
- B. Conform to reference standard by date of issue current as of date of Contract Documents except where specific date is established by code.
- C. Obtain copies of standards and maintain on Site when required by product Specification Sections.
- D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from ENGINEER before proceeding.
- E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of ENGINEER shall be altered from Contract Documents by mention or inference in reference documents.

1.5 LABELING

- A. Attach label from agency approved by authorities having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.
- B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:
 - 1. Model number.
 - 2. Serial number.
 - 3. Performance characteristics.
- C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

1.6 MOCK-UP REQUIREMENTS

- A. Tests will be performed under provisions identified in this Section and identified in individual product Specification Sections.
- B. Assemble and erect specified or indicated items with specified or indicated attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mockups shall be comparison standard for remaining Work.

1.7 TESTING AND INSPECTION SERVICES

- A. Employ and pay for services of an independent testing agency or laboratory acceptable to OWNER to perform specified testing.

1. Before starting Work, submit testing laboratory name, address, and telephone number, and names of full-time Professional Engineer and responsible officer.
 2. Submit copy of report of laboratory facilities' inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.
- B. Independent firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by ENGINEER, OWNER, and/or authorities having jurisdiction as applicable.
1. Laboratory: Licensed and authorized to operate in the state in which the project is to be constructed.
- C. Reports shall be submitted by independent firm to ENGINEER, CONTRACTOR, and authorities having jurisdiction, indicating observations and results of tests and compliance or noncompliance with Contract Documents.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
1. Notify ENGINEER and an independent firm 48 hours before expected time for operations requiring services.
 2. Make arrangements with independent firm and pay for additional Samples and tests required for CONTRACTOR's use.
- E. Employment of testing agency or laboratory shall not relieve CONTRACTOR of obligation to perform Work according to requirements of Contract Documents.
- F. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from ENGINEER. Payment for retesting or re-inspection will be charged to CONTRACTOR by deducting testing charges from Contract Sum/Price.
- G. Agency Responsibilities:
1. Test Samples of mixes submitted by CONTRACTOR.
 2. Provide qualified personnel at Site. Cooperate with ENGINEER and CONTRACTOR in performance of services.
 3. Perform indicated sampling and testing of products according to specified standards.
 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 5. Promptly notify ENGINEER and CONTRACTOR of observed irregularities or nonconformance of Work or products.
 6. Perform additional tests required by ENGINEER.
 7. Attend preconstruction meetings and progress meetings.
- H. Agency Reports: After each test, promptly submit electronic copies of report to ENGINEER, CONTRACTOR, and authorities having jurisdiction. When requested by ENGINEER, provide interpretation of test results.
- I. Limits on Testing Authority:

1. Agency or laboratory may not release, revoke, alter, or enlarge any requirements of Contract Documents.
2. Agency or laboratory may not approve or accept any portion of the Work.
3. Agency or laboratory may not assume duties of CONTRACTOR.
4. Agency or laboratory has no authority to stop the Work.

1.8 MANUFACTURER'S FIELD SERVICES

- A. When specified in individual specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe Site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, testing, adjusting, and balancing of equipment, and commissioning as applicable, and to initiate instructions when necessary.
- B. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 014000

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities:

1. Temporary electricity.
2. Temporary lighting for construction purposes.
3. Temporary ventilation.
4. Temporary water service.
5. Temporary sanitary facilities.

B. Construction Facilities:

1. Field offices, sheds and material storage.
2. Vehicular access.
3. Parking.
4. Progress cleaning and waste removal.
5. Traffic regulation.
6. Fire-prevention facilities.

C. Temporary Controls:

1. Barriers.
2. Enclosures and fencing.
3. Security.
4. Water control.
5. Dust control.
6. Erosion and sediment control.
7. Noise control.
8. Pest and rodent control.
9. Pollution control.

D. Removal of utilities, facilities, and controls.

1.2 TEMPORARY ELECTRICITY

- A. Provide and pay for power service required from utility source as needed for construction operation.
- B. Install circuit and branch wiring, with area distribution boxes located so that power and lighting is available as required for construction by the use of construction type power cords.
- C. Provide in accordance with authorities having jurisdiction and shall meet OSHA requirements.

1.3 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain lighting for construction operations in accordance with authorities having jurisdiction and shall meet OSHA requirements.

1.4 TEMPORARY VENTILATION

- A. Provide temporary ventilation as required to maintain adequate environmental conditions to facilitate progress of the Work to meet specified OSHA requirements.
- B. Provide temporary ventilation, if necessary, to protect materials from damage due to temperature or humidity.

1.5 TEMPORARY WATER SERVICE

- A. Provide and pay for suitable quality water service as needed to maintain specified conditions for construction operations. Coordinate with authorities having jurisdictions for connection to and metering of water service.

1.6 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures in accordance with authorities having jurisdiction. Existing facility use is not permitted. Provide facilities at time of Project mobilization.

1.7 FIELD OFFICES, SHEDS AND MATERIAL STORAGE

- A. Locate and arrange storage of field offices, sheds and material storage areas in accordance with authorities having jurisdiction and in accordance with the requirements of the General Conditions, the Supplemental Conditions, and as hereinafter specified.
 - 1. CONTRACTOR shall enforce the instructions of OWNER and ENGINEER regarding the posting of regulatory signs for fire safety and smoking areas.
 - 2. CONTRACTOR shall not store materials upon private property without the written consent of the Owners of such property.
 - 3. CONTRACTOR shall not store unnecessary materials or equipment on the job site and shall take care to prevent any structure from being loaded with a weight which will endanger its security or the safety of persons.
 - 4. Materials shall not be placed within 10-feet of fire hydrants.
 - 5. Gutters, drainage channels, and inlets shall be kept unobstructed at all times.
 - 6. CONTRACTOR shall provide adequate temporary storage buildings/facilities, if required, to protect materials or equipment on the job site.
- B. Construction: Portable or mobile buildings, or buildings constructed with floors raised aboveground, securely fixed to foundations with steps and landings at entrance doors. Construction shall be in accordance with authorities having jurisdiction.

1. Construction: Structurally sound, secure, weathertight enclosures for office and storage spaces. Maintain during progress of Work; remove enclosures when no longer needed or at completion of Work.
 2. Thermal Resistance of Floors, Walls, and Ceilings: Compatible with occupancy and storage requirements.
- C. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas to same or better condition as original condition.

1.8 VEHICULAR ACCESS

- A. Construct and maintain temporary access roads from public thoroughfares to serve construction area, of width and load-bearing capacity to accommodate unimpeded traffic for construction purposes.
1. Access roads shall be located within the easements of the OWNER unless the CONTRACTOR independently secures easements for their use and convenience.
 2. CONTRACTOR shall submit written documentation to the ENGINEER for any easements secured by the CONTRACTOR across private property.
 3. The easement agreement shall specify terms and conditions of use and provisions for site restoration.
 4. A written release from the property Owner, certifying that all terms of the easement agreement have been complied with by the CONTRACTOR, shall be furnished to the ENGINEER prior to final payment.
- B. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage.
- C. Extend and relocate vehicular access as Work progress requires and provide detours as necessary for unimpeded traffic flow.
- D. Locate as indicated on Drawings.
- E. Provide and maintain access to fire hydrants and control valves free of obstructions.
- F. Use designated existing on-Site roads for construction traffic.

1.9 PARKING

- A. Arrange for, provide, and construct temporary gravel surface parking areas or approved parking areas by the ENGINEER to accommodate construction personnel.
- B. Locate as indicated on Drawings and in consultation with OWNER, ENGINEER, and authorities having jurisdiction.
- C. If Site space is not adequate, provide additional off-Site parking.
- D. Use of existing on-Site streets and driveways may be permitted for construction traffic upon approval from the ENGINEER or OWNER. Tracked vehicles are not allowed on paved areas.

- E. Use of designated areas of existing parking facilities used by construction personnel may be permitted. Obtain written permission to use existing parking facilities from OWNER.
- F. Maintenance:
 - 1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, ice, and the like.
 - 2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original condition.
 - 3. Maintenance shall be at no additional cost to the OWNER.
- G. Removal, Repair:
 - 1. Remove temporary materials and construction when permanent paving is usable.
 - 2. Repair existing facilities damaged by use, to original condition.
 - 3. Removal and repair shall be at no additional cost to the OWNER.

1.10 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.

1.11 TRAFFIC REGULATION

- A. CONTRACTOR shall obey all traffic laws and comply with all the requirements, rules, and regulations of the OWNER and the authorities having jurisdiction to maintain adequate warning signs, lights, barriers, etc., for the protection of traffic on public roadways.
- B. Signs, Signals, and Devices:
 - 1. Post-Mounted and Wall-Mounted Traffic Control and Informational Signs: As approved by authorities having jurisdiction.
 - 2. Traffic Control Signals: As approved by local jurisdictions.
 - 3. Traffic Cones, Drums, Flares, and Lights: As approved by authorities having jurisdiction.
 - 4. Flag Person Equipment: As required by authorities having jurisdiction.
- C. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.
- D. Flares and Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
- E. Haul Routes:
 - 1. Consult with authorities having jurisdiction and establish public thoroughfares to be used for haul routes and Site access.
- F. Traffic Signs and Signals:

1. Provide signs at approaches to Site and on Site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
2. Provide, operate, and maintain traffic control signals to direct and maintain orderly flow of traffic in areas under CONTRACTOR's control and areas affected by CONTRACTOR's operations.
3. Relocate signs and signals as Work progresses, to maintain effective traffic control.

G. Removal:

1. Remove equipment and devices when approved by authorities have jurisdiction.
2. Repair damage caused by installation at no additional cost to the OWNER.
3. Remove post settings to depth of 2 feet.

1.12 FIRE-PREVENTION FACILITIES

- A. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.
- B. Portable Fire Extinguishers: Provide fire extinguishers in accordance with applicable code requirements approved by the authority having jurisdiction.

1.13 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide barricades and covered walkways in accordance with and as required by authorities having jurisdiction for public rights-of-way.
- C. Tree and Plant Protection: Preserve and protect existing trees and plants designated to remain.
 1. Protect areas within drip lines from traffic, parking, storage, dumping, chemically injurious materials and liquids, ponding, and continuous running water.
 2. Provide barriers in accordance with the plan drawings and authority having jurisdiction around drip line, with access for maintenance.
 3. Replace trees and plants damaged by construction operations with replacement meeting OWNER approval at no additional cost to the OWNER.

1.14 ENCLOSURES AND FENCING

- A. Construction:
 1. Shall be in accordance with the Plan Drawings.

1.15 SECURITY

A. Security Program:

1. Protect Work on existing premises from theft, vandalism, and unauthorized entry.
2. Initiate program at Project mobilization.
3. Maintain program throughout construction period until directed by ENGINEER.

B. Restrictions:

1. Hours of operation and work restrictions shall be in accordance with authorities having jurisdiction and OWNER.

1.16 WATER CONTROL

A. Grade Site to drain.

B. Maintain excavations free of water.

C. Provide, operate, and maintain necessary dewatering equipment.

D. Protect Site from puddles or channelized water.

1.17 DUST CONTROL

A. Execute Work by methods that minimize raising dust from construction operations.

B. Provide positive means to prevent airborne dust from dispersing into atmosphere.

1.18 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Provide temporary measures as indicated on the drawings and in accordance with the approved AHJ and NPDES permit(s), if obtained.

C. Comply with sediment and erosion control plan indicated on Drawings. If there is an NPDES permit associated with the project, then construction operations shall be in accordance with the approved permit.

1.19 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise produced by construction operations in accordance with authorities having jurisdiction.

1.20 PEST AND RODENT CONTROL

- A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work.

1.21 POLLUTION CONTROL

- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.
- B. Comply with pollution and environmental control requirements of authorities having jurisdiction.

1.22 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials before Final Application for Payment.
- B. Remove underground installations to minimum depth of 2 feet from finished grade surface. Grade Site as indicated on Drawings.
- C. Clean and repair damage caused by installation or use of temporary Work. Cleaning and repair shall be at no additional cost to the OWNER.
- D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.

1.2 PRODUCTS

- A. At minimum, comply with specified requirements and reference standards.
- B. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- C. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- D. Domestic Products: Except where specified otherwise, domestic products are required and interpreted to mean products mined, manufactured, fabricated, or produced in United States or its territories.
- E. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.
- F. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products according to manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products according to manufacturer's instructions.
- B. Store products with seals and labels intact and legible.
- C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.
- D. For exterior storage of fabricated products, place products on sloped supports aboveground.
- E. Provide bonded off-Site storage and protection when Site does not permit on-Site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Products complying with specified reference standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one or more manufacturers named and complying with Specifications; no options or substitutions allowed.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 016000

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Examination.
- B. Preparation.
- C. Coordination of OWNER's portion of the Work.
- D. Field engineering.
- E. Execution.
- F. Cutting and patching.
- G. Protecting installed construction.
- H. Starting of systems.
- I. Demonstration and instruction.
- J. Closeout procedures.
- K. Final adjustment of accounts.
- L. Final application for payment.
- M. Project record documents.
- N. Operation and maintenance data.
- O. Manual for materials and finishes.
- P. Manual for equipment and systems.
- Q. Spare parts and maintenance products.
- R. Product warranties and product bonds.
- S. Warranty requirements.
- T. Final cleaning.

1.2 EXAMINATION

- A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Verify that utility services are available with correct characteristics and in correct locations.

1.3 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance according to manufacturer's instructions.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer-required or -recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

1.4 COORDINATION OF OWNER'S PORTION OF THE WORK

- A. Site Access: Provide access to Project site for OWNER's construction personnel.
 - 1. Refer to Section 015000 – Temporary Facilities and Controls required for OWNER-furnished, CONTRACTOR-installed products.
- B. Coordination: Coordinate construction and operations of the Work with Work performed by OWNER's construction personnel.
 - 1. Construction Schedule: Inform OWNER of CONTRACTOR's preferred construction schedule for OWNER's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify OWNER if changes to schedule are required due to differences in actual construction progress.
 - 2. Preinstallation Conferences: Include OWNER's construction personnel at preinstallation conferences covering portions of the Work that are to receive OWNER's Work. Attend preinstallation conferences conducted by OWNER's construction personnel if portions of the Work depend on OWNER's construction.

1.5 FIELD ENGINEERING

- A. Employ Professional Land Surveyor registered in the State in which the project is being constructed.
- B. Locate and protect survey control and reference points. Promptly notify ENGINEER of discrepancies discovered.
- C. Control datum for survey is indicated on Drawings.

- D. Prior to beginning Work, verify and establish floor elevations of existing facilities to ensure that new Work will meet existing elevations in smooth and level alignment except where specifically detailed or indicated otherwise.
- E. Verify setbacks and easements; confirm Drawing dimensions and elevations.
- F. Provide field engineering services. Establish elevations, lines, and levels using recognized engineering survey practices.
- G. Submit copy of Site drawing signed and sealed by Professional Land Surveyor licensed in the state in which the construction is being performed certifying elevations and locations of the Work are in conformance with Contract Documents.
- H. Protect survey control points prior to starting Site Work; preserve permanent reference points during construction.
- I. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to ENGINEER.
- J. Final Property Survey: Refer to Section 010400 – Construction Surveying for detailed information related to survey requirements. Prior to Substantial Completion, prepare final property survey illustrating locations, dimensions, angles, and elevations of structures and Site Work that have resulted from construction indicating their relationship to permanent benchmarks and property lines.
 - 1. Show significant features (real property) for Project.
 - 2. Include certification on survey, signed by Professional Land Surveyor licensed in the state in which the construction is being performed, that principal metes, bounds, lines, levels, and elevations of Project are accurately shown.

1.6 EXECUTION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from ENGINEER before proceeding.
- C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
 - 1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
 - 2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.

3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual effect choices to ENGINEER for final decision.

1.7 CUTTING AND PATCHING

- A. Employ skilled and experienced Installers to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting the following:
 1. Structural integrity of element.
 2. Integrity of weather-exposed or moisture-resistant elements.
 3. Efficiency, maintenance, or safety of element.
 4. Visual qualities of sight-exposed elements.
 5. Work of OWNER or separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill to complete Work and to accomplish the following:
 1. Fit the several parts together, to integrate with other Work.
 2. Uncover Work to install or correct ill-timed Work.
 3. Remove and replace defective and nonconforming Work.
 4. Remove samples of installed Work for testing.
 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.

1.8 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
- C. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects where applicable.
- D. Prohibit traffic or storage upon waterproofed or roofed surfaces.
- E. Prohibit traffic from landscaped areas.

1.9 STARTING OF SYSTEMS

- A. Coordinate schedule for startup of various equipment and systems.
- B. Notify ENGINEER and OWNER seven days prior to startup of each item.

- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute startup under supervision of manufacturer's representative or CONTRACTORS' personnel according to manufacturer's instructions.
- G. When specified in individual Specification Sections, require manufacturer to provide authorized representative who will be present at Site to inspect, check, and approve equipment or system installation prior to startup and will supervise placing equipment or system in operation.

1.10 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to OWNER's personnel two weeks prior to date of Substantial Completion.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Use operation and maintenance manuals as basis for instruction. Review contents of manual with OWNER's personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, and agreed location.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

1.11 CLOSEOUT PROCEDURES

- A. Prerequisites to Substantial Completion: Complete following items before requesting Certification of Substantial Completion, either for entire Work or for portions of Work:
 - 1. Submit maintenance manuals, Project record documents, digital images of construction photographs, and other similar final record data in compliance with this Section.
 - 2. Complete facility startup, testing, adjusting, balancing of systems and equipment, demonstrations, and instructions to OWNER's operating and maintenance personnel as specified in compliance with this Section.
 - 3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or nonconforming Work, reason for being incomplete, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.

4. Obtain and submit releases enabling OWNER's full, unrestricted use of Project and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases from authorities having jurisdiction and utility companies.
5. Deliver tools, spare parts, extra stocks of material, and similar physical items to OWNER.
6. Make final change-over of locks eliminating construction master-key system and transmit keys directly to OWNER. Advise OWNER's personnel of change-over in security provisions.
7. Discontinue or change over and remove temporary facilities and services from Project Site, along with construction tools, mockups, and similar elements.
8. Perform final cleaning according to this Section.

B. Substantial Completion Inspection:

1. When CONTRACTOR considers Work to be substantially complete, submit to ENGINEER and OWNER:
 - a. Written certificate that Work, or designated portion, is substantially complete.
 - b. List of items to be completed or corrected (initial punch list).
2. Within 14 days after receipt of request for Substantial Completion, ENGINEER and/or OWNER will make inspection to determine whether Work or designated portion is substantially complete.
3. Should ENGINEER and/or OWNER determine that Work is not substantially complete:
 - a. ENGINEER will promptly notify CONTRACTOR in writing, stating reasons for its opinion.
 - b. CONTRACTOR shall remedy deficiencies in Work and send second written request for Substantial Completion to ENGINEER and OWNER.
 - c. ENGINEER and/or OWNER will reinspect Work.
4. Reinspection Fees
 - a. Should the ENGINEER perform reinspection due to failure of the Work to comply with the claims of status of completion made by the CONTRACTOR:
 - b. OWNER will compensate the ENGINEER for such additional services.
 - c. OWNER will deduct the amount of such compensation from the final payment to the CONTRACTOR.
5. When ENGINEER and/or OWNER finds that Work is substantially complete, ENGINEER will:
 - a. Prepare Certificate of Substantial Completion, accompanied by CONTRACTOR's list of items to be completed or corrected as verified and amended by ENGINEER and OWNER (final punch list).
 - b. Submit Certificate to OWNER and CONTRACTOR for their written acceptance of responsibilities assigned to them in Certificate.
6. After Work is substantially complete, CONTRACTOR shall:
 - a. Allow OWNER occupancy of Project under provisions stated in Certificate of Substantial Completion.

- b. Complete Work listed for completion or correction within time period stipulated.
- C. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.
1. When CONTRACTOR considers Work to be complete, submit written certification that:
 - a. Contract Documents have been reviewed.
 - b. Work has been examined for compliance with Contract Documents.
 - c. Work has been completed according to Contract Documents.
 - d. Work is completed and ready for final inspection.
 2. Submittals: Submit following:
 - a. Final punch list indicating all items have been completed or corrected.
 - b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
 - d. Accounting statement for final changes to Contract Sum.
 - e. CONTRACTOR's affidavit of payment of debts and claims on AIA G706 - CONTRACTOR's Affidavit of Payment of Debts and Claims.
 - f. CONTRACTOR affidavit of release of liens on AIA G706A - CONTRACTOR's Affidavit of Release of Liens.
 - g. Consent of surety to final payment on AIA G707 - Consent of Surety to Final Payment Form.

1.12 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the ENGINEER. The statement shall reflect the following:
1. All adjustments to the Contract Sum
 2. The original Contract Sum
 3. Additions and deductions resulting from the following:
 - a. Previous Change Orders
 - b. Allowances
 - c. Unit Prices
 - d. Deductions for uncorrected Work
 - e. Deductions for liquidated damages
 - f. Deductions for reinspection payments
 - g. Other adjustments
 4. Total Contract Sum, as adjusted
 5. Previous payments
 6. Sum remaining due
- B. ENGINEER will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.13 FINAL APPLICATION FOR PAYMENT

- A. CONTRACTOR shall submit the final Application for Payment in accordance with procedures and requirements stated in the General Conditions of the Contract.

1.14 PROJECT RECORD DOCUMENTS

- A. Maintain on Site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed Shop Drawings, product data, and Samples.
6. Field Test Reports.
7. Construction photographs.
8. All construction related permits.
9. Manufacturer's instruction for assembly, installation, and adjusting.

- B. Ensure entries are complete and accurate, enabling future reference by OWNER.

- C. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:

1. Manufacturer's name and product model and number.
2. Product substitutions or alternates used.
3. Changes made by Addenda and modifications.

- D. Record Drawings and Shop Drawings: No work shall be permanently concealed until the required information has been recorded. Legibly mark each item to record actual construction as follows:

1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
2. Include locations of concealed elements of the Work.
3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
4. Actual installed pipe material, class, etc.
5. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
6. Identify and locate existing buried or concealed items encountered during Project.
7. Measured depths of foundations in relation to finish first floor datum.
8. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
9. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
10. Field changes of dimension and detail.
11. Details not on original Drawings.

- E. Submit PDF electronic files of marked-up documents to ENGINEER with claim for final Application for Payment.

1.15 OPERATION AND MAINTENANCE DATA

- A. Submit in PDF composite electronic indexed file.
- B. Submit data bound in 8-1/2 x 11-inch text pages, three D side ring binders with durable plastic covers.
- C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- F. Contents: Prepare table of contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of ENGINEER, CONTRACTOR, subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system. For each category, identify names, addresses, and telephone numbers of subcontractors and suppliers.
 - 3. Part 3: Project documents and certificates.

1.16 MANUAL FOR MATERIALS AND FINISHES

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. ENGINEER will review draft and return one copy with comments. ENGINEER and the OWNER shall be the sole judge of the acceptability and completeness of the manuals and may reject any submittal for insufficient information including incorrect references and/or the manner in which the material is assembled.
- B. For equipment or component parts of equipment put into service during construction and operated by OWNER, submit documents within ten days after acceptance.
- C. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with ENGINEER comments. Revise content of document sets as required prior to final submission.
- D. Submit two sets of revised final volumes within ten days after final inspection.
- E. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.
- F. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Include information for re-ordering custom-manufactured products.

- G. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

1.17 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. ENGINEER and the OWNER shall be the sole judge of the acceptability and completeness of the manuals and may reject any submittal for insufficient information including incorrect references and/or the manner in which the material is assembled.
- B. ENGINEER will review draft and return one copy with comments.
- C. For equipment, or component parts of equipment put into service during construction and operated by OWNER, submit documents within ten days after acceptance.
- D. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy will be reviewed and returned after final inspection, with ENGINEER comments. Revise content of document sets as required prior to final submission.
- E. Submit two sets of revised final volumes within days after final inspection.
- F. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.
- G. Each Item of Equipment and Each System: Include description of unit or system and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
 - 1. For pumps, the Operation and Maintenance manual cover sheets shall include the following:
 - a. Manufacturer
 - b. Manufacturer's local representative with address and telephone number
 - c. Source of spare parts with address and telephone number
 - d. Operating conditions, i.e., rated capacity and TDH
 - e. Model number, serial number, and impeller diameter
- H. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; by label machine.
- I. Operating Procedures: Include startup, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and special operating instructions.
- J. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- K. Include servicing and lubrication schedule and list of lubricants required.

1.18 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specification Sections.
- B. Deliver to Project Site and place in location as directed by OWNER; obtain receipt prior to final payment.

1.19 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.
- B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.
- C. Time of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with OWNER's permission, submit documents within ten days after acceptance.

1.20 WARRANTY REQUIREMENTS

- A. When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty
 - 1. When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement.
 - 2. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost
 - 1. Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents.
 - 2. The CONTRACTOR is responsible for the cost of replacing or rebuilding defective Work regardless of whether the OWNER has benefited from use of the Work through a portion of its anticipated useful service life.
- D. Written warranties made to the OWNER are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the OWNER can enforce such other duties, obligations, rights, or remedies.
- E. The OWNER reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the contract Documents.

- F. The OWNER reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work until evidence is presented that entities required to countersign such commitments are willing to do so.
- G. Manufacturer's disclaimers and limitations on product warranties do not relieve the CONTRACTOR of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the CONTRACTOR.
- H. Each Prime CONTRACTOR is responsible for warranties related to its own Contract.

1.21 FINAL CLEANING

- A. Execute final cleaning prior to final Project payment.
 - 1. Employ experienced personnel or professional cleaning firm.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 017000

SECTION 024100.00 - DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition of designated site improvements including paving, curbing, site walls, buildings, and utility structures.
2. Demolition of below-grade foundations and site improvements to depth to avoid conflict with new construction or site work.
3. Removal of hollow items or items which could collapse.
4. Salvage of designated items.
5. Protection of designated site improvements, site work, adjacent construction and adjacent structures.
6. Interruption, disconnection, capping, and removal of utilities.
7. Pollution control during building demolition, including noise control.
8. Removal and legal disposal of materials.
9. Notification to OWNER and local jurisdiction of schedule of shut-off of utilities which serve occupied spaces.

B. Hazardous Materials:

1. Notifications regarding discovery.

1.2 SUBMITTALS

- A. Section 013300 - Submittal Procedures specifies requirements for submittals.
- B. Schedule: Submit for approval selective demolition schedule, including schedule and methods for capping utilities to be abandoned and maintaining existing utility service.

1.3 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements specifies requirements for submittals.
- B. Project Record Documents: Record actual locations of abandoned and capped utilities in accordance with Section 010400.00 – Construction Surveying.

1.4 QUALITY ASSURANCE

- A. Codes and Regulations: Comply with governing codes and regulations. Use experienced workers.

1.5 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this Section.

1.6 SEQUENCING

- A. Immediate areas of work will not be occupied during selective demolition. Public, including children, may occupy adjacent areas.
- B. No responsibility for buildings and structures to be demolished will be assumed by OWNER.
- C. Ensure that products of this Section are supplied to affected trades in time to prevent interruption of construction progress.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements specifies requirements for transporting, handling, storing, and protecting products.
- B. Deliver materials in manufacturer's packaging including application instructions.

1.8 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements specifies requirements for installation examination.
- B. If hazardous materials are encountered during construction, immediately stop work within area of hazardous materials; address any emergency situations; and notify OWNER, ENGINEER, and pertinent regulatory agencies upon discovery of hazardous materials.
- C. Do not resume work within area of hazardous materials until affected area has been rendered safe to resume work, special conditions have been addressed, and required permits have been acquired.

3.2 SELECTIVE DEMOLITION

- A. General:
 - 1. Use of explosives is not permitted.
 - 2. Obtain necessary demolition permits and inspections required by the local jurisdiction.
 - 3. Conduct demolition to minimize interference with adjacent structures and properties.
 - 4. Cease operations immediately when adjacent structures or improvements appear to be in danger.
 - 5. Conduct operations with minimum interference to public or private accesses.
 - 6. Obtain written permission from adjacent property owners when demolition equipment will traverse, infringe upon, or limit access to their property.
 - 7. Provide water or other method for dust control.
 - 8. Remove existing items as required for new construction.

- B. Demolition Operations: Do not damage building elements and improvements indicated to remain. Items of salvage value, not included on schedule of salvage items to be returned to OWNER, shall be removed from structure. Storage or sale of items at project Site is prohibited.

- C. Utilities:
 - 1. Disconnect and cap designated utilities to street connection.
 - 2. Identify utilities at termination of demolition.
 - 3. Record termination or capped location on Record Documents.

- D. Shoring and Bracing: Provide and maintain interior and exterior shoring and bracing.

- E. Occupied Spaces: Do not close or obstruct streets, walks, drives or other occupied or used spaces or facilities without written permission of OWNER and authorities having jurisdiction. Do not interrupt utilities serving occupied or used facilities without written permission of OWNER and local jurisdiction. If necessary, provide temporary utilities as directed by the local jurisdiction.

- F. Operations: Cease operations if public safety or remaining structures are endangered. Perform temporary corrective measures until operations can be continued properly.

- G. Security: Provide adequate protection against accidental trespassing. Secure project after work hours.

- H. Restoration: Restore finishes of patched areas.

- I. Excavate as required to expose and remove items.

- J. Saw cut and breakup concrete as necessary for removal. Where possible remove concrete to nearest joint. Do not leave jagged edges. Where indicated, remove concrete slabs-on-grade.

- K. Remove foundation walls and footings to minimum of two feet below finished grade within area of new construction.

- L. Where indicated, remove existing pipe culverts. If existing pipe culverts are in good condition, remove in manner to prevent damage. Stockpile pipe culverts in good condition along edge of roadway for OWNER to salvage.
- M. Where indicated, remove concrete headwalls, drainage boxes and other miscellaneous structures.
- N. Remove signs and mailboxes as required for new construction. Where indicated, re-install signs and mailboxes to designated locations.
- O. For traffic regulatory signs, install signs in temporary locations until signs can be installed in final locations.
- P. Where indicated, obliterate existing road. Follow below unless specified otherwise Drawings.
 - 1. Remove existing pavement.
 - 2. Scarify road to depth of one foot.
 - 3. Fill depressions and form rounded slopes to blend with surrounding contours.
- Q. Remove and relocate fence and gate as indicated on Drawings.
- R. Remove materials to be re-installed or retained in manner to prevent damage; store and protect during construction.
- S. Backfill areas excavated resulting from demolition. Compact backfill to density of surrounding ground or as indicated for new construction.
- T. Rough grade and compact areas affected by demolition to maintain Site grades and contours.
- U. Continuously clean up and remove demolished materials from Site. Do not allow materials to accumulate on-Site.
- V. Do not burn or bury materials on-Site. Leave Site in clean condition. Dispose of demolition materials off-Site.
- W. Re-install indicated items. Re-install to equal or better condition as existed prior to construction.

3.3 PROTECTION

- A. Protect existing built environment including utilities unless indicated to be removed.
- B. Protect adjoining areas surrounding items to be removed.

3.4 PROTECTION SCHEDULE

- A. Items for Protection During Demolition and Construction:
 - 1. Existing trees as indicated on Drawings.

2. Existing utilities to remain in serviced.
 3. Existing stairways and walkways as indicated on Drawings.
 4. Existing buildings and structures.
 5. Existing streams or ditches as indicated on Drawings.
 6. Existing property and adjoining property fencing.
 7. Adjoining properties except as indicated on Drawings. Verify property access and/or easements are in place before commencing work on adjoining properties.
- B. CONTRACTOR shall coordinate with OWNER and ENGINEER regarding Items to be Salvaged for Reinstallation in accordance with plan drawings.
- C. CONTRACTOR shall coordinate with OWNER and ENGINEER regarding Utilities Requiring Interruption, Capping, or Removal.

3.5 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements specifies requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements specifies requirements for testing, adjusting, and balancing.

3.6 CLEANING

- A. Section 017000 - Execution and Closeout Requirements specifies requirements for cleaning.

3.7 PROTECTION

- A. Section 017000 - Execution and Closeout Requirements specifies requirements for protecting finished Work.

3.8 MAINTENANCE

- A. Section 017000 - Execution and Closeout Requirements specifies requirements for maintenance service.

END OF SECTION

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formwork for cast-in-place concrete.
2. Shoring, bracing, and anchorage.
3. Architectural form liners.
4. Form accessories.
5. Form stripping.

1.2 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications for Structural Concrete.
3. ACI 318 - Building Code Requirements for Structural Concrete.
4. ACI 347 - Guide to Formwork for Concrete.

B. American Forest & Paper Association:

1. AF&PA - National Design Specification (NDS) for Wood Construction.

C. APA - The Engineered Wood Association:

1. APA/EWA PS 1 - Voluntary Product Standard - Structural Plywood.

D. ASTM International:

1. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

E. West Coast Lumber Inspection Bureau:

1. WCLIB - Standard No. 17 Grading Rules for West Coast Lumber.

1.3 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with other Sections of Work in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings:
 - 1. Indicate:
 - a. Formwork, shoring, and reshoring.
 - b. Pertinent dimensions, openings, methods of construction, types of connections, materials, joint arrangement and details, ties and shores, location of framing, studding and bracing, and temporary supports.
 - c. Means of leakage prevention for concrete exposed to view in finished construction.
 - d. Sequence and timing of erection and stripping, assumed compressive strength at time of stripping, height of lift, and height of drop during placement.
 - e. Vertical, horizontal, and special loads according to ACI 347, and camber diagrams when applicable.
 - f. Notes to formwork erector showing size and location of conduits and piping embedded in concrete according to ACI 318.
 - g. Procedure and schedule for removal of shores and installation and removal of reshores.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Information Submittals: Delegated Design Submittals:
 - 1. Submit signed and sealed Shop Drawings with design calculations and assumptions for formwork, shoring, and reshores, as required and in conformance with authorities having jurisdiction.
 - 2. Include structural calculations to support design.
- E. Field Quality-Control Submittals: Indicate results of CONTRACTOR-furnished tests and inspections.

1.5 QUALITY ASSURANCE

- A. Perform Work according to ACI 301, ACI 318, and ACI 347.
- B. For wood products furnished for Work of this Section, comply with AF&PA.
- C. Perform Work according to State and local standards.

1.6 QUALIFICATIONS

- A. Licensed Professional: Professional engineer experienced in design of specified Work and licensed in State of which the work is commencing.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Store materials off ground in ventilated and protected manner to prevent deterioration from moisture.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

- A. Design, engineer, and construct formwork, shoring, and bracing according to ACI 318 to conform to design and applicable code requirements to achieve concrete shape, line, and dimension as indicated on Drawings.

2.2 WOOD FORM MATERIALS

- A. Form Materials: At discretion of CONTRACTOR. Use forms of such section and design that they will adequately support the concrete and the construction equipment.

B. Lumber Forms:

- 1. Applications: Edge forms and unexposed finish concrete.
- 2. Boards:
 - a. Description:
 - 1) Shiplapped or tongue and groove.
 - 2) Surface boards on four sides.
 - b. Material: "Standard" grade Douglas fir according to WCLIB Standard No. 17.
 - c. Width: [6] [8] inches.

C. Plywood Forms:

- 1. Application: Exposed finish concrete.
- 2. Description:
 - a. Comply with APA/EWA PS 1.
 - b. Panels: Full size, 4 by 8 feet.
 - c. Label each panel with grade trademark of APA/EWA.
- 3. Plywood with "Smooth Finish" Indicated on Drawings:
 - a. Minimum Thickness: 3/4 inch.
 - b. Grade: APA/EWA "HD Overlay Plyform Structural I Exterior."

2.3 PREFABRICATED FORMS

- A. Furnish materials according to the prevailing jurisdiction standards.
- B. Preformed Steel Forms:
 - 1. Description: Matched, tightly fitted, and stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
 - 2. Minimum Thickness: 16 gage.
- C. FRP Forms: Matched, tightly fitted, and stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished concrete surfaces.
- D. Steel Forms:
 - 1. Description: Sheet steel, suitably reinforced.
 - 2. Design: For particular use as indicated on Drawings.
- E. Form Liners: Smooth, durable, grainless, and non-staining hardboard unless otherwise indicated on Drawings.

2.4 COATINGS

- A. Coatings for Aluminum:
 - 1. Polyamide epoxy finish coat with paint manufacturer's recommended primer for aluminum substrate.
 - 2. One coat primer and one coat finish.
 - 3. Minimum Total Dry Film Thickness: in accordance with manufacturer recommendations. mils.

2.5 FORMWORK ACCESSORIES

- A. Form Ties:
 - 1. Type: Removable or Snap off.
 - 2. Material: Galvanized.
 - 3. Length: Adjustable.
 - 4. Free of defects capable of leaving holes larger than 1 inch in concrete surface.
- B. Spreaders:
 - 1. Description: Standard, non-corrosive metal-form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face.
 - 2. Wire ties, wood spreaders, or through bolts are not permitted.
- C. Form Release Agent:

1. Description: Colorless mineral oil that will not stain concrete or absorb moisture or impair natural bonding or color characteristics of coating intended for use on concrete.
- D. Corners:
1. Type: Chamfer.
 2. Size: as indicated on the drawing in inches.
- E. Bituminous Joint Filler: Comply with ASTM D1751.
- F. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength, and character to maintain formwork in place while placing concrete.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify lines, levels, and centers before proceeding with formwork.
- C. Verify that dimensions agree with Drawings and Shop Drawings.
- D. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from ENGINEER before proceeding.

3.2 INSTALLATION

- A. Earth Forms (may only be used for non-exposed areas):
 1. Trench earth forms neatly, accurately, and at least 2 inches wider than footing widths indicated on Drawings.
 2. Trim sides and bottom of earth forms.
 3. Construct wood edge strips at top of each side of trench to secure reinforcing and to prevent trench from sloughing.
 4. Form sides of footings where earth sloughs.
 5. Tamp earth forms firm and clear them of debris and loose material before depositing concrete.
- B. Formwork:
 1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.
 2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.

3. Camber forms where necessary to produce level finished soffits unless indicated otherwise on Drawings.
4. Positioning:
 - a. Carefully verify horizontal and vertical positions of forms.
 - b. Correct misaligned or misplaced forms before placing concrete.
5. Complete wedging and bracing before placing concrete.
6. Erect formwork, shoring, and bracing to achieve design requirements according to ACI 318.
7. Stripping:
 - a. Arrange and assemble formwork to permit dismantling and stripping.
 - b. Do not damage concrete during stripping.
 - c. Permit removal of remaining principal shores.
8. Do not use wood or other formwork that is not structurally sound or that will not meet finish requirements.
9. Do not patch formwork.
10. Leave forms in place for minimum number of days according to ACI 347.

C. Form Removal:

1. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads, and removal has been approved by ENGINEER.
2. Loosen forms carefully; do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
3. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged.
4. Discard damaged forms.
5. Form Release Agent:
 - a. Apply according to manufacturer instructions.
 - b. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
 - c. Do not apply form release agent if concrete surfaces are indicated to receive special finishes or applied coverings that may be affected by agent.
 - d. Soak inside surfaces of untreated forms with clean water, and keep surfaces coated prior to placement of concrete.
6. Form Cleaning:
 - a. Clean forms as erection proceeds to remove foreign matter within forms.
 - b. Clean formed cavities of debris prior to placing concrete.
 - c. Flush with water or use compressed air to remove remaining foreign matter.
 - d. Ensure that water and debris drain to exterior through cleanout ports.
 - e. Cold Weather:
 - 1) During cold weather, remove ice and snow from within forms.
 - 2) Do not use de-icing salts.

- 3) Do not use water to clean out forms unless formwork and concrete construction proceed within heated enclosure; use compressed air or other dry method to remove foreign matter.
7. Reuse and Coating of Forms:
 - a. Thoroughly clean forms and reapply form coating before each reuse.
 - b. For exposed Work, do not reuse forms with damaged faces or edges.
 - c. Apply form coating to forms according to manufacturer instructions.
 - d. Do not coat forms for concrete indicated to receive "scored finish."
 - e. Apply form coatings before placing reinforcing steel.
- D. Forms for Smooth Finish Concrete:
1. Use steel, plywood, or lined-board forms.
 2. Use clean and smooth plywood and form liners, uniform in size, and free from surface and edge damage capable of affecting resulting concrete finish.
 3. Install form lining with close-fitting square joints between separate sheets without springing into place.
 4. Use full-sized sheets of form liners and plywood wherever possible.
 5. Tape joints to prevent protrusions in concrete.
 6. Apply forming and strip wood forms in a manner to protect corners and edges.
 7. Level and continue horizontal joints.
 8. Keep wood forms wet until stripped.
- E. Form Anchors and Hangers:
1. Do not use anchors and hangers leaving exposed metal at concrete surface.
 2. Symmetrically arrange hangers supporting forms from structural-steel members to minimize twisting or rotation of member.
 3. Penetration of structural-steel members is not permitted.
- F. Inserts, Embedded Parts, and Openings:
1. Install formed openings for items to be embedded in or passing through concrete Work.
 2. Locate and set in place items required to be cast directly into concrete.
 3. Install accessories straight, level, and plumb, and ensure that items are not disturbed during concrete placement.
 4. Openings:
 - a. Provide temporary ports or openings in formwork as required to facilitate cleaning and inspection.
 - b. Locate openings at bottom of forms to allow flushing water to drain.
 5. Close temporary openings with tight-fitting panels, flush with inside face of forms, and neatly fitted such that joints will not be apparent in exposed concrete surfaces.
- G. Form Ties:
1. Provide sufficient strength and quantity to prevent spreading of forms.

2. Place ties at least 1 inch away from finished surface of concrete.
 3. Leave inner rods in concrete when forms are stripped.
 4. Space form ties equidistant, symmetrical, and aligned vertically and horizontally unless indicated otherwise on Drawings.
- H. Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.
- I. Construction Joints:
1. Install surfaced pouring strip where construction joints intersect on exposed surfaces to provide straight line at joints.
 2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
 3. Appearance:
 - a. Show no overlapping of construction joints.
 - b. Construct joints to present same appearance as butted plywood joints.
 4. Arrange joints in continuous line straight, true, and sharp.
- J. Embedded Items:
1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, waterstops, and other features.
 2. Do not embed wood or uncoated aluminum in concrete.
 3. Obtain installation and setting information for embedded items furnished under other Sections.
 4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
 5. Ensure that conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 regarding size and location limitations.
- K. Openings for Items Passing through Concrete:
1. Frame openings in concrete where indicated on Drawings.
 2. Establish exact locations, sizes, and other conditions required for openings and attachment of Work specified under other Sections.
 3. Coordinate Work to avoid cutting and patching of concrete after placement.
 4. Perform cutting and repairing of concrete required as result of failure to provide required openings.
- L. Screeds:
1. Set screeds and establish levels for tops of and finish on concrete slabs.
 2. Slope slabs to drain where required or as indicated on Drawings.
 3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms; remove freestanding water.
- M. Screenshot Supports:

1. For concrete over waterproof membranes and vapor retarder membranes, use cradle-, pad-, or base-type screed supports that will not puncture membrane.
2. Staking through membrane is not permitted.

N. Cleanouts and Access Panels:

1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris, and waste material.
2. Clean forms and surfaces against which concrete is to be placed.
3. Remove chips, sawdust, and other debris.
4. Thoroughly blow out forms with compressed air just before concrete is placed.

3.3 TOLERANCES

- A. Construct formwork to maintain tolerances according to ACI 301 and 318.
- B. Tolerances: Construct formwork to produce completed concrete surfaces within construction tolerances according to ACI 117.

3.4 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Inspection:
 1. Inspect erected formwork, shoring, and bracing to ensure that Work complies with formwork design and that supports, fastenings, wedges, ties, and items are secure.
 2. Notify ENGINEER after placement of reinforcing steel in forms but prior to placing concrete.
 3. Schedule concrete placement to permit formwork inspection before placing concrete.

END OF SECTION 031000

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Reinforcing bars.
2. Welded wire fabric.
3. Reinforcement accessories.

1.2 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 318 - Building Code Requirements for Structural Concrete.
2. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.
3. ACI SP-66 - ACI Detailing Manual.

B. American Welding Society:

1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

C. ASTM International:

1. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
2. ASTM A706 - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
3. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

1.3 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with placement of formwork, formed openings, and other Work.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings:

1. Indicate bar sizes, spacings, locations, splice locations, and quantities of reinforcing steel and welded wire fabric.

2. Indicate bending and cutting schedules.
3. Indicate supporting and spacing devices.

- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Submit certified copies of mill test report of reinforcement materials analysis.

1.5 QUALITY ASSURANCE

- A. Perform Work according to ACI 318.
- B. Prepare Shop Drawings according to ACI SP-66.
- C. Perform Work according to state and local standards.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 1. Protect materials from moisture by storing in clean, dry location remote from construction operations areas.
 2. Provide additional protection according to manufacturer instructions.

1.7 EXISTING CONDITIONS

- A. Field Measurements:
 1. Verify field measurements prior to fabrication.
 2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 REINFORCEMENT

- A. Reinforcing Steel:
 1. Comply with ASTM A615.
 2. Yield Strength: 60 ksi.
 3. Billet Bars: Deformed unless otherwise indicated on the drawings.

4. Finish: Uncoated.

B. Welded Deformed Wire Fabric:

1. Comply with ASTM A1064.
2. Configuration: Flat sheets or Coiled rolls.
3. Finish: Uncoated.

C. Welded Plain Wire Fabric:

1. Comply with ASTM A1064.
2. Configuration: Flat sheets or Coiled rolls.
3. Finish: Uncoated.

2.2 FABRICATION

A. Fabricate concrete reinforcement according to ACI 318.

B. Form standard hooks for 180-degree bends, 90-degree bends, stirrups and tie hooks, and seismic hooks as indicated on Drawings.

C. Form reinforcement bends with minimum diameters according to ACI 318.

D. Fabricate column reinforcement with offset bends at reinforcement splices.

E. Form ties and stirrups from following:

1. Bars No. 10 and Smaller: No. 3 deformed bars.
2. Bars No. 11 and Larger: No. 4 deformed bars.

F. Weld reinforcement according to AWS D1.4.

G. Splicing:

1. If not indicated on Drawings, locate reinforcement splices at point of minimum stress.

2.3 ACCESSORY MATERIALS

A. Tie Wire:

1. Minimum 16 gage, annealed type.

B. Chairs, Bolsters, Bar Supports, and Spacers:

1. Size and Shape: To strengthen and support reinforcement during concrete placement conditions.
2. Furnish load-bearing pad on bottom to prevent vapor retarder puncture.

C. Special Chairs, Bolsters, Bar Supports, and Spacers Adjacent to Weather-Exposed Concrete Surfaces:

1. Material: Plastic-tipped steel.
 2. Size and Shape: To meet Project conditions.
- D. Reinforcing Splicing Devices:
1. Type: Exothermic welding type; full tension and compression.
- E. Epoxy Coating Patching Material: Type as recommended by coating manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Place, support, and secure reinforcement against displacement.
- B. Do not deviate from required position beyond specified tolerance.
- C. Do not weld crossing reinforcement bars for assembly except as permitted by ENGINEER.
- D. Do not displace or damage vapor retarder.
- E. Accommodate placement of formed openings.
- F. Spacing:
1. Space reinforcement bars with minimum clear spacing according to ACI 318.
 2. If bars are indicated in multiple layers, place upper bars directly above lower bars.
- G. Maintain minimum concrete cover around reinforcement according to ACI 318 as follows:
1. Footings and Concrete Formed against Earth: 3 inches
 2. Concrete Exposed to Earth or Weather:
 - a. No. 6 Bars and Larger: 2 inches
 - b. No. 5 Bars and Smaller: 1-1/2 inches
 3. Supported Slabs, Walls, and Joists:
 - a. No. 14 Bars and Larger: 1-1/2 inches
 - b. No. 11 Bars and Smaller: 3/4 inch
 4. Beams and Columns: 1-1/2 inches
 5. Shell and Folded Plate Members:
 - a. No. 6 Bars and Larger: 3/4 inch
 - b. No. 5 Bars and Smaller: 1/2 inch
- H. Splice reinforcing where indicated on Drawings according to manufacturer's instructions.

3.2 TOLERANCES

- A. Section 014000 - Quality Requirements: Requirements for tolerances.
- B. Install reinforcement within following tolerances for flexural members, walls, and compression members:
 - 1. Reinforcement Depth Greater Than 8 inches:
 - a. Depth Tolerance: Plus or Minus 3/8 inch
 - 2. Reinforcement Depth Less Than or Equal to 8 inches:
 - a. Depth Tolerance: Plus or Minus 1/2 inch
- C. Foundation Walls: Install reinforcement within tolerances according to ACI 530/530.1.

3.3 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Perform field inspection and testing according to ACI 318.
- D. Reinforcement Inspection:
 - 1. Placement Acceptance: Inspect specified and ACI 318 material requirements and specified placement tolerances.
 - 2. Welding: Inspect welds according to AWS D1.1.
 - 3. Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.
 - 4. Weldability Inspection: Inspect for reinforcement weldability if formed from steel other than ASTM A706.
 - 5. Continuous Weld Inspection: Inspect reinforcement according to ACI 318.
 - 6. Periodic Weld Inspection: Inspect other welded connections.

END OF SECTION 032000

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all materials and labor necessary to complete all concrete, plain and reinforced, as indicated on Drawings or as specified in these specifications and as required to complete the Project. Work, without limiting the generality thereof, includes:
1. Installation of concrete as required by plans and specifications.
 2. Setting of utility structures to grade, setting of granite curb, setting of precast concrete curb, grouting around pipe at manholes, manhole bases, and general repairs caused by utility Work.
 3. Installation of concrete to provide water retention vaults, sewage vaults, and sewage clarifiers.
 4. Concrete pads for mechanical equipment.
 5. Pervious concrete for roads, parking areas and drives.
 6. Furnishing and installation of admixtures.
 7. Work of other trades required to be built into concrete, such as embedded plates and reinforcing dowels.
 8. Finishing of concrete as specified herein or as indicated on Drawings.

1.2 DEFINITIONS

- A. Cementitious Materials: The materials that are subject to compliance with requirements, such as Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume.
- B. Conventional Concrete: A type of concrete that has a specified compressive strength of less than 6,000 psi.
- C. High-Strength Concrete (HSC): A type of concrete that has a specified compressive strength of 6,000 psi or greater.
- D. Self-Consolidating Concrete (SCC) (Flowable Fill): A type of highly flowable, nonsegregating concrete that can spread into place, fill formwork, and encapsulate reinforcement without any mechanical consolidation.
- E. Strain Hardening: The ability to carry increasing tensile load beyond the point of first crack.
- F. Strain Softening: The ability to carry a reduced (but nonzero) tensile load beyond the point of first crack.
- G. Water-Cementitious Materials Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials (AASHTO):
1. AASHTO M182 - Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats.
- B. American Concrete Institute:
1. ACI 301 (301M) - Specifications for Structural Concrete.
 2. ACI 305.1 (305.1M) - Specification for Hot Weather Concreting.
 3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
 4. ACI 308.1 (308.1M) - Specification for Curing Concrete.
 5. ACI 318 (318M) - Building Code Requirements for Structural Concrete.
- C. ASTM International:
1. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 2. ASTM C33/C33M - Standard Specification for Concrete Aggregates.
 3. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 4. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 5. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.
 6. ASTM C150/C150M - Standard Specification for Portland Cement.
 7. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
 8. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete.
 9. ASTM C231/C231M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
 10. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete.
 11. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 12. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
 13. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 14. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete.
 15. ASTM C989/C989M - Standard Specification for Slag Cement for Use in Concrete and Mortars.
 16. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 17. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
 18. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.
 19. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
 20. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete.
 21. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
 22. ASTM C1260 - Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method).

23. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
24. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
25. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
26. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

D. Canadian Standards Association (CSA):

1. CSA A23.1/A23.2 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

E. National Ready Mixed Concrete Association (NRMCA):

1. NRMCA - Certification of Ready Mixed Concrete Production Facilities.

F. National Sanitation Foundation (NSF):

1. NSF/ANSI Standard 61 - Drinking Water System Components - Health Effects.

G. South Coast Air Quality Management District:

1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

H. U.S. Army Corps of Engineers:

1. CRD-C 48 - Standard Test Method for Water Permeability of Concrete.

1.4 COORDINATION

- A. Coordinate placement of control and expansion joint devices with erection of concrete formwork and placement of form accessories.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project Site as required by ENGINEER and OWNER.

1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. CONTRACTOR's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Independent testing agency responsible for field quality control.
 - d. Concrete Subcontractor.
 - e. Special concrete finish subcontractor.

2. Review the following:
 - a. Special inspection and testing agency procedures for field quality control.
 - b. Construction joints, control joints, isolation joints, and joint-filler strips.
 - c. Cold and hot weather concreting procedures.
 - d. Concrete finishes and finishing.
 - e. Curing procedures.
 - f. Forms and form-removal limitations.
 - g. Shoring and reshoring procedures.
 - h. Concrete repair procedures.
 - i. Concrete protection.
 - j. Initial curing and field curing of field test cylinders in accordance with ASTM C31/C31M.
 - k. Protection of field-cured field test cylinders.

1.6 SUBMITTALS

A. Product Data: Submit data on the following:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Silica fume.
6. Performance-based hydraulic cement.
7. Aggregates.
8. Admixtures:
 - a. Include limitations of use, such as restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
9. Color pigments.
10. Curing materials:
 - a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.
11. Joint fillers.
12. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Maximum water-cementitious materials ratio.
4. Slump limit.
5. Air content.
6. Nominal maximum aggregate size.

7. Indicate amounts of mixing water to be withheld for later addition at Project Site, if permitted.
 8. Include manufacturer's certification that permeability-reducing admixture is compatible with mix design.
 9. Include certification that dosage rate for permeability-reducing admixture matches dosage rate used in performance compliance test.
 10. Submit intended placement method.
 11. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 12. Submit separate mix designs if admixtures are required for the following:
 - a. Hot and cold weather concrete Work.
 - b. Air-entrained concrete Work.
- C. Qualification Data: Submit data for the following:
1. Installer: Include copies of applicable ACI certificates.
 2. Ready-mixed concrete manufacturer.
 3. Testing agency: Include copies of applicable ACI certificates.
- D. Shop Drawings:
1. Construction Joint Layout:
 - a. Indicate proposed construction joints required to construct structure.
 - b. Location of construction joints is subject to approval of ENGINEER.
- E. Samples: For manufacturer's standard colors for color pigment, minimum 12 by 12 inches in size.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer Instructions: Submit installation procedures and interfacing required for adjacent Work.
- H. Batch Ticket: Submit to ENGINEER's onsite representative with each truck load delivered if required. Include information as follows:
1. Name of batch plant.
 2. Name of CONTRACTOR and Project.
 3. Mix design number or designation.
 4. Class of concrete mix and type of cement.
 5. Time and date of batching.
 6. Cubic yards of concrete.
 7. Weights of cement and each size of aggregate.
 8. Amount of water added at plant and any additional water added.
 9. Amount of each admixture.
 10. Truck Number
- I. Field Quality-Control Submittals: Indicate results of CONTRACTOR-furnished tests and inspections.

1.7 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Section 010400 – Construction Surveying
 - 1. Project Record Documents: Record actual locations of embedded utilities and components concealed from view in finished construction.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified Installer employing Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor certified as ACI Flatwork Concrete Finisher/Technician, or an ACI Concrete Flatwork Technician with experience installing and finishing concrete, and incorporating permeability-reducing admixtures.
- B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced manufacturing ready-mixed concrete products that complies with ASTM C94/C94M requirements for production facilities and equipment.
- C. Concrete Testing Service: Employ and pay an independent testing laboratory, acceptable to the OWNER, ENGINEER, to perform material evaluation tests and to review concrete mix designs proposed by CONTRACTOR to conform to this Specification.
- D. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.
- E. Alkali-Silica Reactivity Testing: Aggregates used in the concrete shall be tested by an independent testing agency for alkali-silica reactivity in accordance with ASTM C1260.
- F. Additional Testing and Inspection Services:
 - 1. If required, OWNER's testing agency will perform additional testing and inspection services to verify conformance to Contract Documents as listed below:
 - a. Inspect concrete batching, mixing, and delivery operations.
 - b. Inspect forms, foundation preparation, reinforcement, embedded items, reinforcement placement, and concrete placing, finishing, and curing operations.
 - c. Sample concrete at point of placement and other locations as directed by ENGINEER and perform required tests.
 - d. Review manufacturer's report for shipment of cement, reinforcement, and prestressing tendons, and conduct laboratory tests or spot checks of materials received for compliance with specifications.
 - e. Other testing or inspection services as required by ENGINEER.
 - 2. Provide OWNER's testing agency with requested documentation and access to perform testing and inspection activities.

1.9 MOCKUPS

- A. Section 014000 - Quality Requirements: Requirements for mockup.
- B. Construct mockups as follows:
 - 1. Size: Cast concrete to demonstrate typical joints, surface finish, texture, tolerances, and standard of workmanship.
 - 2. Location: Coordinate location of site with ENGINEER and OWNER.
 - 3. If approved by the ENGINEER and OWNER, mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 AMBIENT CONDITIONS

- A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.
- B. Cold-Weather Placement: Comply with ACI 301, ACI 306.1, and as follows:
 - 1. Protect concrete Work from physical damage or reduced strength caused by frost, freezing actions, or low temperatures.
 - 2. When average high and low temperature is expected to fall below 40 deg. F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 3. Do not use frozen materials or materials containing ice or snow.
 - 4. Do not place concrete in contact with surfaces less than 35 deg. F, other than reinforcing steel.
 - 5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- C. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:
 - 1. Maintain concrete temperature at time of discharge not to exceed 95 deg. F.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

- A. Concrete Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
3. Obtain aggregate from single source.
4. Obtain each type of admixture from single source from single manufacturer.

B. Concrete Components:

1. Cement:
 - a. Comply with ASTM C150/C150M, Normal Type IA/IIA - Air Entraining.
 - b. Type: Portland.
2. Fly Ash: Comply with ASTM C618, Class C or F.
3. Silica Fume: Comply with ASTM C1240, amorphous silica.
4. Slag (use of slag shall be in accordance with NCDOT Standard Specifications for Road and Structures, latest edition):
 - a. Description: Ground granulated, blast furnace.
 - b. Comply with ASTM C989/C989M.
 - c. Grade 100.
5. Normal Weight Aggregates:
 - a. Comply with ASTM C33/C33M coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1) Alkali-Silica Reaction: Comply with NCDOT Standard Specifications for Road and Structures, latest edition.
 - b. Coarse Aggregate Maximum Size: in accordance with NCDOT Standard Specifications for Road and Structures, latest edition
 - c. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
6. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.
 - a. Air-Entraining Admixture: ASTM C260/C260M.
 - b. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 - c. Retarding Admixture: ASTM C494/C494M, Type B.
 - d. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
 - e. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
 - f. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
 - g. Plasticizing and Retarding Admixture:
 - 1) Comply with ASTM C1017/C1017M.
 - 2) Type I, plasticizing or II, plasticizing and retarding.

- h. Color Pigment: ASTM C979/C979M, synthetic mineral-oxide pigments, color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.
 - 1) Color: As indicated on drawings or as selected by ENGINEER from manufacturer's full range.
- 7. Water and Water Used to Make Ice: ASTM C94/C94M, potable.

2.3 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 - 1. Furnish materials according to NCDOT standards.
- B. Concrete Curing Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Concrete Curing Reusable Moisture-Retaining Covers, ASTM C171:
 - 1. Burlap-polyethylene sheet.
 - a. 10 oz. burlap laminated onto 5 mil white coated polyethylene.
 - b. Reusable, natural burlap provides moisture absorption.
 - c. Coated white poly reflects sunlight and intense heat rays.
 - d. Quality lamination between the two fabrics.
 - e. Size: 10-by-100-foot roll.
 - 2. Provide wet cure blankets comprised of a non-woven polypropylene fabric coated with a white-pigmented polyethylene, complying with ASTM C171; total thickness varies per manufacturer.
 - a.
- D. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.
 - 1. Furnish materials according to NCDOT standards.
- E. Clear, Solvent-Borne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.
 - 1. Furnish materials according to NCDOT standards.

2.4 RELATED MATERIALS

- A. Joint Devices and Filler:
 - 1. Joint Filler, Type A:
 - a. Description: Asphalt-impregnated fiberboard or felt.
 - b. Comply with ASTM D1751.
 - c. Thickness: 1/2-inch.
 - d. Profile: Tongue-and-groove.

2. Expansion and Contraction Joint Devices:
 - a. Comply with ASTM B221.
 - b. Material: Extruded aluminum.
 - c. Filler Strip: Resilient elastomeric, vinyl, or neoprene with Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery.
 - d. Cover Plate: Extruded aluminum, or Vinyl, of longest manufactured length at each location, and flush mounted.
 - e. Color: As selected.
 - f.
3. Sealant and Primer: as specified in Section 079000 - Joint Protection.

B. Nonshrink Grout:

1. Furnish materials according to NCDOT standards.
2. Description: Premixed compound consisting of non-metallic aggregate, cement, and water-reducing and plasticizing agents.
3. Comply with ASTM C1107/C1107M.

C. Bonding Agent:

1. Furnish materials according to NCDOT standards.

2.5 CONCRETE MIXTURES, GENERAL

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, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:

1. Fly Ash or Other Pozzolans: in accordance with NCDOT standards.
2. Slag Cement: in accordance with NCDOT standards.

C. Admixtures: Use in accordance with manufacturer's written instructions.

1. Use water-reducing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
5. Use permeability-reducing admixture in concrete mixtures where indicated.

D. Color Pigment: Add color pigment to concrete mixture in accordance with manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.6 CONCRETE MIXTURES

- A. Select proportions for normal weight concrete according to ACI 301, Method 1.
- B. Performance and Design Criteria shall be in accordance with NCDOT Standard Specification for Roads and Structures, latest edition.
- C. Average Compressive Strength Reduction: Not permitted.
- D. Ready-Mixed Concrete: Mix and deliver concrete according to ASTM C94/C94M.
- E. Site-Mixed Concrete: Mix concrete according to ACI 318.
- F. Mass Concrete: Comply with requirements of ACI 301 (301M) Section 8 - Mass Concrete.
- G. High Early Concrete Mix Proportions: Provide high early concrete as a preblended, prepackaged material requiring only the addition of water and stone aggregate.

2.7 CONCRETE MIXING

- A. Ready-Mix Concrete: Comply with requirements of ASTM C94/C94M, and as herein specified. Delete references for allowing additional water to be added to batch for material with insufficient slump. Addition of water to the batch will not be permitted.
 - 1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94/C94M may be required. When air temperature is between 85 deg. F and 90 deg. F, reduce mixing and delivery time from 90 minutes to 75 minutes, and when air temperature is above 90 deg. F, reduce mixing and delivery time to 60 minutes.
 - 2. During cold weather, concrete shall not be mixed while the temperature is below 40 degrees without the permission of the Construction Manager. If permission is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature between 50 deg. F and 80 deg. F.
 - 3. Retempering of concrete by adding water or any other material is not permitted.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
 - 2. Do not proceed until unsatisfactory conditions have been corrected.
- B. Verify requirements for concrete cover over reinforcement.

- C. Verify that anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

- A. Previously Placed Concrete:
 - 1. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.
 - 2. Remove laitance, coatings, and unsound materials.
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels, and pack solid with nonshrink grout.
- C. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- D. Remove water from areas receiving concrete before concrete is placed.
- E. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:
 - 1. Daily access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project Site during Site curing period for test samples.
 - 4. Security and protection for test samples and for testing and inspection equipment at Project Site.

3.3 INSTALLATION

- A. Placing Concrete:
 - 1. Place concrete according to ACI 318.
 - 2. Notify testing laboratory and ENGINEER, minimum 24 hours prior to commencement of operations.
 - 3. Ensure that reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.
 - 4. Joint Filler:
 - a. Separate slabs on grade from vertical surfaces with 1/2-inch- thick joint filler.
 - b. Place joint filler; set top to required elevations; secure to resist movement by wet concrete.
 - c. Finish Joint Sealer Requirements: As specified in Section 079000 - Joint Protection.
 - 5. Joint Devices:

- a. Coordination: Install construction joint devices in coordination with pattern placement sequence; set top to required elevations; secure to resist movement by wet concrete.
 - b. Apply sealants in joint devices as specified in Section 079000 - Joint Protection.
6. Deposit concrete at final position, preventing segregation of mix.
 7. Place concrete in continuous operation for each panel or section as determined by predetermined joints.
 8. Consolidate concrete.
 9. Maintain records of concrete placement, including date, location, quantity, air temperature, and test samples taken.
 10. Place concrete continuously between predetermined expansion, control, and construction joints.
 11. Do not interrupt successive placement and do not permit cold joints to occur.
 12. Saw-Cut Joints:
 - a. Saw-cut joints within 12 hours after placing.
 - b. Use 3/16 inch thick blade.
 - c. Cut depth of slab thickness in accordance with plan drawings.
 13. Screeding:
 - a. Screed slabs on grade level.
 - b. Surface Flatness:
 - 1) Maximum 1/4 inch in 10 feet.
- B. Concrete Finishing:
1. Provide formed concrete surfaces to be left exposed with finish as indicated in schedule.
 2. Finish concrete floor surfaces according to ACI 318.
 3. Broom Finish:
 - a. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
 - b. Coordinate required final finish with ENGINEER before application.
 4. Slip-Resistive Finish:
 - a. Apply in accordance with manufacturer's written instructions
- C. Curing and Protection:
1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
 2. Maintain concrete with minimal moisture loss at relatively constant temperature for period as necessary for hydration of cement and hardening of concrete.
 3. Cure concrete according to ACI 308.1.

3.4 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Inspection and Testing: Performed by OWNER's testing laboratory according to ACI 318 and applicable code.
- D. Perform inspection and testing according to ACI 318 and applicable code.
- E. Provide unrestricted access to Work and cooperate with appointed testing and inspection firm.
- F. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.
- G. Concrete Inspections:
 - 1. Continuous Placement Inspection: Inspect for proper installation procedures.
 - 2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.
- H. Strength Test Samples:
 - 1. Sampling Procedures: Comply with ASTM C172.
 - 2. Cylinder Molding and Curing Procedures:
 - a. Comply with ASTM C31/C31M).
 - b. Cylinder Specimens: Standard cured.
 - 3. Sample concrete and make one set of four cylinders for every 50 cu. yd. or less of each class of concrete placed each day, and for every 5,000 sq. ft. of surface area for slabs.
 - 4. If volume of concrete for a class of concrete would provide less than five sets of cylinders, take samples from five randomly selected batches, or from every batch if less than five batches are used.
 - 5. Make one additional cylinder during cold weather concreting and field cure.
- I. Field Testing:
 - 1. Slump Test Method: Comply with ASTM C143/C143M.
 - 2. Air Content Test Method: Comply with ASTM C231.
 - 3. Temperature Test Method: Comply with ASTM C1064.
 - 4. Compressive Strength Concrete:
 - a. Measure slump and temperature for each sample.
 - b. Measure air content in air-entrained concrete for each sample.
- J. Cylinder Compressive Strength Testing:
 - 1. Test Method: Comply with ASTM C39/C39M.
 - 2. Test Acceptance: According to ACI 318.

3. Test one cylinder at seven days.
4. Test two cylinders at 28 days. Compressive strength will be average of two cylinders.
5. Retain one cylinder for days for testing when requested by ENGINEER.
6. Dispose of remaining cylinders if testing is not required.

K. Patching:

1. Allow ENGINEER to inspect concrete surfaces immediately upon removal of forms.
2. Honeycombing or Embedded Debris in Concrete:
 - a. Not acceptable.
 - b. Notify ENGINEER upon discovery.
3. Patch imperfections as directed by ENGINEER.

L. Defective Concrete:

1. Description: Concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements.
2. Repair or replacement of defective concrete will be determined by ENGINEER.
3. Do not patch, fill, touch up, repair, or replace exposed concrete except upon express direction of ENGINEER for each individual area.

END OF SECTION 033000

SECTION 079000 - JOINT PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sealants and joint backing.
2. Precompressed foam sealers.
3. Hollow gaskets.
4. Accessories.

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C834 - Standard Specification for Latex Sealants.
2. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.
3. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
4. ASTM C1193 - Standard Guide for Use of Joint Sealants.
5. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
6. ASTM D1667 - Standard Specification for Flexible Cellular Materials – Poly (Vinyl Chloride) Foam (Closed-Cell).
7. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.

1.3 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with Sections referencing this Section.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer Instructions: Submit special procedures, surface preparation requirements, and perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE

- A. Perform Work according to state and local standards.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store products according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.7 AMBIENT CONDITIONS

- A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.
- B. Maintain temperature and humidity as recommended by sealant manufacturer during and after installation.

1.8 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. Include coverage for:
 - 1. Installed sealants and accessories failing to achieve watertight seal.
 - 2. Installed sealants and accessories exhibiting loss of adhesion or cohesion.
 - 3. Sealants that do not cure.

PART 2 - PRODUCTS

2.1 JOINT SEALERS

- A. Manufacturers:
 - 1. Bostik, Inc.
 - 2. DAP Products Inc.
 - 3. Dayton Superior Specialty Chemicals.
 - 4. EMSEAL Joint Systems, Ltd.

5. GE Construction Sealants; Momentive Performance Materials Inc.
6. LymTal International Inc.
7. Master Builders Solutions.
8. May National Associates, Inc.; a subsidiary of Sika Corporation.
9. Pacific Polymers®; ITW Polymers Sealants North America.
10. Pecora Corporation.
11. Permathane®/Acryl-R®; ITW Polymers Sealants North America.
12. Polymeric Systems, Inc.
13. Schul International Company, Inc.
14. Sealex, Inc.
15. Sherwin-Williams Company (The).
16. Sika Corporation.
17. The Dow Chemical Company.
18. Tremco Incorporated.
19. Willseal LLC.
20. Substitutions: As specified in Section 016000 - Product Requirements.

2.2 JOINT SEALERS BY APPLICATION

A. High-Performance General-Purpose Exterior (Nontraffic) Sealant:

1. Material: Silicone or Polyurethane.
2. Comply with ASTM C920, Grade NS, Class 25, Uses M, G, and A.
3. Type: Single- or multiple-component.
4. Color: Standard; match finished surfaces.
5. Applications:
 - a. Control, expansion, and soft joints in masonry.
 - b. Joints between concrete and other materials.
 - c. Other exterior nontraffic joints for which no other sealant is indicated.

B. Exterior Compressible Gasket Expansion Joint Sealer:

1. Description: Hollow neoprene (polychloroprene) compression gasket.
2. Comply with ASTM D2628.
3. Color: Black.
4. Size and Shape: As indicated on Drawings.
5. Applications: Exterior wall and parking area expansion joints.

2.3 ACCESSORIES

A. Primer:

1. Type: Non-staining.
2. As recommended by sealant manufacturer to suit application.

B. Joint Cleaner:

1. Type: Non-corrosive and non-staining.

2. As recommended by sealant manufacturer.
 3. Compatible with joint forming materials.
- C. Joint Backing:
1. Description: Round foam rod, compatible with sealant.
 2. Comply with ASTM D1056, sponge or expanded rubber.
 3. Size: Oversized 30 to 50 percent larger than joint width.
- D. Bond Breaker:
1. Description: Pressure-sensitive tape.
 2. As recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for application examination.
- B. Verify that joint openings are ready to receive Work of this Section.
- C. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for application preparation.
- B. Comply with ASTM C1193.
- C. Remove loose materials and foreign matter that could impair adhesion of sealant.
- D. Clean and prime joints.
- E. Protect elements surrounding Work of this Section from damage or disfiguration.

3.3 APPLICATION

- A. Comply with ASTM C1193.
- B. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated on Drawings.
- C. Install bond breaker where joint backing is not used.

D. Apply sealant free of air pockets, foreign embedded matter, ridges, and sags.

E. Joint Tooling: Concave unless otherwise detailed on Drawings.

F. Precompressed Foam Sealant:

1. Do not stretch.
2. Avoid joints except at corners, ends, and intersections.
3. Apply with face 1/8 to 1/4 inch below adjoining surface.

G. Compression Gaskets:

1. Avoid joints except at ends, corners, and intersections.
2. Seal joints with adhesive.
3. Install with face 1/8 to 1/4 inch below adjoining surface.

3.4 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

B. Clean adjacent soiled surfaces.

3.5 PROTECTION

A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Protect sealants until cured.

END OF SECTION 079000

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removing surface debris.
2. Removing designated trees, shrubs, and other plant life.

1.2 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit data for herbicide. Indicate compliance with applicable codes for environmental protection.

1.3 QUALITY ASSURANCE

- A. Conform to applicable code for environmental requirements, disposal of debris, burning debris on site, and use of herbicides.
- B. Perform Work in accordance with of state transportation standards.
- C. Perform Work in accordance with State Department of Environmental Quality standards. The CONTRACTOR shall ensure required permits are in place prior to commencing work.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify existing plant life designated to remain is tagged or identified.
- C. Identify waste area for placing removed materials.

3.2 PREPARATION

- A. Call Local Utility Line Information service at 811 not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.

3.3 PROTECTION

- A. Locate, identify, and protect from damage utilities indicated to remain.
- B. Protect trees, plant growth, and features designated to remain, as final landscaping as specified in Section 015000 - Temporary Facilities and Controls.
- C. Protect benchmarks, survey control points, and existing structures from damage or displacement.

3.4 CLEARING

- A. Clearing shall consist of the cutting and removal of all trees, brush, logs, hedges, the removal of fences and other loose or projecting material from the designated areas. Trees, stumps, and brush shall be cut a minimum of six inches (6") from the ground surface.
- B. The CONTRACTOR shall clear the indicated area of all materials as indicated on the plans. Trees unavoidably falling outside the specified clearing limits must be cut up, removed, and disposed of in a satisfactory manner. To minimize damage to trees that are to be left standing, trees shall be felled toward the center of the area being cleared. The CONTRACTOR shall preserve and protect from injury all trees not to be removed.
- C. Clear areas as indicated on the Drawings.
- D. Clear undergrowth and deadwood, without disturbing soil.
- E. Apply herbicide to remaining stumps to inhibit growth.

3.5 REMOVAL AND DISPOSAL

- A. CONTRACTOR shall coordinate in accordance with OWNER's agreement regarding any material that can be commercially salvaged.
- B. All materials removed by clearing shall be disposed of outside the project limits at the CONTRACTOR's responsibility, except when otherwise directed by the ENGINEER.
- C. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.
- D. Do not burn or bury materials on site. Leave site in clean condition.

END OF SECTION 311000

SECTION 312213 - ROUGH GRADING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating topsoil.
2. Excavating subsoil.
3. Stockpiling materials.
4. Cutting, grading, filling, rough contouring, and compacting, site.

1.2 REFERENCES

A. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
3. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
4. ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
5. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head).
6. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Material Test Reports: For each on-site and borrow soil material proposed for use as follows:

1. Classification according to ASTM D2487.
2. Laboratory compaction curve according to ASTM D698.
3. Submit test results within 24-hours after testing is completed.

C. Materials Source: Obtain materials from same source throughout.

D. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E329 and ASTM D3740 for testing indicated.

1.4 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

- B. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ASTM C136, ASTM D2419, and ASTM D2434.
- B. Perform Work in accordance with authorities having jurisdiction requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Fill and Backfill: Where suitable, use existing onsite excavated satisfactory soils free from rubbish, debris, organic material, frozen material, or other objectionable materials.
- C. Topsoil: Top 6 inches of existing onsite soil.
- D. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D2487, or combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- E. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or combination of these groups. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- F. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; with at least 90 percent passing 1-1/2-inch sieve and not more than 12 percent passing No. 200 sieve.
- G. Base Course: In accordance with Section 32 11 23.
- H. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; with at least 90 percent passing 1-1/2-inch sieve and not more than 12 percent passing No. 200 sieve.
- I. Drainage Course: Narrowly graded mixture of washed crushed stone or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing 1-1/2-inch sieve and zero to 5 percent passing No. 8 sieve.
- J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D448; coarse-aggregate grading Size 67; with 100 percent passing 1-inch sieve and zero to 5 percent passing No. 4 sieve.

- K. Sand: ASTM C33; fine aggregate.
- L. Impervious Fill: Clayey gravel and sand mixture capable of compacting to dense state.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify site conditions and report any deviations from the plan drawings to the ENGINEER within 48 hours of discovery.
- C. Verify survey benchmark and intended elevations for the Work are as indicated on Drawings.

3.2 PREPARATION

- A. Call Local Utility Line Information service at 811 not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum.
- C. Notify utility company to remove and/or relocate utilities as indicated on the plan drawings.
- D. Protect utilities indicated to remain from damage.
- E. Protect plant life, lawns, and other features remaining as portion of final landscaping.
- F. Protect benchmarks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded, and as indicated on the plan drawings, without mixing with foreign materials for use in finish grading.
- B. Do not excavate wet topsoil.
- C. Stockpile in areas designated on site and in accordance with §3.5 below. Stockpile material until reuse or removal/disposal.
- D. Remove excess topsoil not intended for reuse, from site.

3.4 SUBSOIL EXCAVATION

- A. Excavate subsoil from areas to be further excavated, relandscaped, or regraded.
- B. Do not excavate wet subsoil.
- C. When excavating through roots, perform Work by hand and cut roots with sharp axe.
- D. Remove excess subsoil not intended for reuse, from site.
- E. Stability: Replace damaged or displaced subsoil as specified for fill.

3.5 STOCKPILING

- A. Stockpile excavated material meeting requirements for subsoil and/or topsoil materials.
- B. Stockpile materials on Site at locations as indicated or designated by ENGINEER.
- C. Stockpile in sufficient quantities to meet Project schedule and requirements.
- D. Separate differing materials with dividers or stockpile apart to prevent intermixing of soil types or contamination.
- E. Stockpile in areas designated on site to depth not exceeding 35 feet and protect from erosion. Stockpile material until reuse or removal/disposal.
- F. Direct surface water away from stockpile to prevent erosion or deterioration of materials.
- G. Stockpile hazardous materials on impervious material and cover to prevent erosion and leaching until they are disposed.

3.6 FILLING

- A. Fill areas to contours and elevations with unfrozen materials.
- B. Place material in continuous layers as follows:
 - 1. Subsoil Fill: Maximum 8 inches compacted depth.
 - 2. Structural Fill: Maximum 8 inches compacted depth.
 - 3. Granular Fill: Maximum as indicated on the Plan Drawings.
- C. Maintain optimum moisture content of fill materials to attain required compaction density.
- D. Slope grade away from building minimum 5 percent slope for minimum distance of 10 ft, unless noted otherwise.
- E. Make grade changes gradual. Blend slope into level areas.

- F. Repair or replace items indicated to remain that were damaged by excavation or filling. Repair and replacement shall be at CONTRACTOR's expense and to the satisfaction of the OWNER and ENGINEER.
- G. Install Work in accordance with authorities having jurisdiction standards.

3.7 TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.
- B. Top Surface of Subgrade: Plus or minus 1/10-foot from required elevation.

3.8 FIELD QUALITY CONTROL TESTING AND ACCEPTANCE

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Perform laboratory material tests in accordance with ASTM D698 or Geotechnical Engineer's recommendations. Geotechnical Engineer's recommendation shall govern testing requirements.
- C. Perform in place compaction tests in accordance with the following:
 - 1. Density Tests: In accordance ASTM D1556, ASTM D6938 or Geotechnical Engineer's recommendations. Geotechnical Engineer's recommendation shall govern testing requirements. or.
 - 2. Moisture Tests: ASTM D3017.
- D. When tests indicate Work does not meet specified requirements, remove Work, replace, and retest.
- E. Frequency of Tests:
 - 1. Under Structures, Building Slabs, Steps, and Pavements: At least one test per 1,000 square feet or less, but no fewer than three tests.
 - 2. Under Walkways: At least one test per 1,000 square feet or less, but no fewer than three tests.
 - 3. Under Turf or Unpaved Areas: Random tests, as necessary.
 - 4. In accordance with Geotechnical Engineer's recommendations. Geotechnical Engineer's recommendation shall govern frequency of testing.
- F. Test Acceptance
 - 1. Backfill and Fill Acceptance:
 - a. Under Structures, Building Slabs, Steps, and Pavements: 100 percent of maximum laboratory density.
 - b. Under Walkways: 95 percent of maximum laboratory density.
 - c. Under Turf or Unpaved Areas: 90 percent of maximum laboratory density.
 - 2. Filter Material Acceptance: 95 percent of maximum laboratory density.
 - 3. Subbase Course Acceptance: 100 percent of maximum laboratory density.
 - 4. Drainage Course Acceptance: 100 percent of maximum laboratory density

5. If tests indicate Work is not acceptable, re-compact and retest. If necessary, remove and replace Work.

END OF SECTION 312213

SECTION 312316 - EXCAVATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Soil densification.
2. Excavating for building foundations.
3. Excavating for paving, roads, and parking areas.
4. Excavating for slabs on grade.
5. Excavating for Site structures.
6. Excavating for landscaping.

1.2 DEFINITIONS

- A. Backfill: Soil material or flowable fill used to fill an excavation after placement of bedding course, utility, and embedment material.
- B. Initial Backfill: Backfill placed beside and over pipe in trench, including haunches to support sides of pipe.
- C. Final Backfill: Backfill placed over initial backfill to fill trench.
- D. Bedding Course: Aggregate layer placed over excavated subgrade in trench before laying pipe.
- E. Borrow Soil: Satisfactory soil imported from off-site for use as backfill.
- F. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1-cubic yard for bulk excavation or $\frac{3}{4}$ -cubic yard for footing, trench, and pit excavation that cannot be removed by rock-excavating equipment equivalent to following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
- G. Equipment for Footing, Trench, and Pit Excavation: Late-model, track-mounted hydraulic excavator; equipped with 42-inch maximum-width, short-tip-radius rock bucket; rated at not less than 138-horsepower flywheel power with bucket-curling force of not less than 28,700-pound-foot and stick-crowd force of not less than 18,400-pound-foot with extra-long reach boom. Ratings are based on Caterpillar's Model No. 320CL or Model No. 320DL.
- H. Equipment for Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-horsepower flywheel power and developing minimum of 47,992-pound-foot breakout force with general-purpose bare bucket. Ratings are based on Caterpillar's Model No. 973C.
- I. Soil Classification: ASTM D2487.

- J. Subgrade: Uppermost surface of excavation or top surface of fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- K. Utility: Any buried pipe, duct, conduit, cable, underground service to buildings, and associated appurtenances.

1.3 SUBMITTALS

A. Shop Drawings:

- 1. Indicate soil densification grid for each size and configuration footing requiring soil densification.
- 2. Excavation Protection Plan:
 - a. Describe sheeting, shoring, and bracing materials and installation, as required, to protect excavations and adjacent structures and property.
 - b. Submit signed and sealed Shop Drawings with design calculations and assumptions to support plan.

B. Field Quality-Control Submittals: Indicate results of CONTRACTOR-furnished tests and inspections.

C. Qualifications Statement: For licensed professional.

1.4 QUALITY ASSURANCE

- A. Licensed Professionals Qualifications: Professional Engineer experienced in design of specified Work and licensed in the state of which the work is commencing.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Perform Work according with authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

A. Utility Service Locator:

- 1. Call local utility service-line information at 811 not less than three working days before performing Work.
- 2. Request that underground utilities be located and marked within and immediately surrounding construction areas.
- 3. Identify required lines, levels, contours, and data.

- B. Existing Utilities:
 - 1. Notify utility company to remove and/or relocate utilities as indicated on the plan drawings.
 - 2. Protect from damage utilities indicated to remain.
- C. Protect plant life, lawns, and other features designated to remain as portion of final landscaping.
- D. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- E. Do not close or obstruct roadways, sidewalks, or hydrants without appropriate permits from authorities having jurisdiction.
- F. Erect and maintain temporary barriers and security devices at indicated locations, including warning signs, warning lights, and similar measures, for protection of public, OWNER, and existing improvements indicated to remain.

3.2 TOLERANCES

- A. Maximum Deviation from Center of Completed Compaction: 8 inches from indicated position.
- B. Maximum Deviation from Vertical: 4 degrees during vibrator insertion.

3.3 EXCAVATION

- A. Underpin adjacent structures which may be damaged by excavation Work.
- B. Excavate subsoil to accommodate building foundations, slabs on grade, paving, Site structures, bridge abutments, and construction operations.
- C. Excavate to working elevation for piling Work.
- D. Compact disturbed load-bearing soil in direct contact with foundations to original bearing capacity, as specified in Section 312323 "Fill" and Section 312316.13 "Trenching".
- E. Slope banks with machine to angle of repose or less until shored.
- F. Do not interfere with 45-degree bearing splay of foundations.
- G. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- H. Trim excavation and remove loose matter.
- I. Removal of Deleterious Materials:
 - 1. Remove excess and unsuitable material from Site.
- J. Notify ENGINEER of unexpected subsurface conditions.
- K. Correct over-excavated areas as directed by ENGINEER.

- L. Stockpiling:
 - 1. Stockpile excavated material meeting requirements for subsoil and/or topsoil materials.
 - 2. Stockpile materials on Site at locations as indicated or designated by ENGINEER.
 - 3. Stockpile in sufficient quantities to meet Project schedule and requirements.
 - 4. Separate differing materials with dividers or stockpile apart to prevent intermixing of soil types or contamination.
 - 5. Stockpile maximum height shall be 35 feet.
 - 6. Direct surface water away from stockpile to prevent erosion or deterioration of materials.
 - 7. Stockpile hazardous materials on impervious material and cover to prevent erosion and leaching until they are disposed.

- M. Repair or replace items indicated to remain that have been damaged by excavation.

3.4 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. Request visual inspection of bearing surfaces by ENGINEER and inspection agency 3 days before installing subsequent Work.

3.5 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation and maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- C. Protect structures, utilities, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that may be created by earth operations.

END OF SECTION 312316

SECTION 312316.13 - TRENCHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating trenches for utilities from 5 feet outside building to utility service.
2. Backfilling and compaction.

1.2 REFERENCES

A. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
2. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
3. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
4. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.3 DEFINITIONS

- A. Backfill: Soil material or flowable fill used to fill an excavation after placement of bedding course, utility, and embedment material.
- B. Initial Backfill: Backfill placed beside and over pipe in trench, including haunches to support sides of pipe.
- C. Final Backfill: Backfill placed over initial backfill to fill trench.
- D. Bedding Course: Aggregate layer placed over excavated subgrade in trench before laying pipe.
- E. Borrow Soil: Satisfactory soil imported from off-site for use as backfill.
- F. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1-cubic yard for bulk excavation or $\frac{3}{4}$ -cubic yard for footing, trench, and pit excavation that cannot be removed by rock-excavating equipment equivalent to following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
- G. Equipment for Footing, Trench, and Pit Excavation: Late-model, track-mounted hydraulic excavator; equipped with 42-inch maximum-width, short-tip-radius rock bucket; rated at not less than 138-horsepower flywheel power with bucket-curling force of not less than 28,700-

pound-foot and stick-crowd force of not less than 18,400-pound-foot with extra-long reach boom. Ratings are based on Caterpillar's Model No. 320CL or Model No. 320DL.

- H. Equipment for Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-horsepower flywheel power and developing minimum of 47,992-pound-foot breakout force with general-purpose bare bucket. Ratings are based on Caterpillar's Model No. 973C.
- I. Soil Classification: ASTM D2487.
- J. Subgrade: Uppermost surface of excavation or top surface of fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- K. Utility: Any buried pipe, duct, conduit, cable, underground service to buildings, and associated appurtenances.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer's product data for marker tape.
- C. Material Test Reports: For each on-site and borrow soil material proposed for bedding, embedment, and backfill as follows:
 - 1. Classification according to ASTM D2487.
 - 2. Laboratory compaction curve according to ASTM D698.
 - 3. Submit test results within 24-hours after testing is completed.
- D. Materials Source: Obtain materials from same source throughout. .

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with authorities having jurisdiction.

1.6 QUALIFICATIONS

- A. If required, prepare excavation protection plan under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of North Carolina.

1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.8 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.

- B. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Fill and Backfill: Where suitable, use existing onsite excavated satisfactory soils free from rubbish, debris, organic material, frozen material, or other objectionable materials.
- C. Topsoil: Top 6 inches of existing onsite soil.
- D. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D2487, or combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- E. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or combination of these groups. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- F. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; with at least 90 percent passing 1-1/2-inch sieve and not more than 12 percent passing No. 200 sieve.
- G. Base Course: In accordance with Section 32 11 23.
- H. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; with at least 90 percent passing 1-1/2-inch sieve and not more than 12 percent passing No. 200 sieve.
- I. Drainage Course: Narrowly graded mixture of washed crushed stone or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing 1-1/2-inch sieve and zero to 5 percent passing No. 8 sieve.
- J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D448; coarse-aggregate grading Size 67; with 100 percent passing 1-inch sieve and zero to 5 percent passing No. 4 sieve.
- K. Sand: ASTM C33; fine aggregate.
- L. Impervious Fill: Clayey gravel and sand mixture capable of compacting to dense state.

PART 3 - EXECUTION

3.1 LINES AND GRADES

- A. Lay pipes to lines and grades indicated on Drawings.
 - 1. ENGINEER and OWNER reserve right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.
- B. Use laser-beam instrument with qualified operator to establish lines and grades.

3.2 PREPARATION

- A. Call Local Utility Line Information service at 811 not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum locations.
- C. Protect plant life, lawns, and other features remaining as portion of final landscaping.
- D. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- E. Maintain and protect above and below grade utilities indicated to remain.
- F. Establish temporary traffic control and detours when trenching is performed in public right-of-way. Relocate controls and reroute traffic as required during progress of Work.

3.3 TRENCHING

- A. Excavate subsoil required for utility installation.
- B. Remove lumped subsoil, boulders, and rock.
- C. Perform excavation within 24 inches of existing utility service in accordance with utility's requirements.
- D. Do not advance open trench more than 60 feet ahead of installed pipe.
- E. Cut trenches to width indicated on Drawings. Remove water or materials that interfere with Work.
- F. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material and utilities.
- G. Do not interfere with 45 degree bearing splay of foundations.

- H. When Project conditions permit, slope side walls of excavation starting 2 feet above top of pipe. When side walls cannot be sloped, provide sheeting and shoring to protect excavation as specified in this section.
- I. When subsurface materials at bottom of trench are loose or soft, excavate to greater depth as directed by ENGINEER until suitable material is encountered.
- J. Cut out soft areas of subgrade not capable of compaction in place. Backfill with Fill Type as directed by ENGINEER and compact to density equal to or greater than requirements for subsequent backfill material.
- K. Trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.
- L. Correct areas over excavated areas with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by ENGINEER.
- M. Remove excess subsoil not intended for reuse, from site.

3.4 SHEETING AND SHORING

- A. Sheet, shore, and brace excavations to prevent danger to persons, structures, and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.
- B. Support trenches in accordance with authorities having jurisdiction and OSHA standards.
- C. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.
- D. Repair damage to new and existing Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing. Repair shall be at no additional cost to the OWNER.

3.5 BACKFILLING

- A. Backfill trenches to contours and elevations with unfrozen fill materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Place geotextile fabric as indicated on the Plan Drawings.
- D. Place material in continuous layers as follows:
 - 1. Subsoil Fill: Maximum 8 inches compacted depth.
 - 2. Structural Fill: Maximum 6 inches compacted depth.
 - 3. Granular Fill: Maximum as indicated on Plan Drawings.
- E. Employ placement method that does not disturb or damage foundation perimeter drainage or utilities in trench.

- F. Maintain optimum moisture content of fill materials to attain required compaction density.
- G. Do not leave more than 50 feet of trench open at end of working day.
- H. Protect open trench to prevent danger to OWNER and the public.

3.6 TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.
- B. Top Surface of Backfilling Under Paved Areas: Plus or minus 0.5 inch from required elevations.
- C. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.7 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Perform laboratory material tests in accordance with ASTM D698. Geotechnical Engineer's report shall govern testing requirements.
- C. Perform in place compaction tests in accordance with the following:
 - 1. Density Tests: ASTM D1556 or ASTM D2922.
 - 2. Moisture Tests: ASTM D3017.
- D. Frequency and Acceptance of Tests:
 - 1. Frequency: At each compacted initial and final backfill layer, take at least one test for every 100-feet or less of trench length, but no fewer than two tests per 100-feet of trench.
 - 2. Acceptance: Compact bedding, embedment and backfill materials to minimum of 95 percent of maximum laboratory density regardless of material.
 - 3. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

3.8 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution and Closeout Requirements: Protecting finished work.
- B. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION 312316.13

SECTION 312323 - FILL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Backfilling building perimeter to subgrade elevations.
2. Backfilling site structures to subgrade elevations.
3. Fill under slabs on grade.
4. Fill under paving.
5. Fill for over-excavation.

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
3. ASTM D6031/D6031M - Standard Test Method for Logging In Situ Moisture Content and Density of Soil and Rock by the Nuclear Method in Horizontal, Slanted, and Vertical Access Tubes.
4. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer information for geotextile fabric, indicating fabric and construction.

C. Material Test Reports: For each on-site and borrow soil material proposed for use as follows:

1. Classification according to ASTM D2487.
2. Laboratory compaction curve according to ASTM D698.
3. Submit test results within 24-hours after testing is completed.

D. Materials Source: Obtain materials from same source throughout.

E. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E329 and ASTM D3740 for testing indicated.

- F. Field Quality-Control Submittals: Indicate results of CONTRACTOR-furnished tests and inspections.

1.4 QUALITY ASSURANCE

- A. Perform Work according to authorities having jurisdiction standards.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Fill and Backfill: Where suitable, use existing onsite excavated satisfactory soils free from rubbish, debris, organic material, frozen material, or other objectionable materials.
- C. Topsoil: Top 6 inches of existing onsite soil.
- D. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D2487, or combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- E. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or combination of these groups. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- F. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; with at least 90 percent passing 1-1/2-inch sieve and not more than 12 percent passing No. 200 sieve.
- G. Base Course: In accordance with Section 32 11 23.
- H. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; with at least 90 percent passing 1-1/2-inch sieve and not more than 12 percent passing No. 200 sieve.
- I. Drainage Course: Narrowly graded mixture of washed crushed stone or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing 1-1/2-inch sieve and zero to 5 percent passing No. 8 sieve.
- J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D448; coarse-aggregate grading Size 67; with 100 percent passing 1-inch sieve and zero to 5 percent passing No. 4 sieve.
- K. Sand: ASTM C33; fine aggregate.

- L. Impervious Fill: Clayey gravel and sand mixture capable of compacting to dense state.

2.2 ACCESSORIES

- A. Geotextile Fabric: As specified in Section 310519.13 - Geotextiles for Earthwork.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that subdrainage, dampproofing, and waterproofing installations have been inspected.
- C. Verify that underground tanks are anchored to their own foundations to avoid flotation after backfilling.
- D. Verify structural integrity of unsupported walls to support loads imposed by fill.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Compact subgrade to specified density requirements for subsequent backfill materials.
- C. Soft Subgrade:
 - 1. Cut out soft areas of subgrade not capable of compaction in place.
 - 2. Backfill with structural or granular fill, as directed by ENGINEER, and compact to density equal to or greater than specified requirements for subsequent fill material.
- D. Scarify subgrade surface to depth of 8 inches.

3.3 BACKFILLING

- A. Backfill areas to contours and elevations.
- B. Systematically backfill to allow maximum time for natural settlement.
- C. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces, and do not backfill with frozen materials.
- D. Geotextile: Place geotextile fabric as indicated on the Plan Drawings.
- E. Maximum Compacted Depths:

1. Place material in continuous layers to following depths:
 - a. Subsoil Fill: 8 inches.
 - b. Structural Fill: 6 inches.
 - c. Granular Fill: Maximum as indicated on the Plan Drawings.
- F. Use placement method that does not disturb or damage utilities in trench.
- G. Maintain optimum moisture content of fill materials to attain required compaction density.
- H. Structures:
 1. Backfill against supported foundation walls.
 2. Backfill simultaneously on each side of unsupported foundation walls and vaults until supports are in place.
 3. Slope grade away from building minimum 5 percent slope for minimum distance of 10 feet, unless otherwise noted otherwise.
- I. Make gradual grade changes and blend slope into level areas.
- J. Remove surplus backfill materials from Site.
- K. Leave fill material stockpile areas free of excess fill materials.

3.4 TOLERANCES

- A. Section 014000 - Quality Requirements: Requirements for tolerances.
- B. Top Surface of Turf, Unpaved Areas, General Fill, and Backfill: Plus, or minus 0.08-foot from required elevation.
- C. Walks and Pavements: Plus, or minus 0.04-foot from required elevation.
- D. Top Surface of Subgrade: Plus, or minus 0.04-foot from required elevation.
- E. Grading Inside Building Lines: Plus, or minus 0.50-inch with 10-foot straight edge.
- F. Moisture Content: Plus, or minus 2-percent of optimum. Test in accordance with ASTM D6938.

3.5 FIELD QUALITY CONTROL TESTING AND ACCEPTANCE

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Inspecting: Request visual inspection of bearing surfaces by inspection agency 2 days before installing subsequent Work.
- D. Testing:

1. Laboratory Material Testing: Comply with ASTM D698 and/or ASTM D1557 as noted. Geotechnical Engineer's recommendation shall govern testing requirements.
2. In-Place Compaction Testing:
 - a. Density Tests: Comply with ASTM D6938.
 - b. Moisture Tests: Comply with ASTM D6031/D6031M.
3. If tests indicate that Work does not meet specified requirements, remove Work, replace, compact, and retest.
4. Testing Frequency:
 - a. Under Structures, Building Slabs, Steps, and Pavements: At least one test per 1,000 square feet or less, but no fewer than three tests.
 - b. Under Walkways: At least one test per 1,000 square feet or less, but no fewer than three tests.
 - c. Under Turf or Unpaved Areas: Random tests, as necessary.
 - d. In accordance with Geotechnical Engineer's recommendations. Geotechnical Engineer's recommendation shall govern frequency of testing.
5. Test Acceptance. Compaction testing shall be in accordance with ASTM D698 unless otherwise noted.
 - a. Backfill and Fill Acceptance:
 - 1) Under Structures, Building Slabs, Steps, and Pavements: 100 percent of maximum laboratory density in accordance with ASTM D1557.
 - 2) Under Walkways: 95 percent of maximum laboratory density.
 - 3) Under Turf or Unpaved Areas: 90 percent of maximum laboratory density.
 - b. Filter Material Acceptance: 95 percent of maximum laboratory density.
 - c. Subbase Course Acceptance: 100 percent of maximum laboratory density.
 - d. Drainage Course Acceptance: 100 percent of maximum laboratory density.
 - e. If tests indicate Work is not acceptable, re-compact and retest. If necessary, remove and replace Work.
6. Proof-roll compacted fill surfaces under slabs on grade, pavers, paving, and as directed by ENGINEER.

3.6 PROTECTION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Reshape and recompact fills subjected to vehicular traffic during construction.

END OF SECTION 312323

SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Diversion channels.
 2. Rock energy dissipator.
 3. Rock apron.
 4. Sediment ponds.
 5. Sediment traps.

1.2 REFERENCES

- A. North Carolina Department of Transportation (NCDOT):
1. NCDOT Standard Specifications for Roads and Structures (NCDOT Specifications):
- B. NCDOT Asphalt Quality Management System, Materials and Tests Unit, Asphalt QMS Manual (QMS Manual), latest edition.
- C. North Carolina Department of Environmental Quality (NCDEQ)

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Product Data: Submit data on geotextile.
- C. Submit proposed mix design of each class of concrete for review prior to commencement of Work.
- D. Test Reports: Indicate certified tests results for precast concrete at manufacturing facility, cast-in-place concrete in field, and granular backfill.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

1.5 QUALITY ASSURANCE

- A. Perform Work according to North Carolina Department of Environmental Quality (NCDEQ), Department of Energy, Mineral, and Land Resources (DEMLR), and any additional authorities that may have jurisdiction standards.
- B. Install and maintain erosion control devices as required to function properly and to satisfy the representatives of the NCDEQ, DEMLR, local authorities having jurisdiction, and the ENGINEER.
 - 1. Any time delays experienced due to a shutdown by the NCDEQ, other authorities having jurisdiction, or due to unanticipated corrective work will not receive any time extensions on the contract.
 - 2. The CONTRACTOR is responsible for installing all devices necessary to control runoff from the site, regardless of any conditions of the permit or design by the ENGINEER.

1.6 PREINSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.
- B. Conduct a pre-installation meeting in accordance with the approved permit and local jurisdictional requirements, as applicable.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.
- B. Do not place grout when air temperature is below freezing.
- C. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 ROCK AND GEOTEXTILE MATERIALS

- A. Furnish materials according to NCDEQ and NCDOT standards.
- B. Rock: irregular shaped rock; solid and nonfriable; of type and size indicated on Drawings.
- C. Geotextile Fabric: Furnish according to NCDEQ and NCDOT standards.

2.2 CONCRETE MATERIALS AND REINFORCEMENT

- A. Concrete Materials and Reinforcement shall be in accordance with NCDOT standards, other applicable sections of these documents and Drawings.

2.3 BLOCK, STONE, AGGREGATE, AND SOIL MATERIALS

- A. Stone: In accordance with NCDOT, NCDEQ and these Drawings.
- B. Coarse Aggregate: In accordance with NCDOT standards.
- C. Soil Backfill: As specified in Division 31 of these specifications.

2.4 PIPE MATERIALS

- A. Pipe: At the type and size indicated on the drawings.

2.5 ACCESSORIES

- A. Anti-Seep Collar: Furnish according to NCDEQ standards.
- B. Trash Rack: Furnish according to NCDEQ standards.

2.6 SOURCE QUALITY CONTROL (AND TESTS)

- A. Section 014000 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Perform tests on cement, aggregates, and mixes to ensure conformance with specified requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting Work.
- B. Verify compacted subgrade, granular base and stabilized soil is acceptable and ready to support devices and imposed loads.
- C. Verify gradients and elevations of base or foundation for other Work are correct.

3.2 DIVERSION CHANNELS

- A. Windrow excavated material on low side of channel.
- B. Compact to 95 percent maximum density.
- C. On entire channel area, apply soil supplements and sow seed as specified on the Drawings.
- D. Mulch seeded areas as specified on the Drawings.

- E. Install Work according to NCDEQ standards.

3.3 ROCK ENERGY DISSIPATOR

- A. Excavate to indicated depth of rock lining or nominal placement thickness indicated on Drawings. Remove loose, unsuitable material below bottom of rock lining, then replace with suitable material. Thoroughly compact and finish entire foundation area to firm, even surface.
- B. Lay and overlay geotextile fabric over substrate. Lay fabric parallel to flow from upstream to downstream. Overlap edges upstream over downstream and upslope over downslope. Provide a minimum overlap of six inches. Offset adjacent roll ends a minimum of 5 feet when lapped. Cover fabric as soon as possible and in no case leave fabric exposed more than 4 weeks.
- C. Carefully place rock on geotextile fabric to produce an even distribution of pieces, with minimum of voids and without tearing geotextile.
- D. Unless indicated otherwise, place full course thickness in one operation to prevent segregation and to avoid displacement of underlying material. Arrange individual rocks for uniform distribution.

3.4 ROCK APRON

- A. Construct generally in accordance with rock energy dissipator requirements to indicated shape and depth.

3.5 ROCK FILTER OUTLET

- A. Install Work according to NCDEQ standards.

3.6 SEDIMENTATION POND

- A. Clear and grub storage area and embankment foundation area site as specified in Section 311001.
- B. Excavate key trench for full length of dam.
- C. Install pipe spillway, with anti-seep collar attached, at location indicated.
- D. Place forms and reinforcing for concrete footing at bottom of riser pipe with trash rack and anti-vortex device. Construction of embankment and trench prior to placing pipe is not required.
- E. Mix, place, finish, and cure concrete, as specified in Section 033000.
- F. Do not use coarse aggregate as backfill material around pipe. Backfill pipe with suitable embankment material to prevent dam leakage along pipe.

- G. Construct rock apron at outlet end of pipe, as specified in this Section. Place embankment material, as specified in Section 312323. When required, obtain borrow excavation for formation of embankment, as specified in Section 312323.
- H. On entire sedimentation pond area, apply soil supplements and sow seed in accordance with NCDEQ requirements.
- I. Mulch seeded areas with hay as specified on the Drawings.

3.7 SEDIMENT TRAPS

- A. Clear site, as specified in Section 311000.
- B. Construct trap by excavating and forming embankments as specified in Section 312316, and Section 312323.
- C. Place coarse aggregate or rock at outlet as indicated on Drawings.
- D. Place geotextile fabric, as specified for rock energy dissipator.
- E. On entire sediment trap area, apply soil supplements and sow seed on the Drawings.
- F. Mulch seeded areas with hay as specified on Drawings.

3.8 SITE STABILIZATION

- A. Incorporate erosion control devices indicated on the Drawings into the Project at the earliest practicable time.
- B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.
- C. Stockpile and waste pile heights shall not exceed 35 feet. Slope stockpile sides at 2:1 or flatter.
- D. Stabilize any disturbed area of affected erosion control devices on which activity has ceased and which will remain exposed in accordance with the Drawings.
- E. Stabilize diversion channels, sediment traps, and stockpiles immediately.

3.9 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements 017000
- B. Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- C. Inspect erosion control devices on a weekly basis and after each runoff event. Make necessary repairs to ensure erosion and sediment controls are in good working order.

3.10 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment structure or device, remove, and dispose of sediment.
- C. Do not damage structure or device during cleaning operations.
- D. Do not permit sediment to erode into construction or site areas or natural waterways.
- E. Clean channels when depth of sediment reaches approximately one-half channel depth.

3.11 PROTECTION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.

END OF SECTION 312500

SECTION 321313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aggregate subbase and base course.
2. Concrete paving for:
 - a. Concrete sidewalks.
 - b. Concrete stair steps.
 - c. Concrete integral curbs and gutters.
 - d. Concrete median barriers.
 - e. Concrete parking areas and roads.

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
2. ASTM A775/A775M - S Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
3. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement.
4. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
5. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
6. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
7. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
8. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
9. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
10. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
11. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
12. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
13. ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete.
14. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
15. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
16. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

- B. North Carolina Department of Transportation (NCDOT):
 - 1. NCDOT Standard Specifications for Roads and Structures (NCDOT Specifications):

1.3 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data:
 - 1. Submit data on concrete materials, joint filler, admixtures, and curing compounds.
- C. Design Data:
 - 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 - 2. Identify mix ingredients and proportions, including admixtures.
- D. Source Quality Control Submittals: Indicate results of tests and inspections.

1.5 QUALITY ASSURANCE

- A. Obtain cementitious materials from same source throughout.
- B. Perform Work according to NCDOT and Municipal of standards.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products and listed on NCDOT's approved supplier list.
- B. Installer: Company specializing in performing work of this section and listed on NCDOT's approved installer list.

1.7 AMBIENT CONDITIONS

- A. Section 015000 - Temporary Facilities and Controls: Ambient conditions control facilities for product storage and installation.

- B. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 AGGREGATE SUBBASE and BASE COURSE

- A. Aggregate Subbase and Base Course: As specified in Section 321123.

2.2 CONCRETE PAVING

A. Form Materials:

- 1. Form Materials: As specified in Section 031000.
- 2. Joint Filler: ASTM D1751; Asphalt impregnated fiberboard or felt, 1/4 inch thick.

B. Reinforcement:

- 1. Reinforcing Steel and Wire Fabric: Type specified in Section 032000 or as indicated on the Plan Drawings.

C. Concrete Materials:

- 1. Concrete Materials: As specified in Section 033000. Provide according to NCDOT of standards.
- 2. Water: ASTM C94/C94M; potable,.
- 3. Air Entrainment: ASTM C260.
- 4. Chemical Admixture: ASTM C494/C494M. Use a quantity of chemical admixture within the range shown on the current list of approved admixtures issued by the Materials and Test Unit of NCDOT.
 - a. Type A - Water Reducing.
 - b. Type B - Retarding.
 - c. Type C - Accelerating.
 - d. Type D - Water Reducing and Retarding.
 - e. Type E - Water Reducing and Accelerating.
 - f. Type F - Water Reducing, High Range.
 - g. Type G - Water Reducing, High Range and Retarding.
- 5. Fly Ash: In accordance with NCDOT standards.
- 6. Slag: In accordance with NCDOT standards.
- 7. Plasticizing: ASTM C1017/C1017M Type I, plasticizing or Type II, plasticizing and retarding.
- 8. Color Pigment: ASTM C979; mineral oxides, alkali and fade resistant.
 - a. Color: As directed by the ENGINEER and OWNER.

2.3 FABRICATION

- A. Fabricate reinforcing according to NCDOT standards.
- B. Form standard hooks for 180-degree bends, 90-degree bend, and seismic hooks as indicated on Drawings.

2.4 MIXES

- A. Concrete Mix:
 - 1. Select proportions for normal weight concrete according to NCDOT standards.
 - 2. Provide concrete compressive strength, slump, minimum cement content and air entrainment in accordance with NCDOT Standard Specifications for Roads and Structures, latest edition, Section 1000. .
 - 3. Limit the following cementitious materials to maximum percentage by mass of all cementitious materials:
 - a. Fly Ash: In accordance with NCDOT standards..
 - b. Blast Furnace Slag: In accordance with NCDOT standards..
 - c. Fly Ash and Blast Furnace Slag: In accordance with NCDOT standards..
 - 4. Use accelerating admixtures in cold weather only when approved by the ENGINEER in writing. Use of admixtures will not relax cold weather placement requirements.
 - 5. Use calcium chloride only when approved by the ENGINEER in writing.
 - 6. Use set retarding admixtures during hot weather only when approved by the ENGINEER in writing.

2.5 FINISHES

- A. Shop Finishing - Reinforcement:
 - 1. Galvanized Finish for Steel Bars: ASTM A767/A767M, Class I, hot dip galvanized after fabrication.
 - 2. Epoxy Coated Finish for Steel Bars: ASTM A775/A775M.
- B. Epoxy Coated Finish for Steel Wire: ASTM A884/A884M; Class A, using ASTM A775/A775M.

2.6 ACCESSORIES

- A. Curing Compounds: In accordance with NCDOT standards..
- B. Liquid Surface Sealer: In accordance with NCDOT standards..
- C. Surface Retarder: In accordance with NCDOT standards..
- D. Joint Sealers: Specified in Section 079000.

2.7 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Testing and Inspection Services:
- B. Submit proposed mix design of each class of concrete to ENGINEER for review prior to commencement of Work.
- C. Tests on cement, aggregates, and mixes shall be performed to ensure conformance with specified requirements.
- D. Test samples according to ASTM C94/C94M

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify compacted subbase, subgrade, granular fill, or stabilized soil is dry and ready to support paving and imposed loads.
 - 1. Proof roll subbase, subgrade, granular fill, or stabilized soil with 20-ton tandem axle dual wheel dump truck loaded to the legal limit with the tires inflated to 100 psi in minimum in two perpendicular passes to identify soft spots. Proof roll shall be done in the presence of the RPR or authorities having jurisdiction.
 - 2. Soft areas of the subbase, subgrade, granular fill, or stabilized soil that deflect more than 1 inch or show permanent deformations greater than 1 inch shall be removed and replaced with suitable materials or reworked to conform to the moisture content and compactions requirements in accordance with these specifications. Remove soft subbase, subgrade, granular fill, or stabilized soil and replace with compacted fill as specified in Section 312323.
 - 3.
- C. Verify gradients and elevations of base are correct.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Moisten substrate to minimize absorption of water from fresh concrete.
- C. Coat surfaces of utility structure frames with oil to prevent bond with concrete paving.
- D. Notify ENGINEER minimum 24 hours prior to commencement of concreting operations.

3.3 INSTALLATION

A. Subbase and Base Course:

1. Aggregate Subbase and Base Course: Install as specified in Section 321123.

B. Forms:

1. Place and secure forms and screeds to correct location, dimension, profile, and gradient.
2. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Reinforcement:

1. Place reinforcing as indicated on Drawings.
2. Interrupt reinforcing at contraction and expansion joints.
3. Place dowels and reinforcing to achieve paving and curb alignment as detailed.
4. Provide doweled joints as indicated on the Drawings.
5. Repair damaged galvanizing to match shop finish.

D. Placing Concrete:

1. Coordinate installation of snow melting components.
2. Place concrete as specified in Section 033000.
3. Ensure reinforcing, inserts, embedded parts, and formed joints are not disturbed during concrete placement.
4. Place concrete continuously over the full width of the panel and between predetermined construction joints.
5. Place concrete to pattern indicated.

E. Joints

1. Saw cut contraction joints 3/16 inch wide at an optimum time after finishing. Cut 1/3 into depth of slab.
2. Seal joints as indicated on Drawings according to Section 079000.

F. Exposed Aggregate:

1. Apply surface retarder where exposed aggregate finish is required.
2. Wash exposed aggregate surface with clean water and scrub with stiff bristle brush exposing aggregate to match plan requirements..

G. Finishing:

1. Area Paving: Wood float.
2. Sidewalk Paving: Light broom radius, and trowel joint edges.
3. Median Barrier: Light broom radius, and trowel joint edges.
4. Curbs and Gutters: Light broom.
5. Direction of Texturing: Transverse to paving direction.
6. Inclined Vehicular Ramps: Broomed perpendicular to slope.
7. Place curing compound on exposed concrete surfaces immediately after finishing.

H. Curing and Protection

1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
2. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
3. Cure concrete floor surfaces as specified in Section 033900.

3.4 TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.
- B. Maximum Variation of Surface Flatness: 1/4 inch
- C. Maximum Variation From True Position: 1/4 inch.

3.5 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Perform field inspection and testing according to ASTM C94/C94M and NCDOT of standards.
- D. Inspect reinforcing placement for size, spacing, location, support.
- E. Testing firm shall take cylinders and perform slump and air entrainment tests according to NCDOT standards.
- F. Strength Test Samples:
 1. Sampling Procedures: ASTM C172.
 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, standard cured.
 3. Sample concrete and make one set of five cylinders for every 75 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area paving.
- G. Field Testing:
 1. Slump Test Method: ASTM C143/C143M.
 2. Air Content Test Method: ASTM C173/C173M.
 3. Temperature Test Method: ASTM C1064/C1064M.
 4. Measure slump and temperature for each compressive strength concrete sample.
 5. Measure air content in air entrained concrete for each compressive strength concrete sample.
- H. Cylinder Compressive Strength Testing:
 1. Test Method: ASTM C39/C39M.
 2. Test Acceptance: according to NCDOT standards.

3. Test cylinders in accordance with NCDOT standards.
 4. Retain one cylinder for 56 days for testing when requested by ENGINEER.
 5. Dispose remaining cylinders when testing is not required.
- I. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.6 PROTECTION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury.
- C. Do not permit pedestrian or vehicular traffic over paving until accepted by ENGINEER.

END OF SECTION 321313

SECTION 329219 - SEEDING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Fertilizing.
 2. Seeding.
 3. Mulching.
 4. Maintenance.

1.2 DEFINITIONS

- A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass. Additionally, the definition of weeds includes vegetative species other than specified species to be established in given area.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit data for seed mix, fertilizer, mulch, and other accessories.
- C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

1.5 QUALITY ASSURANCE

- A. Provide seed mixture in containers showing percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight, date of packaging, and location of packaging.
- B. Perform Work according to these Plans and authorities having jurisdiction.

1.6 QUALIFICATIONS

- A. Seed Supplier: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum three years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.8 WARRANTY

- A. Time Period: Guarantee that all lawns and grasses shall be in a healthy and flourishing condition of active growth for the warranty period as specified in the Contract Agreement with the OWNER.
- B. Appearance During Warranty:
 - 1. Lawns: Shall be free of dead or dying patches, and all areas shall show foliage of a normal density, size, and color. Complete lush cover with no brown sections or cracks showing.
- C. Delays: All delays in completion of planting operations which extend the planting into more than one planting season shall extend the Warranty Period correspondingly.
- D. Exceptions: CONTRACTOR shall not be held responsible for failures due to neglect by OWNER, vandalism, etc., during Warranty Period. Report such conditions in writing.
- E. Replacements: Replace, without cost to OWNER, and as soon as weather conditions permit, all lawns and grasses not in a vigorous, thriving condition, as determined by Landscape Architect during and at the end of Warranty Period.

1.9 MAINTENANCE SERVICE

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance service.
- B. Maintain seeded areas immediately after placement until grass is well established and exhibits vigorous growing condition through the warranty period.

PART 2 - PRODUCTS

2.1 SEED MIXTURE

- A. Suppliers:
 - 1. Ernst Seeds (www.ernstseed.com)
 - 2. Pennington Seed (www.pennington.com)
 - 3. Or approved equal Substitutions: Section 016000 - Product Requirements.
- B. Furnish materials according to these Plan Drawings and authorities having jurisdiction.

2.2 SOIL MATERIALS

- A. Topsoil: Fertile, friable topsoil, typical for locality, capable of sustaining vigorous plant growth; free of subsoil, clay or impurities, plants, weeds and roots; pH within acceptable range for local planting; organic matter content between 4-12 percent of total dry weight. Additional soil characteristics within normal ranges as provided by soil test report.

2.3 SOIL AMENDMENT MATERIALS

- A. When soil tests indicate the need for soil amendment, apply soil conditioners or fertilizers to amend soil to specified conditions.
 - 1. Fertilizer: Containing 50 percent of elements derived from organic sources; of proportion necessary to eliminate deficiencies of topsoil, as indicated in analysis.
- B. Water: Clean, fresh, and free of substances or matter capable of inhibiting vigorous growth of plants.
- C. Herbicide: For pre-plant preparation, a broad-spectrum non-selective contact herbicide. For post-plant weed control, a granular or liquid-applied pre-emergent herbicide. Chemicals must be approved for use in the State of North Carolina and be applied by licensed applicators. The OWNERS' Representative must be notified at least 48 hours in advance of herbicide applications.
- D. Pesticide: Pesticides may be used for specific pest infestations, but only in limited application. Broad- spectrum insecticides applied over large portions of landscape will not be allowed. Chemicals must be approved for use in the State of North Carolina and be applied by licensed applicators. The OWNER and/or OWNERS' Representative must be notified at least 48 hours in advance of pesticide applications.

2.4 ACCESSORIES

- A. Mulching Material: As indicated on the drawings and in accordance with authorities having jurisdiction.

- B. Fertilizer: Commercial grade; recommended for grass; of proportion necessary to eliminate deficiencies of topsoil, as indicated in analysis or as indicated on the soil test report and in accordance with authorities having jurisdiction.
- C. Lime: As indicated on the drawings and in accordance with authorities having jurisdiction.
- D. Water: Clean, fresh and free of substances or matter capable of inhibiting vigorous growth of grass.
- E. Erosion Fabric: As indicated on the drawings and in accordance with authorities having jurisdiction.

2.5 SOURCE QUALITY CONTROL

- A. Section 014000 – Quality Requirements: Testing, inspection and analysis requirements.
- B. Provide recommendation for soil amendment application rates for specified seed mix as result of testing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 – Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify prepared soil base is ready to receive the Work of this section.

3.2 PREPARATION

- A. Prepare subgrade in accordance with Section 312213.00 – Rough Grading.
- B. Once subsoil is lightly but firmly re-compacted, spread existing stockpiled topsoil over areas to be seeded to a 2-inch depth minimum after natural settlement occurs.
- C. Final Grading:
 - 1. Stones, Weeds, Debris: Verify that all areas to receive lawns (as indicated in Drawings) are clear of stones larger than 1 inch diameter, weeds, debris and other extraneous materials.
 - 2. Grades: Verify that grades are within 1 inch of the required finished grades. Verify that soil preparation and fertilization has been installed as required by soil testing. Report all variations in writing.
- D. Soil Moisture:
 - 1. Excessive Moisture: Do not commence work of this section when soil moisture content is so great that excessive compaction will occur, nor when it is so dry that dust will form in air or clods will not break readily.

2. Inadequate Moisture: Apply water, as necessary, to bring soil to an optimum moisture content for planting.

E. Apply soil amendments after smooth raking of topsoil and at application rate recommended by soil analysis.

3.3 SEEDING

A. Apply seed at rate indicated on the Drawings, unless otherwise specified by manufacturer. Rake in lightly.

B. Do not seed areas in excess of that which can be mulched on same day.

C. Planting Season: The planting season shall be ideal for the type of planting specified on the Drawings.

D. Do not sow immediately following rain, when ground is too dry, or when winds are over 12 mph.

E. Immediately following seeding, apply mulch to thickness indicated on the Drawings. Maintain clear of shrubs and trees.

F. Apply water with fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

3.4 SEED PROTECTION

A. Cover seeded slopes where grade is 4 inches per foot or greater with erosion control fabric. Roll fabric onto slopes without stretching or pulling.

B. Lay fabric smoothly on surface, bury top end of each section in 6-inch-deep excavated topsoil trench. Overlap edges and ends of adjacent rolls minimum 12 inches. Backfill trench and rake smooth, level with adjacent soil.

C. Secure outside edges and overlaps at 36-inch intervals with stakes.

D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.

E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

3.5 MAINTENANCE

A. Mow grass at intervals as required by manufacturer and/or Agreement with OWNER.

B. Neatly trim edges and hand clip where necessary.

C. Water to prevent grass and soil from drying out.

- D. Control growth of weeds with hand removal or use of organic, targeted herbicides.
- E. Immediately reseed areas showing bare spots.
- F. Repair washouts or gullies.
- G. Protect seeded areas with warning signs during maintenance period.

END OF SECTION 329219

SECTION 331417 - SITE WATER SERVICE UTILITY LATERALS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipe and fittings for water service connections to buildings at the type and size indicated on the Plan Drawings.
2. Corporation stop assemblies.
3. Curb stop assemblies.
4. Backflow preventers.
5. Meter setting equipment.
6. Meter boxes.
7. Trenching, bedding, and cover.

1.2 REFERENCE STANDARDS

A. American Society of Mechanical Engineers:

1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.

B. American Society of Sanitary Engineering:

1. ASSE 1012 - Performance Requirements for Backflow Preventers with an Intermediate Atmospheric Vent.
2. ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers.

C. ASTM International:

1. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings.
2. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
3. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
4. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
5. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
6. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
7. ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
8. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.

9. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

D. American Water Works Association:

1. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service.
2. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances.
3. AWWA C800 - Underground Service Line Valves and Fittings.
4. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. (13 mm) Through 3 In. (76 mm), for Water Service.
5. AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information regarding pipe materials, pipe fittings, corporation stop assemblies, curb stop assemblies, meters, meter setting equipment, service saddles, backflow preventers, and accessories.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
- E. Field Quality-Control Submittals: Indicate results of CONTRACTOR-furnished tests and inspections.
- F. Qualifications Statement:
 1. Submit qualifications for manufacturer.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of service lines, curb stops, connections, thrust restraints, pressure-pipe centerline elevations, and gravity-pipe invert elevations.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 WATER PIPING AND FITTINGS

- A. All water service piping shall be copper tubing unless otherwise stated in the Drawings.
- B. Direct taps without the use of fittings or saddles shall not be allowed on PVC or HDPE water mains. Direct taps in DIP water mains shall be performed using a corporation stop of equal size to the water service connection unless ductile iron MJ fittings are specified on the approved Plans.
- C. Copper Tubing:
 - 1. Comply with ASTM B88.
 - 2. Type: K, annealed.
 - 3. Fittings: Cast copper; ASME B16.18.
 - 4. Joints: Compression connection or flared connection.
- D. PVC Pipe:
 - 1. Comply with ASTM D1785 for Schedule 40 and Schedule 80, ASTM D2241 for SDR-26 (160-psig pressure rating), ASTM D2241 for SDR-41 (100-psig rating), and ASTM D2241 for SDR-21 (200-psig rating).
 - 2. Fittings: PVC; ASTM D2466.
 - 3. Joints: Solvent welded; ASTM D2855.
- E. HDPE Pipe:
 - 1. Comply with AWWA C901.
 - 2. Fittings:
 - a. Type: Molded.
 - b. Comply with AWWA C901,
 - 3. Joints: Butt fusion.

2.2 CORPORATION STOP ASSEMBLIES

A. Manufacturers:

1. A.Y. McDonald Mfg. Co.
2. Hydro Instruments.
3. Mueller Co.
4. Substitutions: As specified in Section 016000 - Product Requirements.
5. Furnish materials according to local and state standards.

B. Corporation Stops:

1. Comply with ASTM B62.
2. Body: Brass or red brass alloy.
3. Inlet End: Threaded for tapping according to AWWA C800.
4. Outlet End: Suitable for service pipe specified.

C. Service Saddles:

1. Material: 85-5-5-5 brass alloy per ASTM B62, ASTM B584 and AWWA C800.
2. Type: double strap, hinge-less design with two (2) fastening nuts on each side of the saddle body, incorporating an EPDM rubber gasket per ASTM D2000.
3. Designed to hold pressures in excess of pipe working pressure.

2.3 CURB STOP ASSEMBLIES

A. Manufacturers:

1. A.Y. McDonald Mfg. Co.
2. Mueller Co.
3. Substitutions: As specified in Section 016000 - Product Requirements.
4. Furnish materials according to local and state standards.

B. Curb Stops:

1. Body: Brass or red brass alloy.
2. Comply with AWWA C800.
3. Valve Type: Ball.
4. Sealing: Positive pressure.

C. Curb Boxes and Covers:

1. Body: Cast iron.
2. Type: Extension.
3. Base: Minneapolis.
4. Lid:
 - a. Inscription: WATER.
 - b. Plug: Pentagonal.

2.4 BACKFLOW PREVENTERS

A. Manufacturers:

1. FEBCO; A WATTS Brand.
2. Flomatic Corporation.
3. Matco-Norca.
4. NIBCO INC.
5. WATTS.
6. Zurn Industries, LLC.
7. Substitutions: As specified in Section 016000 - Product Requirements.
8. Furnish materials according to local and state standards.

B. Reduced-Pressure Backflow Preventers:

1. Comply with ASSE 1013.
2. Materials:
 - a. Body: Bronze.
 - b. Internal Parts: Bronze.
 - c. Springs: Stainless steel.
3. Check Valves:
 - a. Quantity: Two, operating independently operating.
 - b. Spring-loaded.
 - c. Third Check Valve: Open under back pressure in case of diaphragm failure.
4. Differential Pressure Relief Valve:
 - a. Type: Diaphragm.
 - b. Location: Between check valves.
5. Gate Valves:
 - a. Type: Resilient seated.
 - b. Comply with AWWA C509.
 - c. Quantity: Two.
6. Accessories:
 - a. Non-threaded vent outlet.
 - b. Strainer.
 - c. Four resilient-seated ball valve test cocks.

C. Double-Check Valve Assemblies:

1. Comply with ASSE 1012.
2. Materials:
 - a. Body: Bronze.

- b. Internal Parts: Corrosion resistant.
 - c. Springs: Stainless steel.
3. Check Valves:
- a. Quantity: Two, operating independently.
 - b. Intermediate atmospheric vent.

2.5 METER BOXES

- A. Polyvinyl Chloride Meter Boxes
- 1. Type: round style
 - 2. Materials:
 - a. Minimum wall thickness of 0.375 inches
 - b. Minimum inside diameter of 18 inches with a 30 inch depth
 - c. Non-locking cast iron lid
 - d. Sized to accept a 5/8-inch water meter
- B. Cast Iron Meter Boxes
- 1. Type: Two-piece design (box and cover)
 - 2. Cast iron shall comply with ASTM A48 Class 25.
 - 3. Non-locking cast iron lid
 - 4. Sized to accept a 5/8 inch water meter

2.6 METER SETTING EQUIPMENT

- A. Manufacturers:
- 1. Mueller Co.
 - 2. Substitutions: As specified in Section 016000 - Product Requirements.
 - 3. Furnish materials according to local and state standards.
- B. Meter Setting:
- 1. Material:
 - a. Setter Tubing: Copper
 - b. Yoke: Iron or Copper
 - c. Valves: Brass
 - 2. Height: 12", unless otherwise noted.
 - 3. Inlet: Lockable angle inverted ball valve
 - 4. Key Valves:
 - a. Connection: Bronze pins and spring washers.
 - 5. Outlet: Expansion connection, dual check valve
 - 6. End Connections: Flared copper tubing or compression type for plain end copper tubing.
 - 7. Furnish test valves.

2.7 MATERIALS

- A. Bedding and Cover: As specified on the Plan Drawings and in accordance with authorities having jurisdiction.

2.8 ACCESSORIES

- A. Pipe Markers: In accordance with authorities having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that building service connections and municipal utility water main sizes, locations, and inverts are as indicated on Drawings.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
- C. Remove scale and dirt from inside and outside of piping before assembly.
- D. Prepare pipe connections to equipment with flanges or unions.

3.3 INSTALLATION

- A. General:
 - 1. Water System Expansion:
 - a. For extensions of the existing water system, all buildable lots adjacent to the extension shall have a water service line provided unless otherwise directed. Additional service lines may be installed by the CONTRACTOR as directed and authorized by the ENGINEER.
 - 2. Rehabilitation of Existing Water Mains:
 - a. Where existing water mains are being rehabilitated, water service lines shall be constructed for each property that is occupied by a business or dwelling if it is currently served by the system being rehabilitated.
 - b. The CONTRACTOR shall be responsible to locate and connect all existing water service lines to the new main. In the event a service is missed during construction, the CONTRACTOR shall return to the site and perform all work necessary to reinstate the connection. The CONTRACTOR will be compensated in accordance

with the original contract unit pricing; however, re-mobilization to the site will not be paid for.

- c. Service connections shall be made only after the new main has been tested and disinfected.
- d. Only enough new service tubing shall be required to connect the new water main to the existing service line on the street side of the meter. Meter yoke, meter, meter box, etc.; are all existing and shall remain in service. Reconnection of dwellings on the opposite side of the street from the new water mains will require replacement of the service tubing through bored holes to avoid damage to the existing pavement. The bored hole shall extend a minimum of 2 feet beyond the edge of pavement on each side of the road.

B. Corporation Stop Assemblies:

1. Make connection for each different kind of water main, using suitable materials, equipment, and methods as approved by ENGINEER.
2. Provide service clamps for mains constructed of materials other than cast iron or ductile iron.
3. Location:
 - a. Screw corporation stops directly into tapped and threaded iron main at 10- and 2-o'clock positions along main's circumference.
 - b. Locate and stagger corporation stops at least 12 inches apart longitudinally.
4. Plastic Pipe Mains:
 - a. Provide full support for service clamp for full circumference of pipe, with minimum 2-inch width of bearing area.
 - b. Exercise care against crushing or causing other damage to mains at time of tapping or installation of service clamp or corporation stop.
5. Use seals or other devices such that no leaks are present in mains at points of tapping.
6. Do not backfill and cover service connections until installation has been approved by ENGINEER.

C. Bedding:

1. Excavate pipe trench and backfill in accordance with the Plan Drawings and these specifications.
2. Placement:
 - a. Place bedding material as indicated on Drawings.
 - b. Level fill materials in one continuous layer not exceeding 8 inches of compacted depth.
 - c. Compact to 95 percent maximum density.
3. Backfill around sides and to top of pipe with cover fill, tamp in place, and compact to 95 percent maximum density.
4. Maintain optimum moisture content of fill material to attain required compaction density.

D. Pipe and Fittings:

1. Maintain separation of water main from sewer piping according to state standards code.
 2. Group piping with other Site piping Work whenever practical.
 3. Install pipe to allow for expansion and contraction without stressing pipe or joints.
 4. Install access fittings to permit disinfection of water system.
 5. Thrust Restraints: Form and place concrete for thrust restraints at each elbow or change of direction of pipe.
 6. Establish elevations of buried piping with not less than three feet of cover.
 7. Pipe Markers: As specified in Section 330597 - Identification and Signage for Utilities.
 8. Backfill trench as shown on the Plan Drawings and in accordance with authorities having jurisdiction.
- E. Curb Stop Assemblies:
1. Set curb stops on compacted soil.
 2. Boxes:
 - a. Center and plumb curb boxes over curb stops.
 - b. Set box cover flush with finished grade.
- F. Water Meters: Install positive displacement meters according to AWWA M6, with isolating valves on inlet and outlet as indicated on Drawings.
- G. Backflow Preventers:
1. Install backflow preventers where indicated on Drawings and according to manufacturer instructions.
 2. Testing and Installation Requirements: Comply with local water company requirements and plumbing codes.
- H. Service Connections:
1. Install water service according to utility company requirements and as indicated on Drawings.
 2. Install water service to within 5 feet of building unless otherwise indicated.
- I. Disinfection of Water Piping System: Flush and disinfect system in accordance with authorities having jurisdiction.
- J. Installation Standards: Install Work according to municipal and state standards.
- 3.4 TOLERANCES
- A. Install pipe to indicated elevation to within tolerance of 5/8-inch.
- 3.5 FIELD QUALITY CONTROL
- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.

- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Testing:
1. Pressure test system according to AWWA C600 and following:
 - a. Test Pressure: Not less than 200 psig or 50 psi in excess of maximum static pressure, whichever is greater.
 - b. Conduct hydrostatic test for a minimum of two hours.
 - c. Slowly fill with water section to be tested, and expel air from piping at high points.
 - d. Install corporation cocks at high points.
 - e. Close air vents and corporation cocks after air is expelled.
 - f. Raise pressure to specified test pressure.
 - g. Observe joints, fittings, and valves under test.
 - h. Remove and renew cracked pipes, joints, fittings, and valves that show visible leakage. Retest.
 - i. Correct visible deficiencies and continue testing at same test pressure for additional two hours to determine leakage rate. Maintain pressure within plus or minus 5.0 psi of test pressure.
 - j. Leakage is defined as quantity of water supplied to piping as necessary to maintain test pressure during testing period.
 - k. Compute maximum allowable leakage using following formula:
 - 1) $L = SD \times \sqrt{P}/C$.
 - 2) L = testing allowance, gph.
 - 3) S = length of pipe tested, feet.
 - 4) D = nominal diameter of pipe, inches.
 - 5) P = average test pressure during hydrostatic test, psig.
 - 6) C = 148,000.
 - l. If pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size.
 - m. Leakage:
 - 1) If test of pipe indicates leakage greater than that allowed, locate source of leakage, make corrections, and retest until leakage is within allowable limits.
 - 2) Correct visible leaks regardless of quantity of leakage.
- D. Perform pressure test on water distribution system according to municipal and state standards.
- E. Compaction Testing for Bedding: Comply with ASTM D698 and in accordance with recommendations for Geotechnical Engineer. Geotechnical Engineer recommendations shall govern compaction testing requirements.
- F. If tests indicate Work does not meet specified requirements, remove Work, replace, and retest.
- G. Frequency of Compaction Tests: In accordance with local and state requirements.

END OF SECTION 331417

SECTION 333100 - SANITARY SEWERAGE PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sanitary sewerage piping.
2. Manholes.
3. Flexible couplings.
4. Flexible pipe boots for manhole pipe entrances.

1.2 DEFINITIONS

- A. Bedding: Fill placed under, beside, and directly over pipe, prior to subsequent backfill operations.

1.3 COORDINATION

- A. Coordinate Work of this Section with termination of sanitary sewer connection outside building, connection to municipal sewer utility service, and trenching.

1.4 SUBMITTALS

A. Product Data:

1. Sanitary sewerage piping.
2. Manholes.
3. Flexible couplings.
4. Flexible pipe boots for manhole pipe entrances.

- B. Source Quality-Control Reports: Indicate results of factory tests and inspections.

- C. Field Quality-Control Reports: Indicate results of CONTRACTOR-furnished tests and inspections.

- D. Qualifications Statement: For manufacturer and installer.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For sanitary sewerage piping.

1.6 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.
- B. Installers Qualifications: Company specializing in performing Work of this Section with minimum three years' documented experience.
- C. Perform Work according to 15A NCAC 02T and the following requirements:
- D. Comply with all requirements of utility OWNER.
- E. Comply with all standards of authorities having jurisdiction for public sanitary sewerage, including materials, installation, and testing.
- F. All piping materials shall bear label, stamp, or other markings of specified testing agency.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Storage:
 - 1. Store materials according to manufacturer instructions.
 - 2. Store valves in shipping containers with labeling in place.
- C. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Block individual and stockpiled pipe lengths to prevent moving.
 - 3. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Perform Work according to:
 - 1. The State Department of Transportation standards.
 - 2. The Municipal Department of Public Works standards.
 - 3. The above standards shall be in the state and municipality in which construction takes place.

2.2 SANITARY SEWERAGE PIPING

- A. Ductile-Iron Pipe:

1. Comply with AWWA C151.
 2. Minimum Pressure Class: 150, unless otherwise specified.
 3. Minimum Special Thickness Class: 50.
 4. End Connections: Bell and spigot.
 5. Outside Coating:
 - a. Type: Asphaltic.
 - b. Minimum Uniform Thickness: 1 mil.
 - c. Comply with AWWA C151.
 6. Cement-Mortar Lining: Comply with AWWA C104.
 7. Lining:
 - a. Seal coating applied to lining at following thickness:
 - 1) Nominal Pipe Sizes 6 through 12 Inches (150 through 300 mm): 1/8 inch.
 - 2) Nominal Pipe Sizes 14 through 24 Inches (250 through 600 mm): <Insert> inch.
 8. Asphaltic Sealcoat Lining:
 - a. Minimum Uniform Thickness: 1 mil.
 - b. Comply with AWWA C104.
 9. PE Encasement: Comply with AWWA C105.
 10. Fittings:
 - a. Material: Ductile iron, Class 50 or greater.
 - b. Comply with AWWA C110.
 - c. Lining: Cement-mortar lined according to AWWA C104.
 11. Joints:
 - a. Rubber gasket joint devices.
 - b. Comply with AWWA C111.
- B. Plastic Pipe:
1. Material: PVC.
 2. Comply with ASTM D3034, SDR-35.
 3. Inside Nominal Diameter: As indicated on the Drawings.
 4. End Connections: Bell and spigot with solvent-sealed ends.
 5. Fittings: PVC.
 6. Joints:
 - a. Solvent welded with solvent cement conforming to ASTM D2564.
 - b. Comply with ASTM F477.

2.3 MANHOLES

- A. As specified in Section 330561 "Concrete Manholes."

2.4 FLEXIBLE COUPLINGS

- A. Manufacturers:
 - 1. Fernco Inc.
 - 2. Romac Industries, Inc.
- B. Material: Resilient, chemical-resistant, elastomeric PVC.
- C. Attachment: Two Series-300 stainless-steel clamps, screws, and housings.

2.5 FLEXIBLE PIPE BOOTS FOR MANHOLE PIPE ENTRANCES

- A. Manufacturers:
 - 1. A-Lok.
 - 2. Press-Seal Corporation.
- B. Material: EPDM.
- C. Comply with ASTM C923.
- D. Attachment: Series-300 stainless-steel clamp and hardware.

2.6 MATERIALS

- A. Bedding and Cover: As specified on the Plan Drawings and in accordance with authorities having jurisdiction.

2.7 ACCESSORIES

- A. Pipe Markers: In accordance with authorities having jurisdiction.

2.8 SOURCE QUALITY CONTROL

- A. Provide shop inspection and testing of pipe.
- B. Certificate of Compliance:

1. If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.
2. Specified shop tests are not required for Work performed by approved manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify that excavation base is ready to receive Work of this Section.
- C. Verify that excavations, dimensions, and elevations are as indicated on Drawings.
- D. Examine roughing-in for sanitary sewerage piping to verify actual locations of piping connections before installation.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Correct over-excavation with in accordance with the Drawings and authorities having jurisdiction.
- B. Remove large stones or other hard materials that could damage pipe or impede consistent backfilling or compaction.
- C. Protect and support existing sewer lines, utilities, and appurtenances.
- D. Utilities:
 1. Maintain profiles of utilities.
 2. Coordinate with other utilities to eliminate interference.
 3. Notify ENGINEER if crossing conflicts occur.

3.3 INSTALLATION OF SANITARY SEWERAGE PIPING

- A. Bedding:
 1. Excavate pipe trench as specified in Section 312316.13 "Trenching".
 2. Place bedding material at trench bottom.
 3. Level materials in continuous layer not exceeding 8 inches.
 4. Maintain optimum moisture content of bedding material to attain required compaction density.
- B. Piping:

1. Install pipe, fittings, and accessories according to ASTM D2321, and seal joints watertight.
2. Lay pipe to slope gradients as indicated on Drawings.
3. Begin at downstream end of system and progress upstream.
4. Bedding: In accordance with Plan Drawings and authorities having jurisdiction.
5. Lay bell-and-spigot pipe with bells upstream.
6. Backfill and compact as specified in Section 312316.13 "Trenching."
7. Do not displace or damage pipe when compacting.
8. Connect to municipal sewer system.
9. Pipe Markers: In accordance with Plan Drawings and authorities having jurisdiction.
10. Install Site sanitary sewage system piping to within 5 feet of building.

C. Manholes: As specified in Section 330561 "Concrete Manholes."

D. Backfilling:

1. As specified in Section 312323 "Fill."
2. Backfill around sides and to top of pipe with cover fill in minimum lifts of 8 inches.
3. Tamp fill in place, and compact to 95 percent of maximum density.
4. Place and compact material immediately adjacent to pipes to avoid damage to pipe and prevent pipe misalignment.
5. Maintain optimum moisture content of bedding material as required to attain specified compaction density.

3.4 TOLERANCES

A. Maximum Variation from Indicated Slope: 1/8 inch in 10 feet.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Request inspection by ENGINEER prior to and immediately after placing bedding.

C. Tests and Inspections:

1. If tests indicate that Work does not meet specified requirements, remove Work, replace, and retest.
2. Perform testing on Site sanitary sewage system according to local code.
3. Pipe Testing:
 - a. Pressure Testing: As specified and in accordance with authorities having jurisdiction.
 - b. Infiltration and Exfiltration Testing: As specified and in accordance with authorities having jurisdiction.
 - c. Deflection Testing: As specified and in accordance with authorities having jurisdiction.
4. Compaction Testing:

- a. Comply with ASTM D698.
 - b. Testing Frequency: As specified and in accordance with authorities having jurisdiction..
5. Sanitary sewerage piping system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.6 PROTECTION

- A. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.
- B. Cap open ends of piping during periods of Work stoppage.

END OF SECTION 333100