Bid Invitation
for
The City of Wilmington

10TH STREET AND GRACE STREET INTERSECTION IMPROVEMENTS

PAV-IH-0724

PROJECT MANAGER
Zach Roman, PE,
Email: zach.roman@wilmingtonnc.gov
Phone: 910-777-3332

PROJECT DIRECTOR
Aaron T. Beckner, PE
Email: aaron.beckner@wilmingtonnc.gov
Phone: 910-341-0062

SUBMIT BIDS TO
Christine R. Karem, Sr. Contract Specialist – M/WBE Coordinator
929 North Front Street
P O Box 1810
Wilmington, NC 28401
Phone: 910-765-0463
Email: christine.karem@wilmingtonnc.gov

Date Issued: August 12, 2024

Pre-Bid Conference: August 20, 2024 @ 10:00 AM

Date Due: Thursday, September 5, 2024 @ 3:00 PM

10th STREET AND GRACE STREET
INTERSECTION IMPROVEMENTS
PAV-IH-0724

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ADVERTISEMENT FOR BIDS
CITY OF WILMINGTON, NC
10th STREET AND GRACE STREET
INTERSECTION IMPROVEMENTS
CONTRACT #: PAV-IH-0724

Pursuant to North Carolina General Statute 143-129, sealed proposals addressed to the CONTRACT SPECIALIST, P. O. Box 1810, 929 North Front Street, 10th Floor, Wilmington, NC 28402, and marked **"10th STREET AND GRACE STREET INTERSECTION IMPROVEMENTS"** will be received until **3:00 P.M., Thursday September 05, 2024**, at which time they will be publicly opened and read at the Purchasing Division, 929 North Front Street, Room 154-B,Wilmington, NC. The City will receive SINGLE PRIME BIDS ONLY for this project. All firms submitting bids for the proposed work must be properly licensed under Chapter 87, N. C. General Status. The Bidder's license number must appear on the outside of the envelope.

Project Description: The project will consist improvements to an existing intersection including: the removal of unused asphalt area; construction of new curb and sidewalk; construction of a storm water bio-retention cell; milling and overlay of existing asphalt; new storm water catch basins and pipes; and other associated items. **Potential Subcontract** opportunities which may exit on this project include, but may not be limited to concrete, milling, asphalt, materials, and other incidentals. Potential subcontractors may secure a list of potential prime contractors from the City's website, www.wilmingtonnc.gov.

In accordance with the City of Wilmington's Minority/Disadvantaged Business Policy, the bidder shall make good faith efforts, as defined by the Bid Specifications, to subcontract 14% of the dollar value of the prime contract to businesses which are at least 51% owned and controlled by minority, socially, and/ or economically disadvantaged individuals (MBE/DBE's). A complete copy of the City of Wilmington's MBE/WBE policy is available for inspection at the Purchasing Manager's Office. If the bidder fails to achieve the contract goal stated herein, it is required to provide documentation demonstrating that it made a good faith effort in attempting to meet the established goals. A bid which fails to meet these requirements will be considered non-responsive and will be rejected.

A Pre-Bid Conference will at held at 929 North Front Street Room 154-B, Wilmington, NC, August 20, 2024 at 10:00 AM.

Contact Raquel I. Perez at raquel.perez@wilmingtonnc.gov for an electronic version of the Specifications and bid documents or use the button at the bottom of the home page to request bid documents and RSVP to the Pre-Bid Conference.

The City of Wilmington does not discriminate of the basis of race, sex, color, age, national origin, religion or disability in its employment opportunities, programs, services, or activities.

Bids for this project shall be guaranteed by all bidders for a period of 90 calendar days following the bid opening. **The City of Wilmington Reserves the Right to Reject any and all Bids.**

Christine R. Karem
Sr. Contract Specialist-M/WBE Coordinator
August 12, 2024

BIDDER'S CHECKLIST

1. READ AND UNDERSTAND ALL SPECIAL NOTICES.

2. SIGN AFFIDAVIT OF NON-COLLUSION A-1 AND A-2.
   HAVE THIRD PARTY NOTARIZE PAGE A-3

3. SIGN AFFIDAVIT OF COMPLIANCE WITH NC E-VERIFY STATUTES

4. READ AND UNDERSTAND MBE/DBE PROVISIONS MBE-1 TO MBE-4.

5. COMPLETE, SIGN AND SUBMIT WITH THE BID, AFFIDAVIT A "AFFIDAVIT OF GOOD FAITH COMPLIANCE" LISTING OF THE GOOD FAITH EFFORT INDICATING ALL ACTIONS UNDERTAKEN, AS DESCRIBED IN THE FORM, TO RECRUIT MINORITY PARTICIPATION ON THIS PROJECT. (AFFIDAVIT A)

6. SUBMIT A LISTING OF PARTICIPATING SUBCONTRACTORS AND SUPPLIERS.

7. PORTION OF WORK TO BE PERFORMED BY M/WBE FIRMS (AFFIDAVIT C)

8. BIDDERS GOOD FAITH EFFORTS (AFFIDAVIT D)

9. LIST ALL FIRMS CONTACTED TO PERFORM SUBCONTRACT WORK IN ACCORDANCE WITH THE SPECIAL NOTICE. (Subcontractor Contact Schedule)

10. COMPLETE THE PROPOSAL SECTION AND SIGN.

11. ALL ADDENDA ISSUED FOR THIS PROJECT HAVE BEEN SIGNED OR ACKNOWLEDGED ON THE PROPOSAL PAGE.

12. THE BID SURETY IS ENCLOSED AND PROPERLY EXECUTED.
    REFERENCE PARAGRAPH G-1.04.2, PAGE G-2.

13. BID ENVELOPE SEALED AND MARKED WITH THE BIDDERS NAME, LICENSE NUMBER, PROJECT NAME AND NUMBER. NOTE: MULTIPLRIME AND SINGLE PRIME BIDS FROM THE SAME BIDDER MUST BE IN SEPARATE CLEARLY MARKED ENVELOPES.

14. ENVELOPE ADDRESSED AND MARKED:

    SR. CONTRACT SPECIALIST
    CITY OF WILMINGTON
    PO BOX 1810
    929 N FRONT STREET, 10th FLOOR
    WILMINGTON, NC 28402
    BID NAME: **10th STREET AND GRACE STREET INTERSECTION IMPROVEMENTS**

15. THE BID MUST BE MAILED OR DELIVERED TO THE ABOVE ADDRESS SO THAT RECEIPT IS PRIOR TO THE TIME AND DATE OF THE BID OPENING. BIDS RECEIVED AFTER THE SPECIFIED TIME WILL NOT BE CONSIDERED. THE CITY OF WILMINGTON ASSUMES NO RESPONSIBILITY FOR MAIL DELIVERY.

SPECIAL NOTICE TO ALL BIDDERS

MARCH 23, 1990

1. Bid Rigging Affidavit

In accordance with the City of Wilmington's Bid Rigging and Conflict of Interest Ordinances, an Affidavit and Certificate of Non-Collusion and Non-Suspension is enclosed, Pages A-1, A-2 and A-3. The affidavit must be properly filled out, sealed and attested in order for your bid to be considered.

2. Subletting

Paragraph G-1.15, SUBLETTING OR ASSIGNMENT OF CONTRACT, of the City's General Specifications. All bidders must submit with their bid a listing of subcontractors contacted to submit proposals for this project. The listing must indicate the subcontractors to be used, the dollar amount of the proposed subcontract work, and type of work to be performed. If no subcontractors are to be utilized, this must be specified. This must be submitted at the time of the bid opening in order for the bid to be considered.

If subcontract firms are contacted but their proposals rejected for any reason the bidder must complete the justification form included in the bid document.

3. The City reserves the right to waive any immaterial defects in the bid documents.

4. Minority Business Policy

The MBE/WBE/HUB/DBE statement, MBE-4, must be properly filled out in order for your bid to be considered.

5. Federal Funding

This project may be funded in whole or in part with Federal funds and all bidders are advised to pay strict attention to the Federal requirements which may be attached. Bid packages which include Affirmative Action under Section 3 require that each bidder submit with his bid an Affirmative Action Plan. The City will not require bidders to submit their plan with the bid. However, it will be required and must be submitted by the lowest responsible bidder and approved by the City prior to beginning work.

Paragraph 5 applies only if Federal Regulations are included in the Bid Documents.

If you have any questions concerning these requirements, please contact my office.

Daryle L. Parker
Purchasing Manager

Rev: 3/2020

STATE OF NORTH CAROLINA

COUNTY OF NEW HANOVER

AFFIDAVIT AND CERTIFICATE OF
NON-COLLUSION, NON-SUSPENSION AND NON-CONVICTION

The undersigned, being first duly sworn, deposes and says:

1. I understand that for the purposes of this affidavit, the term "bidder" shall include the person(s), firm(s), or corporation(s) signing this affidavit, the undersigned's subcontractor(s), subsidiary(ies) and affiliate(s) and any officer, director, employee or agent of the bidder; and the term "conviction" shall include guilty pleas, pleadings of nolo contendere and similar pleas.

2. This Affidavit and Certificate is made in accordance with Article 3 of Chapter 133 of the North Carolina General Statutes; I certify that this proposal is made without prior understanding, agreement, or connection with any person(s), firm(s), or corporation(s) making bids or proposals; I further certify that the bidder has not entered into any agreement with any other bidder or prospective bidder or with any other person(s), firm(s) or corporation(s) relating to the price named in said proposal, nor any agreement or arrangement under which any person(s), firm(s) or corporation(s) is to refrain from bidding, nor any agreement or arrangement for any act or omission in restraint of free competition among bidders; I understand collusive bidding is a violation of state and federal law and can result in fines, prison sentences, and civil damage awards; and I further certify that the bidder will abide by all terms of this bid or proposal.

3. The bidder is not suspended or debarred from bidding by any federal or state governmental agency that is providing funds for this contract.

4. The bidder is not presently charged in an indictment or information with engaging in any conspiracy, combination, or other unlawful act in restraint of trade or any similar charges in any federal court or a court of this or any other state.

5. The bidder, within one year immediately preceding the date of this affidavit, has not been convicted of charges or engaging in any conspiracy, combination, or other unlawful act in restraint of trade or similar charges in any federal court or a court of this or any other state.

6. If, during the time of this proposal, from the date advertised to the date bids are opened, the bidder is indicted or convicted of bid-rigging, I understand this proposal shall be rejected and not considered for award.

7. I hereby affirm that all information contained in this affidavit is true, correct, accurate and complete, and any untrue, incorrect, inaccurate or incomplete statements will result in the disqualification and rejection of this proposal. I certify that I am authorized to sign this bid and to make the representations set forth herein on behalf of myself and the bidder.

This the _____ day of _____, 2024.

COMPANY NAME _____

BY: _____
(Owner, Partner, or Corporate President, Vice President or Assistant Vice President only)

ATTEST:

_____
(Secretary, Assistant Secretary, Cashier or Assistant Cashier only)

(CORPORATE SEAL)

(TO BE EXECUTED ON BEHALF OF THE CONTRACTOR)

STATE OF _____

COUNTY OF _____

I, _____, a Notary Public, certify that
(Name)
_____ personally came
(Name of Secretary, Assist. Sec., Cashier, Assist. Cashier)

before me this day and acknowledged that he (she) is _____
(Secretary, Assist. Sec.,
_____ of _____, a
Cashier, Assist. Cashier) (Name of Corporation)

corporation, and that by authority duly given and as the act of the corporation, the foregoing Affidavit was signed in its name by its _____,
(President, Vice President, Assist. Vice President)

sealed with its corporate seal, and attest by himself (or herself) as its

_____.
(Secretary, Assist. Sec., Cashier, Assist. Cashier)

WITNESS my hand and official seal, this the _____ day of _____, 2024.

_____
Notary Public

My Commission Expires: _____

(NOTARY SEAL)

Rev. 3/98 AFF-MBE.DOC

STATE OF NORTH CAROLINA

COUNTY OF NEW HANOVER

AFFIDAVIT of COMPLIANCE with N.C. E-VERIFY STATUTES

I, _____ (hereinafter the "Affiant"), duly authorized by and on behalf of _____ (hereinafter the "Employer") after being first duly sworn deposes and says as follows:

1. I am the _____ (President, Manager, CEO, etc.) of the Employer and possess the full authority to speak for and on behalf of the Employer identified above.

2. Employer understands that "E-Verify" means the federal E-Verify program operated by the United States Dept. of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law.

3. ____ Employer employs 25 or more employees in the State of North Carolina, and is in compliance with the provisions of N.C. Gen. Stat. §64-26. Employer has verified the work authorization of its employees through E-Verify and shall retain the records of verification for a period of at least one year.

____ Employer employs fewer than 25 Employees and is therefore not subject to the provisions of N.C. Gen. Stat. §64-26.

4. All subcontractors engaged by or to be engaged by Employer have or will have likewise complied with the provisions of N.C. Gen. Stat. §64-26.

5. Employer shall keep the City of Wilmington informed of any change in its status pursuant to Article 2 of Chapter 64 of the North Carolina General Statutes.

Further this affiant sayeth not.

This the _____ day of _____, 20____.

_____
Affiant

STATE OF NORTH CAROLINA
COUNTY OF _____

Sworn to and subscribed before me, this the _____ day of _____, 20____.

_____ [NOTARY SEAL]
Notary Public

My commission expires: _____

CITY OF WILMINGTON

MBE/WBE/HUB/DBE POLICY STATEMENT

SPECIAL NOTICE

1. ALL FIRMS SUBMITTING BIDS FOR THIS PROJECT MUST MAKE A GOOD FAITH EFFORT, AS DEFINED ON PAGES MBE-1 TO MBE-3, TO SUBCONTRACT 14% OF THE WORK TO CERTIFIED MBE/WBE/HUB/DBE FIRMS. THIS REQUIREMENT APPLIES EVEN THOUGH THE BIDDER HAS THE CAPABILITY OF PERFORMING ALL WORK WITH HIS OWN FORCES OR IF THE BIDDER IS A CERTIFIED MBE/WBE CONTRACTOR.

2. **AS PART OF THE SUBMITTED BID DOCUMENT BIDDERS MUST SUBMIT A LISTING OF ALL SUBCONTRACTORS CONTACTED OR ATTEMPTED TO CONTACT FOR WORK ON THIS CONTRACT. THE LIST MUST INCLUDE THE FIRM NAME, CONTACT PERSON, PHONE NUMBER, TYPE OF SUBCONTRACT WORK, INDICATION AS TO MBE/WBE/HUB/DBE FIRM OR NON-MBE/WBE/HUB/DBE FIRM, AND DOLLAR AMOUNT OF THE WORK. THE LISTING MUST INDICATE THE FIRM TO BE UTILIZED FOR THE SUBCONTRACT WORK. A FORM IS INCLUDED HEREIN FOR THIS LISTING.**

A FORM IS INCLUDED HEREIN FOR THIS PURPOSE HOWEVER, BIDDERS MAY SUBMIT THE DATA ON THEIR OWN FORM.

3. AS PART OF THE SUBMITTED BID DOCUMENTS, ALL BIDDERS MUST SUBMIT, THE ENCLOSED "AFFIDAVIT OF GOOD FAITH COMPLIANCE". THE AFFIDAVIT MUST INCLUDE EVIDENCE OF THE GOOD FAITH EFFORTS MADE BY THE BIDDER TO CONTRACT WITH AND HIRE MBE/WBE/HUB/DBE FIRMS AS SUBCONTRQACTORS FOR THIS PROJECT.

A LISTING OF GOOD FAITH EFFORTS THAT THE CITY WILL REVIEW AND CONSIDER IS CONTAINED IN THE BID DOCUMENT.

"The bidder/proposer shall make good faith efforts, as defined in the bid specifications, to subcontract **14%** percent of the dollar value of the prime contract to business owned and/or controlled by minority, socially, and or economically disadvantaged individuals (MBE/WBE/HUB/DBE's).

Bidders are required to submit information concerning MBE/WBE/HUB/DBE's which will participate in the contract. The information will include (1) name and address of each MBE/WBE/HUB/DBE; (2) a description of the work to be performed by named firm; and (3) the dollar value of the work of the contract. If the bidder fails to achieve the contract goal stated herein, it is required to provide documentation demonstrating that it made good faith efforts in attempting to meet established goals. A bid that fails to meet these requirements will be considered non-responsive."

MBESUPP 6/93

SPECIAL PROVISION
MINORITY/DISADVANTAGED BUSINESS ENTERPRISE PROGRAM
CITY OF WILMINGTON, NC

POLICY:

It is the policy of the City of Wilmington that MBE/WBE/HUB/DBE enterprises as defined in NCGS 143-128(g)(1)(2) and (3) shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part by City funds under this agreement. Consequently, the MBE/WBE/HUB/DBE requirements of NCGS 143-128 apply to this bid and any subsequent contract.

MBE/WBE/HUB/DBE OBLIGATION:

The City and its contractor agree to ensure that MBE/WBE/HUB/DBE's have the maximum opportunity to participate in the performance of contract and subcontracts financed in whole or in part with City of Wilmington funds provided under this agreement. In this regard, bidders and contractors shall take all necessary and reasonable steps in accordance with NCGS 143-128 to ensure that MBE/WBE/HUB/DBE firms have the maximum opportunity to compete and perform under this bid, any change orders and any subsequent contract. The City of Wilmington and its contractors shall not discriminate on the basis of race, color, national origin, or sex in the award and/or performance of this contract.

NOTICE:

All bidders, potential contractors, or subcontractors for this contract are hereby notified that failure to carry out the City of Wilmington policy and MBE/WBE/HUB/DBE obligation, as set forth herein, shall constitute a breach of contract which may result in the termination of the contract or other such remedy as deemed appropriate by the City.

SUBCONTRACT CLAUSES:

All bidders and potential contractors hereby assure the City that they will include the above clauses in all subcontracts which offer further subcontracting opportunities. The terms, conditions and requirements of each contract between the contractor and each subcontractor performing work under a subdivision of branch of work listed in the bid documents shall incorporated by reference the terms, conditions and requirements of this contract between the CITY and the CONTRACTOR.

CONTRACT AWARD:

Bidders are hereby advised that meeting the MBE/WBE/HUB/DBE subcontract goals or making a "GOOD FAITH EFFORT" as defined below to meet such goals are conditions for being awarded this contract. The City proposes to award the contract to the lowest responsible bidder submitting a reasonable bid, provided s/he has made a "GOOD FAITH EFFORT" as defined below to meet the established MBE/WBE/HUB/DBE participation goals.

Bidders are advised that the City has the sole authority to determine if the bidder has made a "GOOD FAITH EFFORT" toward meeting the MBE/WBE/HUB/DBE goals to qualify for contract award. The City reserves the right to reject any and all bids submitted.

SUBSTITUTION OF MBE/WBE/HUB/DBE SUBCONTRACTORS
MBE/WBE/HUB/DBE firms identified in the bid document may not be substituted or replaced without just cause and only with the written approval of the CITY. If a substitution is agreed to by the CITY, the CONTRACTOR must make a good faith effort to replace the MBE/WBE/HUB/DBE with another MBE/WBE/HUB/DBE firm.

MBE/WBE/HUB/DBE SUBCONTRACT GOALS:

The attainment of goals established for this contract are to be measured as a percentage of the total dollar value of the contract. The goals established for this contract are as follows:14%* MBE/WBE/HUB/DBE *
*MBE/WBE/HUB/DBE GOALS ARE ACCOMPLISHED VIA SUBCONTRACTS PERFORMED BY CERTIFIED BUSINESSES. SUBCONTRACTS MAY INCLUDE SUPPLYING OF MATERIALS.

AVAILABLE MBEWBE/HUB/DBE's

MBE/WBE/HUB/DBE firms may be utilized by the bidder provided they meet the minimum requirements as established by NCGS 143-128 and are certified seven (7) days prior to award in accordance with the MBE/WBE/HUB/DBE program.

Bidders may access the N. C. Dept. of Administration, NCDOT web site for certified firms. Failure to achieve the goal and failure to contact known MBE/WBE/HUB/DBE firms on all lists referenced herein may not qualify as a good faith effort to identify and hire MBE/WBE/HUB/DBE firms.

MBE/WBE/HUB/DBE firms certified by the Department of Transportation or Department of Administration may be counted toward to established goal.

Firms listed by the bidder as certified which are not on the Department of Transportation or Department of Administration's list of certified firms must provide evidence of certification.

CONTRACTORS REQUIRED SUBMISSIONS:

If the bidder fails to meet the contract goals established herein, s/he must submit information, which will assist the City in determining whether or not the bidder made acceptable "GOOD FAITH EFFORTS" to meet the contract goals. **Failure to meet the goals by lack of "GOOD FAITH EFFORTS" will disqualify the bidder's proposal**.

The bidder shall complete all forms included herein which pertain the verification of MBE/WBE/HUB/DBE participation and/or good faith efforts made as part of the bid.

DEFINITION
"GOOD FAITH EFFORT"

In accordance with the North Carolina Administrative Code 01-NCAC 301.0101 and the North Carolina General Statutes, the bidder must earn a minimum of 50 points from the good faith efforts listed below in order to be deemed to have made a good faith effort. If the bidder meets the 14% goal, the bidder shall be deemed to have met the good faith effort.

The following is a list of items which the contractor and the city may use in making a determination as to the acceptability of contractors "GOOD FAITH EFFORT" in meeting the goals established herein.

(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 of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses. **10 POINTS**

(5) Attending any prebid 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. Any rejection of a minority business based on lack of qualification should have the reasons 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**

PAY REQUESTS AND MAINTENANCE OF RECORDS:

The contractor shall maintain adequate records of the MBE/WBE/HUB/DBE's performance and payments and shall submit regular reports to the City. These reports shall be sent with the contractors monthly "REQUEST FOR CONTRACT PAYMENT". The request shall include a breakdown of the amount of the payment to be made by the City which will be paid to the MBE/WBE/HUB/DBE's identified in the bid documents.

PROHIBITED AGREEMENTS:

Agreements between the bidder/proposer and a MBE/WBE/HUB/DBE in which the MBE/WBE/HUB/DBE promises not to provide subcontracting quotations to other bidders/proposers are prohibited.

ATTACH THIS PAGE TO THE BID

City of Wilmington - AFFIDAVIT A – **"AFFIDAVIT OF GOOD FAITH COMPLIANCE"**

Listing of the Good Faith Effort

Affidavit of_____
(Name of Bidder)

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

The bidder must earn a minimum of 50 points from the good faith efforts listed below in order to be deemed to have made a good faith effort.

- ☐ **1** - 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. **10 points**
- ☐ **2**.-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. **10 points**
- ☐ **3** - Broken down or combined elements of work into economically feasible units to facilitate minority participation. **15 points**
- ☐ **4** - 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. **10 points**
- ☐ **5** - Attended prebid meetings scheduled by the public owner. **10 points**
- ☐ **6** - Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors. **20 points**
- ☐ **7** - 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. **15 points**
- ☐ **8** - 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. **25 points**
- ☐ **9** - 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. **20 points**
- ☐ **10** - Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands. **20 points**

Total Points _____

In accordance with GS143-128.2(d) the undersigned will enter into a formal agreement with the firms listed in the Identification of Minority Business Participation schedule conditional upon execution of a contract with the Owner. 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:_____

SEAL

State of _____, County of_____
Subscribed and sworn to before me this _____day of _____2024
Notary Public_____
My commission expires _____

City of Wilmington - AFFIDAVIT C - Portion of the Work to be Performed by Minority Firms

**********(NOTE: THIS FORM IS NOT TO BE SUBMITTED WITH THE BID PROPOSAL)*********

If the portion of the work to be executed by minority businesses as defined in GS143-128.2(g) is equal to or greater than 14% 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	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**)

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:_____

SEAL

Signature:_____

Title:_____

State of _____, County of _____
Subscribed and sworn to before me this _____ day of _____ 2024
Notary Public_____
My commission expires_____

City of Wilmington AFFIDAVIT D – Good Faith Efforts

**********(NOTE: THIS FORM IS NOT TO BE SUBMITTED WITH THE BID PROPOSAL)**********

If the goal of 14% participation by minority business **is not** achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts. This affidavit shall be provided by the apparent lowest responsible, responsive bidder within **72 hours** after notification of being low bidder.

Affidavit of: _____
(Name of Bidder)

Project Name: _____

I do certify the attached documentation as true and accurate representation of my good faith efforts.
(Attach additional sheets if required)

Name and Phone Number	*Minority Category	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**)

Documentation of the Bidder's good faith efforts to meet the goals set forth in these provisions. Examples of documentation include, but are not limited to, the following evidence:

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.

Date:_____ Name of Authorized Officer:_____

Signature:_____

Title:_____

SEAL

State of _____, County of _____

Subscribed and sworn to before me this _____ day of _____ 2024

Notary Public_____

My commission expires _____

POTENTIAL SUBCONTRACTING OPPORTUNITIES

CONTRACT NAME: **10th Street and Grace Street Intersection Improvements**

CONTRACT NUMBER: **PAV-IH-0724**

WORK ITEM DESCRIPTION: **Improvements to an existing intersection including: the removal of unused asphalt area; construction of new curb and sidewalk; construction of a storm water bio-retention cell; milling and overlay of existing asphalt; new storm water catch basins and pipes; and other associated items.**

THE ABOVE LISTED AREAS OF SUBCONTRACT OPPORTUNITIES ARE THE AREAS THAT HAVE BEEN IDENTIFIED BY THE CITY STAFF AND/OR THE CITY CONSULTANTS FOR THE ABOVE REFERENCED PROJECT.

THE LIST IS BY NO MEANS EXHAUSTIVE AND BIDDERS ARE ENCOURAGED TO SEARCH FOR OTHER AREAS OF POTENTIAL SUBCONTRACTING OPPORTUNITIES. THE BIDDERS EFFORTS IN THIS REGARD WILL ALSO BE A CONSIDERATION IN THE CITY'S REVIEW OF THE GOOD FAITH EFFORT.

IF THERE ARE NO IDENTIFIED AREAS OF POTENTIAL SUBCONTRACT OPPORTUNITIES FOR A PARTICULAR CONTRACT THEN THE BIDDER MUST MAKE A GOOD FAITH EFFORT TO IDENTIFY OTHER AREAS OF POTENTIAL SUBCONTRACT WORK.

THE REQUIREMENT TO MAKE A "GOOD FAITH EFFORT" APPLIES TO ALL CONTRACTS ESTIMATED BY THE CITY TO BE IN EXCESS OF $100,000. THE POLICY DOES NOT APPLY TO CONTRACTS BELOW $100,000.

THE CONTRACT GOAL FOR MBE/WBE/HUB/DBE PARTICIPATION IS 14%.

MBE/WBE/HUB/DBE Web Sites

North Carolina Department of Administration
www.doa.state.nc.us/hub

North Carolina Department of Transportation
www.ncdot.org

Bidders should furnish evidence as part of the post bid submittal that the above referenced web sites were used in attempting to contact MBE/WBE/HUB/DBE firms and as part of their good faith efforts.

REPORT OF PARTICIPATING SUBCONTRACTORS AND SUPPLIERS

Please supply data for all subcontractors and suppliers, whose services will be utilized on the project being bid upon by your firm. This document must be completed and submitted along with the bid proposal.

BIDDER'S NAME__________________________________ PROJECT: __________________________________

BID IS FOR: GENERAL CONSTRUCTION ( ); ELECTRICAL ( ); HVAC ( ); PLUMBING ( )
AMOUNT OF BID $____________________ VALUE OF SUBCONTRACTS $____________________

PERCENTAGE OF **CERTIFIED** **MBE/WBE/HUB/DBE** PARTICIPATION
_______________%

CERTIFIED MBE/WBE/HUB/DBE SUBCONTACTORS AND SUPPLIERS:

NAME OF FIRM: _____________________________________ PHONE: _______________________________
ADDRESS: _____________________________________ OWNER'S NAME:
____
_____________________________________ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ ________________________________ % OF TOTAL __________

==

NAME OF FIRM: _____________________________________ PHONE: _______________________________
ADDRESS: _____________________________________ OWNER'S NAME: _______________________
_____________________________________ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ ________________________________ % OF TOTAL __________

==

NAME OF FIRM: ____________________________________ PHONE: _______________________________
ADDRESS: _____________________________________ OWNER'S NAME: _______________________
_____________________________________ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ ________________________________ % OF TOTAL __________

==

NAME OF FIRM: ____________________________________ PHONE: ________________________________
ADDRESS: _____________________________________ OWNER'S NAME: _______________________
_____________________________________ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ ________________________________ % OF TOTAL __________

==

NAME OF FIRM: ____________________________________ PHONE: _______________________________
ADDRESS: _____________________________________ OWNER'S NAME: ________________________
_____________________________________ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ ________________________________ % OF TOTAL __________

==

NAME OF FIRM: ____________________________________ PHONE: ________________________________
ADDRESS: _____________________________________ OWNER'S NAME: ________________________
_____________________________________ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ ________________________________ % OF TOTAL __________

==

NAME OF FIRM: ____________________________________ PHONE: ________________________________
ADDRESS: _____________________________________ OWNER'S NAME: _______________________
_____________________________________ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ ________________________________ % OF TOTAL __________

PLEASE LIST BELOW ALL OTHER SUBCONTRACTORS AND SUPPLIERS AND NON-CERTIFIED MBE/WBE/HUB/DBE's.

PERCENTAGE OF OTHER SUBCONTRACTORS, SUPPLIERS AND NON-CERTIFIED MBE/WBE/HUB/DBE's ____________________%

OTHER SUBCONTRACTORS & SUPPLIERS AND NON-CERTIFIED MBE/WBE/HUB/DBE's:

NAME OF FIRM: ____ PHONE: ______________________________
ADDRESS: ____ OWNER'S NAME: ______________________
____ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ __________________________________ % OF TOTAL __________
===

NAME OF FIRM: ____ PHONE: ______________________________
ADDRESS: ____ OWNER'S NAME: ______________________
____ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ __________________________________ % OF TOTAL __________
===

NAME OF FIRM: ____ PHONE: ______________________________
ADDRESS: ____ OWNER'S NAME: ______________________
____ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ __________________________________ % OF TOTAL __________
===

NAME OF FIRM: ____ PHONE: ______________________________
ADDRESS: ____ OWNER'S NAME: ______________________
____ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ __________________________________ % OF TOTAL __________
===

NAME OF FIRM: ____ PHONE: ______________________________
ADDRESS: ____ OWNER'S NAME: ______________________
____ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ __________________________________ % OF TOTAL __________
===

NAME OF FIRM: ____ PHONE: ______________________________
ADDRESS: ____ OWNER'S NAME: ______________________
____ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ __________________________________ % OF TOTAL __________
===

NAME OF FIRM: ____ PHONE: ______________________________
ADDRESS: ____ OWNER'S NAME: ______________________
____ ( ) SUBCONTRACTOR ( ) SUPPLIER
WORK/SERVICE TO BE PERFORMED: ____
AMOUNT TO BE PAID $ __________________________________ % OF TOTAL __________

COMPLETE AND SUBMIT ALONG WITH AFFIDAVIT C OR AFFIDAVIT D

In order for the City to determine the Good Faith Effort performed by the bidder, the bidder must list ALL firms contacted to perform subcontract work for the project.

SUBCONTRACT CONTACT SCHEDULE

PRIME CONTRACTOR: _____
PROJECT NAME: _____
DATE: _____

DATE CONTACTED	NAME & ADDRESS OF PERSON/BUSINESS CONTACTED	PHONE NUMBER	SERVICE PROVIDED	PERSON MAKING CONTACT	CERTIFIED MBE/WBE/HUB/DBE/WBE? YES/NO	RESPONSE	PRICE QUOTED

I HEREBY CERTIFY THAT THE SUBCONTRACTORS LISTED ABOVE WERE CONTACTED BY MY FIRM, AND REQUESTED TO SUBMIT QUOTES ON THE ABOVE REFERENCED PROJECT. ALL INTERESTED SUBCONTRACTORS WERE NEGOTIATED WITH IN GOOD FAITH.

I hereby certify that the above referenced information is true and accurate.
Inaccurate information provided in the bid document will be reported to the North Carolina Attorney General's office and result in investigations and/or legal action against the bidder.

SIGNED: _____ TITLE: _____ COMPANY: _____

GENERAL PROVISIONS
Section G

INSTRUCTION TO BIDDERS

SPECIAL NOTICE

G-1.01 The name of a certain brand, make, manufacturer, or definite specification is to denote the quality standard of the article desired, but does not restrict bidders to the specific brand, make, manufacturer, or specification named; it is to set forth and convey to the prospective bidders the general style, type, character, and quality of the article desired.

G-1.02 The award of each contract will be made to the lowest responsible bidder as soon as practicable; provided, that in the selection of equipment or materials a contract may be awarded to a responsible bidder other than the lowest in the interest of standardization, or if ultimate economy is clearly evident.

If the project is being bid under the single and multiprime bidding methods, the CITY reserves the right to award the contract in whichever manner is in the best interest of the CITY taking into consideration the total cost of the project, including but not limited to contract administration and preparation costs.

The award of the contract represents a preliminary determination as to the qualifications of the bidder, the availability of funds for the project, and other matters precedent to the City's execution of the contract. No legally-binding acceptance of the offer set forth in the Contractor's bid occurs until the City executes the contract.

G-1.03 If any person contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of the plans, specifications, or other proposed contract documents, he may submit to the Engineer a written request for an interpretation thereof. The person submitting the request will be responsible for its prompt delivery. An interpretation of the proposed documents will be made only by addendum duly issued, and a copy of such addendum will be mailed or delivered to each person receiving a set of such documents. The City of Wilmington will not be responsible for any other explanations or interpretations of the proposed documents.

GENERAL SPECIFICATIONS

G-1.04 SEALED PROPOSALS REQUIRED: INSTRUCTIONS: In accordance with the attached copy of advertisement and the following specifications, proposals will be received by the City of Wilmington, North Carolina, at 929 North Front Street, 10th Floor Purchasing Department, on the date and time designated in the Advertisement, when they will publicly open and read the proposals properly submitted for Municipal Improvements in the City of Wilmington, North Carolina. Firms submitting single and multi-prime bids must enclose these in separate sealed, clearly marked envelopes.

If bids are requested for single and multi-prime contracts, bids will be received, but not opened, for the separate prime contracts one (1) hours prior to the deadline for submission of single prime bids. All bids will be opened at the time for receipt of the single prime bids.

G-1.04.1 Proposals must be placed in a sealed envelope and addressed to The Purchasing Manager, City of Wilmington, North Carolina. The envelope shall show the name and address of the bidder and be plainly marked to show the project name and number and section (if applicable), as given in the Advertisement. The envelope must also be marked on the face to show the Contractor's North Carolina Contractor's License Number. Bid forms are contained in this bound copy of the Contract Documents, copies of the proposal pages may be submitted.

Submission of the entire document is not required. However, bidders are cautioned to submit all required forms, as referenced in the bound document, properly signed with the sealed bid. Bid forms will be filled in and completed in all respects as required herein.

Firms submitting bids for Single and Multi-Prime bids on the same project must submit each bid to the Purchasing Manager in a separate, properly identified sealed envelope

Failure by the bidder to properly complete the Bid Proposal, Affidavit of Non-Collusion, MBE/WBE/HUB/DBE forms or other documents will be cause for declaring the bid non-responsive and cause for rejection.

G-1.04.2 Each proposal shall be accompanied by a cash deposit or certified check, said check to be payable to the City of Wilmington, and to be drawn on some bank or trust company insured by the Federal Deposit Insurance Corporation, in an amount equal to not less than five percent (5%) of the proposal. In lieu of making a cash or certified check deposit, as above provided, a bidder may file a bid bond executed by a corporate surety, licensed under the laws of the State of North Carolina to execute such bonds, said bid bond to be in an amount equal to not less than five percent (5%) of the amount of the bid, and said bid bond to be conditioned so that the surety will, upon demand, forthwith make payment to the City of Wilmington upon said bond if the bidder fails to execute the contract as provided below, and upon failure to forthwith make payment, the surety shall pay to the City an amount equal to the amount of said bid bond. Said deposit of cash, certified check, or bid bond to be forfeited to the City of Wilmington in the event of the bidder's failure to execute the contract within ten (10) days after award, as required by Section 143-129 of the General Statutes of North Carolina, Volume 3, as amended.

Deposits will be retained by the City, as property of the several bidders until the award of the contract is made, or all bids are rejected, after which the deposits will be returned.

G-1.04.3 No bid may be withdrawn for a period of ninety (90) days after being filed.

G-1.04.4 The work contemplated in these specifications, and the prices named in the proposals will be considered to include all cost of supplying, delivering, and all labor necessary for the incorporation of all materials into the work, and the use of all tools, machinery and equipment of every name and description that is used in carrying out the plans and specifications under this contract.

G-1.04.5 Bidders are cautioned to carefully examine the proposed location of work, as well as the plans and specifications, and to go over the whole project thoroughly with the Engineer before submitting their bids. It is understood and agreed that the quantities in the specifications, or as shown on the plans are approximate only, and no claim will be made against the City Council for any excess or deficiency, and no allowance will be made for the failure of the bidder to estimate correctly the difficulties attending the execution of the work.

G-1.04.6 Bidders are cautioned to adhere strictly to the spirit of the specifications in submitting their tenders, and it will be considered bad form to submit a proposal, expecting concessions after being awarded the contract by proposing the use of inferior materials and methods of construction for cheapening the work. The Engineer, Owner, or City desires to aid the Contractor in every legitimate way to carry on the work economically and expeditiously as set out in these specifications, and no alternate bids will be allowed unless requested in the proposal.

G-1.04.7 Where bids are received on Unit Prices, the City Council reserves the right, to authorize an increase of fifty percent (50%) of the amount of work set out in the proposal, or to decrease it to an extent equal to fifty percent (50%) of actual cost of the original work predicted on the unit prices given in the proposal. Such increase or decrease shall not vitiate or annul the

contract agreement hereinafter entered into. In the event of a discrepancy in the unit prices and the extended prices the unit prices shall prevail.

G-1.04.8 The bidder shall be required to produce substantial evidence that he is properly qualified to carry on the work as set out in the specifications. The qualifications required of all bidders are as follows: Thorough knowledge and experience in work of this character; labor and equipment in such quantities and quality as to enable the Contractor to carry on the work economically and expeditiously; financial condition must be such as not to require aid from the City Council, other than the regular monthly estimates.

G-1.04.9 The City Council will not consider any bid or award of contract to any person, firm, or corporation, who has defaulted in any obligation to the City of Wilmington, or who, in the opinion of the Council, failed to perform his work satisfactorily as to character or time.

G-1.04.10 The City reserves the right to reject any and all bids, or to accept the bid, or bids on the entire project, or any section of the project, as given in the Proposal, which, in its opinion, is to the best interest of the City.

G-1.04.11 The Contractor's attention is especially called to the fact that he will be requested by the Council, and will be expected to push this work with all speed possible.

G-1.05 CONTRACT SURETY OF PERFORMANCE BOND: Contractor shall furnish and deliver to the City a Payment Bond and a Performance Bond covering the faithful performance and completion of the work included in this Agreement and payment for all materials and labor furnished or supplied in connection with the work included in this Agreement. Said bonds shall be issued and furnished to the City prior to, and as a condition precedent to, commencement of the work of this Agreement. Each of the Payment Bond and Performance Bond shall be furnished on behalf of the Contractor, shall name the City of Wilmington obligee, and shall be in the amount of one hundred percent (100%) of the contract price. Such bond(s) shall be solely for the protection of the City. The Payment Bond and the Performance Bond shall be issued by a surety of financial standing having a rating from A.M. Best Company equal to or better than A and must be included on the approved list of sureties issued by the United States Department of Treasury. The surety bond must be in the form set forth in NCGS 44A-33, without any variations there from. The Contractor shall provide surety bond wherein Surety waives notice of any and all modifications, omissions, additions, changes and advance payments or deferred payments in or about the Contract, and agrees that the obligations undertaken by the Bond shall not be impaired in any manner by reason of any such modifications, omissions, additions, changes, and advance payments or deferred payments. The surety bond must set forth no requirement that suit be initiated prior to the time stipulated in applicable North Carolina Statutes of Limitation.

G-1.06 INSURANCE REQUIREMENTS: Before commencing any work, the Contractor shall procure insurance in the contractor’s name and maintain all insurance policies for the duration of the contract of the types and in the amounts listed in Section G-1.06. The insurance shall provide coverage against claims for injuries to persons or damages to property which may arise from operations or in connection with the performance of the work hereunder by the contractor, his agents, representatives, employees, or subcontractors, whether such operations by himself/herself or anyone directly or indirectly employed by him/her.

G-1.06.1 COMMERCIAL GENERAL LIABILITY: Contractor shall maintain Commercial General Liability (CGL) and if necessary, Commercial Umbrella Liability insurance with a total limit of not less than $3,000,000 each occurrence for bodily injury and property damage/$6,000,000 Aggregate. If such CGL insurance contains a general aggregate limit, it shall apply separately to this project/location or the general aggregate shall be twice the required limit. CGL insurance shall be written on Insurance Services Office (ISO) “occurrence” form CG 00 01 covering Commercial General Liability or its equivalent and shall cover the liability arising from premises, operations,

independent contractors, products-completed operations, personal and advertising injury, and liability assumed under an insured contract (including the tort liability of another assumed in a business contract).

The City of Wilmington, its officers, officials, agents, and employees are to be covered as additional insureds under the CGL by endorsement CG 20 10 or CG 20 33 **AND** CG 20 37 or an endorsement providing equivalent coverage as respects to liability arising out of activities performed by or on behalf of the contractor; products and completed operations of the contractor; premises owned, leased or used by the contractor; and under the commercial umbrella, if any. The coverage shall contain no special limitations on the scope of protection afforded to the City of Wilmington, its officers, officials, agents, and employees.

There shall be no endorsement or modification of the CGL or Umbrella Liability limiting the scope of coverage for liability arising from explosion, collapse, underground property damage, or damage to the named insured's work, when those exposures exist.

The insurer shall agree to waive all rights of subrogation against the City of Wilmington, its officers, officials, agents and employees for losses arising from work performed by the contractor for the City of Wilmington.

G-1.06.2 WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY**:** Contractor shall maintain Workers' Compensation as required by the general statutes of the State of North Carolina and Employer's Liability Insurance. The Employer's Liability, and if necessary, Commercial Umbrella Liability insurance shall not be less than $3,000,000 each accident for bodily injury by accident, $3,000,000 each employee for bodily injury by disease, and $3,000,000 policy limit.

The insurer shall agree to waive all rights of subrogation against the City of Wilmington, its officers, officials, agents and employees for losses arising from work performed by the contractor for the City of Wilmington.

The U.S. Longshore and Harborworkers Compensation Act endorsement shall be attached to the policy when the services will be on or in close proximity to navigable waterways. The Maritime Coverage endorsement (WC 00 02 01) shall be attached to the policy when the contracted services involve the use of watercraft.

G-1.06.3 BUSINESS AUTO LIABILITY: Contractor shall maintain Business Auto Liability and, if necessary, Commercial Umbrella Liability insurance with a limit of not less than $3,000,000 each accident. Such insurance shall cover liability arising out of any auto, including owned, hired, and non-owned autos. Business Auto coverage shall be written on ISO form CA 00 01, or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in ISO form CA 00 01.

Pollution liability coverage equivalent to that provided under the ISO pollution liability-broadened coverage for covered autos endorsement (CA 99 48) shall be provided, and the Motor Carrier Act endorsement (MCS 90) shall be attached when those exposures exist.

Contractor waives all rights against the City of Wilmington, its officers, officials, agents and employees for recovery of damages to the extent these damage are covered by the business auto liability or commercial umbrella liability insurance obtained by Contractor pursuant to G-1.06.03 of this agreement.

The contractor's Business Auto Liability insurance shall be primary as respects the City of Wilmington, its officers, officials, agents, and employees. Any other insurance or self-insurance maintained by the City of Wilmington, its officers, officials, and employees shall be excess of and not contribute with the contractor's insurance.

G-1.06.4 OWNERS AND CONTRACTORS' PROTECTIVE LIABILITY INSURANCE: DELETED

G-1.06.5 BUILDERS RISK INSURANCE: DELETED

G1-1.06.6 INSTALLATION FLOATER: E E E

G1-1.06.7 PROFESSIONAL LIABILITY INSURANCE: DELETED

G1-1.06.8 ENVIRONMENTAL PROFESSIONAL LIABILITY INSURANCE: DELETED

G1-1.06.9 BAILEE COVERAGE (INCLUDING TRANSIT): DELETED

G1-1.06.10 CONTRACTORS POLLUTION LIABILITY INSURANCE: DELETED

G1-1.06.11 PROTECTION & INDEMNITY: DELETED

G1-1.06.12 ABUSE/MOLESTATION COVERAGE: DELETED

G1-1.06.13 ACCIDENT INSURANCE: DELETED

G1-1.06.14 ELECTRONIC DATA LIABILITY INSURANCE: DELETED

G1-1.06.15 FIDELITY COVERAGE: DELETED

G1-1.06.16 GARAGE LIABILITY AND/OR COMMERCIAL GENERAL LIABILITY: DELETED

G1-1.06.17 GARAGEKEEPER'S LEGAL LIABILITY: DELETED

G1-1.06.18 ON-HOOK CARGO: DELETED

G1-1.06.19 NETWORK SECURITY AND PRIVACY LIABILITY: DELETED

G1-1.06,20 TECHNOLOGY ERRORS & OMISSIONS: DELETED

G1-1.06.21 RAILROAD PROTECTIVE LIABILITY INSURANCE: DELETED

G1-1.06.22 DEDUCTIBLES AND SELF-INSURED RETENTIONS: The contractor shall be solely responsible for the payment of all deductibles to which such policies are subject, whether or not the City is an insured under the policy.

G1-1.06.23 MISCELLANEOUS INSURANCE OPROVISIONS: The policies are to contain, or be endorsed to contain, the following provisions:

1. Each insurance policy required by this contract shall be endorsed to state that coverage shall not be canceled by either party except after 30 days prior written notice has been given to the City of Wilmington, PO Box 1810, Wilmington, NC 27402-1810.

2. If Contractor's liability policies do not contain the standard ISO separation of insureds provision, or a substantially similar clause, they shall be endorsed to provide cross-liability coverage.

G1-1.06.24 ACCEPTABILITY OF INSURERS: Insurance is to be placed with insurers licensed to do business in the State of North Carolina with an A.M. Best's rating of no less than A VII unless specific approval has been granted by the City.

G1-1.06.25 EVIDENCE OF INSURANCE: The Contractor shall furnish the City with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements prior to commencing the work, and thereafter upon renewal or replacement of each certified coverage until all operations under this contract are deemed complete. Evidence of additional insured status shall be noted on the certificate of insurance as per requirements in Section G1-1.06. This Certificate shall be in six (6) counterparts and, when the contract is signed by the Contractor, a copy thereof shall be inserted in each copy of the contract documents and upon insertion shall become a part of such documents.

With respect to insurance maintained after final payment in compliance with requirements, an additional certificate(s) evidencing such coverage shall be provided to the City with final application for payment and thereafter upon renewal or replacement of such insurance until the expiration of the period for which such insurance must be maintained.

G1-1.06.26 SUBCONTRACTORS: Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated herein. Commercial General Liability coverage shall include independent contractors' coverage, and the contractor shall be responsible for assuring that all subcontractors are properly insured.

G1-1.06.27 CONDITIONS:

1. The insurance required for this contract must be on forms acceptable to the City.
2. The contractor shall provide that the insurance contributing to satisfaction of insurance requirements in G1-1.06 shall not be canceled, terminated or modified by the contractor without prior written approval of the City.
3. The contractor shall promptly notify the Safety & Risk Manager at (910) 341-5864 of any accidents arising in the course of operations under the contract causing bodily injury or property damage. property damage.
4. The City reserves the right to obtain complete, certified copies of all required insurance policies, at any time. te, certified copies of all required insurance policies, at any time.
5. Failure of the City to demand a certificate of insurance or other evidence of full compliance with these insurance requirements or failure of the City to identify a deficiency from evidence that is provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
6. By requiring insurance herein, the City does not represent that coverage and limits will necessarily be adequate to protect the Contractor and such coverage and limits shall not be deemed as a limitation of Contractor's liability under the indemnities granted to the City of Wilmington in this contract.
7. The City shall have the right, but not the obligation of prohibiting Contractor or any subcontractor from entering the project site or withhold payment until such certificates or other evidence that insurance has been placed in complete compliance with these requirements is received and approved by the City.

G-1.07 DELETED

G-1.08 DELETED

G-1.09 DELETED

G-1.10 DELETED

G-1.11 PAYMENT OF EMPLOYEES: The Contractor, and each of his Sub-contractors, shall pay each of his employees, engaged in work on this project, in full (less deductions made mandatory by law) not less often than on the Contractor's regular pay days, which shall be normally each week.

G-1.12 PAYMENT: Payment by the City to the Contractor will be made under either one of the following procedures:

G1.12.1 Public Construction Contracts equal to or greater than one hundred thousand dollars ($100,000)

A. The City shall retain five percent (5%) of any periodic payment due a Contractor.

B. When the project is fifty percent (50%) complete, the City, with written consent of the surety, shall not retain any further retainage from periodic payments due the Contractor if the Contractor continues to perform satisfactorily and any nonconforming work identified in writing prior to that time by the Architect, Engineer, or City has been corrected by the Contractor and accepted by the City Engineer, Architect, Engineer, or Project Manager. If the City determines the Contractor's performance is unsatisfactory, the City may reinstate retainage for each subsequent periodic payment application up to the maximum amount of five percent (5%). The project shall be deemed fifty percent (50%) complete when 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.

C. 50% complete means:
- Gross project invoices, excluding material stored off site, of the value of the contract
- The value of materials stored on-site shall not exceed 20% of the gross project invoices

G-1.12.2 PAYMENT ON UNIT PRICE CONTRACTS: Not later than 30 work days after receipt of a City approved invoice the City will make partial payment to the Contractor, on the basis of a duly certified approved estimate by the City Engineer, Project Architect or City Project Manager of the work performed during the preceding calendar month by the Contractor, in accordance with item 12.1.1 above.

G-1.12.3 PAYMENT ON LUMP SUM CONTRACTS, THIRTY DAYS OR MORE IN DURATION: Not later than 30 work days after receipt of a City approved invoice and acceptance of work performed during that period, the City will make partial payment to the Contractor on the basis of a duly certified approved estimate by the City Engineer, Architect,

Designer or Project Manager of the work performed during the preceding calendar month by the Contractor, and the value of the materials on the job, but not installed. The City will retain five percent (5%) of the amount of each such estimates in accordance with item 12.1.1 above. For purposes of preparing these monthly estimates, after the execution of the Contract, the Contractor will be required to submit to the City Engineer, Architect, Designer or Project Manager a breakdown of his lump sum bid in sufficient detail to permit an accurate determination of the progress of the work.

G-1.12.4 UNSATISFACTORY PERFORMANCE AND RETAINAGE: Retainage of the maximum of 5% may be reinstated if performance of the Contractor is unsatisfactory as determined by the City.

G-12.5 Within 60 days after the submission of a pay request and one of the following occurs, as specified in the contract documents, the owner with written consent of the surety shall release to the contractor all retainage on payments held by the owner: (i) the City receives a certificate of substantial completion from the Project Manager, Architect, Engineer, or Designer in charge of the project; or (ii) the owner receives beneficial occupancy or use of the project. However, the City may retain sufficient funds to secure completion of the project or corrections on any work. If the City retains funds, the amount retained shall not exceed two and one-half (2 ½) times the estimated value of the work to be completed or corrected. Any reduction in the amount of the retainage on payments shall be with the consent of the contractor's surety.

G1.12.6 Release of Retainage shall be in accordance with G.S. 143-134.1.

G1.12.7 There will be no retainage on periodic or final payments made by the City or prime contractor on public construction contracts in which the total project costs are less than one hundred thousand dollars ($100,000).

G-1.12.8 PAYMENT ON LUMP SUM CONTRACTS, THIRTY DAYS OR LESS IN DURATION: Where the time for completion of work, as stated in the proposal, is thirty (30) calendar days, or less, the City will make one payment in full upon completion of work and acceptance by the City Council. No partial or interim payments will be made.

G-12.9 The Prime contractor and all Subcontractors working on the project shall comply with G.S. 143-134.1in regards to payments to all subcontractors

G-12.9 Nothing in this section shall prevent the City from withholding payment to the contractor in addition to the amounts authorized under G.S. 143-134.1 for unsatisfactory job progress, defective construction not remedied, disputed work, or third-party claims filed against the owner or reasonable evidence that a third-party claim will be filed.

G1-12.10 Payment to Subcontractors by Prime Contractor or General Contractor

In accordance with N.C. Gen. Stat. § 22C, within seven days of receipt by the prime contractor of each periodic or final payment, the prime contractor shall pay the subcontractor based on work satisfactorily completed or service satisfactorily provided under the subcontract. Additionally, the Contractor shall pay the undisputed portions of subcontractors' invoices within one hundred five (105) calendar days of the date of subcontractor's invoice, independent of any payment by the City to the Contractor. If the Contractor withholds any retainage pending final completion of any subcontractor's Work, the Contractor is required to pay the retainage so withheld within seven (7) calendar days after such subcontractor completes his Work satisfactorily, regardless of any payment of retainage by the City to the Contractor. The Contractor's failure to pay subcontractors as provided herein shall be a material breach for which the City may cancel the Contract.

If any periodic or final payment to the subcontractor is delayed by more than seven days after receipt of periodic or final payment by the prime contractor, the prime contractor shall pay the subcontractor interest, beginning on the eighth day, at the rate of one percent (1%) per month or fraction thereof on unpaid balance as may be due.

A subcontract on a contract governed by this section may include a provision for the retainage on periodic payments made by the prime contractor to the subcontractor. However, the percentage of the payment retained: (i) shall be paid to the subcontractor under the same terms and conditions as provided to the Prime Contractor and shall not exceed the percentage of retainage on payments made by the owner to the prime contractor. Subject to section G-1.12.4, any percentage of retainage on payments made by the prime contractor to the subcontractor that exceeds the percentage of retainage on payments made by the owner to the prime contractor shall be subject to interest to be paid by the prime contractor to the subcontractor at the rate of one percent (1%) per month or fraction thereof.

Nothing in this section shall prevent the prime contractor at the time of application and certification to the City from withholding application and certification to the City for payment to the subcontractor for unsatisfactory job progress; defective construction not remedied; disputed work; third party claims filed or reasonable evidence that claim will be filed; failure of subcontractor to make timely payments for labor, equipment, and materials; damage to prime contractor or another subcontractor; reasonable evidence that subcontract cannot be completed for the unpaid balance of the subcontract sum; or a reasonable amount for retainage not to exceed the initial percentage retained by the owner.

The Prime contractor shall comply in all respects with G.S. 143-134.1.in all manners in payments to any and all subcontractors.

Neither the City's nor contractor's release of retainage on payments as part of a payment in full on a line-item of work shall affect any applicable warranties on work done by the contractor or subcontractor, and the warranties shall not begin to run any earlier than either the owner's receipt of a certificate of substantial completion from the architect, engineer, or designer in charge of the project or the owner receives beneficial occupancy.

G-1.13 COMMENCEMENT AND COMPLETION OF WORK: The Contractor for the construction of improvements under this contract shall commence work under his contract within ten days after written notice by the City PURCHASING MANAGER, and shall fully complete all work thereunder within the time stated in the proposal form.

G-1.14 EXISTING CONDITIONS: The Contractor, in signing this contract, acknowledges that he has read these Specifications and is familiar with their terms; that he has studied the plans and drawings, which are entirely clear to him; that he has been over the ground where the work is to be done, and has fully acquainted himself with the existing conditions; that he is fully prepared to sustain all losses or damages incurred by the action of the elements, or from any unforeseen obstructions, or encumbrances that may be encountered in the prosecution of the work; is prepared to provide the necessary tools, appliances and machinery, skilled and unskilled labor and materials of all kind as specified, and to guarantee that on completion, all work will be in strict compliance with the plans and specifications.

G-1.15 SUBLETTING OR ASSIGNMENT OF CONTRACT: The Contractor shall keep the work under his own control, and shall not assign, by power of attorney, or otherwise, nor sublet the work or any part thereof, without the written consent of the City. The Contractor shall perform on the site and with his own organization work equivalent to at least thirty percent (30%) of the work to be

performed under this Contract. If, during the progress of the work hereunder, the Contractor requests a reduction of such percentage, and the City Manager determines that it would be to the City's advantage, the percentage of the work required to be performed by the Contractor's own organization may be reduced; provided prior written approval of such reduction is obtained by the Contractor from the City Manager. The Contractor shall submit in writing the name of such Sub-contractor as he intends employing, the portion of the work which he is to do, the dollar amount of the work, indication as the MBE/WBE/HUB/DBE status of the subcontractor, his place of business, and such other information as the City may require, in order to know whether said Sub-contractor is reputable, reliable and able to properly perform the work he proposes to do and to determine the effort made by the bidder in securing MBE/WBE/HUB/DBE subcontractors. Also, with respect to each Sub-contractor, the Contractor shall either submit certification by his insurance carrier that such Sub-contractor is covered under the provisions of his policy, or submit a certificate from the Sub-contractor's insurer that the Sub-contractor is covered, in accordance with Paragraphs G-1.05 through G-1.10, inclusive.

The Contractor shall not, either legally or equitably, assign any of the monies payable under this Contract, or his claim thereto, except by consent of the City.

Written consent by the City to sublet or assign any portion of the contract shall not be construed to relieve the Contractor, or surety, of any responsibility for the fulfillment of the Contract.

INTENT OF SPECIFICATIONS

G-1.16 INTENT: The intent of these specifications is to provide for the work herein enumerated to be constructed of the best materials of their respective kinds, and perfectly suited to the work contemplated. The work to be fully completed in every detail for the purpose designed, and it is hereby understood that the Contractor, in accepting this contract, agrees to furnish skilled labor, and everything necessary to complete the work in a workmanlike and satisfactory manner.

G-1.17 CONTRACT: In order that the contractor may understand the scope of the work to be performed and the details of its construction, several documents have been prepared, and it is understood and agreed by and between the contracting parties that the following documents form, and are essential parts of the complete contract: Advertisement, Information for Bidders, General and Technical Specifications, Proposal, Specific Contract, Contractor's Bond, Drawings, Plans, Maps, MBE/WBE/HUB/DBE policy and Profiles, attached or herein described, and others that may be prepared from time to time governing and illustrating the work to be done under the terms of the contract, and all of which shall have the same weight as if embodied herein.

G-1.18 SPECIFICATIONS: The General Provisions of the Specifications give in detail the duties and obligations of the two parties to the contract, the procedure of the work, and manner in which payments are to be made under the contract. The Technical Specifications, following, give in more detail the characteristics and requirements of the several classes of materials and special instructions governing the methods of construction. Where there is conflict, the Technical Specifications shall always take precedence over the General Specifications.

DEFINITIONS

G-1.19 DEFINITIONS: Wherever in the Specifications, Proposal, Contract, or Bond the following terms, pronouns, or abbreviations used in their stead, occur, the intent and meaning shall be interpreted as follows:

A. N. S. I.
American National Standards Institute

A. S. T. M.
American Society for Testing and Materials

A. W. S.
American Welding Society

A. W. W. A.
American Water Works Association

A. A. S. H. T. O.
American Association of State Highway and Transportation Officials

Bid Bond
BID BOND: The security to be furnished by the bidder as guaranty of good faith to enter into a contract with the City for the proposed work, if such work is awarded to him.

Bidder
The person, or persons, partnership, firm or corporation submitting a proposal for the work contemplated.

Change Order
A written order from the Engineer signed by the Contractor and the City of Wilmington authorizing addition, deletion or revision in the work or an adjustment in the price or time for completion. All change orders must be approved by the City Manager and all change orders exceeding $5,000.00 must be approved by the Wilmington City Council.

City
The word City in these specifications refers to the City of Wilmington, North Carolina, the party of the second part to the contract, also referred to herein as the "Owner".

City Council or Council
The word Council, or City Council, refers to the City Council, the governing body of the City of Wilmington.

Contractor
The person, or persons, partnership, firm or corporation who enters into the contract awarded him by the City.

Drawings
All drawings, or reproductions thereof, pertaining to the construction of the work, which are approved by the Engineer for such purpose.

Engineer
The word Engineer, as used in these specifications, refers to the consulting engineer whose name appears on the drawings and/or to the City Engineer, and to his or their properly authorized assistants, limited to the duties entrusted to them.

Extra Work
A written order to the Contractor, signed by the Engineer, ordering a change in, or an addition to the work done, from that originally shown by the drawings and specifications. An authorized Change order shall be issued for this work.

F. S.
Federal Specifications

General Specifications
All requirements and provisions contained in this document.

Performance Bond

The approved form of security executed by the Contractor and his surety, guaranteeing complete execution of the contract.

Bond Proposal

Written offer submitted by the bidder in the required manner to perform the work contemplated.

N. C. S. H. C. or N. C. H. C. Specifications

North Carolina State Highway Commission, Raleigh, North Carolina, and to their "Standard Specifications of Roads and Structures," latest edition.

Request for Contract Payment

The form supplied by the City and completed by the Contractor to request periodic payments on the contract. This form also includes a MBE/WBE/HUB/DBE payment form.

Special Provisions

Statements modifying or changing the requirements or provisions of the General Specifications, or adding new requirements or provisions thereto.

Specifications

The General Specifications, Special Provisions, and all written or printed agreements and instructions pertaining to the performance of the work, and to the quantity and quality of the materials to be furnished under the contract.

Standard Details

The Standard Detail drawings, or reproductions thereof, which pertain to the standard method of construction of the work, and which are approved by the Engineer.

Surety

The corporate body which is bound with and for the contractor, that is primarily liable with the contractor, for the acceptable performance of the contract and for the completion of the work.

Phrases

Wherever, in the specifications, or upon the drawings, the words "As required", "As permitted", or words of like import are used, it shall be understood that the direction, requirements, or permission of the Engineer is intended; and similarly the words "approved", "acceptable" and "satisfactory", or words of like import shall mean approved, acceptable, or satisfactory to the Engineer.

MBE/WBE/HUB/DBE POLICY

The policy adopted by City Council. A copy of the entire policy is available for inspection at the office of the Purchasing Manager.

THE DUTIES AND AUTHORITY OF THE ENGINEER DEFINED

G-1.20 INTERPRETATIONS AND CORRECTIONS: It is agreed by and between the contracting parties that the Engineer shall make all necessary explanations as to the meaning and intent of these specifications, and correct any errors, discrepancies or omissions that occur in the plans and specifications; it is further agreed that the Engineer shall, in all cases, determine the amount, quality, acceptability, and fitness of the several classes of work which are to be paid for under the contract; and it is also agreed that the Engineer shall act as referee upon all questions arising

between the parties of this contract; and in all differences that occur between contractors working on adjoining sections concerning the work to be done under the terms of the contract, and the Engineer's decision shall be final and binding.

G-1.20.1 INTERPRETATIONS OF PLANS AND/OR SPECIFICATIONS PRIOR TO RECEIPT OF BIDS: If any prospective bidder feels that there are items within the plans or specifications, in the work proposed, or upon the site contemplated, which need clarification or interpretation, he shall, prior to the date and time for the receipt of bids, address a written statement to the Engineer, covering the points which he feels need clarification. It shall be the responsibility of the person addressing the inquiry to see that such a request is in the hands of the Engineer in sufficient time for proper consideration and answer. Upon receipt of such a written request, the Engineer will make a determination and if, in his opinion, interpretation, clarification and/or change should be made in the plans and/or specifications, he will inform each holder of the plans and specifications in writing of his decision or findings in the matter in question. No other procedure will be followed in interpretation or addendum to these specifications, and the City of Wilmington will not be responsible for any change unless made in accordance with this procedure.
Questions related to the proposed project, including questions concerning the plans and specifications will be addressed by the City or Engineer up to Seven (7) calendar days prior to the bid opening. No addenda will be issued after this time.

G-1.21 FIELD WORK: The Engineer shall give all necessary base lines and bench marks and information of like character for the guidance of the contractor, and all the work shall accurately conform thereto. Any work done without established lines, grades, may be ordered removed and replaced, without additional expense to the City.

G-1.22 INSPECTION: All materials and workmanship will be inspected by the Engineer, and the Contractor will be held to the spirit of the specifications at all times, the intent of such inspection being simply to obtain work of a high character, and one in which both parties to the contract can take pride.

G-1.23 ALTERATIONS: It is agreed by the contracting parties that the Engineer may at all times, before or after the commencement of the work, make alterations, or changes in the location, alignment, grades, materials and methods of construction that is desired, regardless of whether the location of such work be as shown on the plans upon which bids have been invited, and such change shall not vitiate or annul this contract, but the Engineer will determine the value of said work, and should such change diminish the amount of work to be done, no claim shall be made by the Contractor for damages on the grounds of anticipated profits from the part disposed with, but should the plan of a particular piece of work be altered or changed after commencement of said work and result in extra cost to the Contractor, the Engineer shall determine and certify a fair equitable value therefor, and his decision shall be final and binding.

G-1.24 INSPECTORS: Should it be found necessary, in the opinion of the Engineer, to appoint inspectors to pass upon the quality, amount, and general character of the work and the materials incorporated therein, such person, or persons, who, in the opinion of the Engineer, are deemed competent, may be appointed. The duties of this office are purely supervisory, and their decisions are subject to review by the Engineer.

EXTRA WORK

G-1.25 EXTRA WORK: The Contractor shall do any work not otherwise herein provided for when, and as ordered by the Engineer in writing by himself or specially authorized assistants. In the event that a mutually agreed price is not arrived at prior to the accomplishment of this extra work, the Contractor shall keep a strict account of the labor, equipment, and material used on said extra work, and shall give the Engineer an itemized statement each day of the amount. He shall further

furnish the Engineer with bills, accounts and vouchers relating to the cost and access to all accounts concerning this work.

G-1.25.1 Request for reimbursement for Extra Work must be submitted by the Contractor within ten (10) days of the date upon which such extra work is accomplished, and subject request for reimbursement must bear on its face the authorizing number of the written order issued by the Engineer.

G-1.25.2 No request for reimbursement on account of additional work will be honored by the Engineer unless previously authorized by him in the manner stated.

G-1.26 PROTECTION: When such work is being carried on under the written instructions of the Engineer, and the work is damaged from whatever cause due to the carelessness or neglect of properly protecting it, or the use of improper materials, or inferior workmanship, such part thereof as the Engineer directs shall be removed and replaced by the Contractor at his own expense.

G-1.27 PAYMENT: For all such extra work, as authorized under the terms of Paragraph G-1.25, where it is possible for the Contractor and the Engineer to arrive at a mutually agreeable price (either lump sum or unit price) for this extra work in advance of the actual accomplishment of said work, this price may be used. In the event that this is not possible or practicable, the Contractor shall receive the reasonable cost of said work, plus ten percent (10%) of such cost. The decision of the Engineer shall be final upon all questions of the amount and value of extra work. The Engineer will include in such valuation the cost to the Contractor of all materials used, all labor, Social Security and insurance on labor only, common and skilled, labor foremen, and the fair rental of all machinery used for the period of such use. The Engineer will not include in this valuation any cost or rental of small tools, buildings, any portion of the time of the Contractor or superintendent, clerical help, overhead expenses or any allowance for the use of capital, these items being considered as covered by the ten percent (10%) added to the reasonable cost.

G-1.28 TIMEKEEPER: The Engineer shall have the right to appoint a timekeeper to represent the City on extra work, and the Contractor shall furnish him all necessary facilities for obtaining a correct record of the time and the materials incorporated in the work. The Engineer shall have the right to designate what force shall be employed, the compensation therefor and the foreman shall be approved by the Engineer.

GENERAL INSTRUCTIONS

G-1.29 OBSERVANCE OF THE LAW: In all operations connected with the work, the Contractor shall observe and obey all the precepts of the law, the ordinances and regulations of the Federal, City, County and State. The Contractor shall provide and maintain such barriers, signals, red lights, and watchmen to effectually prevent any accident in consequence of the work, and the Contractor shall be responsible and liable for all damage to life or property occasioned in any way by his acts or that of his agents.

G-1.30 DISPOSITION OF CLAIMS: In the event of injuries or damages to persons or property of any kind legally existing along, or adjacent to the work, the Contractor agrees to make repairs or payment for damages or injuries as may be necessary, and should the Contractor fail to promptly repair or satisfy any legal complication that arises, after being notified in writing by the Engineer, the right is conferred upon the CITY to deduct the cost thereof from any money due, or to become due, the Contractor under the terms of the contract. All claims arising under this contract shall be settled to the satisfaction of the Engineer within sixty (60) days after notification to the Contractor of such claims, unless proceedings are entered into in a court of law.

G-1.31 PATENTS: Should the Contractor use any patented invention, article or contrivance in the construction or maintenance of the work, or any part thereof embraced in these specifications, the fee or royalty for the use of such patented article as aforesaid shall be included in the Contractor's proposal; and the Contractor agrees to hold the City harmless against any and all demands for such fees or royalties; and before final payment to the Contractor he shall furnish satisfactory evidence that all such claims have been settled.

G-1.32 PRIVATE PROPERTY: The Contractor shall not enter, or occupy with men, tools, machinery and materials, any property except that under the control of the City without the consent of the Engineer, and then only with written consent of the property owner. A copy of this written consent shall be given, or mailed to the Engineer.

G-1.33 LAYING OUT THE WORK: The Engineer will provide a base line for alignment purposes and a benchmark for vertical control. All construction offset stakes, forms, and batter boards shall be set by the contractor and are subject to review and approval by the Engineer, however, such approval of these items shall not relieve the Contractor of his responsibility to construct the work to the line and grade shown on the plans.

G-1.34 UNAUTHORIZED WORK: Any work done without lines, levels and instructions having been given by the Engineer, or without the supervision of an Inspector, will not be estimated or paid for, except when such work is authorized by the Engineer. Work so done, without the authority of the Engineer, may be ordered removed and replaced at the Contractor's cost.

G-1.35 RESPECT FOR FIELD RECORDS: The Contractor shall carefully preserve and maintain the proper position of all lines, stakes and grade boards until authorized to remove them. Any work that shows lack of alignment or grade where the Engineer's control stakes are missing, or the position of the points, stakes, or grades indicate that they have been carelessly maintained, such work shall be removed and replaced at the Contractor's expense. If, in the opinion of the Engineer, the Contractor does not utilize reasonable care in preserving control stakes, he shall be required to pay for all expenses involved in the replacement of these stakes.

G-1.36 INSPECTION OF MATERIALS: The Contractor shall furnish and deliver on the ground where it is to be used all materials suitable for the purpose intended. All materials and workmanship shall be subject to the Engineer's inspection, approval, or rejection at all times, and this inspection and approval during the progress of the work does not relieve the Contractor of repairs or renewal where the work has been damaged, proven defective, or overlooked, and on demand of the Engineer any work found not in conformity with the specifications shall be removed at once and replaced in accordance with the specifications.

G-1.37 WORKERS: Only competent and skilled workers of each class shall be employed on the work, and if the Engineer notifies the Contractor that any common or skilled workers, including those superintending the work, are unfaithful, disobedient, disorderly, or unsatisfactory, such worker, or workers shall be taken off of this project not again employed upon the work without the consent of the Engineer.

G-1.38 PROSECUTION OF WORK: The Contractor shall begin the work provided for under the terms of the contract within ten (10) days after written notice by the Purchasing Manager, and shall diligently prosecute and fully complete same within the time stated in his proposal. The Contractor shall prosecute the work in such manner, time and place as directed by the Engineer, and he shall carry out without delay all orders and instructions given by the Engineer. During the absence of the Contractor, a qualified representative shall have authority to direct the work and to receive orders and instructions from the Engineer; but this direction by the Engineer for prosecuting the work shall not relieve the Contractor of any of the obligations or liabilities assumed under the contract.

G-1.39 SANITATION: Necessary sanitation conveniences for the use of workers employed upon the work shall be constructed and maintained by the Contractor, in strict accordance with the provisions of the City-County, and State Health Departments. The Contractor shall obey and enforce the aforesaid rules and regulations, including preventative measures where the workers have been exposed to infections and communicable diseases.

G-1.40 PUBLIC TRAFFIC: The Contractor shall maintain, in a safe and practical way, the roadways that are now used by the public or individuals that neither may be unnecessarily delayed nor inconvenienced on account of the work being carried on by the Contractor. The Contractor will be responsible for all injuries, damages to persons or property incurred by such person, or persons, firm or corporation on account of the acts or claims of negligence by the Contractor to the aforesaid while passing over the public or private roadways. The Contractor will be required to repair, or make reparation for any damages that he may have caused to the roadways, public or private, immediately after discontinuing traffic along such route, or when authorized to do so by the Engineer.

G-1.41 BARRICADES AND LIGHTS:

G-1.41.1 Travel upon streets or any intersecting alley, street, or private driveway shall not be inconvenienced needlessly, nor shall any street or alley be wholly obstructed for more than two blocks at any one time, except in special cases where a greater distance may be allowed by the Engineer.

G-1.41.2 Whenever a street is closed, the Contractor shall cause plainly worded signs, announcing such fact, to be placed with proper barricades at the nearest cross street upon each side of such obstruction, and upon intersecting streets.

G-1.41.3 The Contractor shall also maintain sufficient warning lights during the hours of darkness in and about the work which is under way, and it is his full responsibility to see that such lights are lit and kept lit from sunset to sunrise.

G-1.41.4 The Contractor shall also provide and maintain suitable detour signs so as to warn the public of work under way, and to guide them around the work in progress where it would be dangerous for them to proceed through the working area.

G-1.41.5 If required by the Engineer, the Contractor shall also provide watchmen, or signalmen for protection and guidance of the public.

G-1.41.6 All barricades, lights, signage, flagging, and signalmen shall be established and operate in accordance with City requirements and North Carolina Department of Transportation.

G-1.42 DRAINAGE: The Contractor shall maintain an unobstructed flow of the natural and artificial drains at all times, and in the event it is necessary during the prosecution of work to obstruct the free flow of either, the Contractor shall provide for flow of water in such manner that no damage shall result, or a nuisance be created.

G-1.43 CLEANING UP: On the completion of any part of the work, the Contractor shall remove all surplus earth, materials of construction, debris, and refuse from the work as directed by the Engineer. On the final completion of the work, all debris over the entire contract, which is a result of work by the Contractor, shall be moved or destroyed as directed by the Engineer.

G-1.44 INCIDENTAL WORK: The duties of the Contractor have been set out in these specifications in a broad manner, with the intent of bringing to the attention of the Contractor his responsibilities under the contract, and any details of the work not specifically mentioned, but obviously necessary for carrying on, and the completion of the work shall be considered incidental thereto,

and as being a part of, and included with the work for which prices have been named in the proposal, and the Contractor will not be entitled to any additional compensation therefor.

G-1.45 CONTRACTOR'S CLAIM FOR DAMAGES: In the event the Contractor is of the opinion that he should be compensated for damages sustained by reason of some act of the City, its agents or employees, the amount of such claims shall be itemized and a detailed report shall be furnished the Engineer by the Contractor within ten (10) days after the date it is claimed such damages were sustained. If the Contractor fails to file his claim in the manner and within the time named, but presents such claim at a later date when it would be impossible to make a thorough investigation, such claims will be forfeited and invalidated, and payment of the alleged damages will be disallowed.

G-1.46 EXTENSION OF TIME: No extension of time will be made the Contractor for completing the work on account of ordinary and usual delays, such as the condition of the weather, and lack of material, accidents, and the occurrence of such will not relieve the Contractor from the necessity of maintaining the rate of progress agreed upon. The City will have the right, upon the recommendation of the Engineer after investigation, to extend the time for completion when extraordinary delays or accidents of unusual nature are incurred over which the Contractor has no possible control; but such action on the part of the City shall not operate or be construed to waive any of the rights of the City under this Contract and the Performance Bond. In the event the Contractor fails to complete the work in the specified time named in the proposal, and is permitted to continue and complete the work as if such time had not lapsed, such permission shall not be deemed a waiver in any respect by the City of any liability for extra expense thereby incurred arising from the noncompletion of said work, within the specified time, but such liability shall remain in full force against the Contractor.

G-1.47 TIME FOR COMPLETION AND LIQUIDATED DAMAGES: It is hereby understood and mutually agreed, by and between the Contractor and the City, that the date of beginning and the time for completion as specified in the contract of work to be done hereunder are ESSENTIAL CONDITIONS of this contract.

The beginning date of the construction period shall be ten (10) days following the date on the NOTICE TO PROCEED letter duly mailed by the Purchasing Manager to the contractors address indicated in the bid documents.

The Contractor agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the City, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the City, then the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the City the amount specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the contract for completing the work.

The said amount is fixed and agreed upon by and between the Contractor and the City because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the City would in such event sustain, and said amount is agreed to be the amount of damages which the City would sustain and said amount shall be retained from time to time by the City from current periodical estimates.

It is further agreed that time is of the essence of each and every portion of this contract and of the specification wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be to the essence of this contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the City determines that the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the City; Provided further, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to any preference, priority or allocation order duly issued by the City.

G-1.48 SALVAGED MATERIALS: Any used materials removed from the site of the construction, such as granite curb, manhole and catch basin castings, pipe, fill materials, which materials will not be re-used under this contract, are the property of the City of Wilmington. Pipe, curb, castings, etc., shall be carefully removed by the Contractor and delivered to the City Lot at Tenth and Fanning Streets, where a receipt will be given. Excess fill material will be dumped on disposal areas indicated by the Engineer. The Contractor will be charged with any salvaged materials which he cannot account for as having delivered, as specified.

G-1.49 FINAL ESTIMATE: The Engineer shall certify to the City in writing when, in his opinion, the Contractor has performed all that is set out in the contract and the specifications relative to the construction, and the Engineer shall show in such certificate the amount of work done from actual measurement, and the value of such work under and according to the prices named in the proposal. The City, on acceptance of said certificate, shall pay unto the Contractor within thirty (30) days thereafter the amount remaining due, and that part of the estimate remaining unpaid and including all moneys retained in the monthly estimates and for other causes under the contract.

The acceptance by the Contractor of the final payment shall release the City of any and all claims, liabilities and obligations to the Contractor for any and all work done and materials furnished, or for any act of the City or its agents or employees affecting the same. Before final payment is made, the Contractor shall submit an affidavit to the Engineer, stating that he has fully paid all bills for equipment, materials, or labor used on this project.

G-1.50 INSPECTION AND TESTING MATERIALS: Whenever in these contract documents, inspection and testing of materials is called for, the selection of bureaus, laboratories and/or agencies for such inspection and testing is subject to the approval of the Engineer.

G-1.50.1 Documentary evidence satisfactory to the Engineer that the materials have passed the required inspection and testing must be furnished to the City by the Contractor prior to the incorporation of such materials in the work, when required by the Engineer, and rejected materials must be promptly removed from the premises.

G-1.50.2 Wherever an outside testing laboratory is employed for testing of materials to be incorporated in this contract, the City of Wilmington shall employ and pay said laboratory for services rendered.

G-1.51 CONTRACTOR'S USE OF PUBLIC WATER: The Contractor shall comply with all requirements of the Cape Fear Public Utility Authority for use of public water.

G-1.52 PRECAUTIONS PRIOR TO AND DURING EXCAVATION OF ANY STREETS: No excavation, tree removal or clearing shall be begun by the Contractor upon any street within the City, or any area upon which work is to be done under this contract until he has notified and arranged for an authorized representative of the utility companies and departments which maintain underground systems within the City of Wilmington (water, sewer, electric, telephone and gas) to go over all areas to be graded, excavated or cleared, and designate the location of all hidden or underground facilities, lines, cables, pipes, or other structures and adequately mark

these for proper protection during the progress of the proposed construction. The City will use its best offices to require that the owners of utilities which are in physical interference with the work relocate their utilities with utmost speed when these obstructions are encountered. In case any obstruction so located or placed as to interfere with the work, is unexpectedly encountered, the Contractor shall at once notify the Engineer of the locality and circumstances, and the place shall be passed over until satisfactory arrangements can be made. The Contractor shall make no claim against the City for damages arising out of such a delay.

G-1.52.1 Any utility which requires relocation due to physical interference with the proposed construction will be required to be relocated by the owners by the City under its franchise agreement with the operators of said utility.

G-1.52.2 Any utility line which, in the opinion of the Engineer, does not require relocation due to physical interference with the proposed project shall be the responsibility of the Contractor to protect during the progress of the work. In the event of damage to any such line upon which a repair cost is claimed, this claim shall be paid by the Contractor. Where the utility owner has given incorrect or insufficient information to the Contractor as to the location of its underground lines, then the Contractor shall be relieved of the costs of repair, which shall then be borne by the utility company or operating department.

G-1.52.3 Under no circumstances, however, shall machine excavation, grading or cut of any nature be made in a street, or areas where high voltage underground cable or gas distribution lines, services, or mains are situated without the continuous presence of an authorized representative of the owning utility who is capable of "shutting down", "cutting off", discontinuing, or taking such other action as may be necessary to prevent a dangerous condition or occurrence of said utility lines, cables or facilities are damaged during such operations.

G-1.52.4 Should the location or position of any underground or surface obstruction be such that in the opinion of the Engineer its removal, replacement, realignment, or change is required for the prosecution of the work, and it shall be deemed desirable or expedient by the Engineer, the Contractor shall perform such work as may be required as Extra Work under this Contract. (See G-1.25, G-1.26, G-1.27, and G1.28).

G-1.53 RIGHTS-OF-WAY: The City shall furnish all needed rights-of-way for the project, but in the event that any certain rights-of-way and grounds necessary for the purpose of this Contract be not acquired by the City until after the beginning of the work, the Contractor shall so arrange the procedure of work as to allow time for the acquisition of such rights-of-way, and the City will not reimburse, or be liable to the Contractor for any losses resulting from, or incident to, such delay. As soon as the rights-of-way in question have been acquired, the Contractor shall at once proceed with the work thereon with such forces as will insure its prompt completion, but if there is such delay in procuring the right-of-way in question that there will not remain a reasonable length of time before the date set for the completion of this particular work, this fact shall operate so as to extend the time for completion of the particular work affected and to compensate for the actual time lost.

G-1.54 USE OF A PORTION OF THE WORK: Whenever, in the opinion of the Engineer, any portion of the work is completed, or is in an acceptable condition for use, it shall be used for the purpose intended. Such use shall not be held in any way as an acceptance of that portion of the work used, or as a waiver of any of the provisions of these specifications. Necessary repairs or renewals in any section of the work due to defective materials, defective workmanship, or natural causes, under the instructions of the Engineer shall be performed by the Contractor at no additional cost to the City.

G-1.55 EXCISE TAX ON MATERIALS OR FEDERAL TRANSPORTATION TAX, EXEMPTION THEREON: Wherever existing Federal Laws concerning Federal Excise Taxes and Federal

Transportation Tax provide that the City of Wilmington is exempt from payment of such tax on items purchased by it, and these laws and regulations permit the extension of this exemption to the Contractors performing work for the City, the City will supply affidavits as to the existence and nature of the Contract, as requested by the Contractor for his use in filing with his vendors and transportation agencies to make his purchases for work under this Contract exempt from such taxes; providing (1) that the Contractor shall have filed an affidavit with the City that his bid on this contract does not include any costs of said taxes, and (2) that the materials for which he will request exemption from tax will be only those materials, which upon completion of the Contract will have actually been incorporated into the work under this Contract, and upon receipt of final payment by the Contractor will become the property of the City of Wilmington.

G-1.56 REQUIRED RECORDS ON SALES AND USE TAX: In order that the City may substantiate a refund claim for sales and use taxes, the Contractor shall furnish the City certified statements in triplicate, setting forth the cost of building materials, supplies and fixtures, and equipment which become a part of, or are annexed to any building or structure being erected, altered, or repaired under contract with the City and the amount of sales and/or use taxes paid thereon.

In the event the Contractor makes several purchases from the same vendor, such certified statement must indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices and the sales and use taxes paid thereon. Such statement must also include the cost of any tangible personal property withdrawn from the Contractor's warehouse stock which is incorporated in the work, and the amount of sales and use tax paid thereon by the Contractor. The Contractor shall also obtain similar certified statements by his Sub-contractors and submit them to the City.

Bidders are reminded that an additional Two percent (2%) North Carolina Sales Tax is now collected on all sales made within certain counties. Purchases within these counties will require separate certified statements for this 2% tax. This statement shall give the vendors name, invoice number, total amount of invoice, date of invoice, the amount of the special 2% tax paid and the County in which the purchase was made. In the event that the Contractor wishes to file a combined certified statement showing the 4% tax and the 2% tax separately, this will be acceptable provided he gives the counties in which the 2% tax was paid.

This certified statement must be submitted to the City Engineer monthly, and all certified statements shall be submitted before final payment is made for work performed under this contract.

G-1.57 SURFACE AND SUB-SURFACE STRUCTURES: The Contractor shall be held responsible for the proper replacement of all bridges, crossings, or like structures.

In case any pipe or other obstruction, located or placed so as to interfere with the work is unexpectedly encountered, the Contractor shall at once notify the Engineer of the locality and circumstances, and the place shall be passed over until satisfactory arrangement can be made, without any claim for damages arising from such delay.

Should the location or position of any underground or surface obstruction be such that, in the opinion of the Engineer it must be relocated, and he deems it desirable or expedient that the Contractor undertake the necessary work, the Contractor will undertake to accomplish such work as directed by the Engineer, as provided under the sections of these Specifications dealing with Extra Work.

The Contractor is to take all risks and shall be responsible for all expenses and damage attending the presence or proximity of any gas or water pipe, or public or private sewers or drains, conduits, or other structures located in such a manner as shall not, in the opinion of the Engineer, require shifting, accommodating, or removing.

G-1.58 SETTLEMENT OVER EXCAVATION: The Contractor shall be entirely responsible for all settlement over any and all trenches and excavations which may have been cut along the line of his work at any time prior to the completion of his contract, and for a period of twelve (12) months after completion of his contract.

G-1.59 TEMPORARY SUSPENSION OF WORK: The Engineer shall have the authority to suspend the work, wholly or in part, for such period or periods as may be deemed necessary due to unsuitable weather, or other such conditions as are considered unfavorable for the suitable prosecution of the work, or for such time as is necessary due to the failure on the part of the Contractor to carry out orders given, or perform any or all provisions of the Contract. If it should be necessary to stop work for an indefinite period, the Contractor shall store all materials necessary in such a manner that they will not deteriorate or become damaged in any way, and he shall take every precaution necessary to prevent damage or deterioration of the work performed, provide suitable drainage by opening ditches, shoulder drains, etc., and erect structures where necessary. The Contractor shall not suspend the work without authority from the Engineer. Neither the failure of the Engineer to notify the Contractor to suspend the work on account of bad weather, nor permission from the Engineer to continue work during bad weather shall be cause for the acceptance of any work which does not comply in every respect with the Contract and Specifications.

G-1.60 EQUAL OPPORTUNITY REQUIREMENTS: The Contractor agrees that it will in carrying out the terms of this agreement, comply with the provisions of Executive Order 11246 entitled "Equal Employment Opportunity".

In complying with the provisions of Executive Order 11246, the Contractor agrees as follows:

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

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

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

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

(e) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records and accounts by

the Department of Housing and Urban Development and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

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

(g) The Contractor will include the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor.

(h) EXEMPTIONS TO EQUAL OPPORTUNITY CLAUSE: (1) Contracts and sub-contracts not exceeding $10,000.00 (other than Government bills of lading) are exempt. The amount of the contract, rather than the amount of the Federal Financial Assistance shall govern in determining the applicability of this exemption. (2) Except in the case of sub-contractors for the performance of construction work at the site of construction, the clause shall not be required to be inserted in sub-contracts below the second tier. (3) Contracts and sub-contracts not exceeding $100,000.00 for standard commercial supplies or raw materials are exempt.

G-1.61 SAFETY: The contractor and each of his subcontractors shall comply at all times with all regulations of the Occupational Safety and Health Administration and all labor laws and regulations of the State of North Carolina applicable to safety. Such standards include 29 CFR Part 1926 and applicable standards from 29 CFR Part 1910 of the Code of Federal Regulations.

The contractor and each of his subcontractors shall maintain adequate protection against damage to life and property during the work and shall provide and maintain all necessary protective devices until completion and acceptance of the work by the City.

In any emergency threatening life or property not considered by the contractor as coming under the provisions provided in this Section G-1.61 the contractor may act at his own discretion to prevent or alleviate the threatening situation without authorization by the City.

G-1.62 Contractor shall obtain building, electrical, mechanical and plumbing permits for all work under the Contract. <u>There will be no fee for obtaining these permits</u>.

G-1.63 GENERAL CONTRACTOR: In the event the bid and subsequent contract require separate prime contractors for the various phases of the work, the Contractor receiving the GENERAL CONSTRUCTION contract shall act as the General Contractor for the project in regards to scheduling of the work and other duties generally carried out by the General Contractor.

G-1.64 PLANS AND SPECIFICATIONS: All firms receiving award on a section of the contract shall receive free of charge from the City of Wilmington two (2) complete sets of plans and specifications for the project. For Single prime contracts involving multiple subcontractors, the primary subcontractors (HCAC, Plumbing, and Electrical or specialty item specifically bid as a separate item) shall receive up to two (2) complete sets of plans and specifications. Any further sets required by the contractor shall be charged to the contractor at the cost of reproduction.

G-1.65 DISPUTES: Any disputes in excess of $15,000 shall be processed in accordance with Section 13 of the contract.

Rev. 2/02

STATE OF NORTH CAROLINA CONTRACT NO: PAV-IH-0724

NEW HANOVER COUNTY

CONTRACT FOR CONSTRUCTION SERVICES

THIS CONTRACT, made this the _____ day of _____, 2024 by and between the CITY OF WILMINGTON, NORTH CAROLINA, a Municipal Corporation located in New Hanover County (hereinafter called "CITY"); and 1. a corporation organized under the laws of the State of _____; 2. a non-profit corporation organized under the laws of the State of _____; 3. an unincorporated association having its principal place of business in _____; 4. a resident of _____; or 5. owner of a partnership organized under the laws of the State of _____, with its principal offices in _____ (hereinafter called "CONTRACTOR").

W I T N E S S E T H:

1. Purpose

The CITY hereby employs the CONTRACTOR to furnish all labor, materials and equipment to perform all work in manner and form as specified by the attached plans, specifications and documents consisting of, but not limited to: Advertisement, Instructions to Bidders, General Conditions, Technical Specifications, Proposal and Affidavit, Contract and Performance and Payment Bonds, which are incorporated as if fully set out, for the following:

10th Street and Grace Street Intersection Improvements as specified herein and on the plans, specifications, contract documents, drawings, addenda and change orders (if any).

2. Term of Contract/Liquidated Damages

The CONTRACTOR shall commence the work to be performed under this contract within ten (10) days of receipt of a written order from the Purchasing Manager and shall complete all work hereunder within 90 calendar days of the date of beginning. The CONTRACTOR further agrees to pay, as liquidated damages, the sum of $230.00 for each consecutive calendar day thereafter as hereinafter provided in Paragraph G-1.47 of the General Conditions.

3. Extra Work

In the event extra work is necessary, not set forth or contemplated in this contract, the CONTRACTOR agrees to faithfully perform all such work under a written change order from the CITY, setting forth and describing fully the work to be done. The CITY hereby agrees to pay to the CONTRACTOR, for any such extra work, upon presentation of properly prepared, itemized statements of cost computed as follows:

(a) The CONTRACTOR shall be allowed to charge for labor used at the actual payroll charges during the time actually spent on extra work, (b) He shall be allowed to add on labor charges the percentage shown in Paragraph 8 of the Proposal for Workmen's Compensation Insurance, Social Security and other payroll charges, (c) The rate for such equipment, this hourly

rate to be for operating hours only, (d) The CONTRACTOR shall be allowed to charge for material purchased by him and used on extra work orders the amount charged to him by the vendor upon presentation of paid invoices, (e) The CONTRACTOR shall be allowed to add to the costs of said work arrived at enumerated above ten (10%) percent of materials, cost of equipment and actual payroll cost for overhead and profit.

4. Payment

4.1 The CITY agrees to pay to the CONTRACTOR for the faithful performance of this contract, subject to any additions or deductions as provided for in the Specifications or Proposal, and in accordance with the prices as set forth, subject to any additions which may be due under Paragraph 3 of this Agreement, Unit Prices and/or lump sum price, as set forth in the Proposal, the estimated total cost of _____
_____

4.2 Not later than 30 work days after receipt of a City approved invoice the City will make partial payment to the Contractor on the basis of a duly certified approved estimate by the City Engineer of the work performed during the preceding calendar month by the Contractor, and the value of the materials on the job, but not installed, less ten (5%) percent of the amount of such estimate, which is to be retained by the CITY until all work has been performed strictly in accordance with this contract and until such work is accepted by the CITY.

4.3 Invoices, or estimates or the cost of work performed, through June 30th, must be received by the 10th calendar day of July.

4.4 Upon submission by the CONTRACTOR of evidence satisfactory to the CITY that all payrolls, materials, bills and any other liabilities or costs incurred by the CONTRACTOR in connection with the construction of this work has been paid in full, final payment on account of this contract shall be made within thirty (30) days after completion by the CONTRACTOR of all work covered by this agreement and the acceptance of such work by the CITY.

5. Performance Bond

It is agreed that if, at any time after the execution of this contract and the surety bond attached for its faithful performance, the CITY shall deem the surety or sureties upon such bond to be unsatisfactory, or if for any reason such bond ceases to be adequate to cover the performance of the work, the CONTRACTOR shall, at his expense, within five days after receipt of notice from the CITY to do so, furnish an additional bond or bonds in such form and amount, and with such surety, or sureties, as shall be satisfactory to the CITY.

6. Insurance; Proof of Coverage

The CONTRACTOR shall take out and maintain, during the life of this contract, all insurance required under Paragraph G-1.06 of the General Provisions, and shall, at execution of this contract, attach to each of the counterparts thereof documentary proof of compliance in the form of a Certificate from his insurer, stating the amount, policy numbers, and kinds of insurance carried. This certificate shall also contain a statement by the insurer that he will notify the City of Wilmington by Registered Mail twenty (20) days prior to any cancellation or lapse of the insurance shown on this certificate. It is further agreed that the CONTRACTOR shall furnish the CITY with one memorandum copy of the policy, or policies, shown on this certificate at the time of the signing of this contract.

7. Guarantee

The CONTRACTOR hereby agrees to guarantee, for a period of one year after date of final payment, the work accomplished under this Contract. The CONTRACTOR agrees to repair at no cost to the CITY any defects due to faulty workmanship or materials which may appear in his work during this period.

8. Release and Indemnity

To the fullest extent permitted by law, the CONTRACTOR shall release, indemnify, keep and save harmless the CITY, its agents, officials and employees, from any and all responsibility or liability for any and all damage or injury of any kind or nature whatever (including death resulting therefrom) to all persons, whether agents, officials or employees of the CITY or third persons, and to all property proximately caused by, incident to, resulting from, arising out of, or occurring in connection with, directly or indirectly, the performance or nonperformance by CONTRACTOR (or by any person acting for the CONTRACTOR or for whom the CONTRACTOR is or is alleged to be in any way responsible), whether such claim may be based in whole or in part upon contract, tort (including alleged active or passive negligence or participation in the wrong), or upon any alleged breach of any duty or obligation on the part of the CONTRACTOR, its agents, officials and employees or otherwise. The provisions of this Section shall include any claims for equitable relief or for damages (compensatory or punitive) against the CITY, its agents, officials, and employees including alleged injury to the business of any claimant and shall include any and all losses, damages, injuries, settlements, judgments, decrees, awards, fines, penalties, claims, costs and expenses. Expenses as used herein shall include without limitation the costs incurred by the CITY, its agents, officials and employees, in connection with investigating any claim or defending any action, and shall also include reasonable attorneys' fees by reason of the assertion of any such claim against the CITY, its agents, officials or employees. The CONTRACTOR expressly understands and agrees that any performance bond or insurance protection required by this agreement, or otherwise provided by the CONTRACTOR, shall in no way limit the CONTRACTOR'S responsibility to release, indemnify, keep and save harmless and defend the CITY as herein provided. The intention of the parties is to apply and construe broadly in favor of the CITY the foregoing provisions subject to the limitations, if any, set forth in N.C.G.S. 22B-1.

9. Personnel

It is mutually agreed that CONTRACTOR is an independent contractor and not an agent of the CITY, and as such the CONTRACTOR shall not be entitled to any CITY employment benefits, such as, but not limited to, vacation, sick leave, insurance, workmen's compensation, or pension and retirement benefits.

10. Conflict of Interest

No paid employee of the CITY shall have a personal or financial interest, direct or indirect, as a contracting party or otherwise, in the performance of this agreement.

11. Non-Waiver of Rights

It is agreed that the CITY'S failure to insist upon the strict performance of any provision of this agreement, or to exercise any right based upon a breach thereof, or the acceptance of any performance during such breach, shall not constitute a waiver of any rights under this agreement.

12. Suspension or Termination of Agreement

12.1 In the event that review of Contractor's performance shows non-conformance to the attached scope of service or other terms or conditions contained herein as a result of the Contractor's errors, omissions or negligent acts, the contractor shall be in breach of this Agreement and the City may take corrective action as it deems necessary including, but not limited to, withholding or reduction of payment.

12.2 The City shall also have the right to suspend this Agreement upon written notice to the Contractor. Such suspension may be made for any of the following reasons: (a) violations or non-compliance with the contract terms, (b) violations of OSHA laws or regulations, (c) violations of Federal or State environmental and health laws or regulations, (d) operating City valves without permission, (e) moving City supplied water meters without permission, (f) failure to adequately plan for the protection of underground utilities during construction, (g) violation of any City ordinances or regulations or (h) verbal abuse of any City employees or others. In addition, any such violations may result in the Contractor being disqualified from bidding on future City projects. The written notice of suspension shall state the reasons for suspension and allow for a review period of ten (10) days during which the Contractor shall be provided with an opportunity to respond with an explanation or a justification, and/or shall undertake any reasonable remedial action required by the City. If, in the opinion of the City, the Contractor has not addressed the reasons for suspension at the completion of the ten (10) day suspension period, the City shall have a right to terminate this Agreement whereupon all obligations of the City to the Contractor shall cease.

12.3 The City may, at any time, terminate this contract for the City's convenience and without cause. Upon receipt of written notice from the City of such termination for the City's convenience, the Contractor shall (a) cease operations as directed by the City in the notice; (b) take actions necessary, or that the City may direct, for the protection and preservation of the work; and (c) except for work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing sub- contracts and purchase orders and enter into no further sub-contracts and purchase orders. In the event that this project is terminated for the convenience of the City, the Contractor shall be paid for services performed to the date of termination and costs incurred by reason of such termination, but such costs shall not include anticipated profit on unperformed work. (In no event will the amount due contractor in the event of termination for convenience exceed that amount set forth in Paragraph 4.1 of this Agreement. Contractor shall be paid for all reimbursables, as defined herein, which are due him.)

12.4 If after notice of termination of this contract under the provisions of Paragraph 12.2, it is determined for any reason that the Contractor was not in default under the provisions of such paragraph, or that the default was excusable under the provisions of this contract, the rights and obligations of the parties shall be the same as if the notice of termination had been issued by the City for convenience as set forth in Paragraph 12.3.

12.5 Nothing contained herein shall prevent the City from pursuing any other remedy which it may have against the Contractor including claims for damages.

13. Contract Disputes

In accordance with G.S. 143-128.1(8) the parties agree to mediate contract disputes in excess of $15,000.00. Within ten (10) days of such contract disputes, the parties shall select a mediator that is certified pursuant to all of the parties involved in the dispute. If the parties cannot agree on a mediator or do not timely select a mediator, the City shall select the mediator. The parties and the mediator shall agree upon the mediator's rate of compensation. The parties to the dispute shall

share in the payment of the mediator's compensation with the City paying a minimum of one-third of the compensation if the City is a party to the dispute.

14. Assignment of Agreement

It is mutually agreed by the parties hereto that this agreement is not transferable by either party to this agreement without the consent of the other party to this agreement.

15. Subcontracts

The CONTRACTOR shall utilize no subcontracts for carrying out the services to be performed under this agreement without the written approval of the CITY.

16. Entire Agreement

The agreement constitutes the entire understanding of the parties.

17. Binding Effect

The agreement shall be binding upon the heirs, successors, assigns, agents, officials, employees, independent contractors, and subcontractors of the parties.

18. Continuing Obligation

The parties will make and execute all further instruments and documents required to carry out the purposes and intent of the agreement.

19. Reference

Use of the masculine includes feminine and neuter, singular includes plural; and captions and headings are inserted for convenience of reference and do not define, describe, extend or limit the scope of intent of the agreement.

20. Interpretation

All of the terms and conditions contained herein shall be interpreted in accordance with the laws of the State of North Carolina. In the event of a conflict between the various terms and conditions contained herein or between these terms and other applicable provisions, then the more particular shall prevail over the general and the more stringent or higher standard shall prevail over the less stringent or lower standard.

21. Saving Clause

If any section, subsection, paragraph, sentence, clause, phrase or portion of this contract is for any reason held invalid, unlawful, or unconstitutional by any court of competent jurisdiction, such portion shall be deemed severable and such holding shall not affect the validity of the remaining portions hereof.

22. Other Laws and Regulations

CONTRACTOR will comply with any and all applicable federal, state and local standards, regulations, laws, statutes and ordinances including those regarding toxic, hazardous and solid wastes and any pollutants; public and private nuisances; health or safety; and zoning, subdivision or other land use controls. CONTRACTOR will take all reasonably necessary, proper or required safety, preventative and remedial measures in accordance with any and all relations and directives from the North Carolina Department of Human Resources, the United States Environmental

Protection Agency, the North Carolina Department of Environmental Quality, Health Departments, and any other federal, state or local agency having jurisdiction, to insure the prompt prevention or cessation (now or in the future) of violations of either the applicable provisions of such standards, regulations, laws, statutes, and ordinances or any permits or conditions issued thereunder. CONTRACTOR specifically acknowledges and agrees that CONTRACTOR, and any subcontractors it uses, has complied with and shall continue to comply with the provisions of the federal E-Verify program in compliance with Article 2 of Chapter 64 of the North Carolina General Statutes. CONTRACTOR shall maintain adequate safeguards with respect to sensitive customer information in conformance with and pursuant to 16 C.F.R. §681.1 and in accordance with N.C. Gen. Stat. §132-1.10 and §75-65.

23. Amendments

This agreement shall not be modified or otherwise amended except in writing signed by the parties.

24. Non-Discrimination

CONTRACTOR will take affirmative action not to discriminate against any employee or applicant for employment or otherwise illegally deny any person participation in or the benefits of the program which is the subject of this agreement because of race, creed, color, sex, age, disability or national origin. To the extent applicable, CONTRACTOR will comply with all provisions of Executive Order No. 11246, the Civil Rights Act of 1964, (P.L. 88-352) and 1968 (P.L. 90-284), and all applicable federal, state and local laws, ordinances, rules, regulations, orders, instructions, designations and other directives promulgated to prohibit discrimination. Violation of this provision, after notice, shall be a material breach of this agreement and may result, at CITY'S option, in a termination or suspension of this agreement in whole or in part.

25. Authority to Act

Each of the persons executing this Agreement on behalf of CONTRACTOR does hereby covenant, warrant and represent that the CONTRACTOR is a duly organized and validly existing legal entity authorized to transact business within the State of North Carolina, that the CONTRACTOR has full right and authority to enter into this Agreement, and that each and all persons signing on behalf of the CONTRACTOR were authorized to do so.

26. Counterparts.

This Agreement may be executed in several counterparts, including separate counterparts. Each shall be an original, but all of them together constitute the same instrument.

27. No Publicity.

No advertising, sales promotion or other materials of the CONTRACTOR or its agents or representations may identify or reference this Contract or the CITY in any manner absent the written consent of the CITY. Notwithstanding the forgoing, the parties agree that the CONTRACTOR may list the CITY as a reference in responses to requests for proposals, and may identify the CITY as a customer in presentations to potential customers.

28. Immunity Not Waived

This Agreement is governmental in nature, for the benefit of the public. CONTRACTOR acknowledges that City reserves all immunities, defenses, rights or actions arising out of City's sovereign status under applicable law. No waiver of any such immunities, defenses, rights or actions shall be implied or otherwise deemed to exist by reason of City's entry into this Agreement.

29. CITY Not Liable For Special or Consequential Damages.

The CITY shall not be liable to the CONTRACTOR, its agents or representatives or any subcontractor for or on account of any stoppages or delay in the performance of any obligations of the CITY, or any other consequential, indirect or special damages or lost profits related to this Contract.

30. Public Records.

CONTRACTOR acknowledges that the CITY is a public entity, subject to North Carolina's public records laws (N.C.G.S. § 132) and that any documents related to this Agreement may be subject to disclosure pursuant to state law in response to a public records request or to subpoena or other judicial process.

If CONTRACTOR believes documents related to the Agreement contain trade secrets or other proprietary data, CONTRACTOR must notify the CITY and include with the notification a statement that explains and supports CONTRACTOR'S claim. CONTRACTOR also must specifically identify the trade secrets or other proprietary data that CONTRACTOR believes should remain confidential.

In the event the CITY determines it is legally required to disclose pursuant to law any documents or information CONTRACTOR deems confidential trade secrets or proprietary data, the CITY, to the extent possible, will provide CONTRACTOR with prompt written notice by certified mail, fax, email, or other method that tracks delivery status of the requirement to disclose the information so CONTRACTOR may seek a protective order from a court having jurisdiction over the matter or obtain other appropriate remedies. The notice will include a time period for CONTRACTOR to seek court ordered protection or other legal remedies as deemed appropriate by CONTRACTOR. If CONTRACTOR does not obtain such court ordered protection by the expiration of said time period, the CITY may release the information without further notice to CONTRACTOR.

31. Minority Business Enterprise (MBE)

The CITY desires that minority business enterprises have the maximum opportunity to participate in the performance of this contract and will:

31.l Promote affirmatively (where feasible) in accordance with North Carolina General Statute l43-l29, together with all other applicable laws, statutes and constitutional provisions, the procurement of goods, services in connection with construction projects for minority owned business enterprises.

31.2 Insure that competitive and equitable bidding opportunities are followed to afford minority business enterprises participation. Strive to obtain contract and subcontract awards to minority business enterprises.

31.3 Identify and communicate to the minority business enterprises community procedures and contract requirements necessary for procurement of goods and services for construction projects and subcontracts.

31.4 Provide technical assistance as needed.

31.5 Promulgate and enforce contractual requirements that the general CONTRACTOR or all construction projects shall exercise all necessary and reasonable steps to insure that minority business enterprises participate in the work required in such construction contracts.

The CONTRACTOR shall insure that minority business enterprises have the maximum opportunity to compete for and perform portions of the work included in this contract and shall not discriminate on the basis of race, color, national origin or sex. The CONTRACTOR shall include this special provision, Minority Business Enterprise (MBE), in all subcontracts for this contract. Failure on the part of the CONTRACTOR to carry out the requirements set forth in this special provision may constitute a breach of contract and after proper notification may result in termination of the contract or other appropriate remedy.

A minority business enterprise is defined as a business, with at least fifty-one (51%) percent owned and controlled by minority group members. The minority ownership must exercise actual day-to-day management. Minority group members may consist of Black Americans (an individual of the Black race of African origin), Hispanic Americans (an individual of a Spanish speaking culture and origin at parentage), Asian Americans (an individual of a culture, origin or parentage traceable to the areas of the Far East, Southeast Asia, the Indian subcontinent and the Pacific Islands), Indian Americans (an individual who is an enrolled member of a Federally recognized Indian tribe, or recognized by the tribe as being an Indian, as evidenced by a certification of a tribal leader), American Aleuts or any recognized minority group approved by the CITY.

A Woman Business Enterprise is a business with at least fifty-one (51%) percent owned and controlled by women who exercise actual day-to-day management.

The CONTRACTOR shall exercise all necessary and reasonable steps to insure that Minority Business Enterprises and Woman Business Enterprises participate in the work required in this contract. The CONTRACTOR agrees by executing this contract that he will exercise all necessary and reasonable steps to insure that this special provision contained herein on Minority Business Enterprise is complied with.

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33. Federal Contract Provisions

A. Federal Applicability

The Work to be performed under this Contract will be financed in whole or in part with Federal funding. As such, Federal laws, regulations, policies, and related administrative practices apply to this Contract. The most recent of such Federal requirements, including any amendments made after the execution of this Contract, shall govern this Contract, unless the Federal Government determines otherwise. This Section identifies the Federal requirements that are applicable to this Contract. The Contractor is responsible for complying with all applicable provisions.

To the extent applicable, the Federal requirements are deemed incorporated into this Contract by reference and shall be incorporated into any subcontract or subcontract executed by the Contractor pursuant to its obligations under this Contract. The Contractor and its subcontractors, if any, hereby represent and covenant that they have complied and shall comply in the future with all applicable provisions of Federal, State, and local laws, regulations, and rules and local policies and procedures, as amended from time to time, relating to the Work to be performed under this Contract. Anything to the contrary herein notwithstanding, all Federal awarding agency-mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Contract. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any City requests, which would cause the City to be in violation of the Federal awarding agency's terms and conditions.

The Work performed under this Contract will be financed, in whole or in part, by funding provided by programs of the Federal Emergency Management Agency (FEMA). Contractor shall at all times comply with all applicable FEMA regulations, policies, procedures, and directives, including without limitation those listed directly or by reference, as they may be amended or promulgated from time to time during the term of this Contract. Contractor's failure to so comply shall constitute a material breach of this Contract.

B. Civil Rights Requirements

The City is an Equal Opportunity Employer. As such, the City agrees to comply with all applicable Federal civil rights laws and implementing regulations. Apart from inconsistent requirements imposed by Federal laws or regulations, the City agrees to comply with the requirements of 49 USC 5323(h)(3) by not using any Federal assistance to support procurements using exclusionary or discriminatory specifications.

Under this Contract, the Contractor shall at all times comply with the following requirements and shall include these requirements in each subcontract entered into as part thereof.

1. Nondiscrimination

In accordance with 41 CFR 60-1.4, during the performance of this Contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or

national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

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

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

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

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

(6) The Contractor will comply with Section 504 of the Rehabilitation Act of 1973, as amended.

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

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

(9) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (9) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States. The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: provided, that if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract. The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance. The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

2. Age

In accordance with Section 4 of the Age Discrimination in Employment Act of 1967, as amended, and 29 USC 623 through 634 and the implementing U.S. Equal Employment Opportunity Commission (U.S. EEOC) regulations, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements the Federal awarding agency may issue.

3. Sex

The Contractor agrees to comply with all applicable requirements of Title IX of the Education Amendments of 1972, as amended, 20 USC 1681 *et seq*., and with implementing U.S. DOT regulations, "Nondiscrimination on the Basis of Sex in Educations Programs or Activities Receiving Federal Financial Assistance," 49 CFR Part 25, that prohibit discrimination on the basis of sex.

4. Disabilities

In accordance with Section 102 of the Americans with Disabilities Act, as amended, 42 USC 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 CFR Part 1630, pertaining to employment of persons with disabilities.

5. Access to Services for Persons with Limited English Proficiency

The Contractor agrees to comply with Executive Order No. 13166,"Improving Access to Services for Persons with Limited English Proficiency," 42 USC 2000d-1 note, and U.S. DOT Notice, "DOT Policy Guidance Concerning Recipients' Responsibilities to Limited English Proficiency (LEP) Persons," 70 Fed. Reg. 74087, December 14, 2005, except to the extent that the Federal Government determines otherwise in writing.

6. Drug or Alcohol Abuse-Confidentiality and Other Civil Rights Protections

To the extent applicable, the Contractor agrees to comply with the confidentiality and other civil rights protections of the Drug Abuse Office and Treatment Act of 1972, as amended, 21 USC 1101 *et seq*., with the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, as amended, 42 USC 4541 *et seq*., and with the Public Health Service Act of 1912, as amended, 42 USC 290dd through 290dd-2, and any amendments thereto.

7. Other Nondiscrimination Laws

The Contractor agrees to comply with applicable provisions of other Federal laws and regulations, and follow applicable directives prohibiting discrimination, except to the extent that the Federal Government determines otherwise in writing.

8. Inclusion in Subcontracts

The Contractor also agrees to include the requirements of this Section in each subcontract financed in whole or in part with Federal assistance, modified only if necessary to identify the affected parties.

C. Davis-Bacon & Copeland Anti-Kickbacks Acts.

1. Applicability. The Davis-Bacon Act only applies to the Emergency Management Preparedness Grant Program, Homeland SecurityGrant Program, Nonprofit Security Grant Program, Tribal Homeland Security Grant Program, Port Security Grant Program, and Transit Security Grant Program. It DOES NOT apply to other FEMA grant and cooperative agreement programs, including the Public Assistance Program.
2. All transactions regarding this contract shall be done in compliance with the Davis-Bacon Act (40 USC 3141- 3144, and 3146-3148) and the requirements of 29 CFR pt. 5 as may be applicable. The Contractor shall comply with 40 USC 3141-3144, and 3146-3148 and the requirements of 29 CFR pt. 5 as applicable.

3. Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.

4. Contractors are required to pay wages not less than once a week.

5. Compliance with the Copeland "Anti-Kickback" Act.

a. Contractor. The Contractor shall comply with 18 USC 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.

b. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as FEMA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor orlower tiersubcontractor with all of these contract clauses.

c. Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 CFR 5.12.

D. Contract Work Hours & Safety Standards Act

1. Overtime requirements.
No contractor or subcontractor contracting for any part of the Contract Work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty (40) hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty (40) hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages.
In the event of any violation of the clause set forth in paragraph above of this section the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the U.S. for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in the paragraph above of this section, in the sum of twenty-seven dollars

($27.00) for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty (40) hours without payment of the overtime wages required by the clause set forth in the paragraph above of this section.

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

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

E. Right to Inventions Made Under a Contract or Agreement—NOT APPLICABLE

F. Clean Air
The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401, et seq. The Contractor agrees to report each violation to the CITY and understands and agrees that the CITY will, in turn, report each violation as required to assure notification to the Federal awarding agency and the appropriate EPA Regional Office.

The Contractor also agrees to include these requirements in each subcontract exceeding one hundred and fifty thousand dollars ($150,000.00) financed in whole or in part with Federal assistance.

G. Clean Water
The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251, et seq. The Contractor agrees to report each violation to the CITY and understands and agrees that the CITY will, in turn, report each violation as required to assure notification to the Federal awarding agency and the appropriate EPA Regional Office.

The Contractor also agrees to include these requirements in each subcontract exceeding one hundred fifty thousand dollars ($150,000.00) financed in whole or in part with Federal assistance.

H. Energy Conservation

The Contractor agrees to comply with the mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act, 42 U.S.C. § 6321, *et seq.*

This requirement extends to all third party contractors and their contracts at every tier and this clause shall be included in all such subcontracts.

I. Government-Wide Debarment & Suspension

1. This contract is a covered transaction for purposes of 2 CFR pt. 180 and 2 CFR pt. 3000. As such, the Contractor is required to verify that none of the Contractor's principals (defined at 2 CFR 180.995) or its affiliates (defined at 2 CFR 180.905) are excluded (defined at 2 CFR 180.940) or disqualified (defined at 2 CFR 180.935).

2. The contractor must comply with 2 C.F.R. pt. 180, subpart C and2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it entersinto.

3. This certification is a material representation of fact relied upon by City. If it is later determined that the Contractor did not comply with 2 CFR pt. 180, subpart C and 2 CFR pt. 3000, subpart C, in addition to remedies available to City, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

4. The bidder or proposer agrees to comply with the requirements of 2 CFR pt. 180, subpart C and 2 CFR pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

This requirement extends to all third party contractors and their contracts; this clause shall be included in all subcontracts of any tier executed in furtherance of this contract.

The requisite Debarment and Suspension Certification is included as ATTACHMENT A and must be executed for contracts of $25,000 or more and prior to the award of the contract.

J. Byrd Anti-Lobbying

The Contractor agrees to comply with the provisions of Title 31 USC 1352, The Byrd Anti-Lobbying Amendment, as in force or as it may hereafter be amended. The Contractor and all subcontractor tiers shall file the certification required by 49 CFR Part 20, "New Restrictions on Lobbying." Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 USC 1352. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-Federal funds with respect to that Federal contract, grant, or award covered by 31 USC 1352. Such disclosures are forwarded from tier to tier up to the CITY.

The Contractor further agrees to secure like undertakings from all subcontractor tiers whose subcontracts are expected to be of a value of one hundred thousand dollars ($100,000.00) or more.

The requisite "Lobbying Certification" is included as ATTACHMENT B and must be executed for contracts of $100,000 or more and prior to the award of the contract.

K. Recovered Materials

The Contractor agrees to comply with all requirements of Section 6002 of the Resource Conservation and Recovery Act (RCRA), as amended, 42 USC 6962, including but not limited to the regulatory provisions of 40 CFR Part 247 and Executive Order 12873, as they apply to the procurement of the items designated in Part B of 40 CFR Part 247.

This requirement extends to all third party contractors and their contracts; this clause shall be included in all subcontracts of any tier executed in furtherance of this contract.

L. Conflict of Interest

No employee, officer, board member, or agent of the CITY or the Contractor shall participate in the selection, award, or administration of a contract supported by FEMA funds if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when the employee, officer, board member, or agent, any member of his or her immediate family, his or her partner, or an organization that employees or is about to employ any of the above, has a financial or other interest in the firm selected for the award.

M. Disadvantaged Business Enterprises (DBE)

The CITY promotes policies which assure and encourage the full participation of Disadvantaged Business Enterprises (DBE) in the provision of goods and services. Disadvantaged Business Enterprises, as defined in 2 CFR § 200.321, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The Contractor agrees to solicit small and minority business and women's business enterprises whenever they are potential sources. When economically feasible, the Contractor agrees to divide total requirements into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises. Where the requirement permits, the Contractor agrees to establish delivery schedules which encourage participation by small and minority businesses and women's business enterprises. As appropriate, the Contractor agrees to use the services and assistance of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

This requirement extends to all third party contractors and their contracts; this clause shall be included in all subcontracts of any tier executed in furtherance of this contract.

N. Access to Records and Reports and Record Retention

The record keeping and access requirements extend to all third party contractors and their contracts at every tier. Under 49 USC 5325(g) and 2 CFR 200.336, FEMA has the right to

examine and inspect all records, documents, and papers, including contracts, related to any FEMA project financed with Federal assistance authorized by 49 U.S.C. Chapter 53.

1. Record Retention. The Contractor will retain, and will require its subcontractors of all tiers to retain, complete and readily accessible records related in whole or in part to the contract, including, but not limited to, data, documents, reports, statistics, sub-agreements, leases, subcontracts, arrangements, other third party agreements of any type, and supporting materials related to those records.

2. Retention Period. The Contractor agrees to comply with the record retention requirements in accordance with 2 CFR § 200.333. The Contractor shall maintain all books, records, accounts and reports required under this Contract for a period of at not less than three (3) years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case records shall be maintained until the disposition of all such litigation, appeals, claims or exceptions related thereto.

3. Access to Records.
   a. The Contractor agrees to provide sufficient access to FEMA and its contractors to inspect and audit records and information related to performance of this contract as reasonably may be required.

   b. The Contractor agrees to permit, and require its subcontractors to permit, the U.S. Secretary of Transportation, and the Comptroller General of the United States, and, to the extent appropriate, the State, or their authorized representatives, upon their request to inspect all Project work, materials, payrolls, invoices, and other data, and to audit the books, records, and accounts of the Contractor and its subcontractors pertaining to the Project, as required by 49 USC 5325(g) and 2 CFR 200.336.

   c. Contractor also agrees, pursuant to 49 CFR 633.17 to provide the FEMA Administrator or authorized representatives including any PMO Contractor access to Contractor's records and construction sites pertaining to a major capital project, defined at 49 USC 5302(a)1, which is receiving federal financial assistance through the programs described at 49 USC 5303, 5307, 5309, 5339, 5310, 5311, 5316, or 5317.

   d. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

4. Access to the Sites of Performance. The Contractor agrees to permit FEMA and its contractors access to the sites of performance under this contract as reasonably may be required.

O. Termination or Cancellation of Contract

1. Termination without Cause: City shall have the right to terminate this Agreement at any time and without cause upon thirty (30) days written notice to the other party. Upon receipt of Notice of Termination, the Contractor shall immediately discontinue all services directed (unless the Notice directs a date specific for services to terminate). As soon as practicable after receipt of a written Notice of Termination without cause, the

Contractor shall submit a statement to the City showing in detail the Work performed under this Contract through the date of termination. The City shall pay the Contractor for Work rendered through the date of termination.

2. Termination for Cause: City shall have the right to terminate this Contract because of the failure of the Contractor to fulfill its obligations under the Contract by giving thirty (30) days' written notice to Contractor. The Notice of Termination shall specify the nature, extent, and effective date of the termination.

For all contracts in excess of $10,000, this clause extends to all third party contractors, and their contracts at every tier, and subrecipients and their subcontracts at every tier, as referenced in 2 CFR 200.339 and 2 CFR Part 200, Appendix II (B).

P. Breach of Contract Rights and Remedies

All contracts in excess of $250,000 shall contain administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate as provided in 2 CFR 200.326 and 2 CFR part 200, Appendix II (A). The Violations and Breach of Contracts clause flow down to all third party contractors and their contracts at every tier. For purposes of this Contract, breach shall include the Contractor and any subsequent named subcontractor.

1. Rights and Remedies of the Owner - The City shall have the following rights in the event that the Owner deems the Contractor guilty of a breach of any term under the Contract.City
    a. The right to take over and complete the work or any part thereof as agency for and at the expense of the Contractor, either directly or through other contractors;
    b. The right to cancel this Contract as to any or all of the work yet to be performed;
    c. The right to specific performance, an injunction or any other appropriate equitable remedy; and
    d. The right to money damages.

2. Rights and Remedies of the Contractor - Inasmuch as the Contractor can be adequately compensated by money damages for any breach of this Contract, which may be committed by the City, the Contractor expressly agrees that no default, act or omission of the City shall constitute a material breach of this Contract, entitling Contractor to cancel or rescind the Contract (unless the City directs Contractor to do so) or to suspend or abandon performance.

3. Remedies - Substantial failure of the Contractor to complete the Project in accordance with the terms of this Contract will be a default of this Contract. In the event of a default, the City will have all remedies in law and equity, including the right to specific performance, without further assistance, and the rights to termination or suspension as provided herein. The Contractor recognizes that in the event of a breach of this Contract by the Contractor before the City takes action contemplated herein, the City will provide the Contractor with sixty (60) days written notice that the City considers that

such a breach has occurred and will provide the Contractor a reasonable period of time to respond and to take necessary corrective action.

4. If there is credible evidence that a Third Party Participant (Contractor) has submitted a false claim under the False Claims Act, 31 USC 3729 *et seq*., or has committed a criminal or civil violation of law pertaining to fraud, conflict of interest, bribery, gratuity, or similar misconduct involving Federal funding, notification of the Federal awarding agency is required.

Q. Copyrights and Rights in Data. NOT APPLICABLE

R. Cost Principles. Any adjustment to the Contractor's compensation, including requested reimbursable expenses, shall include only costs and other compensation that are allowable, allocable, and reasonable as provided elsewhere herein, or otherwise by law, and that are allowable, allocable, and reasonable under 2 CFR 200 Subpart E—Cost Principles and any implementing guidelines or regulations issued by the Office of Management and Budget (OMB). Contractor further agrees to provide adequate documentation to support costs (direct and indirect) charged to the Federal award.

This requirement extends to all third party contractors and their contracts; this clause shall be included in all subcontracts of any tier executed in furtherance of this contract.

S. DHS Seal, Logo, and Flags. The Contractor shall not use the DHS seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific FEMA preapproval.

T. Program Fraud and False or Fraudulent Statements or Related Acts. The Contractor acknowledges that 31 USC Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the contractor's actions pertaining to this contract

U. F.A.R. Compliance. Any adjustment to the Contractor's compensation under the Contract shall include only costs and other compensation that are allowable, allocable and reasonable as provided elsewhere herein, or otherwise by law, and that are allowable, allocable and reasonable under the Contract Cost Principles of the Federal Acquisition Regulations (F.A.R.) System, 48 CFR, Ch.1, Pt.31, and any implementing guidelines or regulations issued by the said Administration.

V. No Federal Government Obligations to Third Parties
The No Obligation clause extends to all third party contractors and their contracts at every tier.

The City and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this contract and shall not be subject to any obligations or liabilities to the City, Contractor, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.

The Contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FEMA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

ATTACHMENT A

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY and VOLUNTARY EXCLUSION LOWER TIER COVERED TRANSACTION

(To be submitted with all bids exceeding $25,000.)

(1) The prospective lower tier participant (Bidder/Contractor) certifies, by submission of this bid or proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) The prospective Bidder/Contractor also certifies by submission of this bid or proposal that all subcontractors and suppliers (this requirement flows down to all subcontracts at all levels) are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(3) Where the prospective lower tier participant (Bidder/Contractor) is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this bid or proposal.

The lower tier participant (Bidder/Contractor), _____, certifies or affirms the truthfulness and accuracy of this statement of its certification and disclosure, if any.

DATE _____

SIGNATURE _____

COMPANY _____

NAME _____

TITLE _____

State of _____

County of _____

Subscribed and sworn to before me this ___ day of _____, 20___.

Notary Public _____

My Appointment Expires _____ [SEAL]

ATTACHMENT B

CERTIFICATION REGARDING LOBBYING

(To be submitted with all offers exceeding $100,000; must be executed prior to Award)

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

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any persons for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding to any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

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

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 1352, *et seq*., apply to this certification and disclosure, if any.

_____
Signature of Contractor's Authorized Official

Date _____

_____
Printed Name and Title of Contractor's Authorized Official

State of _____

County of _____

Subscribed and sworn to before me this ___ day of _____, 20___.

Notary Public _____

My Appointment Expires _____ [SEAL]

IN WITNESS WHEREOF, the CITY has caused this agreement to be duly executed in its name and behalf and the CONTRACTOR has caused this agreement to be duly executed in its name and behalf and its corporate seal to be hereunto affixed, and attested to.

CITY OF WILMINGTON, NORTH CAROLINA

BY: _____
Anthony N. Caudle, City Manager

WITNESS:

_____
Daryle L. Parker, Purchasing Manager

APPROVED AS TO FORM:

_____
Gina Essey, Assistant City Attorney

FINANCE OFFICER'S CERTIFICATION STATEMENT

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act this the _____ day of _____, 2024.

_____
Jennifer R. Maready, Director of Finance

Project String: _____

Org./Obj.: _____ Project: _____

Amount of Contract: _____

Req#: _____

Federal ID Number: 56-6000239

BY: _____
President, Vice President,
Assistant Vice President

ATTEST:

_____
Secretary, Assistant Secretary,
Trust Officer

(CORPORATE SEAL)

STATE OF _____

COUNTY OF _____

I, _____, a Notary Public, certify that
(Name)
_____ personally came before me this day and
(Name of Sec., Assist. Sec., Cashier, Assist. Cashier)

acknowledged that he (she) is _____ of
(Secretary, Assist. Sec., Cashier, Assist. Cashier)

_____, a corporation, and that by authority duly given and
(Name of Corporation)

as the act of the corporation, the foregoing Contract: Page C-10, Performance Bond: Page C-11, and

Payment Bond: Page C-12 were signed in its name by its

_____, sealed with
(President or Vice President)

its corporate seal, and attested by himself (or herself) as its

_____.
(Sec., Assist. Sec., Cashier, Assist. Cashier)

WITNESS my hand and official seal, this the _____ day of _____, 2024

_____
Notary Public

My Commission expires: _____

(NOTARY SEAL)

PERFORMANCE BOND

CITY OF WILMINGTON, NORTH CAROLINA

PRINCIPAL: _____

SURETY: _____

BOND AMOUNT: _____

_____DOLLARS ($_____)

BOND DATE: _____

CONTRACT NUMBER: _____

"KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL AND SURETY above named, are held and firmly bound unto the CITY OF WILMINGTON, NORTH CAROLINA, hereinafter called the CITY, 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 CITY, numbered 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 CITY, 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."

(CORPORATE SEAL)

ATTEST:

PRINCIPAL: _____

_____
Secretary

By: _____

Title: _____

SURETY: _____

WITNESS:

By: _____

_____

Title: _____

PAYMENT BOND

CITY OF WILMINGTON, NORTH CAROLINA

PRINCIPAL: _____

SURETY: _____

BOND AMOUNT: _____

_____DOLLARS ($_____)

BOND DATE: _____

CONTRACT NUMBER: _____

"KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL AND SURETY above named, are held and firmly bound unto the CITY OF WILMINGTON, NORTH CAROLINA, hereinafter called the CITY, 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 CITY, numbered as shown above and hereto attached:

"NOW, THEREFORE, if the Principal shall promptly make payment to all persons supplying labor and 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."

(CORPORATE SEAL)

ATTEST:

PRINCIPAL: _____

_____
Secretary

By: _____

Title: _____

SURETY: _____

WITNESS:

By: _____

_____

Title: _____

(TO BE EXECUTED ON BEHALF OF SURETY AGENT)

STATE OF _____

COUNTY OF _____

On this the _____ day of _____, 2023 before me the subscriber, Notary Public of the State of _____, in and for the County of _____, duly commissioned and qualified came _____, to me personally known, and to me personally known to be the individual who executed the foregoing Payment Bond and Performance Bond: Pages C-9 and C-10, and he acknowledges the execution of the same, and being by me duly sworn deposes and says that he has Power-of-Attorney from _____ _____, with their principal offices at _____, to execute the preceding instruments in the amount specified in the Payment Bond and Performance Bond on their behalf, that his signature was duly affixed and he subscribed to the said Payment Bond and Performance Bond by authority and direction of said corporation.

IN WITNESS, I have hereunto set my hand and affixed my official seal at the City of _____, the day and year first above written.

My Commission expires:

_____

_____
Notary Public

(SEAL)

POWER OF ATTORNEY

DOCUMENTS

(Attached hereto original or validated documents which give to individual who signed Contract Bond Power of Attorney for Surety)

INSURANCE CERTIFICATES

(Staple Insurance Certificates as required
under Paragraph G-1.06 to this sheet)

CITY OF WILMINGTON

NORTH CAROLINA

PROPOSAL
FOR
10th STREET AND GRACE STREET
INTERSECTION IMPROVEMENTS
PROJECT NO. 7DCEM2310
CONTRACT NO. PAV-IH-0724

1. The undersigned, having carefully examined the site of the proposed work, the entire Bidding Document, including but not limited to the Advertisement, Special Notice, General Provisions, Technical Specifications, MBE/WBE/HUB/DBE documents and requirements, Federal Requirements (if any), Contract and Plans and/or Standard Details attached hereto, all of which are fully understood and hereby agreed to, proposes to furnish all materials, labor, equipment and plant necessary to complete in-place the specified improvements, in strict accordance with the above mentioned bidding documents.

2. Where an interpretation as to specifications is necessary, or as to the character of the work performed, or as to further instructions relating to the work, before or during construction, the undersigned bidder hereby agrees that (hereinafter called "ENGINEER") shall be the authority and his word shall be final.

3. The prices, as stated, are for the work completed and also to include all charges and expenses for furnishing all labor, materials, equipment and plant for completing the specified work in the manner specified in the specifications, and according to the instructions of the ENGINEER, unless otherwise shown in the Proposal.

4. If awarded this contract, the undersigned agrees to begin construction on the date to be specified in the written order by the Purchasing Manager and to complete all work within 90 calendar days of the date of beginning. The CONTRACTOR further agrees to pay, as liquidated damages, the sum of $230.00 for each consecutive calendar day thereafter as hereinafter provided in paragraph G-1.47 of the General Conditions.

5. The undersigned hereby certifies that this Proposal is made without connection with any person or persons making bids or proposals for the above work, and that the bid is in all respects fair and without collusion or fraud.

6. The undersigned further agrees that in case of failure on his part to execute the said contract and bond within ten (10) consecutive calendar days after written notice of award of the contract by the Purchasing Manager , the check or bid bond, or both, accompanying this bid and the monies payable thereon shall be paid into the funds of the City of Wilmington, North Carolina, as liquidated damages for such failure; otherwise the check and/or bid bond accompanying this Proposal shall be returned to the undersigned.

7. The undersigned understands and agrees that if awarded this contract he will execute the contract and post a Performance Bond and Payment Bond to the extent of one hundred percent (100%) of the amount of this contract.

8. The undersigned understands and agrees that all extra work shall be done and paid for as provided under the applicable sections of the specifications. In the event that extra work is necessary, the percentage to be added to the actual payroll cost to cover Social Security, small hand tools, office overhead on labor management only, Workmen's Compensation Insurance and other insurance for labor costs shall be 5% percent.

All extra work shall be done using actual payroll and material costs, and a profit of ten percent (10%) of the total cost shall be added thereto. All items of materials shall be billed to the CITY on the extra work invoice, and a delivery slip from the vendor shall be submitted therewith to verify actual cost. No additional profit will be allowed on materials other than the normal overall ten percent (10%) above stated. Items not provided for above shall be agreed upon between the CONTRACTOR and the ENGINEER prior to invoicing.

9. The undersigned understands that, if awarded this contract, he must guarantee, for a period of one year after date of final payment, all work accomplished under this contract to the extent that he will repair any defects due to faulty workmanship, or materials which may appear in his work during this period.

10. The undersigned supplies the information recorded below for use in the preparation of the contract documents, in event of contract award:

10.1 Please indicate type of business organization:

(a) Proprietorship _____
(b) Partnership _____
(c) Corporation _____
(d) Limited Liability Co. _____

10.2 If business is a Corporation, please answer the following questions:

Name and title of officers, authorized by Corporate Resolution, who will execute the contract on behalf of corporation (generally President and Secretary).

_____

Firm is incorporated in what state?

_____

If firm is a foreign corporation, does firm have a certificate of authority from the North Carolina Secretary of State? _____

10.3 If business is a Partnership, please answer the following:

Name in full or all general partners and addresses:

_____ Is this a limited or general partnership? _____

If a limited partnership, what is state of registration? _____

If business is a foreign limited partnership, does business have a certificate of authority from the North Carolina Secretary of State? _____

10.4 If business is a Proprietorship, please answer the following:

Name of owner: _____

10.5 If business is a limited liability company, please answer the following:

List the names and title of managers or member-managers who will execute the contract on behalf of the company? _____

What is state of organization? _____

If business is a foreign limited liability company, does business have a certificate of authority from the North Carolina Secretary of State? _____

10.6 For all bidders:

If the business operates under an assumed name, what is the assumed name?

_____

_____

Has a certificate of assumed name been filed in the New Hanover County Registry?

_____

If so, please provide the recording information. Deed Book _____ at Page _____.

11. Bid Surety Information - Please fill in the applicable paragraph.

11.1 Attached hereto is a cash deposit in the amount of _____ _____ Dollars ($_____), this amount being not less than five percent (5%) of the total bid.
OR

11.2 Attached hereto is a certified check on the _____ Bank of _____ in the amount of _____

_____ Dollars ($_____), made payable to the City of Wilmington, North Carolina. The bank on which the certified check is submitted is warranted to be a member of the Federal Deposit Insurance Corporation, and the amount of the check is not less than five percent (5%) of the total bid.

OR

11.3 Attached hereto is a bid bond in the amount of five percent (5%) of the total bid, said bid bond being indemnified by the _____
(Insert Name of Bonding Company)
whose address is _____. This bond is

executed by a corporate surety licensed to issue such bonds in the State of North Carolina and is made payable to the City of Wilmington. This bid bond is conditioned so that the surety will upon demand make payment to the City of Wilmington upon said bond if the bidder fails to execute the contract the surety shall pay to the CITY an amount equal to the amount of said bid bond in an amount not less than five percent (5%) of the total bid.

12. Additional Information - Please respond to each:

12.1 North Carolina Tax Payer Identtification Number: _____

_____

12.2 Does your company have an Affirmative Action Plan: Yes _____ No _____

13.3.The undersigned proposes to accomplish the work as described in the following at the unit prices and/or lump sum price shown. In the event of a discrepancy in the unit prices and the extended prices, the unit prices shall prevail

Bid Schedule

Base Bid

Item No.	Item Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization & General Requirements	1	LS		
2	Traffic Control	1	LS		
3	Erosion Control Measures	1	LS		
4	Tree Protection	3	EA		
5	Asphalt Pavement Demolition	1010	SY		
6	Curb Demolition	685	LF		
7	Miscellaneous Demolition	1	LS		
8	Tree Removal	3	EA		
9	Backfill Material	350	CY		
10	Fine Grading	1	LS		
11	Asphalt Pavement Variable Height Mill and Overlay	1850	SY		
12	Concrete Sidewalk	150	SY		
13	Curb Ramp	8	EA		
14	6" Concrete Curb	875	LF		
15	Driveway Turnout	2	EA		
16	Pavement Marking	1	LS		
17	Remove/Salvage/Reinstall Signage	1	LS		
18	12" Reinforced Concrete Pipe	5	LF		
19	18" Reinforced Concrete Pipe	10	LF		
20	Catch Basin w/ Frame, Grate, and Hood	2	EA		
21	Drop Inlet Frame and Grate	2	EA		
22	Existing Curb Inlet Top Replacement	1	EA		
23	Bioretention Cell Excavation	100	CY		
24	Bioretention Cell Media Mix	80	CY		
25	Bioretention Cell Outlet Control Structure	1	EA		
26	Bioretention Cell Sod Surface	285	SY		
27	Bioretention Cell Rip-Rap	6	CY		
28	Street Trees	3	EA		
29	Permanent Seeding, Fertilizing, Mulching	815	SY		
				Total	

Alternate

Item No.	Item Description	Quantity	Unit	Unit Cost	Total Cost
ALT-1	Asphalt Pavement Standard Height Mill and Overlay	1850	SY		
ALT-2	Permanent Seeding, Fertilizing, Mulching (in lieu of Bioretention Cell)	125	SY		
				Total	

14. The undersigned understands that the award under this Proposal will be made to the lowest responsible bidder as described in Section G-1.02 of the General Provisions, on the proposal page or in Section 15 Special Conditions.

15. The undersigned acknowledges receipt of any issued Addendums to this Project by recording the Addendum number and date acknowledged below:

Addendum #1: _____Dated: _____
Addendum #2: _____Dated: _____
Addendum #3: _____Dated: _____

If awarded the work, I/we agree to begin work as soon as given the notice to proceed and complete the work ready for occupancy within the time limits specified.

This Proposal is submitted by:

_____
Company Name

Signed by: _____
Authorized Person's Signature

_____
Type or Print Name of Person Signing Above

Title: _____

Address: _____

_____ Zip_____

Phone: _____

Date: _____

North Carolina Contractor's License Number: _____

N. 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

MUNIS PROJECT No. 7DCEM2310

TECHNICAL SPECIFICATIONS

PROJECT DIRECTOR: FRED ROYAL, P.E.

PROJECT ENGINEER: ZACH ROMAN, P.E.

Zach Roman
5/22/2024

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON NORTH CAROLINA

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TECHNICAL SPECIFICATIONS
SECTION I: EXCAVATING, GRADING & BACKFILLING **10/26/2017**

T-1.01 **SCOPE**:
The work covered by this section of the specifications consists of furnishing all plant, labor, equipment, supplies and materials, and in performing all operations in connection with the excavations, grading and backfilling, including borrow, drainage structures, curb and gutter, sidewalks, driveways, pavements, slopes, storm drains, water and sanitary sewer lines, including all hauling, wetting, rolling and other operations pertaining thereto within the project or work limits, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract. Prior to any work, the Contractor shall comply with the provisions of the General Conditions Section G-1.52. Precautions prior to and during excavation of any street.

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

T-1.02.1 **EXCAVATION**:
All excavation shall be performed in accordance with the grades and lines as established by the Engineer and as required by the work to be performed. Excavation, unless otherwise indicated in the Special Conditions, shall include the removal of all concrete, curb, rock, earth, fences, trees, shrubs, and other materials, excepting trees having a diameter of 6" or more, measured four feet above the ground, which shall be paid for as outlined in the proposal or shall be included in the cost of clearing and grubbing where indicated on the plans and in the proposal. Care will be exercised by the Contractor to prevent undercut lower than the required subgrades. In the event such undercutting takes place, the areas so cut will be backfilled as provided for in Paragraph T-1.02.2 on Embankment. All excavation, unless otherwise indicated, shall be performed on an unclassified basis. All excavation shall be performed in compliance with OSHA Safety and Health Standards Applicable to Construction, 29 CFR Part 1926, as amended.

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

T-1.02.2 **EMBANKMENT, FILL**:
Where existing grades require the use of embankment or fill to reach the required section elevation, the Contractor shall deposit suitable spoil or borrow material from excavated areas. Such spoil material shall be free from debris, roots, trash, stones, or other deleterious materials, and shall be placed in successive layers of loose material not more than 12 inches in depth.

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

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

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

T-1.02.3 **UNDERCUTTING**:
Any undercutting, unless authorized by the Engineer, shall be replaced and compacted, as specified for embankment, at the Contractor's expense. If the material, after excavation to subgrade is found to be soft, spongy or unfit for use as subgrade, such unsuitable materials shall be removed to a depth as directed by the Engineer and the subgrade shall be brought to proper elevation by filling with suitable spoil from excavation elsewhere.

T-1.02.4 **BORROW**:
The contractor shall use suitable excavation from the project. If suitable excavation is not available then the Contractor will supply the site for all borrow necessary in this work. The Contractor will provide all labor and equipment necessary to dig and haul such borrow material. All borrow or material sources supplied by the contractor and used on this job shall have the limits of the borrow source identified, and be excavated from a permitted borrow site. The contractor have Standard Proctor Test Method, ASTM D-698, test performed and submitted to the Engineer for approval, prior to beginning borrow operations. The placing of borrow shall be as provided for in the paragraph of Embankment. No overhaul will be allowed. Borrow shall be a natural sand material with not more than 15% passing the No. 200 sieve, and shall be furnished as directed for use to replace excavated soils found to be unsuitable for trench backfill (if any) and/or to supplement excavated soil supply if needed to complete backfilling operations to suitable grade. Digging, hauling and placing of borrow will be paid for as specified under Payment.

T-1.02.5 **GRADING & SLOPING BANKS**:
Where it is necessary to terrace or slope banks, either in the street right-of-way or behind the property line, the Contractor is hereby notified that this work will be considered **common excavation and paid for as such**. In grading these banks, a slope of 3 horizontal to 1 vertical will generally be held except in cases where it is necessary to build retaining walls or otherwise change this slope in order to protect property or meet other conditions. In these cases, the slope shall be as designated by the Engineer.

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

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

T-1.03 **EXCAVATION & BACKFILLING FOR WATER MAINS, SANITARY SEWER & STORM DRAINS**:
Pipes shall be laid true to the lines and grades shown on the plans. The grade shown on the profile is the invert to which the work must conform. Work not conforming to the grade shall be corrected by the Contractor at his own expense.

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

1. By String Line

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

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

2. By Laser Beams

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

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

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

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

T-1.03.1 **BACKFILLING MATERIALS**:

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

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

TYPE 2 MATERIAL:
Excavated material from the trench or materials from other sources, which are free from large clods, roots or stones larger than 8 inches.

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

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

T-1.03.2 **EXCAVATION**:
Perform all excavation of every description and of whatever substances encountered to the depth shown on the plans.

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

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

T-1.03.3 E**XISTING FACILITIES**:

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

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

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

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

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

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

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

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

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

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

T-1-03.5 **CARE AND RESTORATION OF PROPERTY**:
Excavating machinery and cranes shall be operated with care to prevent damage to existing structures, paving and/or wires.

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

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

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

T-1.03.6 **TRENCHING**:
Trenches shall be dug to the depth required by the contract documents adding, however, to such depths the thickness of the pipe and the required bedding. A recess sufficiently large enough to receive the couplings, where applicable, and to permit making the joints, shall be cut out of the bottom of the trench. Where the bottom of the trench is or appears to be soft or spongy, the excavation shall be made deeper as described under this section to permit a bedding being laid.

T-1.03.7 **TUNNELING UNDER TREES, CURBS, ETC.**:
In areas where specific trees, curbs, etc., are designated to be saved, excavation may be made by alternate sections of open cut and wedge tunnel.

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

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

T-1.03.8 **SHEETING AND SHORING**:
Where sheeting, shoring, bracing or trench boxes are used, they must be designed and sealed by a professional engineer licensed to practice in the State in which the construction work is being accomplished.

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

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

T-1.03.9 **QUICKSAND EXCAVATION**:
Where quicksand excavation is encountered, the Contractor shall drive either tight tongue and groove wooden sheet piling or steel sheet piling to a depth, which will effectually cut off the flow of sand. Well points and other methods shall then be used to dewater the trench. Excavation and construction shall follow as rapidly as possible thereafter. A satisfactory foundation must, however, be secured.

T-1.03.10 **TRENCHING IN ADVANCE OF PIPE LAYING**:
The trench for the pipe lines shall not be opened for a distance of more than one hundred (100) feet at any one time. At no time will the Contractor be permitted to leave the trench open at the end of a working day.

T-1.03.11 **KEEPING TRENCH DRY**:
All ground water which may be found in the trenches and any water which may get into them from any cause whatsoever shall be pumped or bailed out so that the trench shall be dry during pipe laying period. No water shall be permitted to reach concrete until it has set sufficiently. All water pumped from the trenches shall be disposed of in compliance with the applicable local regulations of the appropriate governing body. The Contractor hall provide a minimum of two pumps for each trench opened in wet ground, one operating and one standby. The standby pump shall be of a size that will replace the largest operating pump. The Contractor shall be required to well point, pump, or provide other measures necessary to keep the trench dry, at no additional cost to the owner.

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

T-1.03.12 **PIPE BEDDING**:

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

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

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

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

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

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

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

T-1.03.13 **BACKFILLING**:
No backfilling shall be done before the Engineer gives permission. After pipes have been checked for alignment and bedding, the backfilling may be started. Backfill material may be deposited in trench either by hand or machine. Sufficient number of men shall be available to spread the backfill in uniform layers.

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

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

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

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

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

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

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

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

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

3. Backfilling Trench to Subgrade After Initial Backfilling.

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

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

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

4. Settlement

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

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

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

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

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

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

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

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

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

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

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

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

T-1.03.14 **COMPACTION AND TESTING**:

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

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

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

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

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

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

T-1.03.15 **DISPOSAL OF MATERIAL**:

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

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

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

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

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

When pipe lines are placed under existing pavements, a cut-back of the pavement of 12" will be required on each side of the trench, see Standard Detail 1-05. After the pipe line has been laid and backfilled in City streets, a minimum 6-inch compacted base of marl-type rock shall be placed over the total width of the pavement cut. After manipulation and the compaction, this base shall be 2 inches below the level of the adjacent pavement. A wearing surface of 2 inches (or equal to existing pavement thickness, whichever is greater) of bituminous concrete, Type I, shall then be applied over this base in such a manner as to, when rolled, match the grade of existing pavement. N.C. D.O.T. street base and pavement will be specified on plans.

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

T-1.04.1 **ASPHALT PAVEMENT**:

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

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

T-1.04.2 **CURB & GUTTER**:

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

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

T-1.04.3 **SIDEWALKS & DRIVEWAYS**:

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

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

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

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

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

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

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

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

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

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

T-1.07 **SALVAGE OF USABLE MATERIALS**:
All materials such as granite curbing, paving blocks, brick pavers, castings, pipe, etc., removed during excavation, shall be delivered to the City Street Division lot in the vicinity of Tenth and Fanning Streets. Care shall be taken that granite curb, when encountered, shall not be broken into short lengths, but shall be delivered in the same lengths found in place when encountered. Loss or unnecessary damage to any such items shall be considered the Contractor's responsibility, and the City shall take credit for such loss or damage when deemed advisable by the Engineer.

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

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

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

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

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

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

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

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

T-1.11 **METHODS OF MEASUREMENT:**

T-1.11.1 **EXCAVATION:**
The unit of measurement for excavation shall be cubic yards, which will be computed by the average end-area method from the cross sections taken before and after the excavation operations. The yardage to be paid for under this section of the specifications shall be the number of cubic yards of material, measured in its original

position and removed from the excavation areas. The measurement will include the excavation below grade, where ordered, and allowance made on the same basis for suitable excavation as replacement. The measurement will not include the yardage excavated without authorization beyond the normal slope lines nor the yardage of any material which is used for proposes other than those directed.

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

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

T-1.11.2 **EXCAVATION AND BACKFILL:**

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

T-1.11.3 **CLEARING AND GRUBBING:**

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

T-1.12 **PAYMENT:**

T-1.12.1 **EXCAVATION:**

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

T-1.12.2 **CLEARING AND GRUBBING:**

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

CITY OF WILMINGTON ENGINEERING

TECHNICAL SPECIFICATIONS
SECTION 2: STORM DRAINS **03/21/18**

T-2.01 **SCOPE**:
The work covered by this section of the specifications consists of furnishing all labor, materials, plant, and equipment necessary to construct all storm drain lines, structures, and appurtenances where shown on the plans or as directed by the Engineer. The Contractor is cautioned to review the General Specifications pertaining to precautions for excavation of streets.

T-2.02 **GENERAL**:
Storm drain lines, structures, etc. shall be constructed to line and grade as established by the Engineer. It shall be the Contractor's responsibility to protect and maintain any grade alignment stakes. All pipe lines and structures shall be constructed by the use of competent workmen under the supervision of an experienced foreman. Proper materials and equipment shall be used and shall be subject to the approval of the Engineer. Great care shall be taken to obtain well-aligned and tight pipelines so as to assure good flow and the exclusion of ground water and foreign substances.

T-2.03 **MATERIALS**:

T-2.03.1 **PIPE**:
All storm drain pipe shall be reinforced concrete pipe unless otherwise indicated on the plans, specifications, and proposal or unless otherwise directed by the Engineer. Only sound, undamaged pipe shall be used. The Contractor or his suppliers shall be responsible for the delivery, storage, and handling of the pipe. The Contractor shall, at his own expense, replace any damaged or otherwise unacceptable sections of pipe.

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

REINFORCED CONCRETE ARCHED AND ELLIPTICAL PIPE:
Reinforced concrete arched and elliptical pipe shall be manufactured in accordance with ASTM C 506 latest revision.

REINFORCED CONCRETE ELLIPTICAL PIPE:
Reinforced concrete elliptical pipe shall be manufactured in accordance with ASTM C 507 and AASHTO M-207.

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

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

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

HIGH DENSITY POLYETHYLENE PIPE (HDPE):
HDPE shall not be permitted within rights-of-ways or public easements.

CORRUGATED POLYPROPYLENE PIPE:
Corrugated polypropylene (PP) pipe shall be manufactured in accordance with ASTM F2881 or AASHTO M330. PP shall have a smooth interior and annular exterior corrugations. PP shall be required to be furnished in eight (8) foot joints for sizes twelve (12) inches through twenty-four (24) inches except where shorter joints are needed for tie-ins. The City prefers that ALL sizes of PP be furnished in the eight (8) foot lengths when the Contractor has the proper equipment and sufficient working area. Permission may be granted for use of other length joints by the Engineer on a case-by-case basis. Pipe shall have double-gasket connections and shall be installed in accordance ASTM D2321 and manufacturer's recommended installation guidelines.

T-2.03.2 **FLARED END SECTIONS**:
Flared end sections (FES) shall be installed at locations shown on the plans or as directed by the Engineer. FES's shall be manufactured of the same material as the pipe to which it is being connected and shall be manufactured and installed with the same type of joint as the pipe.

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

T-2.03.3 **BRICK**:
Bricks shall conform to AASHTO M-91-90, Grade MS, and shall be WHOLE solid brick of standard size, with straight and parallel edges and square corners. They shall be of compact texture, full weight, entirely true, free from injurious cracks and flaws, tough, strong, and shall have a clear ring when struck together.

T-2.03.4 **CASTINGS**:
All castings for storm drain structures shall be Gray Iron castings manufactured in accordance with ASTM A-48, latest revision and shall be fabricated in accordance with the City of Wilmington Standard Details for each casting. Storm drain manholes shall have the words "STORM DRAIN" or "STORM SEWER" cast in the lids.

T-2.03.5 **FILTER FABRIC**:

Filter fabric shall be Supac Style 5-NP, Trevira Spunbound Type S-1115, Amoco Style 4545, or an approved equal. The Contractor shall furnish the Engineer sufficient data to evaluate the adequacy of any substitute non-woven filter fabric. No installation of substitute fabric shall be permitted until written approval has been furnished by the Engineer.

T-2.04 **STRUCTURES**:

T-2.04.1 **MANHOLES**:

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

BRICK MANHOLES:

Brick manholes shall be constructed in accordance with City of Wilmington Standard Details 2-03. Where the depth of the manhole exceeds eight (8) feet, the inside diameter of the manhole shall be increased to five (5) feet and the wall thickness shall be increased to twelve (12) inches for the portion of the manhole greater than eight (8) feet deep. Where the plans or the Engineer specify, the manhole shall be constructed at the specified diameter and corbelled in accordance with SD 2-03.

PRECAST MANHOLES:

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

CORRUGATED METAL PIPE MANHOLES:

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

INTERFERENCE MANHOLE:

Interference manholes shall be constructed in accordance with City of Wilmington Standard Detail 2-05 and in accordance with the other specifications for manholes as specified in this Section. Interference manholes shall be constructed where shown on the plans or where directed by the Engineer to eliminate a conflict with the storm drain system.

T-2.04.2 **JUNCTION BOXES**:

REINFORCED CONCRETE JUNCTION BOXES:

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

junction boxes shall be cast to provide for a City of Wilmington approved manhole ring and cover.

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

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

BRICK CATCH BASINS:
All catch basins, unless directed otherwise by the Engineer or specifically noted on the plans, shall be open throat basins constructed of brick and in accordance with City of Wilmington Standard Detail 2-01.

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

DROP INLETS:
All drop inlets, unless specifically noted otherwise on the plans or directed by the Engineer, shall be constructed of brick and in accordance with City of Wilmington Standard Detail 2-02.

T-2.04.4 **REINFORCED CONCRETE HEADWALLS**:
Reinforced concrete headwalls shall be constructed at locations shown on the plans or where directed by the Engineer. All reinforced concrete headwalls shall be constructed in accordance with the details and specifications included with the project and in accordance with applicable sections of the ACI Manual of Concrete Practices.

T-2.05 **CHANNEL LININGS**:

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

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

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

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

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

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

T-2.06 **SUBDRAINS**:

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

T-2.07 **INSTALLATION**:

T-2.07.1 **PIPE INSTALLATION**:
All pipe and related structures shall be installed to the line and grade as shown on the plans or as established by the Engineer. The Contractor shall adhere to any and all construction techniques established by the pipe manufacturer unless directed otherwise by the Engineer. The Contractor shall be responsible for and correct any and all defects due to settlement, poor workmanship, improper handling, or lack of maintenance. It shall be the Contractor's responsibility to maintain the new and existing pipe system as well as existing utilities on the job site for the duration of the project. This is to include, but not be limited to, the infiltration of sand and debris into the new and existing storm drainage system and into the other utility lines. Should sand or debris collect in any portion of the new or existing systems as a result of construction, the Contractor shall be required to remove said sand and debris at his own expense.

T-2.07.2 **PIPE JOINTS:**

JOINTS:

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

REINFORCED CONCRETE PIPE:
Joints for reinforced concrete pipe shall be tongue and groove with flexible watertight

joints unless specified otherwise on the plans, specifications, or proposal or unless directed otherwise by the Engineer. The joint material shall be as recommended by the reinforced concrete pipe manufacturer and shall provide water tight seals at all joints, meeting the requirements of Section T-14.10.2. Joint materials specifications shall be submitted to the Engineer for review and approval prior to installation.

REINFORCED CONCRETE ARCHED AND ELLIPTICAL PIPE:
Joints for reinforced concrete arched and elliptical pipe shall conform to the specifications for joints for reinforced concrete pipe.

REINFORCED CONCRETE BOX CULVERTS:
Joints for reinforced concrete box culverts shall conform to the specifications for joints for reinforced concrete pipe.

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

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

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

T-2.07.3 **FLARED END SECTIONS**:
All flared end sections shall be manufactured of the same material as the pipe to which it is being connected, with the exception of aluminum. No aluminum flared end sections shall be permitted. The contractor shall use a concrete headwall when using aluminum pipes. The flared end section shall be installed such as to minimize and prevent undermining of the flared end section and to minimize erosion of the receiving channel. The Contractor shall use extreme care not to undercut the soil under the flared end section. Where the soil is undercut, the Contractor shall be required to replace the material and to place the material in six (6) inch lifts achieving 100 percent of the maximum density at optimum moisture, as determined by ASTM D-1557 Standard Test Method.

T-2.07.4 **STRUCTURES**:
All structures shall be constructed on firm, undisturbed soil at locations shown on the plans or as directed by the Engineer, provided that all precast structures shall have a minimum of six (6) inches of washed stone (#57) bedding and the cost of the stone bedding shall be considered incidental to the precast structure. Additional stone bedding thickness may be required as directed by the engineer for structures deeper than six feet. Where the Contractor undercuts the soil for the footing, the Contractor shall be required to use washed stone (#57) to bring the subgrade back to proper elevation. Should the contractor encounter unsuitable material at the subgrade elevation for the manhole footing, he shall immediately notify the Engineer and assist the Engineer in determining the severity of the problem and work with the Engineer in resolving the situation.

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

fabric along the exterior of the pipe and the structure. The filter fabric shall be secured to the exterior of the pipe and the structure with a bituminous adhesive.

MANHOLES:

BRICK MANHOLES:

Brick manholes shall be constructed on concrete footing a minimum of six (6) inches thick and having a diameter a minimum of twelve (12) inches larger than the outside diameter of the structure. Brick manholes shall be plastered with ¾ inch cement on both the exterior and interior of the structure. All brick shall be whole, solid, uniform brick made of cement or hard burned clay. The brick shall be fully soaked in water prior to being set in cement mortar. All pipes entering or leaving the manhole shall be set prior to the setting of bricks. Bricks and mortar shall be placed around the pipes in a manner to ensure a neat watertight seal. Steps shall be installed one (1) foot on center directly below the access opening.

PRECAST MANHOLES:

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

INTERFERENCE MANHOLES:

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

REINFORCED CONCRETE JUNCTION BOXES:

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

PRECAST REINFORCED CONCRETE JUNCTION BOXES:

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

BRICK CATCH BASINS:

Brick catch basins shall be constructed on concrete footing a minimum of six (6) inches thick and extending a minimum of four (4) inches past the outside face of the structure. Brick catch basins shall be plastered with ¾ inch cement on both the exterior and interior of the structure. All brick shall be whole, solid, uniform brick made of cement or hard burned clay. The brick shall be fully soaked in water prior to being set in cement mortar. All pipes entering or leaving the catch basin shall be set prior to the setting of bricks. Bricks and mortar shall be placed around the pipes in a manner to ensure a neat watertight seal.

DROP INLETS:
Drop inlets shall be constructed on concrete footing a minimum of six (6) inches thick and extending a minimum of four (4) inches past the outside face of the structure. Brick drop inlets shall be plastered with ¾ inch cement on both the exterior and interior of the structure. All brick shall be whole, solid, uniform brick made of cement or hard burned clay. The brick shall be fully soaked in water prior to being set in cement mortar. All pipes entering or leaving the drop inlet shall be set prior to the setting of bricks. Bricks and mortar shall be placed around the pipes in a manner to ensure a neat watertight seal.

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

T-2.07.5 **CHANNEL LININGS**:

RIP RAP:
Rip rap shall be installed at the locations shown on the plans or as directed by the Engineer. All rip rap shall be installed in accordance with City of Wilmington Standard Detail 2-15 and shall be installed with non-woven filter fabric resistant to ultraviolet rays between the ground and the rip rap unless noted otherwise on the plans. The Contractor shall use caution to prevent any tears or holes in the filter fabric when placing the rip rap. All tears or holes in the filter fabric shall be repaired as directed by the Engineer. As a minimum, the damaged area shall have an undamaged section of filter fabric which extends a minimum of two (2) feet in all directions past the damaged area, placed over the damaged filter fabric.

T-2.07.6 **SUBDRAINS**:
Sub drains shall be installed at locations shown on the plans or as directed by the Engineer. The sub-drain shall be installed in accordance with SD 2-04. A minimum of six (6) inches of washed stone shall be placed around the perforated pipe. The washed stone shall be wrapped in an approved non-woven filter fabric. Unless directed otherwise, all subdrains shall be connected to the storm drain system at structures and the invert of the subdrain shall be a minimum of six (6) inches above the invert of the structure.

T-2.08 **EXCAVATION AND BACKFILL**:

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

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

T-2.08.2 **EXCAVATION FOR STRUCTURES**:

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

T-2.08.3 **UNDERCUTTING**:

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

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

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

T-2.08.5 **BACKFILL**:

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

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

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

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

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

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

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

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

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

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

T-2.09.1 **TAPPING EXISTING STRUCTURES**:

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

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

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

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

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

T-2.09.4 **SALVAGING EXISTING PIPE, CASTINGS, ETC.**:
All pipes, castings, etc. deemed salvageable by the Engineer shall be removed from the construction site by the Contractor and shall be delivered to the City Operations Center at River Road. Upon such delivery, the Contractor shall receive a receipt for said salvaged material. The Contractor shall be required to replace all material directed to be salvaged which he cannot account for.

T-2.09.5 **PLUGGING EXISTING LINES**:
The Contractor shall install a masonry plug where shown on the plans or directed by the Engineer. Unless otherwise stated in the Special Conditions section or in the proposal, NO EXTRA PAYMENT SHALL BE ALLOWED FOR THIS WORK.

T-2.09.6 **GROUT FILLING ABANDONED LINES AND/OR STRUCTURES**:
Where shown on the plans, specified in the Special Conditions section, or directed by the Engineer, the Contractor shall fill existing pipes and/or structures as required with concrete or grout. This concrete or grout shall be a minimum 2000 psi. For pipe, this grout shall be pumped under pressure into the section being filled in such a manner to ensure that the line completely fills with the concrete or grout.

T-2.09.7 **REPLACEMENT OF EXISTING IMPROVEMENTS**:
Where the storm drain crosses existing improvements, i.e., asphalt, base, curb, driveways, sidewalks, brick pavers, water/sewer services, other utilities, etc., it shall be the Contractor's responsibility to protect and/or to replace these improvements. The cost of protecting and/or replacing these improvements shall be included in the unit prices for new storm drain pipes and structures and NO EXTRA PAYMENT SHALL BE ALLOWED unless otherwise specified in the Special Conditions section. The Engineer shall be the judge as to the extent of replacement required. In the instance of asphalt replacement, it shall be done in accordance with Section T-2.08.6 and Standard Detail SD 1-05.

T-2.10 **MEASUREMENT AND PAYMENT**:

T-2.10.1 **PIPE**:
Payment for pipe shall be for the actual linear footage installed for each size and cut range specified in the proposal. The actual amount of pipe in a given cut range shall be determined by the initial grade at the point of installation and the installed pipe invert unless otherwise specified in the Special Conditions section. No payment through structures will be allowed.

T-2.10.2 **BOX CULVERTS**:
Box culverts shall be measured in the same method as pipe and as described in Section T-2.10.1.

T-2.10.3 **FLARED END SECTIONS**:
Flared end sections shall be paid on a “per each” basis for the specific sizes used as bid in the proposal.

T-2.10.4 **CATCH BASINS AND MANHOLES**:
Catch basins and manholes shall be paid for as specified in the proposal for the actual quantity installed for the various diameters and ranges of cut. The appropriate cut for a given structure shall be determined in the field and shall be measured in feet from the lowest invert of the manhole or basin to the rim.

T-2.10.5 **JUNCTION BOXES**:
Junction boxes shall be measured on a "per each" basis using the inside dimensions and as bid in the proposal. The unit price for junction boxes shall include all costs associated with constructing and/or installing the box including steps, castings, etc.

T-2.10.6 **HEADWALLS**:
Headwalls shall be measured on a "per each" basis for the headwall actually installed for the various ranges of pipe(s) in the headwall and as bid in the proposal unless otherwise specified in the Special Conditions section and/or in the proposal.

T-2.10.7 **CHANNEL LININGS AND OUTLET STABILIZATION**:

RIP RAP:
Rip rap shall be measured on a square yard basis for the actual quantity installed as determined by final field measurements for the various thickness(es) and type(s) specified in the Special Conditions section and/or the proposal.

T-2.10.8 **SUBDRAINS**:
Subdrains shall be measured on a linear foot basis for the actual quantity installed.

T-2.10.9 **EXCAVATION AND BACKFILL**:
No extra payment will be allowed for excavation and/or backfill required for the installation of storm drain pipes and/or structures, except that mucking required below the bedding of the pipe shall be paid for as common excavation. Where undercutting is required for the placement of stone bedding (specified by the Engineer), the cost of the undercutting shall be included in the cost of the stone bedding.

BORROW OR SELECT FILL:
When the Engineer has directed the Contractor to provide select fill (borrow) for the backfilling of pipes and structures, the borrow will be measured on a per cubic yard basis. The method of measurement shall be computed by measuring the trench to be backfilled and subtracting the volume of the pipe and structures, or at the direction of the Engineer by using truck counts and allowing a shrinkage of 20% for the voids.

TECHNICAL SPECIFICATIONS
SECTION 6: CONCRETE: PROPORTIONING, MIXING, TESTING, PLACING AND CURING **4/04/2001**

T-6.1 **GENERAL**:
Concrete shall consist of a mixture of Portland cement, aggregates and water, proportioned in accordance with the requirements of this specification. Admixtures shall be included with these primary ingredients only when specifically authorized.

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

T-6.02.1 **FROZEN AGGREGATES**:
Frozen aggregates or aggregates containing lumps of frozen material shall be thawed before using.

T-6.02.2 **WORK IN FREEZING WEATHER**:
All concrete work during cold weather shall be in conformance with ACI-306R. In general, no concrete shall be placed when the ambient temperature is 40 degrees F. or below without the consent of the Engineer.

T-6.03 **PROPORTIONS AND CONSISTENCY**:
In proportioning concrete materials one (1) bag (sack) of cement shall be considered as being one (1) cubic foot volume and ninety-four (94) pounds weight.

T-6.03.1 **AGGREGATES**:
The weight per unit volume of the aggregates shall be based on dry and rodded weights determined in accordance with ASTM C-29 latest revision.

T-6.03.2 **WATER**:
Total or maximum water shall be considered as all added water, including absorbed (surface) water in the aggregates.

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

T-6.03.3 **CEMENT**:
Cement shall be measured by weight when bulk cement is used and where batching it is necessary to use a portion of a bag, otherwise for bag cement, the bag weight of ninety-four (94) pounds may be used. Cement shall not be weighed in the same batch box as the aggregates, but a separate scale shall be used.

T-6.03.4 **ADMIXTURES**:
Powdered admixtures shall be measured by weight and liquid admixtures by weight or volume.

T-6.03.5 **WEIGHING HOPPERS & SCALES**:
Scales utilized in proportioning shall be either springless dial, multiple beam type, or solid-state digital strain gage transducer type. Scale gradations shall be no greater than the following:

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

All scale indicators shall be enclosed against moisture and dust.

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

T-6.03.6 **CONSISTENCY**:
The consistency of the concrete shall be determined by the slump test, hereinafter referred to, and said mixes shall be of the consistency required by the Engineer; but the ratio of the aggregate to total aggregate shall be maintained as shown in Table 1, T-6.08.

T-6.04 **MIXING AND DELIVERY**:
All concrete under this specification shall be machine mixed in accordance with ACI 304R. Hand mixing may be allowed where the volume to be placed is less than one (1) cubic yard.

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

T-6.04.1 **HAND MIXING**:
Hand mixing shall be permitted when the amount of concrete required for any job is less than one (1) cubic yard. Hand mixed concrete shall be mixed on a watertight platform or in a mortar box in batches not to exceed 1/3 cubic yards each. The aggregate shall first be spread in a uniform layer over which the required quantity of cement shall be evenly distributed. The entire batch shall be turned with shovels until the ingredients are thoroughly blended before adding the water. After adding the proper amount of water, the batch shall again be turned with shovels until a uniform consistency is obtained. Methods of hand mixing which allow the loss of mixing water will not be permitted.

T-6.05 **HANDLING AND PLACING CONCRETE**:
No concrete shall be used which does not reach its final position in the forms within one (1) hour after water is first added to the mix, except when concrete is continually agitated, when the time may be extended to one and one-half (1-1/2) hours.

T-6.06 **INSPECTION**:
Proper facilities shall be provided for the inspection and sampling of concrete at the mixing plant, loading plant and point of delivery.

T-6.06.1 **FACILITIES**:
The manufacturer shall afford the inspector, without charge to the City, all reasonable facilities for securing samples to determine if the concrete is being furnished in accordance with the requirements of this specification. All inspection and sampling shall be so conducted as not to interfere unnecessarily with the manufacture and delivery of the concrete.

6.06.2 **PLACING CONCRETE**:

Concrete shall be placed so as to avoid segregation of the materials and the displacement of the reinforcement. The use of long chutes for conveying concrete from the mixer will be permitted only on written authority of the Engineer. In case an inferior quality of concrete is produced by the use of chutes, the Engineer may order discontinuance of their use and the substitution of a satisfactory method of placing.

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

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

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

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

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

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

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

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

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

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

T-6.07.1 **FINISHING**:

BROOMED FINISH:

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

surface and brooming with a fiber-bristle brush. The surface shall be of uniform texture.

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

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

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

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

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

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

T-6.07.2 **CURING**:

Curing shall be accomplished by preventing loss of moisture, rapid temperature change, and mechanical injury or injury from rain or flowing water for a period of seven (7) days when normal Portland cement has been used and three (3) days when high-early-strength Portland cement has been used. Curing shall be started as soon after placing and finishing as free water has disappeared from the surface of the concrete. Curing may be accomplished by any of the following methods or combination thereof, as approved. All curing shall be in conformance with ACI 308.

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

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

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

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

T-6.08 TABLE I - RECOMMENDED PROPORTIONS OF AGGREGATES

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

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

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

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

T-6.10 **SAMPLING AND TESTING**:
All sampling, curing and testing of Portland cement concrete shall be in accordance with the current A.S.T.M. and ACI Standards. Not less than three cylinders shall be taken for testing at any one time. Unless otherwise directed by the Engineer, a minimum of one cylinder shall be taken for breaking at seven days and two cylinders taken for breaking at twenty-eight (28) days from each batch to be tested. The cost of concrete for samples is to be considered incidental to the project.

TECHNICAL SPECIFICATIONS
SECTION 7: CONCRETE CURBING AND CONCRETE CURB AND GUTTER **10/19/2001**

T-7.01 **SCOPE**:
The work covered by this section of the specifications consists of furnishing all plant, labor, equipment, appliances and materials, and in performing all operations in connection with the construction of concrete. Curbing is to include combination curbing, gutters, driveway gutters, curb returns, slope face curb, vertical curb, header curb, and other related structures shown on the drawings and as required by the Engineers in accordance with these specifications. Prior to any work, the Contractor shall comply with the provisions of Paragraph G-1.52.

T-7.02 **GENERAL**:
Concrete for curbing and other related structures shall be Class "A" concrete, proportioned, mixed, tested and placed as specified, in Section 6, "Concrete, Proportioning, Mixing, Testing and Placing."

The alignment and grade of the curbing will be established by means of off-set stakes by the Engineer, and the completed work shall accordingly conform thereto. The Contractor's foreman or form-setter shall carefully watch all alignment and grades to detect any errors in grade or alignment. In the event any of the curbing is damaged from any cause or proves defective in any way, or is out of alignment or grade, the Contractor shall remove such sections and replace at his own expense.

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

T-7.02.1 **JOINTS**:
Construction joints shall be spaced at ten (10) foot intervals, except that a fifteen (15) foot spacing may be used when a curbing machine is used. Construction joints may be installed by the use of templates or formed by other approved methods. Where such joints are not formed by template, a minimum depth of one and one-half (1-1/2) inches shall be obtained.

Expansion joints filler shall be spaced at thirty (30) foot intervals, except that a ninety (90) foot spacing may be used where a machine is used. Expansion joint filler shall be one half (1/2) inch thick and have same dimensions as the curb section and conform to Materials Section T-14.20.1

Expansion joints filler shall be adjacent to all rigid objects.

T-7.03 **EXCAVATION AND SUBGRADE PREPARATION**:
Excavation and subgrade preparation for concrete curbing shall be in strict compliance with Technical Specifications Section I, Excavation, Grading and Backfilling.

T-7.04 **FORMS**:

Wooden or steel forms, satisfactory to the Engineer, shall be used for the construction of curbing. They shall be set true to alignment and grade as established by the Engineer, and substantially braced. Metal templates, not more than three-sixteenth (3/16) inch in thickness and manufactured in accordance with the curbing section, shall be set in the places provided in the forms not more than ten (10) feet apart, as directed by the Engineer. The forms and templates shall be thoroughly cleaned and oiled after each operation. Templates shall be adjusted under the supervision of the Engineer so as to prevent short sections (less than 5 feet).

When back and front forms have been set to exact grade and secured, the dividing plates shall be inserted and trued up. With these forms as templates, fine grading to exact subgrade elevation shall be completed by hand. Face forms shall then be set. The Contractor shall at all times have at least one hundred (10') feet of forms set and grade tested and approved by the Engineer, ahead of pouring operations. He shall use every effort to observe any possible misalignments in grades and shall call such to the attention of the Engineer promptly.

T-7.05 **SECTIONS**:

Combination curbing shall be of the vertical curb type, conforming to the dimensions shown in the Standard Details of these specifications.

Slope-face curb shall conform to the dimensions shown in the Standard Details of these specifications.

The minimum thickness for curbing shall be six (6) inches in the cross-sections.

T-7.06 **CONSTRUCTION**:

Concrete curbing shall be constructed of Class "A" concrete. All materials incorporated shall conform to the provisions as set out hereinbefore and shall be mixed and deposited in accordance with the requirements of these specifications and the Engineer. The forms for combination curbing shall be placed in accordance with the proper alignment and grade as established by the Engineer, and all attachments, templates, stakes, bracings, etc., shall be securely set in place prior to depositing of concrete. Careful check will be made of all forms prior to pouring and the Contractor shall obtain a visual inspection and approval of all forms prior to depositing concrete therein. Such approval, however, shall not be grounds for claims by the Contractor for additional work in replacing any faulty work poured in forms approved by the Engineer or his authorized assistants.

When sufficient concrete has been placed in the forms, it shall be well spaded along areas in contact with the forms in order to eliminate all honeycombing and floating the proper alignment and grade, after which it shall be toweled smooth and very lightly brushed. Templates shall be removed by stages, but not entirely until the concrete has become thoroughly hard. After removal of the templates, there must be a clear division throughout between these sections. Edging tools will be used to form an edge along the back and front form and at each template.

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

At catch basins, there will be a short section of gutter only, the curbing being replaced by the casting. The catch basin casting shall be parallel with, and on the grade of the back form of the curbing section. The gutter area shall be so shaped and sloped as to increase in slope toward the curbing to an extent that when opposite the catch basin casting, it will provide an eight (8) inch clear opening below the casting top. This warped section at, and adjacent to, each catch basin shall have the exact same finish texture as that of the other curbing present and shall be poured at the same time where possible. A double ply of 30-pound building felt shall be inserted on all sides of catch basin casting covers that come in contact with any concrete. No felt shall be placed against catch basin leg castings.

The use of excessive grout (mud) continuously along the curbing section will not be tolerated. The use of "mules" shall be limited to obtaining the desired finish--they should not be allowed to alter the section of the curb. No floating and little or no troweling should be necessary against the curb face in order to obtain a true and proper section.

Such section should be obtained with the curb face form board, the alignment of which must be extremely good. (1/8 inch for every 6 feet) (1/4 inch for every 10 feet)

T-7.07 **CURBING AT STREET AND DRIVEWAY CORNERS**:
The curbing at street corners shall be constructed on a thirty-five (35) foot radius unless otherwise instructed. At driveways the curb and gutter shall be constructed on a three foot radius unless otherwise directed by the Engineer.

T-7.08 **CONCRETE CURBING, CURING AND FINISHING**:
Concrete curbing will be finished in strict compliance with these specifications as stated in Section 6, “Concrete, Proportioning, Mixing, Testing, and Placing.”

T-7.09 **BACKFILLING OF CURBING**:
Backfilling of curbing shall be in strict compliance with the specifications as stated in Section 1, “Excavation.”

T-7.10 **MEASUREMENT**:
Measurement of combination curbing shall be by actual linear feet of curbing measured at the bottom of the face of the curb, including that area across catch basins. Where driveways occur, the curbing measurement shall continue across driveways, and that area from a line drawn one foot behind the face of the curb extended, or the gutter line shall be paid for as curbing. The remaining driveway between this line and the property line shall be paid for as six (6) inch concrete driveway at the price bid in the proposal. That portion of the driveway return behind the line drawn one foot from the face of the curb shall be converted to equivalent flat area (0.4 sq yd for 4-1/2 ft. radius-0.3 sq yd for 3 ft. radius) and paid for as six (6) inch concrete driveway.

T-7.11 **PAYMENT**:
The quantity of combination curbing, measured as hereinbefore specified, will be paid for at the contract unit price for the cross section shown on the drawings or standard detail. The price paid per linear foot for curbing shall include full compensation for furnishing all labor, materials, tools, and equipment, and doing all the work involved in preparing the subgrade for these structures and constructing the curbing complete-in-place, as hereinbefore specified, including furnishing and placing all expansion joint filler.

T-7.12 **TREE PROTECTION PROCEDURES (AP 88-1)**:

T-7.12.1 **PURPOSE**:
The purpose of this policy is to outline the procedures to be used in determining how to accomplish concrete repair work when there is a conflict with trees located in the public right-of-way.

T-7.12.2 **PROCEDURES FOR SIDEWALK REPAIR WORK**:
If a problem with a tree is encountered when trying to accomplish sidewalk repair the first course of action will be to determine if there is enough room in the public right-of-way between the property line and the tree roots to cobble the sidewalk around the tree roots and still provide a sidewalk that is at least three (3) feet wide. If there is not enough room in the public right-of-way to do this, the next course of action will be to use asphalt for the sidewalk material instead of concrete and lay the asphalt over the tree roots. The installation of the asphalt sidewalk should be done in such a way that a safe sidewalk results in terms of smoothness and slope. When asphalt is used it should be sprinkled with dried cement or a similar material to lighten the appearance so it blends in as well as possible with the concrete sidewalk adjacent to it. The final course of action will be to remove the tree if conditions warrant such removal.

The Street Division will contact the Parks Division to determine if conditions exist that warrant tree removal. Examples of such conditions could be: the tree is already dead or dying and poses a threat to public safety, the tree roots are too large for the plaza area afforded and are causing severe sidewalk and/or curb damage.

It is understood that under this procedure tree roots will **NOT** be cut in order to repair damaged sidewalks unless both the Parks Division and the Streets Division agree that this is a viable course of action due to the circumstances of the situation.

T-7.12.2 **PROCEDURES FOR OTHER CONCRETE REPAIR WORK**:
The Streets Division will contact the Parks Division when curb and gutter repair or any other type of concrete repair work is needed due to damage caused by tree roots. Together the Divisions will determine the course of action to be followed in addressing the situation. Possible courses of action may include: doing nothing, repairing the concrete material with another material such as asphalt, or removing the tree.

TECHNICAL SPECIFICATIONS
SECTION 8: CONCRETE SIDEWALKS & DRIVEWAYS **10/19/2001**

T-8.01 **SCOPE**:
The work covered by this section of the specifications consists of furnishing all plant, labor, equipment, appliances and materials and in performing all operations in connection with the construction of Portland cement concrete sidewalks and driveways, complete, in strict accordance with this section of the specifications, and the applicable drawings. IMPORTANT: SEE PARAGRAPH G-1.52.

T-8.02 **GENERAL**:
Concrete for sidewalks and driveways shall be Class A Concrete proportioned, mixed, tested and placed, in strict accordance with the specifications given in Section 6, "Concrete Proportioning, Mixing, Testing and Placing," and Section 14, "Materials."

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

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

T-8.03 **EXCAVATION AND SUBGRADE PREPARATION**:
Excavation and subgrade preparation for concrete sidewalk and driveways shall be in strict compliance with the specifications as stated in Section 1, Paragraph T-1.04.3.

T-8.04 **FORMS**:
Forms shall be of wood or metal, straight and free from warp, and of sufficient strength to resist springing during the process of depositing and consolidation of the concrete. The width of the forms for sidewalk and driveways shall be equal to the full depth of the sidewalk or driveway. Forms shall be securely staked and braced true to the line and grade set by the Engineer. Suitable metal or wooden division plates shall be provided to completely separate adjacent slab during construction. Forms shall be cleaned and well oiled before being set.

T-8.05 **WIDTH AND THICKNESS**:
The width and thickness of walks and driveways, and the specific size of slabs, shall be as shown on the drawings or as directed by the Engineer. Sidewalks shall be marked in sections with a proper lining tool so as to form squares the size of which will depend upon the width of the walks. The edges of driveways will be worked with an edging tool and will be sectioned into squares or marked as shown on the plans and details, or as directed by the Engineer.

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

T-8.06 **CONSTRUCTION OF SIDEWALKS AND DRIVEWAYS**:
After the forms have been set, the Engineer shall inspect the form for proper line and grade and shall check the subgrade for proper compaction before allowing any concrete to be placed. Concrete for sidewalks and driveways shall be Class "A" concrete. All materials incorporated in this concrete shall conform to the provisions as set out hereinbefore and shall be mixed and deposited in accordance with the requirements of these specifications. When sufficient concrete has been deposited in the forms, it shall be well "spaded" along all areas in contact with the forms in order to eliminate all "honeycombing." Sidewalks shall be "scored" (1 inch deep) in sections equal to the width or as directed by the Engineer. If a sidewalk is greater than six (6) feet in width, scoring shall be as directed by the Engineer. All "scores" shall be straight and rounded at the surface with the proper edging tool, or as directed by the Engineer. Expansion joint shall be installed for every thirty (30) linear feet of sidewalk, against all structures, pavement and curbs, and at such other places as shown on the plans and details, or as directed by the Engineer.

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

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

T-8.07 **CONCRETE CURING AND FINISHING**:
The curing and finishing of concrete sidewalks and driveways shall be in strict compliance with the specifications as stated in Section 6, "Concrete Proportioning, Mixing, Testing and Placing."

T-8.08 **MEASUREMENT**:
Concrete sidewalk and driveways shall be measured by area in square yards. The measurement of four (4) inch concrete sidewalk shall be by actual field measurement and shall not include that portion of six (6) inch concrete where driveways cut across the sidewalk area. This area shall be measured as six (6) inch concrete driveway. Driveway measurement shall include all six (6) inch concrete between the property line and a line drawn one foot behind the face of curb or gutter line for types "A" and "B" curb returns, that portion of the radii falling within this area shall be converted to equivalent six (6) inch concrete (0.4 sq. yd. for each 4-1/2-ft. radius and 0.3 sq. yd. for each 3-ft. radius) and paid for as six (6) inch concrete driveway.

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

T-8.09 **PAYMENT**:

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

T-8.10 **TREE PROTECTION PROCEDURES (AP 88-1)**:

T-8.10.1 **PURPOSE**:

The purpose of this policy is to outline the procedures to be used in determining how to accomplish concrete repair work when there is a conflict with trees located in the public right-of-way.

T-8.10.2 **PROCEDURES FOR SIDEWALK REPAIR WORK**:

If a problem with a tree is encountered when trying to accomplish sidewalk repair the first course of action will be to determine if there is enough room in the public right-of-way between the property line and the tree roots to cobble the sidewalk around the tree roots and still provide a sidewalk that is at least three (3) feet wide. If there is not enough room in the public right-of-way to do this, the next course of action will be to use asphalt for the sidewalk material instead of concrete and lay the asphalt over the tree roots. The installation of the asphalt sidewalk should be done in such a way that a safe sidewalk results in terms of smoothness and slope. When asphalt is used it should be sprinkled with dried cement or a similar material to lighten the appearance so it blends in as well as possible with the concrete sidewalk adjacent to it. The final course of action will be to remove the tree if conditions warrant such removal.

The Street Division will contact the Parks Division to determine if conditions exist that warrant tree removal. Examples of such conditions could be: the tree is already dead or dying and poses a threat to public safety, the tree roots are too large for the plaza area afforded and are causing severe sidewalk and/or curb damage.

It is understood that under this procedure tree roots will **NOT** be cut in order to repair damaged sidewalks unless both the Parks Division and the Streets Division agree that this is a viable course of action due to the circumstances of the situation.

T-8.10.2 **PROCEDURES FOR OTHER CONCRETE REPAIR WORK**:

The Streets Division will contact the Parks Division when curb and gutter repair or any other type of concrete repair work is needed due to damage caused by tree roots. Together the Divisions will determine the course of action to be followed in addressing the situation. Possible courses of action may include: doing nothing; repairing the concrete material with another material such as asphalt; or removing the tree.

TECHNICAL SPECIFICATIONS
SECTION 9: ASPHALT PAVING
Revised 10/31/19 Public Services Department/ Street Division

T-9.01 **SCOPE:**

All work covered by this section shall be performed according to the most recent version of the *North Carolina Department of Transportation Standard Specifications For Roads and Structures*, except as modified below shall apply. The work consists of performing all operations in connection with the construction of a hot-mix pavement consisting of a base, intermediate or surface course on a previously prepared base or existing pavement, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract. Said operations shall include producing, weighing, transporting, placing and compacting the plant mix; furnishing aggregate, asphalt binder, anti-strip additive, and all other materials for the plant mix; furnishing and applying tack coat as specified in Section T-9.22; furnishing scales; maintaining the course until final acceptance of the project; making any repairs or corrections to the course that may become necessary; providing and conducting quality control as specified in Section T-9.06. The design requirements for the various mix types are given in Tables 1-3 for mix types.

Define "warm mix asphalt (WMA)" as additives or processes that allow a reduction in the temperature at which asphalt mixtures are produced and placed. WMA is allowed for use at the Contractor's option when shown in the contract or as approved by the City Engineer.

T-9.02 **MATERIALS:**

All materials shall meet the requirements of NCDOT Division 10 and *NCDOT Standard Specifications for Roads and Structures.*

Item	**NCDOT Section**
Coarse aggregate	1012-1(B)
Fine aggregate	1012-1(C)
Mineral Filler	1012-1(D)
Reclaimed asphalt pavement (RAP)	1012-1(F)
Reclaimed asphalt shingles (RAS)	1012-1(E)
Anti-strip additives	1020-8
Asphalt Binder, Performance Grade	1020-2
Silicone	1020-9

Use only WMA additives or processes listed on the NCDOT Approved Product List maintained by the NCDOT Materials and Tests Unit.

T-9.03 **GENERAL REQUIREMENTS:**

The bituminous surface, intermediate or base course shall be of the type as hereinafter specified or as shown on the plans, and shall consist of fine and coarse mineral aggregate and mineral filler uniformly mixed with hot bituminous material as specified in Section T-9.02 and Section 14 "Materials" of these specifications, placed and compacted on a

prepared base course or existing surface course to the depth specified or as shown on the plans.

T-9.04 **PROPORTIONING AND MIXING OF ASPHALTIC CONCRETE:**

The bituminous concrete base, intermediate, leveling and or surface course material shall be mixed in accordance with the specifications mixture of aggregate and bituminous material mixed in a NCDOT certified plant conforming to the requirements of Article 610-5, 610-6 and Sub-article 610-5 (1) and (2) described in the most recent edition of NCDOT Standard Specifications for Roads and Structures and shall be for placing as laid out herein elsewhere, in conformity with the lines and grades, thickness and section, as shown on the plans, or as directed by the Project Engineer.

T-9.05 **QUALITY MANAGEMENT SYSTEM FOR ASPHALT PAVEMENTS:**

T-9.05-1 **DESCRIPTION:**

Produce and construct asphalt mixtures and pavements in accordance with Section 609 of the latest *NCDOT Standard Specifications for Roads and Structures* manual and all applicable Project or Standard Special Conditions for this project. Perform all quality control activities in accordance Section T-9.05 – T-9.06, unless otherwise approved by the Project Engineer.

(A) Quality Control:

Provide and conduct a quality control program in accordance with Section T-9.05 – Section T-9.06 and these specifications. A quality control program is defined as all activities, including mix design, process control inspection, plant and equipment calibration, sampling and testing, and necessary adjustments in the process that are related to production of a pavement which meets all requirements of the *NCDOT Standard Specifications for Roads and Structures.*.

(B) Quality Assurance:

The City will conduct a quality assurance program in accordance with Section T-9.07 and these specifications. A quality assurance program is defined as all activities, including inspections, sampling, and testing related to determining that the quality of the completed pavement conforms to specification requirements.

T-9.05-2 **MIX DESIGN/JOB MIX FORMULA REQUIREMENTS):**

Apply all requirements of Article 610-3 of the latest edition of the *NCDOT Standard Specifications for Roads and Structures.*

T-9.05-3 **COMPOSITION OF MIXTURES (MIX DESIGN & JOB MIX FORMULA):**

(A) Mix Design-General:

Warm mix asphalt (WMA) is allowed for use at the Contractor's option in accordance with the NCDOT Approved Products List for WMA Technologies available at:
https://connect.ncdot.gov/resources/Materials/MaterialsResources/Warm%20Mix%20Asphalt%20Approved%20List.pdf

Prepare the asphalt mix design utilizing a mixture of course and fine aggregate, asphalt binder, mineral filler, and other additives when required. Size, uniformity grade, and combine the several aggregate fractions in such proportions that the resulting mixture meets the grading and physical requirements of the specifications for the specified mix type. Materials, which will not produce a mixture within the design criteria required by the specifications, will be rejected, unless otherwise approved.

At least 10 days prior to start of asphalt mix production, submit, in writing the mix design and proposed job mix formula (JMF) targets for each required mix type and combination of aggregates to the Project Director for review and approval. Prepare the mix design using a NCDOT certified mix design technician in an approved mix design laboratory and in accordance with the procedures outlined in Section 4.5 of the HMA/QMS Manual.

For the final surface layer of the specified mix type, use a mix design with an aggregate blend gradation above the maximum density line on the 2.36 mm and larger sieves.

For Type S9.5B, the percent passing the 2.36 mm sieve shall be a minimum of 60% and a maximum of 70%.

When the Contractor elects to use a recycled mixture on a project, he must submit to the City Engineer his proposed mix design and JMF target values in accordance with Article 1012-1 and Section 610-3 of the NCDOT Standard Specifications for Roads and Structures and the following applicable requirements.

Reclaimed asphalt pavement (RAP) may constitute up to **20%** of the total material used in recycled mixtures, except for mix Type S 9.5D, and mixtures containing reclaimed asphalt shingle material (RAS). Reclaimed asphalt shingle (RAS) material may constitute up to 6% by weight of total mixture for any mix. When both RAP and RAS are used, do not use a combined percentage of RAS and RAP greater than 20% by weight of total mixture, unless otherwise approved. When the percent of binder contributed from RAS or a combination of RAS and RAP exceeds 20% but not more than 30% of the total binder in the completed mix, the virgin binder PG grade shall be one grade below (both high and low temperature grade) the binder grade specified in Table 610-3 for the mix type, unless otherwise approved. When the percent of binder contributed from RAS or a combination of RAS and RAP exceeds 30% of the total binder in the completed mix, the Engineer will establish and approve the virgin binder PG grade. Use approved methods to determine if any binder grade adjustments are necessary to achieve the performance grade for the specified mix type.

For Type S 9.5D mixes, the maximum percentage of reclaimed asphalt material is limited to 20% and shall be produced using virgin asphalt binder grade PG 76-22. For all other recycled mix types, the virgin binder PG grade shall be as specified in Table 610-5 for the specified mix type.

If a change in the source of RAP or RAS be made, a new mix design and JMF may be required in accordance with Article 1012-1. Samples of the completed recycled mixture may be taken by the Department on a random basis to determine the PG grading on the recovered asphalt binder in accordance with AASHTO M 320. If the grading is determined to be a value other than required for the specified mix type, the Engineer may require the Contractor to adjust any combination of the grade, the percentage of additional asphalt binder or the blend of reclaimed material to bring the grade to the specified value.

(B) Mix Design Criteria:

Design and produce asphalt concrete mixtures which conform to the gradation requirements and design criteria in Table 610-2 and Table 610-3 for the mix type specified. The mix type designates the nominal maximum aggregate size and the design traffic level.

Table 610-2 provides gradation control points to be adhered to in the development of the design aggregate structure for each mix type. Aggregate gradations must be equal to or

pass between the control points, unless approved in writing. Table 610-2 provides the mix design criteria for the various mix types.

Use an anti-strip additive in all Superpave asphalt mixes. It may be hydrated lime or a chemical additive or a combination of both as needed to meet the retained strength requirements as specified in Tables 610-3. When a chemical additive is used, add at rate of not less than 0.25% by weight of binder in the mix. When hydrated lime is used, add at a rate of not less than 1.0 % by weight of the total dry aggregate.

When WMA is used, submit the mix design without including the WMA technology

(C) Job Mix Formula:
Establish the job mix formula (JMF) gradation target values within the design criteria specified for the particular type of asphalt mixture to be produced. Establish the JMF asphalt binder content at the percentage, which will produce voids in total mix (VTM) at the midpoint of the specification design range for VTM, unless otherwise approved. The formula for each mixture will establish the following: blend percentage of each aggregate fraction, the percentage of reclaimed aggregate, if applicable, a single percentage of combined aggregate passing each required sieve size, the total percentage (by weight of total mixture) and grade of asphalt binder required for the mixture (by weight of total mixture), the percentage and grade of asphalt binder to be added to the mixture (for recycled mixtures), the percentage of chemical anti-strip additive to be added to the asphalt binder or percentage of hydrated lime to be added to the aggregate, the temperature at which the mixture is to be discharged from the plant, the required field density, and other volumetric properties.

The mixing temperature at the asphalt plant will be established on the job mix formula. Unless otherwise requested, refer to Table 610-1 to establish the JMF temperature.

(NCDOT TABLE 610-1)
MIXING TEMPERATURE AT THE ASPHALT PLANT

Binder Grade	JMF Mix Temperature
PG 58-28; PG 64-22	250-290 Degree F
PG 76-22	300-325 Degree F

A. The mix temperature, when checked in the truck at the roadway, shall be within plus and minus 25 degree of the temperature specified on the JMF.

When using RAP or RAS with a different binder than specified, use mixing and compaction temperatures in Table 610-1 based on the original binder grade for that mix type shown in Table 610-3.

When RAS is used, the JMF mix temperature shall be established at 275 Degree F or higher.

Have on hand at the asphalt plant the approved mix design and job mix formula prior to beginning the work.

The job mix formula for each mixture will remain in effect until modified in writing, provided the results of QMS tests performed in accordance with Section T-9.06 on material currently being produced conform with specification requirements. When a change in sources of aggregate materials is to be made, a new mix design and job mix formula will be required before the new mixture is produced, unless otherwise approved. When a change in sources of RAP or RAS material is to be made, a new mix design and/or job mix formula may be required in accordance with Article 1012-1 of the most recent *NCDOT Standard*

Specifications for Roads and Structures manual. When unsatisfactory results or other conditions make it necessary, the Contractor shall revoke the existing job mix formula or establish a new job mix formula.

Standard Sieves (mm)	TABLE 610-2 AGGREGATE GRADATION CRITERIA (Percent Passing Control Points)							
	Mix Type (Nominal Maximum Aggregate Size)							
	4.75 mm		9.5 mm (a)		19.0 mm		25.0 mm	
	Min.	Max.	Min.	Max.	Min.	Max	Min.	Max
50.0	-	-	-	-	-	-	-	-
37.5	-	-	-	-	-	-	100.0	-
25.0	-	-	-	-	100.0	-	90.0	100.0
19.0	-	-	-	-	90.0	100.0	-	90.0
12.5	100.0	-	100.0	-	-	90.0	-	-
9.50	95.0	100.0	90.0	100.0	-	-	-	-
4.75	90.0	100.0	-	90.0	-	-	-	-
2.36	-	-	32.0 (b)	67.0 (b)	23.0	49.0	19.0	45.0
1.18	30.0	60.0	-	-	-	-	-	-
0.075	6.0	12.0	4.0	8.0	3.0	8.0	3.0	7.0

(a) For the final surface layer of the specified mix type, use a mix design with an aggregate blend gradation above the maximum density line on 2.36 mm and larger sieves.

(b) For Type S9.5B, the percent passing the 2.36 mm sieve shall be a minimum of 60% and a maximum of 70%.

Asphalt Mix Design & Job Mix Formula - 2018
TABLE 2
TABLE 610-3 (NCDOT)
SUPERPAVE MIX DESIGN CRITERIA

Mix Type	Design ESALs Millions (a)	Binder PG Grade (b)	Compaction Levels No. Gyrations @		Max. Rut Depth (mm)	Volumetric Properties (c)			
			N_{ini}	N_{des}		VMA % Min.	VTM %	VFA Min. - Max.	$\%G_{mm}$ @ N_{ini}
S4.75A	< 1	64-22	6	50	11.5	16.0	4.0 - 6.0	65 - 80	£ 91.5
S-9.5B	0-3	64 -22	6	50	9.5	16.0	3.0 - 5.0	70 - 80	£ 91.5
S-9.5C	3 - 30	64 -22	7	65	6.5	15.5	3.0 - 5.0	65 - 78	£ 90.5
S-9.5D	> 30	76 -22	8	100	4.5	15.5	3.0 - 5.0	65 - 78	£ 90.0
I-19.0C	ALL	64 -22	7	65	-----	13.5	3.0 - 5.0	65 - 78	£ 90.5
B-25.0C	ALL	64 -22	7	65	-----	12.5	3.0 - 5.0	65 - 78	£ 90.5
	Design Parameter					**Design Criteria**			
All Mix Types	1. Dust to Binder Ratio ($P_{0.075}$ / P_{be})					0.6 – 1.4 **(c)**			
	2. Tensile Strength (TSR) D					85% Minimum E			

(a) Based on 20-year design traffic.
(b) Volumetric Properties based on specimens compacted to N_{des} as modified by the NCDOT.
(c) Dust to Binder Ratio ($P_{0.075} / P_{be}$) for Type S4.75A is 1.0 – 2.0.
(d) NCDOT-T-283 (No Freeze-Thaw cycle required).
(e) TSR for Type S4.75A & B25.0C mixes is 80% minimum.

TABLE 610-4
MAXIMUM RECYLED BINDER REPLACEMENT PERCENTAGE(RBR%)

Recycled Material	Intermediate & Base Mixes	Surface Mixes	Mixes Using PG 76-22
RAS	23%	20%	18%
RAP or RAP/RAS Combination	45%	40%	18%

TABLE 610-5
BINDER GRADE REQUIREMENTS (BASED ON RBR%)

Mix Type	% RBR ≤20%	21% ≤ %RBR ≤ 30%	% RBR > 30%
S4.75A, S9.5B.S9.5C, I19.0C, B25.0C	PG 64-22	PG 64-22A	PG 58-28
S9.5D, OGFC	PG 76-22B	N/A	N/A

A. If the mix contain any amount of RAS, the virgin binder shall be PG 58-28.
B. Maximum Recycled Binder Replacement (%RBR) is 18% for Mixes using PG76-22 binder.

T-9.06 **CONTRACTOR'S QUALITY CONTROL SYSTEM:**

(A) Personnel Requirements:

Obtain all certifications in accordance with NCDOT's QMS Asphalt Technician Certification Program as outlined in the most recent edition of NCDOT's HMA/QMS Manual. Perform all sampling, testing, data analysis and data posting by or under the direct supervision of a certified QMS asphalt plant technician.

Provide a certified Asphalt Plant Technician Level I to perform quality control operations and activities at each plant site at all times during production of material for the project. A plant operator who is a certified Asphalt Plant Technician Level I may be utilized to meet this requirement when daily production for each mix design is less than 100 tons (100 metric tons). When performing in this capacity, the plant operator will be responsible for all quality control activities, which are necessary and required

Provide and have readily available a certified Asphalt Plant Technician Level II to supervise, coordinate, and make any necessary adjustments in the mix quality control process in a timely manner. The Level II Technician may serve in a dual capacity and fulfill the Level I Technician requirements specified above.

Provide a certified QMS Roadway Technician with each paving operation at all times during placement of asphalt. This person is responsible for monitoring all roadway paving operations and all quality control processes and activities, to include stopping production or implementing corrective measures when warranted. Provide a certified nuclear gauge operator when nuclear density control is being used.

(B) Field Laboratory Requirements:
For a contract with 5000 or more total tons (metric tons) of asphalt mix, the asphalt producer shall furnish and maintain an NCDOT certified laboratory at the plant site. A minimum of 320 square feet (30 square meters) of floor space (exclusive of toilet facilities), equipment, and supplies necessary for performing Contractor quality control testing is required. Provide convenient telephone and fax machine access for QMS personnel at the plant site.

For a contract with less than 5000 total tons (metric tons) of asphalt mix, the quality control testing may be conducted in an NCDOT certified off-site laboratory. All other requirements in these specifications still apply.

Provide testing equipment meeting the requirements of the test methods herein identified in Subarticle 609-5(C) 2 of the NCDOT Standard Specifications for Roads & Structures manual. Provide equipment that is properly calibrated and maintained. Allow all measuring and testing devices to be inspected to confirm both calibration and condition. If at any time the Contractor or Project Director determines that the equipment is not operating properly or is not within the limits of dimensions or calibration described in the applicable test method, the Contractor or Project Director may stop production until corrective action is taken. Maintain and have available a record of all calibration results at the laboratory.

(C) Plant Mix Quality Control:
(1) General:
Include in the quality control process the preliminary inspections, plant calibrations and field verification of the mix and JMF as described in Section T-9.04-4. In addition, conduct at a minimum but not limited to, the sampling, testing, and determination of all parameters outlined in these provisions using test methods and minimum frequencies as

specified herein. Perform additional sampling and testing when conditions dictate. Obtain all scheduled samples at randomly selected locations in accordance with the current edition of NCDOT's most recent edition of the *HMA/QMS Manual*. Log all samples taken on NCDOT forms. Split and retain all samples taken in accordance with prescribed procedures in the *Manual*. Provide documentation as required in Section T-9.06. Identify any additional quality control samples taken and tested at times other than the regularly scheduled random samples or directed samples that take the place of regularly scheduled as process control (PC) samples on the appropriate forms. Process Control test results should not be plotted on control charts nor reported to the City Quality Assurance Laboratory.

Retain the untested split portion of quality control aggregate and mix samples and the tested TSR specimens for 5 calendar days at the plant site, commencing the day the samples are tested. Retain the QC compacted volumetric test specimens for 5 calendar days, commencing the day the specimens are prepared. Permission for disposal may be given by City Quality Assurance personnel prior to these minimum storage periods. Retain the split portion of the Contractor's mix verification and referee mix samples until either procured by or permission for disposal is given by the City Quality Assurance personnel. Store all retained samples in a dry and protected location.

(2) Required Sampling and Testing Frequencies:
Sample and test the completed mixture from each JMF at the following minimum frequency during mix production: Complete all tests within 24 hours of the time the sample is taken, unless specified otherwise within these provisions.

If the Contractor's testing frequency fail to meet the minimum frequency requirements as specified, all mix without the specified test representation will be considered unsatisfactory. If the City allows the mix to remain in place, payment will be made at 50 percent of the contract unit bid price for the mixture.

If desired, innovative equipment or techniques not addressed by these specifications to produce or monitor the production of mix may be utilized, subject to approval.

QUALITY CONTROL MINIMUM SAMPLING AND TESTING SCHEDULE

Sample and test the completed mixture from each JMF at the following minimum frequency during mix production:

Accumulative Production Increment	Number of Samples per Increment
750 tons	1

If production is discontinued or interrupted before the accumulative production increment tonnage is completed, continue the increment on the next production day(s) until the increment tonnage is completed. Obtain a random sample within the specified increment at the location determined in accordance with the current edition of NCDOT's HMA/QMS Manual. Conduct quality control sampling and testing on each random sample as scheduled below. **When daily production of each mix design exceeds 100 tons (100 metric tons) and a regularly scheduled full test series random sample location for that mix design does not occur during that day's production, perform at least one partial test series consisting of Items A and B in the schedule below**. These partial test series and associated tests do not substitute for the regularly scheduled random sample for that increment.

Perform the following full test series on all regularly scheduled random samples:

During mix production the Contractor shall conduct quality control sampling and testing on the asphalt mixture consisting of:

Full Test Series

Asphalt Mixture – Sampled from Truck at Plant (AASHTO T 168 Modified) (Split Sample Required)

A. Binder Content, % Ignition Furnace (AASHTO T 308 Modified)

2. Note: Contractor may request and use other means (namely AASHTO T 164) of determining percent asphalt binder, subject to approval).

B. Gradation on Recovered Blended Aggregate from Mix Sample (AASHTO T 30 Modified) Gradation required on all sieves specified on JMF

C. Maximum Specific Gravity (AASHTO T 209), optional (ASTM D 6857)

D. Bulk Specific Gravity of Compacted Specimens (AASHTO T 166), Optional (ASTM D 6752), Average of 3 specimens at Ndes gyrations (AASHTO T 312)

E. Air Voids (VTM) (AASHTO T 269), Average of 3 specimens at Ndes gyrations

F Voids in Mineral Aggregate (VMA) (calculation)

G. Voids Filled with Asphalt (VFA) (calculation)

H. P0.075/Pbe Ratio

I. % Maximum Specific Gravity at Nini (calculation)

In addition to the above schedule, conduct the following sampling and testing as indicated:

A. Aggregate Stockpile Gradations (AASHTO T 27 and T 11)

(Sampled from stockpiles or cold feed system as follows; split samples not required)

1. Coarse Aggregates (Approved Standard Sizes)
a. At beginning of production*
b. Weekly thereafter*
2. Fine Aggregates (Stone Screenings, Natural Sands, Etc.)
a. At or within 1 week prior to mix verification (Gradations valid for multiple mix designs) *,
b. Weekly after mix verification*.
c. Anytime production is stopped due to plant mix gradation related problems.

*In lieu of the aggregate stockpile gradations performed by QC, gradation quality control data conducted by the aggregate producer, which is representative of the Contractor's current stockpiles, may be furnished.

B. Reclaimed Asphalt Pavement (RAP) Binder Content and Gradation (AASHTO T 308 Modified or T 164 and AASHTO T 30 Modified or T 164 and AASHTO T 30 Modified) (sampled from stockpiles or cold feed system at beginning of production and weekly thereafter). Have RAP approved for use in accordance with Subarticle 1012-1(G). (Split Sample Required).

C. Reclaimed Asphalt Shingle Material (RAS) Binder Content and gradation (AASHTO T 308 Modified or and AASHTO T 30 Modified) (Sampled from stockpiles or cold feed system at beginning of production and weekly thereafter) (If RAP mixtures are being produced) Have RAS approved for use in accordance with NCDOT Standard Specifications for Roads and Structures, Subarticle 1012-1(F). (Split Sample Required).

D. Combined Aggregate Moisture Content (AASHTO T 255) Drum Plant Only (sampled from stockpiles or cold feed system a minimum of once daily).

E. Retained Tensile Strength (TSR) - (AASHTO T 283 Modified): Additional TSR testing is required when a change is made in antistrip additive dosage or when a new anti-strip additive source or grade is utilized, unless otherwise approved. Other TSR test(s) may be directed as deemed necessary. TSR testing is not required for mix verification but may be performed at that time.

FOR WMA: See Section 7.16.1 (D) of QMS Manual.

F. Draindown Test for Uncompacted Asphalt Mixtures (AASHTO T 305)

NOTE: Any retained samples shall be stored by the Contractor in a safe, dry place for 7 calendar days, or until disposal permission is given by the Quality Assurance personnel, whichever occurs first.

(3) Control Charts:
Standardized control charts shall be maintained by the Contractor at the Quality Control field laboratory on forms furnished by NCDOT. For mix incorporated into the project, record full test series data from all regularly scheduled random samples, or directed samples which replace regularly scheduled samples, on control charts the same day the tests results are obtained. Partial test series results obtained due to reasons outlined in Subarticle 609-6(B) will be reported to Quality Assurance personnel on the proper forms but will not be plotted on the control charts. Process Control (PC) samples which are taken within an increment other than regularly scheduled random samples or directed samples that do not replace the scheduled random sample will not be plotted on control charts nor reported to Quality Assurance Laboratory Personnel.

Results of quality assurance tests performed by the City QA Division will be provided to the Contractor.

Record the following data on the standardized control charts:
1. Aggregate Gradation Test Results:
    a. For each mix type: one sieve size smaller than the mix nominal maximum size.
    b. For all mix types: 2.36 mm and 0.075 mm sieves
2. Binder Content, %, Pb
3. Bulk Specific Gravity of Compacted Specimens at Ndes (NCDOT-T-166 or NCDOT – T-331)
4. Maximum Specific Gravity Determined by (NCDOT-T-209 or NCDOT-D-6857)
5. Percent Voids in Total Mix, (VTM)
6. Percent Voids in Mineral Aggregate, (VMA)
7. P0.075/Pbe Ratio
8. Percent Maximum Specific Gravity at Nini gyrations, (%Gmm @ Nini)

Both the full test series individual test values and the moving average of the last four (4) data points will be plotted on each chart. The Contractor's test data will be shown in black and the moving average in red. The City's assurance data will be plotted in blue. Denote the moving average control limits with a dash green line and the individual test limits with a dash red line.

The moving average(s) shall be continuous except that a new moving average(s) shall be re-established only when:
1. Change in the binder percentage, aggregate blend or Gmm is made on the JMF, or

2. When the Contractor elects to stop or is required to stop production after one or two moving average values, respectively, fall outside the control limits outlined in Subarticle 609-6(D).
3. Failure to stop production after two consecutive moving averages exceed the moving average limits occurs, but production does stop at a subsequent time, re-establish a new moving average beginning at the actual production stop point.

In these cases, re-establish the moving averages for all mix properties. Moving averages will not be reestablished when production stoppage occurs due to an individual test result exceeding the individual test limits and/or specifications.
NOTE: New Moving Averages will be established at the beginning of each calendar year.

All individual test results are part of the plant quality control record and must be included in moving average calculations with the following exception. When the Contractor's testing data has been proven incorrect, use the correct data as determined by the City in lieu of the Contractor's data to determine the appropriate pay factor in accordance with Section T-9.06 and T-9.21
In this case, replace the data in question and any related data proven incorrect.

(4) Control Limits:
The following are established as control limits for mix production. Apply the individual limits to the individual test results. Control limits for the moving average limits are based on a moving average of the last 4 data points. Apply all control limits to the applicable target source.

Table 609-1 NCDOT
Control Limits

Mix Control Criteria	Target Source	Moving Average Limit	Individual Limit
12.5mm Sieve (Type P-57 only)	JMF	±5.0 %	±8.0 %
4.75mm Sieve (Type P-57 only)	JMF	±5.0 %	±8.0 %
2.36mm Sieve	JMF	±4.0 %	±8.0 %
1.18 mm Sieve (S4.75A only)	JMF	±4.0 %	±8.0 %
0.075mm Sieve	JMF	±1.5 %	±2.5 %
Binder Content	JMF	±0.3 %	±0.7 %
VTM @ Ndes	JMF	±1.0 %	±2.0%
VMA @ Ndes	Min. Spec. Limit	Min. Spec. Limit	-1.0%
P0.075/ Pbe Ratio	Max. Spec. Limit	±0.4	±0.8
%Gmm @ Nini	Max. Spec. Limit	N/A	+2.0%
TSR	Min. Spec. Limits	N/A	- 15%

(5) Warning Bands:
DELETED

(6) Corrective Actions:
All required corrective actions are based upon initial test results and shall be taken immediately upon obtaining those results. If more than one corrective action or adjustment applies, give precedence to the more severe of these actions. Stopping production when required takes precedence over all other corrective actions. Document all corrective actions.

A. <u>Individual Test Exceeding Individual Test Limits</u>
When any of the following occur, production of a mix shall cease immediately:
(1) When an individual test result for a mix control criteria (including results for required partial test series on mix) exceeds both the individual test control limits and the applicable specification design criteria, or,
(2) When two consecutive field TSR values fail to meet the minimum specification requirement, or,
(3) When two consecutive binder content test results exceed the individual limits, or
(4) Two consecutive moving average values for any one of the mix control criteria fall outside the moving average limits.

Do not resume normal plant production until one of the following has occurred.

Option 1: Approval has been granted by the appropriate City QA Supervisor.
Option 2: The mix in question has been satisfactorily verified. Normal production may resume based on the approval of the contractor's Level II technician, provided notification and the verification test results have been furnished to the City QA Laboratory.

Failure to fully comply with one of the above provisions will result in immediate production stoppage by the Project Manager. Normal production shall not then resume until a complete verification process has been performed and approved by the Project Director.

Acceptance of all mix failing to meet the individual test control limits (including results for both full and partial test series on mix) or minimum TSR requirements as described above will be determined in accordance with Article 105-3. In addition, any mix, which is obviously unacceptable, will be rejected for use in the work.

Failure to stop production when required will make all mix unacceptable from the stop point tonnage to the point when Option 1 or Option 2 occurs or to the tonnage point when production is actually stopped, whichever occurs first.

In any case, remove and replace this mix with materials that comply with the Specifications at no additional costs to the City, unless otherwise approved. Payment will be made for the actual quantities of materials required to replace the removed quantities, not to exceed the original amounts.

Immediately notify the Project Director when any moving average value exceeds the moving average limit. If two consecutive moving average values for any one of the mix control criteria fall outside the moving average limits, cease production of that mix, immediately notify the Project Director of the stoppage, and make adjustments. The Contractor may elect to stop production after only one moving average value falls outside the moving average. In either case, do not determine a new moving average until the fourth test after the elective or mandatory stop in production.

(7) Allowable Retesting for Mix Deficiencies the Contractor may elect to resample and retest for plant mix deficiencies when individual QC test(s) exceed one or more mix property target(s) by more than the tolerances indicated below. Perform the retesting within 10 days after initial test results are determined. Retesting shall be approved prior to being performed and in accordance with NCDOT GUIDELINES FOR RETESTS OF PLANT MIX DEFICIENCIES outlined in the HMA/QMS Manual. The Contractor, under the supervision of the City's QA personnel, will perform these retests. Retests for any mix deficiency other than as listed below will not be allowed unless otherwise permitted. Acceptance of the mix in question will be based on the retest data.

The City reserves the right to require the Contractor to resample and retest at any time or location as directed.

Table 609-2
RETEST LIMITS FOR MIX DEFICIENCIES

Property	Limit
VTM	By more than +/- 2.5%
VMA	By more than +/- 2.0%
% Binder Content	By more than +/- 1.0%
0.0075 mm sieve	By more than +/- 3.0%
2.36 mm sieve (1.18 mm sieve for 4.75A) (12.5mm & 4.75 mm Sieves for Type p-57)	Exceeds both the Specification mix design limits and one or more of the above tolerances
TSR	By more that – 15% form the Specification limit

(D) Field Compaction Quality Control:

(1) General:

Perform quality control of the compaction process in accordance with these provisions and applicable requirements of Section T-9.06(D)(1-5). The Contractor shall use pavement core samples as the method of density control.

Conduct density sampling and testing by the core method based on test sections consisting of not more than 500 linear feet or fraction thereof per day on pavement placed at the paver laydown width. Perform density sampling and testing on all pavements listed below unless otherwise approved.

(a) All full width travel lane pavements, including normal travel lanes, turn lanes, collector lanes, ramps and loops, and temporary pavements,

(b) Pavement widening 4.0 feet or greater,

(c) Uniform width paved shoulders 2.0 feet or greater,

(d) And wedging as outlined in the NCDOT *HMA/QMS Manual*.

Perform the sampling and testing at the minimum test frequencies as specified above. Should the density testing frequency fail to meet the minimum frequency as specified above, all mix without the required density test representation will be considered unsatisfactory and if allowed to remain in place, will be paid for at 50 percent of the contract unit bid price for the mixture.

Conduct all QC core density testing the same day that the mix being tested is placed and compacted. Obtain all core samples no later than the beginning of the next production day. Test QC core samples and submit test results within one working day of the time the samples are taken. Should the specified density tests not be completed within the allowable time, cease production at that point until such time the required tests are complete. Failure to provide samples may result in suspension of all project operations.

Retain quality control density core samples at the plant site for 5 calendar days, commencing the day the samples are tested, or until permission for disposal is granted by the quality assurance personnel, whichever occurs first. Retain the City's quality assurance comparison and verification core samples in a sealed container at the plant site until obtained by quality assurance personnel. Store all retained density samples on a smooth, flat surface in a cool, dry, and protected location.

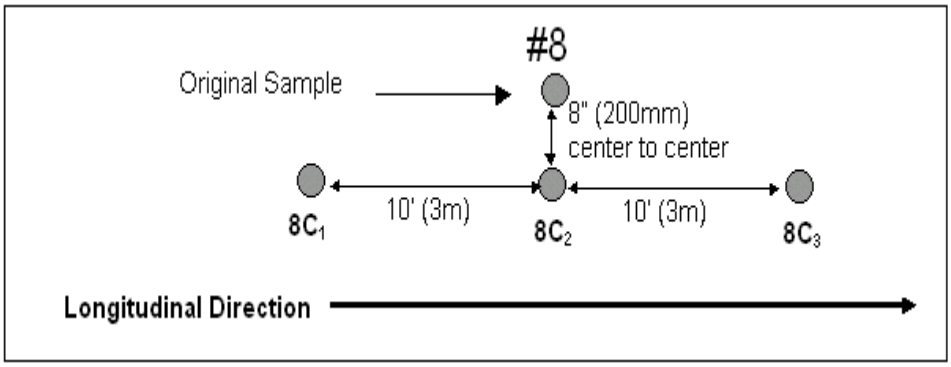
Check core samples may be taken by the Contractor for any of the following reasons:

(a) When core sample control is being used and a test section core sample(s) is more than 2.0 percent below the average of all core samples from the same lot, that core(s) samples may be checked,

(b) When a control strip fails and a core sample(s) is more than 2.0 percent below the average of the control strip, that core(s) may be checked.

For each core sample that is to be checked, take 3 check samples as follows: one adjacent to the initial sample and one ten feet in each direction, longitudinally, of the initial sample. The results of these 3 check samples will be averaged and this average will be used in lieu of the initial core results in question. The initial core sample results will not be used if check samples are taken.

Check samples shall be taken within 2 calendar days of the date of the initial sample. Only one set of check samples per sample location will be allowed. If full depth cores are necessary at these check sample locations, separation of the layer to be tested will be the responsibility of the Contractor. Take all check samples in the presence of a representative of the City QA laboratory. In addition, a QA comparison core sample(s) may be taken adjacent to one or more of these check samples. (See Figure 10-20).



Original Sample #8 = **89.3%**

Check Samples
$8C_1$ = 88.4%
$8C_2$ = 88.8%
$8C_3$ = 88.7%
Avg. = 88.6%

Must use average of 3 check samples (88.6%) instead of original sample results (89.3%)

Figure 10-20

(2) Pavement Samples (Cores):
When cored samples are required by either density method, obtain cores from the full layer depth of the compacted pavement. The pavement will be accepted for density on equally spaced locations consisting of not more than 500 linear foot or fraction thereof per day on pavement placed at the paver laydown width.

When full depth cores are taken, the Contractor is responsible for separating the layer of mix to be tested in a manner such that it is not damaged. The use of a separator medium, including a shovel of asphalt mix, beneath the layer to be tested is prohibited.

Pavement layers may be cooled by approved artificial methods to allow cutting the core samples as quickly as possible. No additional compensation will be made for the costs of artificial cooling.

Take pavement specimens for density testing purposes utilizing a 6-inch (152.4 mm) core drill. Use approved coring equipment that is capable of taking a representative sample of the compacted pavement. In the event a malfunction of the coring equipment occurs, utilize other approved means to obtain the required samples. Repair the coring equipment and restore to use within three working days.

Where samples have been taken, clean the inside surfaces of the sample hole, dry, lightly coat with tack coat, and immediately place and compact new mix of the same type to

conform to the surrounding area. Use a circular tamp or another approved device to achieve compaction.

(3) Cored Sample Density Procedures:
In addition to the above requirements, perform core sample density control procedures as noted herein. When cored sample control is being utilized, the testing frequency will be a minimum of two random 6-inch (152 mm) core samples every 500 linear foot or fraction thereof per day on pavement placed at the paver lay down width. An initial control strip is not required at the beginning of placement of each job mix formula but may be performed by the Contractor for use in determining the necessary compactive effort and roller patterns.

(5) Documentation (Records):
Document all quality control observations, records of inspection, samples taken, adjustments to the mix, and test results on a daily basis. Record adjustment to mix production and test results.

Make all such records available to the Project Director upon request, at any time during project construction.

Falsification of test results, documentation of observations, records of inspection, adjustments to the process, discarding of samples and/or test results, or any other deliberate misrepresentation of the facts will result in the mixture being removed and replaced with mix, which complies with the Specifications. Payment will be made for the actual quantities of materials required to replace the falsified quantities, not to exceed the original amounts.

T-9.07 **QUALITY ASSURANCE:**
The City's quality assurance program will be conducted by a certified QMS technician(s) and will be accomplished in whole or part in the following ways:

Plant Mix Quality Assurance:
1. By periodically observing laboratory and field tests performed by the Contractor;
2. By monitoring test data and or control charts exhibiting test results of control parameters;
3. Conducting verification sampling and testing on samples taken
4. By directing the Contractor to take additional samples at any time and any location during production (in lieu of the next scheduled random sample) and;
5. By any combination of the above

Density Quality Assurance:
1. By periodically observing tests performed by the Contractor in the field and in the Contractors laboratory.
2. By testing randomly selected comparison core samples taken adjacent to the Contractor's quality control core samples (8 inches center-to-center) at a frequency equal to or greater than 5% of the frequency required of the contractor.
3. By retesting randomly selected QC core samples.

In all cases, the City's quality assurance and verification testing will be independent of the Contractor's tests.

Differences between the Contractor and the City's sample test results will be considered acceptable if within the following limits:

Mix Property	**Limits of Precision**
25.0mm sieve (Base Mix)	±10.0%
19.0mm sieve (Base Mix)	±10.0%
12.5mm sieve (Intermediate Mix)	±6.0%
9.5mm sieve (Surface Mix)	±5.0%
4.75mm sieve (Surface mixes)	±5.0%
2.36mm sieve (All mixes)	±5.0%
0.075mm sieve (All mixes)	±2.0%
Asphalt Binder Content, %	±0.5%
Maximum Specific Gravity (Gmm)	±0.020%
Bulk Specific Gravity (Gmb)	±0.030%
TSR	±15.0%
Retest of QC Core Sample	± 1.2% (% Compaction)
Comparison QA Core Sample	± 2.0% (% Compaction)
QA Verification Core Sample	± 2.0% (% Compaction
Density Gauge Comparison of QC Test	± 2.0% (% Compaction
QA Density Gauge Verification Test	± 2.0% (% Compaction

In the event comparison test results are outside the above acceptable limits of precision, or the quality assurance test results are either outside the individual test control limits or fail to meet Specification requirements, the Project Director will immediately investigate the reason for the difference. If the potential for a pavement failure is present, the Project Director may suspend production, wholly or in part. The Project Director's investigation may include but not be limited to:

1. Joint testing of any remaining split samples,
2. Review & observation of the QC technician's sampling and testing procedures.
3. Comparison testing of other retained quality control samples, and/or additional density core samples.

The Project Director will periodically witness the sampling and testing being performed by the Contractor. If the Project Director observes that the sampling and quality control tests are not being performed in accordance with the applicable test procedures, the Project Director may ask that production stops until corrective action is taken. The Project Director will promptly notify the Contractor of observed deficiencies, both verbally and in writing. The Project Director will document all witnessed samples and tests.

The Project Director will obtain verification samples for testing independent of the Contractor's quality control process. These samples will be split for testing by the Project Director and the Contractor if required.

T-9.08 **TYPICAL ASPHALT BINDER CONTENT (BY WEIGHT OF TOTAL MIX):**

The approximate asphalt binder content of the asphalt concrete plant mixtures used on this project will be as follows:

PG 64-22		PG 76-22	
SA-1	6.8%		
S 4.75 A	7.0%		
S 9.5 B	6.7%	S 9.5 D	5.7%
S 9.5 C	6.0%		
I 19.0 C	4.8%		
B 25.0 C	4.5%		
		OGFC, Type FC-1 Mod.	6.1%
PADC, Type P-57	2.5%		
PADC, Type P-78M	3.0%		

The actual asphalt binder content will be established prior to construction by the Project Director within the limits established in the most recent edition of NCDOT's *Standard Specifications for Roads and Structures* manual and by the approved mix design and job mix formula (JMF) targets for each required mix type and combination of aggregates.

T 9.09 **WEATHER, TEMPERATURE, AND SEASONAL LIMITATIONS FOR PRODUCING AND PLACING ASPHALT MIXTURES:**

Do not produce or place asphalt mixtures during rainy weather, when the subgrade or base course is frozen, or when the moisture on the surface to be paved would prevent proper bond. Do not place asphalt material when the air or surface temperature, measured at the location of the paving operation away from artificial heat, do not meet Table 610-5.

As an exception to the above, when in any day's operations the placement of a layer of asphalt base course material or intermediate material 2" (50 mm) or greater in thickness has started, it may continue until the temperature drops to 32°F (0° C).

TABLE 4
TABLE 610-6 (NCDOT)
PLACEMENT TEMPERATURES FOR ASPHALT

Asphalt Concrete Mix Type	Minimum Surface Temperature and Air Temperature
B 25.0B, C,	35°F
Type I 19.0 C	35°F
S4.75A, S9.5B, S 9.5C	40°F [a]
S 9.5D	50°F

a. For the final layer of surface mixes containing recycled asphalt shingles (RAS), the minimum surface and air temperature shall be 50ºF.

T-9.10 **QMS CERTIFIED FIELD LABORATORY:**

The Contractor shall provide an NCDOT certified field laboratory suitable for testing observance only for the Project Director/ Project Manager which laboratory shall be conveniently located at the asphalt plant site.

T-9.11 **ASPHALT MIXTURE PRODUCTION:**

(A) General:

Utilize plants which are either of the batch mixing, continuous mixing, or drum mixing type, and so designed, equipped, and operated that the weighing, proportioning, and mixing of the materials will result in a uniform and satisfactory asphalt mixture meeting

the requirements of these specifications. All plants must conform to requirements of Section T-9.04 and Section T-9.11(A-B) and T-9.12 for the preparation of asphalt mixtures

Prior to production of the mix, stockpile aggregates for a sufficient period of time to facilitate the drainage of free moisture. Keep the different aggregate sizes separated until they have been delivered to the cold feeders. Keep the separate stockpiles readily accessible for sampling. When mineral filler is required in the mix, feed or weigh-in separately from the other aggregates.

Introduce the asphalt binder and other additives, when required; into the mixture at the amounts and percentages specified by the job mix formula. No working tolerance will be allowed. Introduce the dried and heated aggregates, and mineral filler, when required, in amounts and at temperatures such that the mixture produced is within the production control limits of Section T-9.06-4. Provide a positive means of controlling mixing time so as to obtain complete and uniform coating of the aggregate particles and thorough distribution of the asphalt binder throughout the aggregate. Produce the mixture at the asphalt plant within ±25°F (+/- 14°C) of the temperature established on the JMF. **Assure the temperature of the mix immediately before discharge from the hauling vehicle is within +25°F (14°C) to -25ºF (-14ºC) of the JMF temperature. Any asphalt mixture more than +25°F (14°C) or less than -25ºF (-14ºC) of the JMF temperature shall be rejected and removed at no cost to the City.**

Trucks should be checked for the temperature requirements by measuring the temperature with a calibrated digital or dial stem thermometer(having a probe length of 10" or greater) in the 3/8"-5/8" hole in the side of the truck bed prior to dumping mix into the paver. When checked in the truck at the roadway, mix temperature is outside of the above range, minimum of 3 additional readings should be made in different points of the load. The 4 readings are then averaged, and the average used as the temperature of that load. The temperature of the mixture, when discharged from the mixer, shall not exceed 350 Degree F.

> **Note: Mix shall not be rejected based on a single reading of a Dial Stem thermometer.**

All asphalt plants must be NCDOT certified as meeting the requirements of these specifications.

Any completely automatically controlled asphalt plant which, due to the basic design of the plant, does not meet all the requirements of these specifications for conventional batch mixing, continuous mixing, or drum mixing may be utilized on a project by project basis provided a uniformly consistent mix meeting all mix requirements can be produced and the plant has been approved in writing.

(B) Requirements for All Plants:

(1) Equipment for Preparation of Asphalt Binder:

Equip tanks for the supplying of asphalt binder to the plant to uniformly heat and hold the material at the required temperature prior to introduction into the mixer unit. Provide a circulating system for asphalt materials, which is capable of the proper mixing of additives. Provide a system with adequate pump or pumps to charge the mixing unit and unload asphalt material simultaneously. Include provisions for measuring and sampling plant supply tanks.

(2) Anti-Strip Additive Equipment:
When chemical anti-strip additive is to be added to the asphalt binder at the asphalt plant or supplier's terminal, in-line blending equipment shall be used at either location. Provide a thermostatically controlled heating system capable of heating and maintaining the additive tanks, contents and distribution system at the additive supplier's recommended temperature for the additive being used. Interlock the additive metering system with the asphalt binder control equipment in such a manner as to automatically vary the additive feed rate to maintain the required proportions. Provide a system, which will automatically

indicate in the plant control room the amount or rate of flow, when flow is occurring, and when flow is obstructed or stops. Inject the additive into the asphalt binder feed line prior to introduction into the aggregate. Equip the feed line with an in-line blending device capable of thoroughly mixing the additive with the asphalt binder prior to mixing with the aggregate. Provide a metering system capable of being calibrated, checked, and monitored for accuracy and amount of additive used.

Equip the system with an in-line totalizing flow meter capable of measuring the actual quantity in gallons (liters) of anti-strip additive, which is injected into the asphalt binder being introduced into the aggregate. Provide a system, which is capable of being easily read but not capable of being reset. Install the totalizer meter in the anti-strip feed line beyond the calibration bypass and as close to the actual point of additive introduction into the feed line as practical.

When hydrated lime anti-strip additive is used, provide a separate bin or tank and feeder system to store and proportion the lime into the aggregate in either dry or slurry form. Mix the lime and aggregate by pugmill or other approved means to achieve a uniform lime coating of the aggregate prior to entering the drier. When the lime is added in dry form, the aggregate shall contain at least 3 percent free moisture. The stockpiling of lime treated aggregate will not be permitted. Control the lime feeder system by a proportioning device that is accurate to within ±10 percent of the specified amount. Provide a proportioning device with a convenient and accurate means of calibration and that is interlocked with the aggregate feed or weigh system so as to maintain the correct proportion. Provide a flow indicator or sensor that is interlocked with the plant controls such that production of the mixture will be interrupted if there is a stoppage or reduction of the lime feed.

(3) Aggregate Cold Feed Equipment:
Utilize cold bins and a feeder system to proportion the aggregates and feed them to the dryer. Use separate cold bins for each size aggregate and each natural sand being used to provide a uniform and continuous flow. Provide separate dry storage when mineral filler is required. Equip cold aggregate bins with feeder units having interlocking controls capable of maintaining a constant ratio between the relative quantities of each size aggregate at varying plant production rates.

Provide cold feeders, which are capable of being easily and accurately, calibrated to ensure full control of the mix gradation.

(4) Dryer:
Use a plant with a dryer or dryers, which continuously agitate the aggregate during the heating and drying process.

(5) Control Unit for Asphalt Binder:
Provide satisfactory means, either by weighing or metering to introduce the proper amount of asphalt binder into the mix.

(6) Thermometric Equipment:

(a) Asphalt Binder Thermometric Equipment:
Provide a thermometric device of adequate temperature range fixed in the asphalt binder feed line.

(b) Dryer Thermometric Equipment:
Equip the dryer with an automatic burner control device, which uses an approved thermometric instrument located in the discharge chute to actuate the automatic controls.

(7) Pollution Control Equipment:
Equip all plants with such pollution control equipment as is necessary to meet all applicable Local, State, and Federal pollution requirements. Register and certify all plants by applicable environmental regulatory agencies.

(8) Safety Requirements:
Provide adequate safety devices at all points where accessibility to plant operations is required. Provide accessibility to the top of truck bodies by a platform or other suitable device to enable Quality Control and Quality Assurance personnel to obtain samples and mixture temperature data. Thoroughly guard and protect all gears, pulleys, chains, sprockets, and other dangerous moving parts. Provide ample and unobstructed space on the mixing platform. Maintain a clear and unobstructed passage at all times in and around the truck loading area. Keep all work areas free from asphalt drippings.

(9) Production Consistency:
Any asphalt plant that cannot consistently produce a high-quality mix meeting the requirements of these specifications will be considered in non-compliance with these specifications and all mix will be rejected.

Upon a malfunction of required automatic equipment on a batch mixing plant, the plant may continue to operate manually for the following 2 consecutive working days, provided acceptable mixture is being produced.

When a malfunction of required automatic equipment on a drum mixer or continuous plant occurs, manual operation of the plant will not be allowed except an emergency traffic condition exists; the plant may be allowed to operate manually until the unsafe traffic condition is corrected.

T-9.12 **HOT MIX STORAGE SYSTEMS:**
When a storage system is used, provide a system capable of conveying the mix from the plant to the storage bin and storing the mix without a loss in temperature, segregation or oxidation of the mix. Limit storage time to the ability of the storage system to maintain the mix within the specification requirements.

Provide a continuous type or skip bucket type conveyor system. Enclose continuous type conveyors so that the mix temperature is maintained within specification requirements. Provide a system designed in such manner as to prevent segregation of the mix during discharge from the conveyor into the bins and equipped with discharge gates that will not cause segregation of the mix while loading the mix into trucks.

T-9.13 **HAULING OF ASPHALT MIXTURE:**
From the paving plant to the site shall be in trucks having tight, clean, smooth beds that have been sprayed with an approved release agent to prevent adhesion of the mixture to the truck bodies. **Fuel oil is not allowed for this purpose.** Remove excess release agent before loading. Cover each load of mixture with a solid, waterproof tarp constructed of canvas, vinyl, or other suitable material securely fastened and overlapping top of the truck

bed to protect the asphalt from the weather, entrance of moisture and to prevent the loss of temperature. A 3/8 to 5/8-inch diameter hole shall be provided on each side of the vehicle body near the center of the body and above the bed of the vehicle for the purpose of inserting a thermometer.

Assure the temperature of the mix immediately before to discharge from the hauling vehicle is within a tolerance of +25°F (+14**°C) to -25ºF (-14ºC) of the JMF temperature. Any asphalt mixture more than +25°F (14°C) or less than -25ºF (-14ºC) of the JMF temperature shall be rejected and removed at no cost to the City.**

Trucks should be checked for the temperature requirements by measuring the temperature with a calibrated digital or dial stem thermometer(having a probe length of 10" or greater) in the 3/8"-5/8" hole in the side of the truck bed prior to dumping mix into the paver. When checked in the truck at the roadway, mix temperature is outside of the above range, minimum of 3 additional readings should be made in different points of the load. The 4 readings are then averaged, and the average used as the temperature of that load. The temperature of the mixture, when discharged from the mixer, shall not exceed 350 Degree F.

Note: Mix shall not be rejected based on a single reading of a Dial Stem thermometer.

Deliveries shall be made so that spreading and rolling of all the mixture prepared for a day's run can be completed during daylight hours.

The Quality Control Technician/ certified QMS Roadway Technician will reject any loads wet excessively by rain.

Hauling over freshly laid material will not be permitted.

Cleaning truck beds of excess asphalt in front of the paver shall not be permitted under any condition. Any loose or bulk asphalt dumped in front of the paver which is not within +25°F (14°C) to -25°F (14°C) of the JMF temperature shall be removed prior to continuing paving operations. Any loose or bulk asphalt dumped in front of the paver which is within +25°F (14°C) to -25°F (14°C) of the JMF temperature shall be spread to a thickness of 1" or less before resuming paving operations. Paving over loose or bulk asphalt discharged from the hauling vehicle which is not within +25°F (14°C) to -25°F (14°C) of the JMF temperature shall result in an immediate verbal "Stop Work Order" from the Quality Control Technician/ certified QMS Roadway Technician. Any and all asphalt lost or rejected due to inadequate temperatures resulting from the immediate verbal "Stop Work Order" will be incurred at the expense of the Contractor and at no cost to the City with no additional contract extension days being provided to the Contractor.

T-9.14 **PLACING & FINISHING ASPHALTIC SURFACE COURSE:**

Apply tack coat in accordance with Section 605 of the current version of the NCDOT Standard Specifications for Roads and Structures.

The Contractor shall furnish all equipment, tools, machinery and plant necessary for handling, preparing, manufacturing and executing completion of this work.

Superpave Asphalt mixtures immediately before discharge from the hauling vehicle will be rejected if the asphalt temperature is not within +25°F (14°C) to -25°F (14°C) of the JMF temperature.

Trucks should be checked for the temperature requirements by measuring the temperature with a calibrated digital or dial stem thermometer(having a probe length of 10" or greater) in the 3/8"-5/8" hole in the side of the truck bed prior to dumping mix into the paver. When checked in the truck at the roadway, mix temperature is outside of the above range, minimum of 3 additional readings should be made in different points of the load. The 4 readings are then averaged, and the average used as the temperature of that load. The temperature of the mixture, when discharged from the mixer, shall not exceed 350 Degree F.

> **Note: Mix shall not be rejected based on a single reading of a Dial Stem thermometer.**

Mixtures produced simultaneously from different plant sources cannot be intermingled by hauling to the same paver on the roadway unless the mixtures are being produced from the same material sources and same job mix formula.

Prior to delivery of surface course materials, the base course shall be completed for receiving the surface course material, and shall be kept free from traffic, with the exception of the mixture vehicles and those other vehicles necessary for the placing of the pavement. The pavement shall be placed only when weather conditions are suitable. Asphalt mixtures shall not be produced or placed during rainy weather, when the subgrade or base course is frozen, or when the moisture on the surface to be paved would prevent proper bond.

Upon arrival on work, the mixture shall be laid by an approved self-contained, power-propelled type-paving machine and finished to the proper grade, cross sections, thicknesses, and widths shown on the plans and typical sections and to required density and uniform texture. **The paver shall be equipped with either tamping bars or vibrators, depending on the screed type, and must be fully activated at all times**

during the laydown operations. The screed shall be adequate length to spread and finish the full uniform width travel lane being placed, unless otherwise permitted. Do not use strike off devices, either mechanically or manually operated, in spreading and finishing mixture placed in the uniform width travel lane.

Utilize a paver with a receiving hopper and an automatically controlled distribution system which is capable of uniformly maintaining a proper head of material in front of the full length of the screed, including screed extensions. Equip the screed unit with a sliding shoe attachment, which will form a slope on the edge of the mat to prevent edge raveling when the mixture is compacted.

Prior to beginning operations, a string line shall be placed by the Contractor along the edge of the proposed pavement to provide horizontal control for the paver operator., except that a string line will not be required when the first layer is placed adjacent to a curb section. The objective is to ensure a true and uniform line for the pavement edge(s).

Operate pavers at forward speeds consistent with plant production, material delivery, and satisfactory laying of the mixture so as to ensure a uniform and continuous laydown operation. Coordinate and adjust the paving operation and loading operation so as to maintain an adequate amount of asphalt mixture in the paver hopper between truck exchanges. Take necessary precautions during production, loading of trucks, transportation, truck exchanges with paver, folding of the hopper wings, and conveying

material in front of the screed to prevent segregation of the asphalt mixtures. Do not allow the paver hopper to become empty between loads. Should unevenness of texture, tearing, segregation, or shoving occur during the paving operation due to unsatisfactory methods or equipment, immediately take such action as may be necessary to correct such unsatisfactory work. Excessively throwing back material will not be permitted.

Use pavers equipped with an electronic screed control that will automatically control the longitudinal profile and cross slope of the pavement. Control the longitudinal profile through the use of either a mobile grade reference(s), including mechanical, sonic and laser grade sensing and averaging devices, an erected string line(s) when specified, joint matching shoe(s), slope control devices or the approved methods or combination of methods. Unless otherwise specified, use a mobile grade reference system capable of averaging the existing grade or pavement over a minimum 30-foot (9.1 meter) distance or by non-contacting laser or sonar type ski with at least four referencing stations mounted on the paver at a minimum length of 24 feet. Establish the position of the reference system such that the average profile grade is established at the approximate midpoint of the system. The transverse cross-slope shall be controlled as directed by the Project Director.

Use an erected fixed string line for both and longitudinal profile and cross slope control when required by the contract. When an erected fixed string line is required, furnish and erect the necessary guideline for the equipment. Support the string line with grade stakes placed at maximum intervals of 25 feet (7.6 meter) for the finished pavement grade.

Use the 30 foot minimum length mobile grade reference system or the non-contacting laser or sonar type ski *with at least four referencing stations mounted on the paver at a minimum length of 24 feet* to control the longitudinal profile when placing the initial lanes and all adjacent lanes of all layers, including resurfacing and asphalt in-lays, unless otherwise specified or approved. A joint matching device short (6 inch [152.4 mm] shoes) may be used only when approved.

A joint matching device short (6 inch [152.4 mm] shoe) may be used only when approved. Waiver of the use of automatic screed controls does not relieve the Contractor of achieving plan grades and cross-slopes.

Utilize the automatic slope control system unless otherwise approved. The Project Director may waive the use of automatic slope controls in areas where the existing surface (subgrade, base, asphalt layer, etc.) exhibits the desired cross slope of the final surface. The Project Director may also waive the use of automatic slope controls in areas where the use of such equipment is impractical due to irregular shape or cross section (such as resurfacing). When the use of the automatic slope controls is waived, the Project Director may require the use of mobile grade references on either or both sides of the paver. Manual screed operation will be permitted in the construction of irregularly shaped and minor areas, subject to approval. Waiver of the use of automatic screed controls does not relieve the Contractor of achieving plan grades and cross-slopes.

In the case of malfunction of the automatic screed control equipment, the paver may be manually operated for the remainder of the workday provided this method of operation produces acceptable results. Do not resume work thereafter until the automatic system is functional.

The Project Director or his designee will waive the requirement for use of pavers for spreading and finishing where irregularities or obstacles make their use impractical. Spread, rake, and lute the mixture by hand methods or other approved methods in these areas.

Operate the paver as continuously as possible. Pave intersections, auxiliary lanes, and other irregular areas after the main line roadway has been paved, unless otherwise approved.

Repair any damage caused by hauling equipment across structures at no additional cost to the City.

If the paver is equipped with pneumatic tires or moves on tracks (crawlers) the Contractor must check for proper tire pressure and loose crawlers, Low tire pressure or loose crawlers can cause unnecessary movement of the paver and when transmitted to the screed unit will result in an uneven pavement surface.

Fine graded asphalt mixes, which cling to the sides of the hopper, should normally be continually loosened and pushed into the active mix. When the mix is permitted to accumulate, it cools rapidly and eventually a slug of semi-cold mix usually segregated will reach the screed resulting in a non-uniform surface texture.

A sufficient number of experienced shovelers and rakers shall follow the spreading machine, adding hot mixture and raking the mixtures as required to produce a course that, when completed, will conform to all requirements specified herein. In areas where the use of machine spreading is impractical, the mixture may be spread by hand. The mixture shall be distributed into place from the dump beds by means of hot shovels and then spread with hot rakes in a uniformly loose layer of such thickness that, when compacted, it will conform to the required grade and thickness. Any part of the mix that has formed into lumps and does not break down easily should be discarded. The loads shall not be dumped any faster than the shovelers and rakers can properly handle them. Prior to the placing of additional asphalt to bring up to grade low places in the surface existing after the initial placing of asphalt, the area to be filled shall be thoroughly scarified by asphalt rakes. After additional mixture is placed it shall be raked carefully so as to be slightly higher than the surrounding area, so that when properly compacted, it will be at the same grade as the surrounding area.

Contact surfaces of forms, curbing, gutters, manholes, etc., shall be painted with a thin uniform coating of tack just before the surface mixture is placed against them. **Immediately adjacent to the headers, flush curbing, gutters, liners, and other structures the surface course mixture shall be spread uniformly high so that after compression it will be level with the edge of such structures.**

T-9.15 **COMPACTION ASPHALT SURFACE COURSE :**

Immediately after the asphalt mixture has been spread, struck off, and surface and edge irregularities adjusted, thoroughly and uniformly compact the pavement. Compact the mix to the required degree of compaction for the type of mixture being placed.

Provide sufficient number and weight of rollers, except as noted, to compact the mixture to the required density while it is still in a workable condition. **Where uniform density is not being obtained throughout the depth of the layer of material being tested, change the type and/or weight of the compaction equipment as necessary to achieve uniform density even though such equipment has been previously approved.**

Compact all final wearing surfaces, except open-graded asphalt friction course shall be compacted using a minimum of 2 steel wheel tandem rollers, unless otherwise approved.

Pneumatic-tire rollers with 2 tandem axles and smooth tread tires may be used for intermediate rolling.

Limit rolling for open-graded asphalt friction course to one coverage with a tandem steel wheel roller weighing a maximum of 10 tons (9.1 metric tons), with additional rolling limited to one coverage with the roller where necessary to improve the riding surface.

Steel-wheel tandem vibratory rollers specifically designed for the compaction of asphalt pavements may be used on all layers 1" or greater in thickness during the breakdown and intermediate rolling phase. Do not operate vibratory rollers in the vibratory mode during the finish rolling phase on any mix type or pavement course, open-graded asphalt friction course or on permeable asphalt drainage course.

When vibratory rollers are used, use rollers which have variable amplitude and frequency capabilities, and which are designed specifically for asphalt pavement compaction. Provide rollers equipped with controls, which automatically disengage the vibration mechanism before the roller stops when being used in the vibratory mode

The Project Director may prohibit or restrict the use of vibratory rollers where damage to the pavement being placed, the underlying pavement structure, drainage structures, utilities, or other facilities is likely to occur or is evident.

Do not use rolling equipment, which results in excessive crushing of the aggregate or excessive displacement of the mixture.

In areas inaccessible to standard rolling equipment, thoroughly compact the mixture by the use of hand tampers, hand operated mechanical tampers, small rollers, or other approved methods.

Use rollers which are in good condition and capable of being reversed without backlash to compact the mixture. Operate rollers with the drive wheels nearest the paver and at uniform speeds slow enough to avoid displacement of the mixture. Equip steel wheel rollers with wetting devices, which will prevent the mixture from sticking to the roller wheels

Begin compaction of the material immediately after the material is spread and shaped to the required width and depth. **Carry out compaction in such a manner as to obtain uniform density over the entire section.** Perform compaction rolling at the maximum temperature at which the mix will support the rollers without moving horizontally. Complete the compaction (including both intermediate rolling) prior to the mixture cooling below a workable temperature. Perform finish rolling to remove roller marks resulting from the compaction rolling operations.

It is the Contractor's responsibility to determine roller requirements based on contract specifications.

T-9.16 **PAVEMENT DENSITY TESTING PROCEDURES:**

T-9.16.1 **DENSITY TESTING METHODS:**

The Contractor shall perform quality control (QC) of the compaction process in accordance with Section T-9.06(D) (1-5), Section T-9.16 and T-9.17. **The Contractor shall use pavement core samples as the method of density control.**

As stated above, the degree or amount of compaction obtained by rolling is determined by obtaining cores from the pavement.

Density test locations shall be determined on equally spaced locations consisting of not more than 500 linear feet or fraction thereof per day on pavement placed at the paver

laydown width. Perform density sampling and testing on all pavements listed below unless otherwise approved.

T-9.16.2 **DENSITY REQUIREMENTS – SUPERPAVE MIXES:**

TABLE 5
NCDOT Table 610-7
MINIMUM DENSITY REQUIREMENTS

MIX TYPE SUPERPAVE MIXES	MINIMUM % OF Gmm (AASHTO T 209)
S 4.75 A	85.0 (a)
S 9.5B	90.0
S 9.5C, S9.5D, I 19.0C, B 25.0C	92.0

(a) Compaction to the above specified density will be required when the S 4.75 A mix is applied at a rate of 100 lbs./sy (55 kg/m2)

Compact the asphalt plant mix to at least the minimum percentage of the maximum specific gravity listed in Table 5, except as noted below. Perform density sampling and testing on all pavements listed below unless otherwise approved.

(A) Full width travel lane pavements, including normal travel lanes, turn lanes, collector lanes, ramps and loops, and temporary pavements,
(B) Pavement widening 4.0 feet or greater,
(C) Uniform width paved shoulders paved in the same operation as the travel lane. Uniform width paved shoulders greater than 4.0 feet paved as a separate operation from the travel lane.

Compact base and intermediate mix types (surface mixes not included) utilized for pavement widening of less than 4.0 feet and all mix types used in tapers, irregular areas and intersections (excluding full width travel lanes of uniform thickness), using equipment and procedures appropriate for the pavement area width and/or shape. Compaction with

equipment other than conventional steel drum rollers may be necessary to achieve adequate compaction. Occasional density sampling and testing to evaluate the compaction process may be required. Densities lower than that specified in Table 5/ NCDOT Table 610-6 may be accepted, in accordance with Section T-9.17 for the specific mix types and areas listed directly above.

T-9.17 **DENSITY ACCEPTANCE (CORE SAMPLE CONTROL):**

The City will evaluate the asphalt pavement for density acceptance after the asphalt mix has been placed and compacted using the Contractor's quality control test results, the City's quality assurance test results, and by observation of the Contractor's density quality control process conducted in accordance with Section T-9.06 Section T-9.07. Minimum density requirements for all mixes will be as specified in Table 5. Density acceptance will be as provided herein. Core sample densities will be determined by use of the average maximum specific gravity (Gmm), until a moving average of the last four maximum specific gravities is attained. Once a moving average of the last four maximum specific gravities is established, the last Gmm moving average in effect at the end of the same day's production will then be used to determine density acceptance.

The pavement will be accepted for density on test sections consisting of not more than 500 linear foot or fraction thereof per day on pavement placed at the paver laydown width.

A failing test section for density acceptance purposes is defined as a maximum 500-foot test section or fraction thereof per day on pavement placed at the paver laydown width for which the average of all densities fails to meet the minimum specification requirement. In addition, any test section or portion of a test section that is obviously unacceptable will be rejected for use in the work

If the Project Director determines that a given test section of mix does not meet the minimum specification requirements, but the work is reasonably acceptable, the test section will be accepted at a reduced pay factor in accordance with the following formula. **The reduced pay factor will apply only to the mix unit price.**

Reduced Pay Factor = 100 + [(Actual Density – Specified Density/2) X 30]

Where: Actual Density = the lot average density, not to exceed 2.0% of the specified density.
Specified Density = the density in Table 5 or as specified in the contract.

When the deficiency of the test section density exceeds 3.0 %, the Project Director will determine whether or not the mix is reasonably acceptable. If determined to be reasonably acceptable, the mix will be paid for at 50 percent of the contract price. If it is determined not acceptable, the mix will be removed and replaced with mix meeting the requirements of these specifications.

Any reduction in pay due to failing density will be in addition to any reduction in pay due to failing mix property test results on the same mix.

Perform the production and construction of all asphalt mixtures and pavements in accordance with these provisions. There will be no direct payment for work covered by this provision. Payment at the contract unit prices for the various asphalt items will be full compensation for all work covered by this provision.

T-9.18 **JOINTS: GENERAL:**

(A)Transverse Joints :

If traffic will not pass over the end of the paving, a butt joint will be permitted, provided proper compaction is achieved. If traffic will pass over the joint, construct a sloped wedge ahead of the end of the full depth pavement to provide for proper compaction and protection of the full depth pavement. Construct the joint square to the lane alignment and discard all excess material. Place a paper-parting strip beneath this wedge to facilitate joint construction unless waived by the City Quality Control Technician. Required minimum length to compacted thickness ratio of the taper is 12:1.

Before paving operations are resumed, remove the sloped wedge and cut back into the previously constructed pavement to the point of full pavement depth. Coat the exposed edge of the previously constructed pavement with tack coat.

When laying of the mixture is resumed at the joint, complete and then test the construction of the joint in accordance with Article 610-12 while the mixture is still in a workable condition. All joints shall present the same texture, density, and smoothness as other sections of the course.

The joints between old and new pavements or between successive days' work shall be carefully made in such manner as to ensure a continuous bond between old and new sections of the course. All contact surfaces of previously constructed pavements shall be painted with a thin, uniform tack coat of hot bituminous material just before the fresh mixture is placed.

In all cases, before paving operations are resumed, the edge of the previously laid course shall be saw-cut back to expose an even vertical surface to the point of full pavement depth. Coat the exposed edge of the previously constructed pavement with tack coat.

T-9.19 **LONGITUDINAL :**

(B) Longitudinal Joints :

Tack the exposed edge of all longitudinal joints prior to placing the adjoining pavement.

Form longitudinal joints by allowing the paver to deposit the mixture adjacent to the joint to such depth that maximum compaction can be obtained along the joint. Pinch the joint by rolling immediately behind the paver.

When multi-lane multi-layer construction is required, offset the longitudinal joints in each layer from that in the layer immediately below by approximately 6 inches.

The locations of joints must also be planned such that the joint in the final layer of pavement is located, where possible, between designated travel lanes of the final traffic pattern. Joints shall not be located in a wheel path.

T-9.20 **SURFACE REQUIREMENTS AND ACCEPTANCE:**

Construct pavements using quality paving practices as detailed herein. Construct the pavement surface smooth and true to the plan grade and cross slope. Immediately correct any defective areas with satisfactory material compacted to conform to the surrounding area.

Pavement imperfections resulting from unsatisfactory workmanship such as segregation, improper longitudinal joint placement or alignment, non-uniform edge alignment and excessive pavement repairs will be considered unsatisfactory

The Contractor and City Quality Control Technician will test each pavement layer at all joints and at other selected locations using a 10-foot (3.05 m) straightedge furnished by the Contractor. No paving will be allowed without straight edge on site. Apply the straightedge parallel to and or perpendicular to the centerline of the surface. Do not exceed 1/8-inch variation of the surface being tested from the edge of the straightedge between any 2 contact points. Correct areas found to exceed this tolerance by removal of the defective work and replacement with new material, unless other corrective measures are permitted. Provide the work and materials required in the correction of defective work at no cost to the City.

T-9.21 **LIMITED PRODUCTION POLICY FOR UNSATISFACTORY LAYDOWN:**

In the event the laydown of the mix is unsatisfactory due to ride quality, excessive tearing, corrugation, rough surface, segregation, or other mat deficiencies, the City Quality Control Technician will advise the Contractor that the work is unsatisfactory and that steps must be taken to obtain a satisfactory laydown.

When directed due to unsatisfactory laydown or workmanship, the Contractor should operate under the limited production procedures. Limited production for unsatisfactory laydown is defined as being restricted to the production, placement, and compaction and final surface testing (if applicable) of a sufficient quantity of mix necessary to construct only 500 feet of pavement at the laydown width. The Contractor will remain on limited production until such time as satisfactory laydown results are obtained or until three consecutive 500-foot sections at the laydown width have been attempted without achieving satisfactory laydown results. If the Contractor fails to achieve satisfactory laydown results after three consecutive 500-foot sections at laydown width have been attempted, cease production of that mix type until such time as the cause of the unsatisfactory laydown results can be determined. Once satisfactory laydown has been achieved normal production may resume.

Mix placed under the limited production procedures or rejected due to improper temperatures due to the limited production procedures for unsatisfactory laydown or workmanship will be evaluated for acceptance

T-9.22 **TACK COAT: DESCRIPTION:**

Apply tack coat material to existing asphalt or concrete surfaces in accordance with these specifications.

Apply tack coat beneath each layer of asphalt plant mix to be placed, unless otherwise approved.

Where a prime coat or a newly placed asphalt surface treatment mat coat has been applied, apply tack coat as directed.

T-9.22.1 **MATERIALS:**

Refer to the latest edition of *NCDOT Standard Specifications for Roads and Structures*

Item	**Section**
Asphalt binder, Grade PG 64-22	1020-2
Emulsified Asphalt, Grade RS-1H	1020-3
Emulsified Asphalt, Grade CRS-1H	1020-3
Emulsified Asphalt, Grade CRS-1	1020-3
Emulsified Asphalt, Grade HFMS-1	1020-3
Emulsified Asphalt, Grade CRS-2	1020-3

Do not dilute or mix the tack coat material with water, solvents, or other materials prior to application.

Unless otherwise specified in the project special provisions, the Contractor may utilize any of the grades of tack coat material specified in this article.

When tack coat is required beneath an open-graded asphalt friction course, the asphalt grade and rate of application to be used on the project will be specified on the job mix formula in accordance with Section 650-5 of the latest edition of *NCDOT's Standard Specification for Roads and Structures.*

T-9.22.2 **WEATHER LIMITATIONS:**

Apply tack coat only when the surface to be treated is sufficiently dry and when the atmospheric temperature is 35°F or above in the shade away from artificial heat.

Do not apply tack coat when the weather is foggy or rainy.

T-9.22.3 **SURFACE PREPARATION:**

Clean the existing asphalt or concrete surface to which tack coat is to be applied of all dust and foreign material prior to placing the tack coat.

Remove grass, dirt, and other materials from the edge of the existing pavement prior to the placement of tack coat.

T-9.22.4 **APPLICATION EQUIPMENT:**

Provide equipment for heating and uniformly applying the asphalt material in accordance with the requirements of the latest edition of NCDOT's HMA/QMS manual

T-9.22.5 **APPLICATION RATES AND TEMPERATURES:**

Apply tack coat uniformly across the existing surface at target application rates shown in Table 605-1.

TABLE 605-1
APPLICATION RATES FOR TACK COAT

Existing Surface	Target Rate (gal/sy) Emulsified Asphalt
New Asphalt	0.04 ± 0.01
Oxidized or Milled Asphalt	0.06 ± 0.01
Concrete	0.08 ± 0.01

Apply tack coat at a temperature within the ranges shown in Table 605-2. Tack coat shall not be overheated during storage, transport or at application

TABLE 605-2
APPLICATION TEMPERATURE FOR TACK COAT

Asphalt Material	Temperature Range
Asphalt Binder, Grade PG 64-22	350- 400°F
Emulsified Asphalt, Grade RS-1H	130-160°F
Emulsified Asphalt, Grade CRS-1	130-160ºF
Emulsified Asphalt, Grade CRS-1H	130-160ºF
Emulsified Asphalt, Grade HFMS-1	130-160º
Emulsified Asphalt, Grade CRS-2	130-160°F

T-9.22.6 **APPLICATION OF TACK COAT:**

Apply only as much tack coat material as can be covered with base, intermediate, or surface course material during the next day's operation except where public traffic is being maintained.

Where public traffic is being maintained, apply only as much tack coat as can be covered during the same day's operation. In addition, the Project Director or City Quality Control Technician/ certified QMS Roadway Technician may limit the application of tack coat in advance of the paving operation depending on traffic conditions, project location, proximity to business or residential areas, or other reasons. In the event that tack coat material is not covered in the same day's operation, the Project Director may require the application of suitable granular material or other means to provide a safe traffic condition at no additional cost to the City. All suitable granular material shall be removed prior to paving at no cost to the City.

Apply tack coat material with a distributor spray bar, which can be adjusted to uniformly coat the entire surface at the directed rate. Use a hand hose attachment only on irregular areas and areas inaccessible to the spray bar. Cover these areas uniformly and completely.

Apply tack coat as directed by the Project Director and in the presence of the City Quality Control Technician/ certified QMS Roadway Technician or his designee. Do not place any asphalt mixture until the tack coat has sufficiently cured.

Paint or spray contact surfaces of headers, curbs, gutters, manholes, vertical faces of old pavements, and all exposed transverse and longitudinal edges of each course with tack coat before mixture is placed adjacent to such surfaces.

All asphaltic cement or other materials which discolor the surface of concrete structures and items which are spilled or placed on such surfaces shall be removed at the Contractor's expense, and his inability to remove such foreign and disfiguring stains shall result in the complete removal of the structures. These removed structures or surfaces shall be replaced at his expense.

T-9.22.7 **PROTECTION OF TACK COAT:**

After the tack coat has been applied, protect it until it has cured for a sufficient length of time to prevent it from being picked up by traffic.

T-9.22.8 **MEASUREMENT AND PAYMENT:**

There will be do direct payment for work covered by this section. The cost of tack coat shall be included in the unit price bid for bituminous concrete base, intermediate, leveling, surface course or other various mix items as shown in the proposal.

T-9.23 **PREPARATION OF EXISTING PAVEMENTS PRIOR TO RESURFACING:**

T-9.23.1 **CLEANING:**

Immediately prior to tacking and resurfacing the Contractor shall sweep the street free of all loose dirt, clay, fuel, oil, grass, or other foreign matter on the surface and edge of the existing pavement. The City Quality Control shall ensure that all areas are properly cleaned and tacked before the pavement layer is placed. Sweeping shall be performed with power brooms wherever possible. Stiff bristled hand push brooms will be allowed in areas inaccessible to the power broom.

T-9.24 **CASTING ADJUSTMENTS WITHOUT ADJUSTMENT RINGS (SEWER, STORMWATER, WATER VALVES, CLEAN OUTS & CHANGING OUT NON-STANDARD TO STANDARD MOMUMENT CASTINGS:**

All castings designated to be adjusted without the use of adjustment rings shall meet all requirements of Section T-9.24. All castings adjusted for the milling and paving operations shall have asphalt “ramps” installed prior to removing any lighted barricades. Lighted barricades are to be placed over castings until asphalt “ramps” are installed. Monthly progress payments **will not** be processed if there are any ramps not installed in accordance with this paragraph. Asphalt “ramps” must be removed before placing final course of asphalt. Cost of asphalt used is incidental to the casting adjustment. If these provisions are not complied with, the castings shall be paid at ½ of the bid price and will not be paid until final payment. All castings shall be raised prior to final surface course placement. The Contractor shall be entirely responsible for all settlement over any and all trenches, excavations and areas where castings were adjusted at any time prior to the completion of his contract, and for a period of twelve (18) months after completion of his contract.

NCDOT approved releasing agents shall be used on the castings prior to paving. (FUEL OIL IS NOT PERMITTED).

A 10’ straightedge shall be placed across all castings by the Contractor parallel to and perpendicular to the centerline of the final surface course after finish rolling has been completed. Any casting which exceed 1/8” (one eighth inch) variation from the surface being tested from the edge of the 10’ straightedge to any one or more contact points of the adjusted casting shall be reset to finished grade by the Contractor at no cost to the City.

New monument castings replacing old monument castings will be provided by the City of Wilmington.

T-9.25 **CASTING ADJUSTMENTS USING ADJUSTMENT RINGS (MANHOLES AND STAANDARD EXISTING MOMUMENT CASTINGS):**

All castings designated to be adjusted with the use of approved adjustment rings shall provide manhole riser rings with expandable mechanism equal to American Highway Products or approved equal.

T-9.26 **SCALES AND PUBLIC WEIGHMASTER:**

When material is to be paid for on a ton basis, the Contractor shall furnish platform scales or other weighing devices which have been certified by the N. C. Department of Agriculture. The scales may be constructed and operated to provide automatic weighing, recording, and printing of tickets for the load being weighed. The City may deny or withhold any portion of payment for any load of materials weighed if in relation to such load of materials, the Contractor falsifies any weighing certification information or otherwise fails to comply with the requirements contained in this contract. All scales shall be operated by a public weighmaster licensed in accordance with *Chapter 81A of the*

General Statutes of North Carolina. A certified weight certificate shall be issued by a North Carolina public weighmaster for each load

T-9.27 **MEASUREMENT AND PAYMENT:**

Hot or Warm Mix Asphalt Pavement will be paid at the contract unit price per ton that will be the actual number of tons of each type of hot mix asphalt incorporated into the completed and accepted work. The unit price shall include all costs associated with mixing, delivering, placing and compacting, and shall also include the cost of any prime or tack coat required.

Any reduction in pay due to failing density will be in addition to any reduction in pay due to failing mix property test results on the same mix.

Pay Item	**Pay Unit**
Hot or Warm Mix Asphalt Pavement	Ton

TECHNICAL SPECIFICATIONS
SECTION 10: FINE & COARSE AGGREGATE BASE COURSE 1/20/2000

T-10.01 **SCOPE**:

BASE COURSE:
The Contractor for this section shall furnish all materials, labor, equipment and plant necessary for, and to complete in place as shown on the drawings or in the specifications and as directed by the Engineer, the pavement base course of the thickness specified on the plans and in the Project Specifications. Placing, shaping, compacting and reworking of the base course is included in this section. Excavating and grading shall be in conformity with the Section of these specifications entitled, "Excavation, Grading and Backfill."

T-10.02 **BASE COURSE MATERIALS**:
Base course for bituminous concrete pavement shall be fine aggregate, coarse aggregate, or soil cement as shown herein or as shown on the Contract Plans.

T-10.02.1 **FINE AGGREGATE BASE COURSE MATERIAL**:
Fine aggregate base course material shall consist of a mixture of clay, silt, fine and coarse sand and gravel so proportioned as to meet the requirements of these specifications.

The fine aggregate mixture shall be free from vegetative matter and lumps or balls of clay, and shall meet the requirements for Type "A" grading given below, using A.A.S.H.T.O. Method T-88.

TYPE "A": This fine aggregate type shall not contain more than 35 percent of aggregate passing the two (2) inch and retained on the No. 10 sieve, and its soil mortar (material passing the No. 10 sieve) shall conform to the following grading requirements:

SIEVE DESIGNATION	PERCENTAGE BY WEIGHT PASSING
No. 10	100
No. 40	40-75
No. 200	12 - 35

The fraction passing the No. 200 sieve shall be less than two-thirds the fraction passing the No. 40 sieve. The material passing the No. 40 sieve shall have a plasticity index not greater than six and a liquid limit not greater than twenty-five, when tested in accordance with A.A.S.H.T.O. Methods T-89, T-90 and T-91.

T-10.02.2 **COARSE AGGREGATE BASE COURSE MATERIAL**:

Coarse aggregate base material shall consist of crushed stone, crushed or uncrushed gravel, crushed or uncrushed shell rock or other inert materials having similar characteristics, so proportioned as to meet the grading requirements as specified below, using A.A.S.H.T.O. Method T-88:

SIEVE DESIGNATION	PERCENTAGE BY WEIGHT PASSING
1-1/2 inch	100
1 inch	80 - 95
1/2 inch	60 - 75
No. 4	40 - 55
No. 10	28 - 43
No. 40	15 - 27
No. 200	5 - 12

The material passing the No. 200 sieve shall be not more than two-thirds the percentage passing the No. 40 sieve.

The fraction retained on the No. 4 sieve prior to spreading on the road shall meet the following requirements:

1. When tested in accordance with the A.A.S.H.T.O. method T-96, test grading A, it shall show a loss of not greater than 55 percent.

2. The material passing the No. 40 sieve obtained from the above test shall have plasticity index not greater than 6, and liquid limit not greater than 30, when tested with A.A.S.H.T.O. Method T-89, T-90, T-91 and modification of the Liquid Limit Test.

3. When subjected to five alternations of the soundness test, A.A.S.H.T.O. Method T-104, using sodium Sulphate, the weighted average loss shall not be more than 15 percent.

The material passing the No. 4 sieve prior to spreading on the road shall meet the following requirements:

1. The material passing the No. 10 sieve shall meet the following grading requirements:

SIEVE DESIGNATION	PERCENTAGE BY WEIGHT PASSING
No. 10	100
No. 40	40 - 85
No. 200	12 - 35

2. The fraction passing the No. 40 sieve shall have a plasticity index of not greater than 6, and a liquid limit not greater than 30, when tested in accordance with A.A.S.H.T.O. Methods T-89, T-90, T-91 and modification of the Liquid Limit Test.

3. The materials passing the No. 200 sieve shall not be more than two-thirds the percentage passing the No. 40 sieve.

4. The fraction passing the No. 10 sieve shall consist of a mixture of screenings or sand, silt, and clay, and it may occur as topsoil meeting the requirements without mixture; or it may be deficient in one or more of the ingredients, coarse or fine sand or screenings, silt, or clay, in which case the required ingredients must be incorporated; or it may consist of crushed decomposed rock which shall meet the requirements stipulated in 1, 2, and 3 above.

After the base course has been completed, that portion of the material which passes the No. 40 sieve shall have a plasticity index of not greater than 6, and a liquid limit of not greater than 30, when tested in accordance with A.A.S.H.T.O. Methods T-89, T-90, T-91 and the modification of the Liquid Limit Test.

T-10.02.3 **SOIL CEMENT BASE COURSE MATERIAL**:
Soil cement base material shall consist of Portland cement and soil in accordance with Section 541, Standard specifications for roads and structures of the N.C. Department of Transportation.

Portland cement shall conform to the requirements of ASTM designation C 150 Type I. Soil for the soil cement mixture shall be existing in place material, except that any rubble or lumps existing or uncovered during mixing which is larger than 3 inches in diameter shall be removed from the site and the maximum allowable volume of these lumps for any square foot of base surface shall not be greater than 50 percent of the base volume. If additional soil is required to bring the base course to grade, the material shall be provided by the Contractor at no additional cost to the owner and shall be clean, sandy soil-free of organic matter with allowable clay content of 0 to 5 percent. The entire soil mixture shall be classified generally as cohesionless soil.

Cement shall be stored in such a manner as to prevent deterioration or intrusion of foreign matter. Any material that has deteriorated or has become lumpy from water intrusion shall not be used.

The soil cement mixture shall be proportioned with cement volume being 14 percent of soil volume.

Before applying cement remove all vegetation and foreign material and blade finish to a fairly level surface so that cement application may be uniformly distributed.

T-10.02.4 **SOURCE OF MATERIALS**:
Material for the base course shall be obtained from sources selected by the Contractor, subject to the approval of the Engineer.

T-10.02.5 **SAMPLING AND TESTING**:

All test samples shall be taken by the Engineer and all tests will be made by the City at no cost to the Contractor.

T-10.02.6 **WATER**:
Water, if used in construction, shall be free from oil and other deleterious matter and shall be subject to the approval of the Engineer.

T-10.03 **EQUIPMENT**:
All plant, equipment, tools, and machines used in the performance of the work covered by this section shall be subject to the approval of the Engineer, and shall be maintained in satisfactory working condition at all times.

T-10.03.1 **POWER ROLLERS**:
The rollers shall be self-propelled, three-wheel type, weighing not less than ten (10) tons, and having a minimum weight of 300 pounds per inch width of rear wheel. The wheels shall be equipped with adjustable scrapers.

T-10.03.2 **TAMPING ROLLERS**: (sheepsfoot type)
Tamping rollers shall consist of one or more units. Each unit shall consist of a watertight cylindrical drum not less than forth-eight (48) inches in length, surmounted by metal studs with tamping feet projecting not less than seven (7) inches from the surface of the drum, and spaced not less than six (6) nor more than ten (10) inches, measured diagonally from center to center. The tamping feet shall be an approved type suitable for compacting stabilized aggregate base courses. Each unit shall be equipped with a suitable device for cleaning the tamping foot. The rolling units of multiple type tamping rollers shall be pivoted on the main frame in a manner which will permit the units to adapt themselves to uneven ground surfaces and to rotate independently. When fully loaded, the roller shall produce at least 300 pounds per square inch on the combined areas of the tamping feet in contact with the ground.

T-10.03.3 **VIBRATING WHEEL ROLLERS**:
Vibrating wheel rollers shall consist of a self-propelled or trailer-type drum wheel roller having a weight of not less than 300 lbs. per inch of wheel width and having a vibrator motor unit capable of causing an effective vibration of soils being compacted.

T-10.03.4 **BLADE GRADERS**:
Blade graders shall have a wheel base of not less than 15 feet, a blade of not less than 10 feet, and shall be self-propelled.

T-10.03.5 **RUBBER-TIRED ROLLERS**:
The rubber-tired rollers shall consist of two axles on which are mounted not less than nine (9) pneumatic-tired wheels in such a manner that a rear group of tires will not follow in the tracks of the forward group. The axles shall be mounted in a rigid frame provided with a loading platform or body suitable for ballast loading. The tires shall be

uniformly inflated. The rollers shall be weighted as directed by the Engineer. The tractor or other towing equipment shall also be pneumatic-tired.

T-10.03.6 **TRAVELING MIXED PLANTS**:
Traveling mixing plants shall be so designed and constructed that they will pick up the windrowed aggregate without damaging the subgrade or leaving any portion of the windrow on the subgrade. Machines shall be mounted on pneumatic-tired wheels or smooth-tread crawler type tracks of such width that, when the plant is fully loaded, they will not cut or damage the subgrade. The equipment for proportioning the aggregates and water shall accurately measure the specified amounts of the materials while the machine is in operation. Each plant shall be capable of producing a uniform mixture without loss of the aggregate and shall have capacity of not less than 100 tons of mixed material per hour.

T-10.03.7 **SPRINKLING EQUIPMENT**:
The sprinkling equipment shall consist of tank trucks, pressure distributors, or other equipment designed to apply water uniformly and at controlled quantities to variable widths of surface.

T-10.03.8 **DISKS**:
Disks shall be of the tandem type, and shall be constructed so as to prevent any cutting of the subgrade during mixing operations.

T-10.03.9 **PLOWS**:
Plows shall be of the multiple-furrow type, and shall be so designed that the depth of furrow can be accurately controlled.

T-10.03.10 **HAULING EQUIPMENT**:
Hauling equipment shall consist of pneumatic-tired vehicles having dump bodies suitable for dumping materials in windrows or in layers on the subgrade of select-material base course.

T-10.03.11 **TAMPERS**:
Hand tampers shall weigh not less than fifth (50) pounds and shall have a face area of not more than one-hundred (100) square inches. Mechanical tampers shall be of an approved type.

T-10.03.12 **MISCELLANEOUS EQUIPMENT**:
Scarifiers, tractors, spring-tooth or spike-tooth harrows, windrow equalizers, spreaders, and other equipment shall be of approved type, suitable for constructing stabilized aggregate base courses.

T-10.04 **OPERATION OF PITS**:
All work involved in the clearing, stripping and excavating, in addition to the processing and blending, in the opening and operation of new pits, or in the operation of approved existing pits, shall be performed by the Contractor. The methods of operating the pits and the processing and blending of the material may be changed or

modified by the Engineer without adjustments in the contract unit prices, when such action is necessary in order to obtain material conforming to the specified requirements.

T-10.05 **STOCKPILING MATERIAL**:
Approved material available from the excavation and grading operations shall be stockpiled in the manner and at the locations designated by the Engineer. Prior to stockpiling of material, the storage sites shall be cleared and leveled by the Contractor. When aggregate or binder material obtained from other sources is to be stockpiled, such materials shall be separately stockpiled in a similar manner on the cleared and leveled areas designated by the Engineer.

T-10.06 **WEATHER LIMITATIONS**:
Stabilized aggregate base courses shall not be constructed when the atmospheric temperature is below 35 degrees F. When the temperature falls below 35 degrees F., it shall be the responsibility of the Contractor to protect all areas of completed base course against any detrimental effects, by methods approved by the Engineer. Any areas of completed base course that are damaged by freezing, shall be reconditioned, reshaped and recompacted by the Con-tractor in conformance with the requirements of this specification without additional cost to the City.

T-10.07 **PREPARATION OF SUBGRADE**:
Prior to constructing the base course, curb and gutter shall have been constructed and cured; the previously constructed subgrade shall be dry and cleaned of all foreign substances. The surface of the subgrade will be inspected by the Engineer for adequate compaction and surface tolerances. Any ruts or soft-yielding spots that may appear in the subgrade, any areas having inadequate compaction, and any deviations of the surface from the requirements set forth therein shall be corrected by loosening, removing, and adding approved material, reshaping, and recompacting the affected areas to line and grade, and to the specified density requirements at the Contractor's expense.

T-10.08 **PLACING AND MIXING OF MATERIAL**:
The base material shall not be dumped directly onto the subgrade from trucks. Dumping shall be either on old pavement or on material already dumped and spread, and material shall be spread by means of bulldozers or graders of a size suitable for such spreading. Spreading will begin at the point nearest the source of supply and all hauling shall be over the material dumped and spread. Constant machining shall accompany the traffic in order to prevent rutting and to provide for even compaction. Hauling shall be distributed over the entire width of the street. Any portions of the layer spread that become segregated shall be remixed by scarifying and the addition of new material to produce a satisfactory blend of materials.

T-10.09 **MANIPULATION AND COMPACTION**:
After sufficient material has been placed on the sub-grade to obtain the specified thickness of base, it shall be well rolled and machined until thoroughly compacted. Frequent template checks shall be made to ensure that a minimum amount of patching

is necessary after complete compaction is secured. If patching is required, the base material in place shall be scarified to ensure adequate bonding together of previously placed base and new material. The base course shall be compacted its full depth to at least 95 percent of the density at optimum moisture, as determined by ASTM D 698, latest revision.

T-10.10 **EDGES OF BASE COURSE WHEN CURB OR SIDE ARE NOT USED**:
Earth or other approved material shall be placed along the edges of the base course in such quantity as will compact to the thickness of the course being constructed, or, when the course is being constructed in two or more layers, to the thickness of each layer of the course, allowing in each operation at least a one (1) foot width of the shoulder to be rolled and compacted simultaneously with the rolling and compacting of each layer of the base course, as approved by the Engineer.

T-10.11 **SMOOTHNESS TEST**:
The surface shall not show any deviations in excess of 3/8 inch when tested with a 10-foot straight-edge applied parallel with and at right angles to the centerline of the paved area. Any deviation in excess of this amount shall be corrected by the Contractor by loosening, adding or removing material, reshaping, watering, and compacting as directed by the Engineer. When the base course is to be constructed in more than one layer, the smoothness requirements specified above shall apply only to the top layer. The surface of the underlying layers shall be finished as directed by the Engineer.

T-10.12 **THICKNESS**:
Compacted thickness of base course shall be shown on the plans and as specified in the Project Specifications. The Contractor will be responsible for securing this final compacted thickness in all cases.

T-10.13 **MAINTENANCE**:
Areas of roadway where base material has been placed will be kept constantly in a moist condition by wetting until final grading and surfacing to prevent dust. No means but wetting shall be used for such dust control. Traffic shall be kept off the base after final compaction and cross-section has been attained, just before surfacing.

T-10.14 **METHOD OF MEASUREMENT**:

T-10.14.1 **SQUARE YARDAGE**:
The square yardage of base course shall be the number of square yards of completed and accepted base course determined by the Engineer.

T-10.14.2 **TONNAGE**:
When called for in the Proposal, some coarse aggregate base may be used for “tie-ins” at intersections and at other points where a standard thickness base cannot be used. Where this item is called for and used, it will be measured by tons actually placed.

T-10.15 **BASIS OF PAYMENT**:

Base course shall be paid for at the contract price per square yard or ton, which payment shall constitute full compensation for the construction and completion of the base course, including: the preparation of sub-grade; furnishing all materials, supplies, equipment and tools; the handling, mixing, manipulation, placing, shaping, compacting, rolling, finishing, and the correcting of unsatisfactory areas and mixtures; the furnishing and application of water; the placing and compacting of portions of the shoulders at edges of base course; and the furnishing of all other labor and incidentals necessary for and incidental to the work required by this section of the specifications.

TECHNICAL SPECIFICATIONS
SECTION 11: PAVEMENT MARKINGS **11/14/2003**

T-11.01 **SCOPE**:
This portion of the project will consist of furnishing, placing and removing pavement markings in accordance with the plans and specifications.

These markings shall be installed at the locations shown on the pavement marking plans or where directed by the Engineer. Installation shall be performed in accordance with the lines, symbols, and dimensions shown on the pavement marking plans or as described in the proposal. The Contractor shall furnish all materials, services, labor, and equipment necessary for the required pavement preparation, pavement marking installation, and pavement marking removal.

The work covered by this Section shall be in accordance with Section 1205 of the **2002 Standard Specifications for Roads and Structures** of the NCDOT.

T-11.02 **PAVEMENT MARKING MATERIALS**:

GENERAL:

T-11.02.1 **DESCRIPTION**:
All pavement-marking materials shall meet the applicable requirements of Section 14 of these specifications. All permanent pavement markings shall be thermoplastic unless specified different in Section 15, "Special Conditions."

All pavement markings shall be on the North Carolina Department of Transportation's Approved Products List.

T-11.03 **CONSTRUCTION METHODS**:

GENERAL:
The completed pavement marking material shall have a uniform thickness and a smooth surfaced cross-section throughout the entire length. All pavement-marking widths shall be not less than the dimensions specified in the plans or proposal. Also, pavement markings shall not exceed plan dimensions by more than one-half (1/2) inch.

The finished pavement marking lines shall have well defined edges, free from horizontal deviations and be straight or of uniform curvature where required.

The Contractor shall take reasonable steps to ensure that fresh pavement markings are kept track free.

T-11.03.1 **APPLICATION EQUIPMENT**:
All pavement marking application equipment shall be constructed for easy accessibility during cleaning and maintenance.

Marking guns shall be in full view of the operator at all times. The applicator shall be mobile and maneuverable so that straight lines can be followed and all standard curves can be made in true arcs.
The application vehicle shall include include at least one person who is a technical expert in the equipment operations and pavement marking techniques.

T-11.03.2 **REMOVAL OF PAVEMENT MARKINGS**:
This work includes the removal of all types of pavement markings. Pavement markings shall be removed in a manner acceptable to the Engineer that will not materially or structurally damage the surface or texture of the pavement.

The pavement surface shall be left in a condition that will not mislead or misdirect the motorist.

T-11.04 **SURFACE PREPARATION**:
To ensure maximum possible adhesion, the pavement surface upon which Pavement Markings are to be placed shall be properly cleaned and free of grease, oil, mud, dust, dirt, grass, loose gravel and other deleterious material, prior to the application of the Pavement Markings. Cleaning shall be performed on all surfaces that are to receive new Pavement Markings. The area to be cleaned shall be a minimum of two (2) inches wider than the Thermoplastic Pavement Markings to be placed, such that an additional one (1) inch of cleaned area is on each side of the Thermoplastic Pavement Markings after they are applied.

Where cleaning of objectionable material is obscuring existing pavement markings of a lane occupied by public traffic, the residue, including but not limited to dust, shall be removed immediately from the surface being treated. Such removal shall be by methods approved by the Engineer.

On all pavement surfaces greater than two (2) years old and Portland Cement Concrete Pavements, a liquid epoxy resin primer-sealer or equivalent shall be applied to the area where hot Thermoplastic Pavement Markings are to be placed unless otherwise recommended by the manufacturer. The primer-sealer shall be that recommended by the manufacturer of the Thermoplastic Material, and shall be approved by the Engineer. The material shall form a continuous film that shall dry rapidly, which shall adhere to the pavement surface, and shall be completely dry prior to application of the Thermoplastic Material. The primer-sealer shall not discolor nor cause any noticeable change in the appearance of the Thermoplastic PavementMarkings and/or the pavement outside the edge of the finished pavement markings. A sample of the primer-sealer shall be submitted to the Engineer, and shall be approved by the Engineer prior to application.

No direct payment shall be made for this surface preparation (pavement cleaning and application of primer-sealer), as such work shall be considered incidental to the work being paid for by the various Thermoplastic Pavement Marking items in this contract.

T-11.05 **WEATHER LIMITATIONS**:
Pavement markings shall not be installed when the pavement shows visible signs of moisture or when damage causing moisture is likely during the installation and drying period.

T-11.05.1 **PAINT TYPE PAVEMENT MARKINGS**:

Paint shall be applied only when the pavement temperature and the air temperature are a minimum of 40 degrees F. and a maximum of 160 degrees F.

T-11.05.2 **THERMOPLASTIC PAVEMENT MARKINGS**:
Thermoplastic shall not be applied to existing pavements unless the pavement surface temperature and the ambient air temperature is 60 degrees Fahrenheit and rising.

Thermoplastic shall only be applied to newly surfaced pavements (less than 12 hours old) when the ambient air and the pavement surface temperature are 50 degrees F. and rising.

T-11.05.3 **EPOXY PAVEMENT MARKINGS**:
Epoxy pavement markings shall not be applied unless the ambient air temperature and the pavement surface temperature are 35 degrees F. and rising.

T-11.06 **PREMARKING**:
Where no existing markings are in place, the existing markings are not visible and/or the existing markings are to be removed. The contractor shall be required to premark each installation prior to application. The premarking shall be of a manner that will be helpful to the contractor and the Engineer in placing the Pavement Markings as directed in the plans. The actual placement of the Pavement Marking Materials shall not be performed until the premarking has been inspected and approved by the Engineer.

Where existing markings not required to be removed are visible, they shall be retracted as directed by the Engineer and the plans.

No direct payment shall be made for this premarking as such work shall be considered incidental to the work being paid for by the various Pavement Marking items in the contract.

T-11.07 **THERMOPLASTIC AND EPOXY OBSERVATION PERIOD:**
Prior to consideration of final acceptance of all work completed as required herein and shown in the pavement marking plans, there shall be a 180-day observation period beginning upon the satisfactory completion of all work required by the intermediate completion date included elsewhere in this proposal form.

During the 180-day observation period, the Thermoplastic and Epoxy Material furnished and installed under this contract shall be warranted against failure due to blistering, excessive cracking, bleeding, staining, discoloration, oil content of the pavement materials, smearing or spreading under heat, deterioration due to contact with grease deposits, oil, diesel fuel, or gasoline drippings, chipping, spalling, poor adhesion to the pavement materials, loss of reflectivity vehicular damage, and wear.

The contractor, at no expense to the City of Wilmington, shall replace any pavement markings that will not perform satisfactorily under traffic during the 180-day observation period due to defective materials and/or workmanship in manufacture and/or application. (Failure to comply with any portion of this specification shall be considered as unsatisfactory performance of the Pavement Marking Material). Marking replacement shall be performed in accordance with the requirements specified herein for the initial application, including but not limited to, surface cleaning, pavement marking removal, seasonal and weather limitations, etc.

Traffic shall be operating on the facility during the 180-day observation period.

T-11.08 **COMPLIANCE OF MARKING MATERIAL WITH THE SPECIFICATION**:
The Contractor shall provide to the Engineer verifiable certification stating the acceptability of the Pavement Marking Materials.

No direct payment shall be made for any of the test procedures as described within this specification as such work shall be considered incidental to the various Pavement Marking items in the contract.

T-11.09 **METHOD OF MEASUREMENT**:
The quantity of Pavement Marking Lines to be paid for shall be the actual number of linear feet of Pavement Marking Lines that have been satisfactorily placed. The quantity of solid lines shall be the summation of the linear feet of solid line measured end-to-end of the line. The quantity of skip or intermittent lines shall be the summation of the linear feet derived by multiplying the normal length of the marking lines by the number of marking lines in place.

The quantity of Pavement Marking Symbols to be paid for shall be the actual number of Pavement Marking Symbols satisfactorily placed.

The quantity of removal of pavement marking lines to be paid for shall be the actual number of linear feet of pavement marking lines removed and accepted by the Engineer.

The quantity of removal of pavement marking symbols to be paid for shall be the actual number of pavement marking symbols removed and accepted.

T-11.10 **BASIS OF PAYMENT**:
The quantity of Pavement Marking Lines, measured as provided above, shall be paid for at the contract unit price per lineal feet for "Pavement Marking Lines."

The quantity of Pavement Marking Symbols, measured as provided above, shall be paid for at the contract unit price per each for "Pavement Marking Symbols."

The quantity of Removal of Pavement Marking Lines, measured as provided, shall be paid for at the contract unit price per linear foot for "Removal of Pavement Marking Lines."

The quantity of Removal of Pavement Marking Symbols, measured as provided above, shall be paid for at the contract unit price per each for "Removal of Pavement Marking Symbols."

Such prices and payment shall be full compensation for all layout, materials, testing, tools, equipment, labor, and all other requirements necessary to complete the work.

CITY OF WILMINGTON ENGINEERING

TECHNICAL SPECIFICATIONS
SECTION 13: ENVIRONMENT PROTECTION: EROSION AND SEDIMENT CONTROL, AIR AND WATER QUALITY PROTECTION AND NOISE CONTROL **07/23/2008**

T-13.01 **GENERAL**:
The Contractor shall maintain all work areas within and outside the project boundaries free from environmental pollution that would be in violation of any Federal, State or local regulations.

T-13.02 **STORM WATER CONTROL AND PERMIT**:
All construction activities disturbing one than 1 acre of land are subject to stormwater permitting as required by the U.S. Environmental Protection Agency and North Carolina Division of Water Quality (DWQ) for a NPDES permit (National Pollution Elimination Discharge System). Contractor shall comply with the applicable conditions of the Stormwater Permit including, where necessary, implementation of the Erosion and Sedimentation Control (E&SC) plan, maintenance of control facilities and preventing pollution.

In addition to the E&SC plan, stormwater protection includes prevention of contamination from equipment and debris used during construction. This includes preventing spills of oil, fuels, coolants, and fluids, following proper and legal use of herbicides, pesticides and fertilizers and disposing of construction debris, materials, litter and sanitary waste.

T-13.03 **EROSION AND SEDIMENT CONTROL**:
All work shall comply with the regulations of the North Carolina Sedimentation Control Act of 1973, and all subsequent amendments. An erosion and sedimentation control (E&SC) plan must be submitted at least 30 days before land disturbance activities begin on any site 1 acre or larger. The E&SC is a component of the Stormwater Permit and the intent of the law requires installation and maintenance of sufficient erosion control facilities to retain sediment within the boundaries of the site. Primary requirements include: a sufficient buffer zone along any natural watercourse or lake where sediment is captured within the first 25% of the zone; groundcover of disturbed areas must be provided within 15 working days or 90 calendars, whichever is shorter; graded slopes must be vegetated or stabilized within 21 calendar days. The contractor shall implement and install all control facilities included on the approved E&SC plan for this project and conduct appropriate monitoring and inspection of the BMP's and outfalls.

Contractor shall keep on-site the following: Copy of E&SC plan and amendments; a rain gauge; records of rainfall amounts and dates; records of inspections for E&SC control facilities; and records of observations of streams and stormwater outfalls.

Contractor is required to complete and submit a Stormwater Inspection Report through the duration of the project where land disturbing activities have taken place. Inspection of E&SC control facilities shall take place a minimum of once per week and after any storm event one-half inch or greater (during 24-hr period). Contractor must observe the condition of the streams and run-off at stormwater outfalls for the characteristics included in the permit and listed on the sample form 'Stormwater Inspections for General Permit NCG010000 – Land Disturbing Activities

Contractor is required to notify project manager and or inspector whenever any deficiencies in the E&SC plan are noted as inadequate or when large amounts of sediment in the stream are observed. Contractor is required to immediately prioritize and address any damage or deficiencies to the BMP's in regards to managing sedimentation; such activities include addressing findings from inspections and periodic maintenance of facilities including construction entrances.

The contractor shall perform operation & maintenance activities for E&SC facilities as necessary. Such activities may include: regular cleaning of sedimentation basins; stabilizing eroded banks or spillway structures; repairing or cleaning of inlet and outlets; repairing of piping or equipment as necessary; and repairing of damage to silt fencing.

T-13.04 **AREAS UNDER ACTIVE CONSTRUCTION**:

No disturbed area shall be left bare for more than fifteen (15) working days or ninety (90) calendar days, whichever is shorter, unless it is under active construction, at which point it may be necessary to install silt fences or other temporary erosion and sedimentation control facilities to prevent off-site sedimentation damage.

T-13.05 **EROSION & SEDIMENTATION CONTROL BMP'S**:

When construction activities necessitate a modification or addition of an erosion control facility to prevent off-site sedimentation, the contractor shall utilize available BMP's. Such facilities may consist of vegetative cover, inlet protection and sediment traps such as sod, straw bales, seeding, fiber mats or tubes, woven plastic filter cloths, mulches, bituminous spray, rip rap or stone, silt fence, sediment basins and other erosion control facilities as approved by the Engineer prior to installation.

T-13.06.1 **SEEDING AND GROUND COVER**:

Contractor shall be aware of surface and soil conditions necessary for proper application prior to installation.

1. Materials:

(a) Seed: All seed used shall be labeled in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act currently in effect. All seed shall be furnished in scaled standard containers, unless exception is granted by the Engineer. Seed that has become wet, moldy, or otherwise damaged in transit or in storage will not be acceptable.

SCHEDULE OF SEED MIX

Kind of Seed	Percent of Mix
Bermuda Grass	35%
Centipede Grass	10%
Creeping Red Fescue	30%
Winter Rye (Grain)	25%
Guaranteed Germination	not less than 85%
Guaranteed Purity	not less than 96%

Note: The total percentage by weight of material other than grass seed in the above mixes shall not exceed 5 percent. This material shall include all non-viable seed, chaff, hulls, live matter, and weed seed.

(b) Fertilizer shall be 8-8-8 Commercial grade uniform in composition, free-flowing and suitable for application with approved equipment, delivered to the site in bags or other convenient containers, each fully labeled; conforming to the fertilizer laws of the State of North Carolina and bearing the name, trade name, or trade mark and warranty of the producer.

(c) Lime shall be ground limestone, not less than 85 percent of total carbonates, and shall be ground that at least 50 percent will pass through a 100 mesh sieve, and at least 90 percent will pass through a 20 mesh sieve.

2. Application

(a) Application of Fertilizer: Fertilizer shall be distributed uniformly at the rate of 4 pounds per 100 square feet over the areas to be seeded, and shall be incorporated into the soil to a depth of at least two (2) inches.

(b) Application of lime: Lime shall be distributed uniformly at a rate of 10 pounds per 100 square feet over the areas to be seeded, and incorporate into the soil along with the fertilizer to a depth of two (2) inches.

(c) Broadcast Seeding: Seed, if broadcast, shall be distributed by use of mechanical hand-operated sowing equipment at the rate of five (5) pounds of specified seed mix per 1,000 square feet. The seed shall be uniformly distributed over the designated areas. Broadcast seeding shall not be done during windy weather. Seed shall be covered to a depth not to exceed one-eighth (1/8) inch.

3. Maintenance and Growth: The Contractor will maintain, repair, replace where washouts occur, and water until a uniform growth of two (2) inches or higher is generally uniform on planted areas.

T-13.06.2 **SODDING:**

1. General: In order to establish vegetation in critical areas, such as slopes, drainage-ways, and channels, sodding may be required as shown on the plans or required in the Special Conditions.

2. Materials:

a) Sod type shall be Bermuda grass unless specified otherwise in the Special Conditions. The sod shall be of know origin, free of weeds, disease, and insects. The sod should be machine-cut at a uniform depth to a standard size as established by the supplier. Harvest, delivery and installation shall occur within a time period of six (6) hours.

b) Fertilizer and lime shall be furnished and applied as specified above in Paragraph T-13.02.3.

3. Preparation:

a) The surface area established to receive sod shall be cleared of trash, debris, roots, branches and stones. Fill and level low spots to prevent ponding.

b) Rake or harrow the sod area to incorporate the fertilizer and lime into the soil and to smooth and level the surface to final grade.

c) Final preparation will be to roll or cultipack the surface to firm the soil. However, care must be taken to avoid excessive compaction.

4. Installation:

a) After the sod is unrolled it should be moistened and stored in the shade.

b) Moisten the surface area prior to laying out the sod.

c) Lay the first layer in a straight line with the longest dimension perpendicular to the slope and/or channel flow.

d) Install the subsequent rows, parallel to and butted against each other. Stagger the joints in a brick pattern and butt together tightly to prevent voids.

e) Roll the sod after installation to establish firm contact with the roots and soil.

f) On slopes 3:1 or greater and channel ways anchor sod with pegs and or wire staples, six (6) to ten (10) inches long.

g) Irrigate sod until a depth of four (4) inches is wet. Maintain irrigation until the sod takes root.

T-13.06.3 **GOOD STAND OF GRASS**:

The Contractor is hereby advised that the City will hold the normal five percent (5%) retainage of the contract amount until such time as a good stand of grass as approved by the engineer is obtained. In this regard, the Contractor is encouraged to fertilize and seed the plazas as each street nears completion. A good stand of grass shall be defined uniform growth of grass at least two (2) inches in height.

T-13-06.4 **AREAS TO BE MULCHED**:

Where directed by the Engineer, the Contractor shall mulch the plaza areas. Where mulching has been directed, the Contractor shall double the rate of application of seed specified in Section T-13.02.03. The mulch shall be hay mulch tacked lightly with asphalt cement to prevent displacement. All cost associated with the mulching, including the additional seeding, hay, asphalt cement, etc., shall be included in the price bid per square yard for mulching in the proposal.

T-13.06.5 **BIODEGRADABLE EROSION CONTROL BLANKETS**:

The erosion control blanket shall consist of a machine-produced mat of curled wood excelsior of 80% six-inch or longer fiber length, with consistent thickness and the fiber evenly distributed over the entire area of the blanket. The wood fibers shall be held in place by extruded plastic mesh on both sides. The staples shall be made of wire, No. 11 gauge or greater, "U" shaped with legs six (6) inches in length and a one (1) inch crown. Size and gauge of staples used will vary with soil conditions. The

excelsior matting shall be used for channel stabilization when specified in the Special Conditions or shown on the plans.

Channel stabilization of side slopes from top of bank to toe of slope of all grass-lined channel side slopes shall include fine grading so that the channel side slopes are ready for seeding, fertilizer, lime, the erosion control matting, and required staples to ensure the matting is held firmly in place.

T-13.06.6 **NON-BIOGRADABLE EROSION CONTROL MATTING**:
Non-biodegradable erosion control matting shall be used as drainage channel liners where high stormwater velocities are anticipated. The erosion control matting shall be either nylon fiber with UV resistant netting on each side, or a flexible mat of PVC monofilaments bonded together on a three-dimensional web. The erosion control matting shall be installed over prepared channel areas, seeded and mulched per paragraphs T-13.02.3 and T-13.02.6. The erosion control matting shall be anchored with wire staples or pins as per manufactures recommendations.

Erosion control matting shall be installed when shown on the plans and/or specified under Special Conditions.

T-13.06.7 **RIPRAP**:
Riprap should be a well-graded mixture of hard angular stone of such quality that it will not break down on exposure to water or weathering. Riprap shall be Class I as specified by the North Carolina Department of Transportation for slope stabilization and outlet protection.

T-13.06.8 **FILTER BLANKET**:
A filter blanket shall be placed between the riprap and the underlying soil to prevent soil movement into or through the riprap. A suitable filter shall consist of a synthetic filter fabric manufactured for this express purpose. No filter fabric should have less than 4 percent open area or an equivalent opening size (EOS) less than U.S. Standard Sieve No. 100 (0.15mm). The permeability of the fabric must be greater than that of the soil. The fabric shall be of non-woven monofilament yarns and should meet the following minimum requirements:

Thickness 20-60 mils
Grab strength 90-120 lbs
Conform to ASTMD-1682 or ASTM D-177
Placement of a synthetic filter blanket shall be by the manufacturers' recommendations.

T-13.07 **SILT FENCE**:
Silt fence shall be used as a permeable barrier that retains sediment on the construction site. Use a synthetic filter fabric that is certified by the manufacturer or supplier conforming to the following requirements:

Filtering efficiency - 85% minimum
Tensile Strength of 20% maximum elongation 30 lbs/lin in (min)
Slurry Flow Rate - 0.3 gal/sq ft/min

Installation and maintenance shall be by the manufacturers' recommendations. Materials shall meet the requirements of the North Carolina Department of Transportation.

T-13.08 **AIR AND WATER QUALITY PROTECTION:**

T-13.08.1 **PROTECTION OF AIR QUALITY**:

The air pollution likely to occur due to construction operations shall be minimized by wetting down bare soils during windy periods, requiring the use of properly operating combustion emission control devices on construction vehicles and equipment used by contractors, and by encouraging the shutdown of motorized equipment not actually in use. Trash burning will not be permitted on the construction site. Steps to protect air quality shall be taken at all times, including non-working hours, weekends, and holidays.

T-13.08.2 **PROTECTION OF WATER QUALITY**:

The Contractor shall observe the rules and regulations of the State of North Carolina and agencies of the United States Government prohibiting the pollution of stream or river waters by the dumping of any refuse, rubbish or debris therein.

T-13.08.3 **PROTECTION OF FACILITIES**:

The Contractor shall take adequate measures to prevent the impairment of the operation of the existing facilities and prevent construction materials, pavement, concrete, earth, or other debris from entering these facilities.

T-13.09 **NOISE CONTROL**:

The Contractor shall conduct all his work and use appropriate construction methods and equipment to prevent exceeding legal noise levels.

T-13.09.1 **NOISE CONTROL ORDINANCE**:

Section 6-9, "Noises," of the Wilmington City Code shall apply to the Contractor.

TECHNICAL SPECIFICATIONS
SECTION 14: MATERIALS **04/08/2005**

T-14.01 **SCOPE:**
This section includes all materials that may be used in the work as set out herein but does not intend in any way to suggest that all materials listed are included. The intention of the section is to denote the quality and type of materials desired and required. The name of a certain brand, make, manufacturer or definite specification is to denote the quality of material desired, but does not restrict bidders to the specific brand, make, manufacturer or specifications named; it is to set forth and convey to prospective bidders the general style, type, character and quality of the article desired.

T-14.02 **AGGREGATES**:

T-14.02.1 **CONCRETE AGGREGATES**:
Fine concrete aggregates shall conform to either A.S.T.M. C-33 or AASHTO M 6-87. Coarse concrete aggregates shall conform to AASHTO M 80-87.

T-14.02.2 **MORTAR AGGREGATES**:
Mortar aggregates shall conform to A.S.T.M.-C-144-84/ AASHTO M-45-89.

T-14.02.3 **ASPHALT AGGREGATES**:
Fine aggregates used in asphaltic concrete shall be graded from coarse to fine to meet the graduation, as provided under Section 9, "Paving," and shall be composed of sand, stone screenings or a blend of both, which shall be of grains of quartz or other hard, durable rock, rough surfaced and angular grains, clean and free from any injurious materials. Stone screenings shall be produced from stone that shall have a percent of wear not more than 65, as determined by AASHTO Test T-96. In all cases, sand samples shall be submitted to the City and shall be subject to the approval of the Engineer.

Coarse aggregates shall consist of clear, tough, durable fragments, free from an excess of flat, elongated, soft or disintegrated pieces and shall not contain clay, silt or other objectionable matter. Coarse aggregates shall be of crushed stone retaining on a number 10 sieve. Test for quality shall be according to the AASHTO Test T-96, and shall have a loss of not more than 55 percent. In all cases, coarse aggregate samples shall be submitted to the City and shall be subject to the approval of the Engineer.

Mineral filler shall consist of thoroughly dry limestone dust, Portland Cement, or other materials approved by the Engineer. It shall meet the following requirements:

PERCENT OF TOTAL

Passing 30 mesh sieve	100
Passing 100 mesh sieve	85-100
Passing 200 mesh sieve	65-100

T-14.03 **CEMENT**:

T-14.03.1 **PORTLAND**:
Portland cement shall conform to ASTM C-150-latest edition, Type I or III / ASSHTO M 85-89, Type I or III.

T-14.03.2 **MASONRY**:
Masonry cement shall conform to ASTM C 150-86/ASSHTO M 85-89. Type I shall be used on aboveground structures. Type II shall be used on underground drainageand sanitary sewer structures.

T-14.03.3 **ASPHALTIC**:
Shall be 85-100 penetration petroleum asphalt to meet AASHTO M-20-42, subject to the approval of the Engineer.

T-14.04 **WATER**:
All water used for mixing mortar or concrete shall be clean, free from acid, strong alkali, or matter in suspension, and will be obtained from the City water supply system unless otherwise permitted by the Engineer.

T-14.05 **MORTAR**:
Mortar shall be prepared from cement, sand and water that fulfill the requirements as stated for each. The mortar shall consist of one (1) part by volume of Portland Cement and three (3) parts by volume of sand. A maximum of ten (10) percent of lime putty or dry hydrated lime to each volume of cement may be used to attain workability, if desired, or if so instructed by the Engineer. Prepared types of mortar cement may be used only with the written permission of the engineer. The mortar shall be mixed in boxes prepared for that purpose, and must be cleaned after each batch is removed. No mortar may be used that shows signs of setting, or that has been allowed to stand for a period of thirty (30) minutes after mixing.

T-14.06 **BRICK**:
Bricks shall conform to AASHTO, M114, Grade MW, and shall be whole solid brick of standard size, with straight and parallel edges and square corners. They shall be of compact texture, full weight and entirely true, free from injurious cracks and flaws, tough, strong, and shall have a clear ring when struck together.

T-14.07 **BRICK FOR SANITARY SEWER, DRAINAGE, AND WATER MAIN MANHOLES**:
None but whole, solid, sound, hard, straight, thoroughly burned brick, uniform in structure, with true and even faces shall be used. The brick shall be entirely free from injurious defects, and shall ring clear when two are struck together. All brick shall meet ASTM Standard Specifications for Sewer Brick ASTM Designation C-32, Grade MS, latest revision, according to the various classification according to use as given therein.

CONCRETE BRICK:
Concrete brick shall be sized 4"X4"X8", and conform to ASTM C 139-79 / AASHTO C 145-75.

T-14.08 **GRAY IRON CASTINGS**:

T-14.08.1 **REQUIREMENTS AND METHODS OF TESTING**:
All iron castings for manhole and well hole frames and covers, inlet frames, covers and traps, and for other sewer appurtenances, unless otherwise specified in the plans, shall conform to the requirements for Gray Iron Castings of the American Society for Testing Materials.

T-14.08.2 **CLASSIFICATION**:
All castings shall conform to ASTM A 48-83, Class 30 "Gray Iron Castings" unless specified otherwise on the plans or in the Special Conditions.

T.14.08.3 **WORKMANSHIP AND FINISH**:
The castings shall be true to pattern and free from cracks, gas holes, flaws and excessive shrinkage. Surfaces of the castings shall be free from burnt-on sand and shall be reasonably smooth. Runners, risers, fins, and other cast-on pieces shall be removed. In other respects, the castings shall conform to whatever points may be specified in the plans. All covers for manholes, wall holes, inlets, etc., must have a continuous and even bearing on the frames. Castings tolerances shall be plus or minus 1/16 inch per foot.

T-14.08.4 **INSPECTION**:
The Engineer shall have free entry at all times while work on the material to be used in this contract is being performed, to all parts of the manufacturer's work which concern the manufacture of the castings ordered. The manufacturer shall afford the Engineer all reasonable facilities to satisfy him that the castings are being furnished in accordance with these specifications. All tests and inspections shall be made at the place of manufacture prior to shipment, unless otherwise specified on the plans, and shall be so conducted as not to interfere unnecessarily with the operation of the work. When offered for inspection, the castings shall not be painted or covered with any material that will hide defects.

T-14.08.5 **CERTIFICATION**:
Upon request of the Engineer, the manufacturer shall certify that his product conforms to the requirements of these specifications.

The weights of all castings shall be certified by the founder furnishing them and shall not be less than those called for on the plans.

T-14.08.6 **MANHOLE CASTINGS**:
Manhole castings shall conform to ASTM "Gray Iron Casting" and be marked "SANITARY SEWERS" or "STORM SEWER" as required, and shall be East Jordan Iron Works, No. V-1384, Ennis Enterprises No. MH-GRE-24, Vulcan Foundry No.V-2384, or equal. Watertight or lockable manhole castings shall be specified under "Special Conditions."

T-14.08.7 **MANHOLE STEPS:**

STORM DRAIN MANHOLE STEPS:
Manhole steps for masonry structures shall be East Jordan Iron Works, Inc., No. 8500, Neehah Foundry Co. No. R-1980-1, Vulcan Foundry No.1999-6, or equal. Manhole steps for precast manholes shall be fabricated from ½-inch steel rod encapsulated in

polypropylene plastic. The step shall be twelve–inches wide with serrated tread and lugs to prevent feet from off the step and shall be spaced on 16-inch centers.

SANITARY SEWER MANHOLE STEPS:
Sanitary sewer manholes shall not be furnished with manhole steps unless specified in the Special Conditions.

T-14.09 **SANITARY SEWER PIPE AND FITTINGS:**

T-14.09.1 **DUCTILE IRON PIPE AND FITTINGS**:
Ductile iron pipe shall meet the requirements of Section T-14.11.1 of these specifications except that the interior coatings shall be ceramic epoxy coating, 40 mils thick, equal to Protecto 401. Fittings shall meet the requirements of Section T-14.11.4 of these specifications except that "push-on-joints" may be used in lieu of mechanical joint fittings and the interior coating shall be a ceramic epoxy coating, 40 mils thick, equal to Protecto 401.

T-14.09.2 **POLYVINYL CHLORIDE (PVC) PIPE**:
PVC pipe and fittings for sanitary sewer shall meet the following requirements:

A. PVC pipe shall have integral wall bell and spigot push-on joints and shall meet the requirements of ASTM D 3034, Type PSM, SDR 35 or SDR 26 conforming to ASTM 2241 and NSF for 8-inch to 15-inch pipe. When pressure pipe is required or specified, the PVC pipe shall meet the requirements of ASTM D-2241. Fittings shall be push-on-joint PVC furnished by the pipe manufacturer.

B. PVC pipe, with push-on joints and elastomeric gaskets, conforming to the standards of AWWA C900, Class 150 or AWWA C905, Class 150 for pipes larger than 14-inches, shall be required when the depth of main, measured from the invert of the pipe to finished grade, equals or exceeds ten (10) feet. All PVC mains shall be fully encased in stone bedding when the depth equals or exceeds eight feet.

T-14.09.3 **SANITARY SEWER SERVICE PIPE**:
Pipe for sanitary sewer service lines and stacks (4 and 6-inch diameter) shall be either polyvinyl chloride (PVC) or cast iron pipe. PVC pipe shall be SDR 26, with integral bell and spigot and push-on joints conforming to ASTM D-3034, type PSM Fittings shall also conform to ASTM D-3034. Solvent welded joints shall not be acceptable. Cast iron pipe shall be used where directed and shall be heavy-duty cast iron soil pipe conforming to ASTM A-74-latest edition with push-on joints with rubber gaskets conforming to ASTM C-564-latest edition.

T-14.09.4 **TRANSITION FITTINGS:**
Transition fittings for connection between pipes of dissimilar material shall be as follows:

A. 4-inch to 6-inch couplings: Adjustable repair couplings meeting ASTM C 564, with rigid wide non-shear band stainless steel as manufactured by Mission Rubber Company, Inc., Fernco, Romac, or equal.

B. 8-inch and larger couplings: Mechanical joint ductile iron sleeve or adapter conforming to Section T-14-11.4

T-14.10 **REINFORCED CONCRETE PIPE AND JOINT MATERIAL**:

T-14.10.1 Concrete pipe used for storm drain pipe shall conform to the requirements of ASTM-C-76 latest revision, Class III.

T-14.10.2 Concrete pipe for use as casement pipe shall conform to the requirements of ASTM C-76, latest revision, Class IV.

T-14.10.3 Concrete pipe joint material shall meet ASSHTO M-198, ASTM C-990, and Fed. Spec. SS-S-210A.

T-14.11 **WATER PIPE AND FITTINGS**:

T-14.11.1 **PUSH JOINT DUCTILE IRON PIPE**:
Push joint ductile cast iron pipe shall be Class 51. The pipe shall be centrifugally cast and shall be made of ductile cast iron 60-42-10 grade in accordance with ANSI/AWWA C150/A21.51 and ANSI/AWWA C151/A21.51 under Special Thickness Class. The pipe shall be furnished in nominal 16-foot to 20-foot laying lengths. All pipe shall be cement mortar lined and seal coated inside, and bituminous coated outside in accordance with ANSI/AWWA C104/A21.4. Pipe shall be furnished complete with gaskets and lubricant**,** per ANSI/AWWA C104/A21.4.

T-14.11.2 **POLYVINYL CHLORIDE (PVC) PIPE FOR 4 THROUGH 12 INCHES**:
PVC pipe for water pipe shall conform to AWWA C900, Class 150, with push-on joints. Elastomeric gaskets shall conform to ASTM F477. Pipe shall be furnished complete with gaskets and lubricant.

T-14.11.3 **POLYVINYL CHLORIDE (PVC) PIPE FOR 2 AND 3 INCHES**:
PVC pipe for water pipe, 2 through 3 inches in diameter shall be 200 PSI, SDR 21 conforming to ANSI/ASTM D-2241, NSF approved, with push-on-joints meeting ANSI/ASTM D-3139. The pipe compound shall be PVC 1120.

T-14.11.4 **DUCTILE IRON FITTINGS**:
The fittings shall be standard mechanical joint fittings made of ductile iron in accordance with ANSI/AWWA C110/A21.10. Compact ductile iron fittings meeting ANSI/AWWA C153/A21.53-94 shall also be acceptable. Standard mechanical accessories shall be furnished for each bell opening consisting of HSCI bolts, cast iron glands, and plain rubber gaskets in accordance with ANSI/AWWA A21.11-90. Fittings shall be cement mortar lined and seal coated inside per ANSI/AWWA C104/A21.4-90. Where flanges are indicated on fittings they shall be F and D 125 pound per ASME/ANSI B16.42-87.
Fusion bonded epoxy coated ductile iron fittings meeting C116/A21.16-98, NSF 61 with a normal coating thickness of 6-8 mils are acceptable.

T-14.11.5 **PVC FITTINGS**:
PVC fittings for PVC pipe, 4 inches and larger shall be mechanical joint ductile iron fittings as specified under Section T-14.11.4 above. Fittings for PVC pipe, 2 through 3 inches shall be molded PVC, Class 200 conforming to SDR 21 in accordance to ANSI/ASTM D-2241, NSF approved, with push-on-joints meeting ANSI/ASTM D-3139 with gaskets conforming to ASTM F-477.

T-14.12 **WATER SERVICE LATERALS**:

T-14.12.1 **COPPER PIPE SERVICE LATERALS**:
Copper pipe water services shall be installed only where shown on the plans and/or directed by the Engineer. Copper pipe for water services shall be Type K soft, complying with Federal Specifications WW-T-799 and ASTM-B-88.

T-14.12.2 **POLYETHYENE PIPE SERVICE LATERALS**:

Polyethylene pipe for water services shall be polyethylene tubing, CTS, SDR 9, 200 PSI, conforming to AWWA C901, PE 3408. Each service shall be either 1" or 2" size. A pipe marking wire, 10-gauge, insulated solid core, shall be attached at 10-foot intervals with duct tape to each service lateral.

T-14.13 **PIPE MARKING TAPE and WIRE REQUIRED FOR PVC AND POLYETHYLENE PIPE**:

Tape shall be a minimum 3-inches wide, blue in color, bearing continuous message "CAUTION WATER LINE BURIED BELOW". Tape shall be made of plastic or other permanent material with metallized foil core. Tape shall also be used for buried force mains bearing the same type of caution message.

Wire - #10 INSULATED COPPER WIRE shall be installed along the top of the PVC pipe. PVC pipe shall be marked by installing the #10 insulated copper wire along the top along the entire length and strapping the wire to the main with duct tape at intervals of twice per joint. The insulated wire shall be stripped to bare wire at the contact points with fittings and valves. The insulation shall be resistant to petroleum products. Each valve and fitting shall be wrapped around twice with the copper wire.

T-14.14 **VALVE BOXES AND EXTENSIONS**:

Valve boxes and extensions furnished shall be Wilmington Standard Telescoping valve box and extension.

T-14.15 **WATER SERVICE FITTINGS**:

T-14.15.1 **COPPER SERVICE FITTINGS: (USE ONLY AS DIRECTED BY ENGINEER)**:

Service saddle shall have double stainless (ss) straps and factory coated corrosion resistant body. Service saddle shall be Smith-Blair 317, Romac 202S, JCM 406, Mueller DR2S or equal. Curb stops shall be Mueller H 15174, Ford B21, McDonald 6100 series, or equal. Corporation stops shall be Mueller H 15000, Ford F600, McDonald 4701 series, or equal. City will allow compression fittings for copper pipe service of 1-inch diameter. Each curb stop shall be furnished with a IMP brass bushing, 1" x 3/4", and brass meter coupling equal to McDonald 4620, Ford C38-23-2.25, or Mueller H 10890. The brass meter yoke shall be as specified in T-14.15.2. The meter box shall be as shown on Standard Details SD 4-12 or SD 4-13.

T-14.15.2 **POLYETHYLENE SERVICE FITTINGS:**

Service saddles shall be as specified in T-14.15.1. Corporation stop shall be 1-inch or 2-inch, CC x CTS, equal to Mueller P15013 w/ss stiffener, Ford FB 1000 w/ss stiffener or McDonald 4701-22 w/ ss stiffener. Curb stops shall be equal to Ford B61-444 w/ss stiffener, Mueller P-25172 w/ss stiffener, or McDonald 6102W-22 w/ss stiffener. Each curb stop shall be furnished with an IMP brass bushing, 1" x 3/4", and brass meter coupling equal to McDonald 4620, Ford C38-23-2.25, or Mueller H 10890. Each service shall be furnished with a brass meter yoke with lock stop, 7-inch riser, 5/8" x ¾" size unless directed otherwise, equal to Mueller B 24118, McDonald 18-207WX, or Ford V42-7. The meter yoke shall be furnished with a brass meter coupling as specified above. The meter box shall be as shown on Standard Details SD 4-12 or SD 4-13.

T-14.16 **VALVES**:

All valves shall conform to AWWA Specification C500, latest revision, gate valves or ordinary water works service except as hereinafter stated and shall have mechanical joint ends. All valves shall be resilient wedge gate valves, open right and shall have a 2-inch square head nut upon the end of the stem, with the direction arrow clearly and

plainly cast thereon. Valves shall be as manufactured by Clow Corporation, Darling Valve Manufacturing, Mueller Company, Henry Pratt Company, American AVK Company's Series 25; or equal. The City will accept interior and exterior coating of fusion bonded epoxy, normal coating of 6-8 mils, meeting the requirements of AWWA/ANSI C550-01.

T-14.16.1 **VERTICAL GATE VALVES**:
Shall be used on all lines 12 inches and under and shall be non-rising stem type, 175 psi working pressure and 300 psi test pressure with "O" ring stem seal. Valves shall be Resilient Wedge Gate or double disc type with cast iron body and bronze disc seats, stem and wedges. In the open position, the area of the opening shall be equal or greater than the area of the same nominal size pipe.

T-14.16.2 **HORIZONTAL GATE VALVES OR BUTTERFLY VALVES**:
Shall be used on all lines 16 inches and larger. Horizontal valves shall be 150 psi working pressure. 16-inch valves and larger shall be 150 psi working pressure and 300 psi test pressure. All valves shall have conventional packing. Valves shall be equipped with a bevel gear, non-rising type, with grease case of the totally enclosed type and shall be provided with suitable rollers, track, scrapers, and a guide for a disc mechanism through its entire travel length. Valves 16 inches and larger shall have a by-pass with non-rising type valve. Valves shall be double disc, with cast iron body and bronze disc seats, tracks, stem, and wedges. Area of opening in the open position shall be equal to or greater than the nominal pipe diameter.

Butterfly valves shall meet the full requirements of AWWA Standard C504-70 for Class 150B. The manufacturer shall have manufactured tight-closing, rubber-seat butterfly valves for buried service for a period of at least five years. All butterfly valves shall be Henry Pratt Company's "Groundhog," Mueller "Lineseal III," American-Darling "AFC Butterfly valve" or equal.

T-14.16.3 **TAPPING SLEEVE AND VALVES**:
Sleeve shall be DI or SS 150 psi working pressure, mechanical joint. Valve shall be vertical type with "O" ring seals, mechanical joint outlet end, and flange end for connection to tapping sleeve. Flange end shall have machined projections to ensure correct alignment. Seat opening of valve shall be slightly larger than nominal size to provide for full diameter cut to be made. Sleeve shall be furnished by valve manufacturer. (SS Tapping sleeve- heavy duty, fully gasketed and SS MJ or flange) Testing of TS&V shall be as recommended by manufacturer.

T-14.17 **HYDRANT**:
Hydrants shall be improved type conforming to AWWA C-502, latest revision. Fire hydrant shall be for ordinary waterworks service, approved by American insurance association, with four and one half (4-1/2) inch valve opening; two (2) each, two and one half (2 ½) inch hose nozzles with City of Wilmington, North Carolina, standard thread; and four and one half (4-1/2) inch pumper connection. Hydrant shall have breakable barrel and operating stem with minimum barrel length of three (3) foot, six (6) inch bury and shall be equipped with six (6) inch mechanical joint bottom hub with strapping lugs and one and two-thirds (1-2/3) inch solid pentagonal operating nut and "O" ring seals. Hydrants shall open right and be rated at 150 psi working pressure and 300 psi test pressure. Hydrant shall have two (2) coats of aluminum paint. Hydrant shall be dry-barrel type and be provided with drain outlet for draining when valve is closed. Hydrant shall be Mueller Centurion, Kennedy Guardian, American Darling Mark 73, - American AVK Co. Model 27/80 Dry Barrel fire Hydrants (11/2001) or

equal. New hydrants shall be furnished with proper bury depths so as not to require "riser kits."

T-14.17.1 **FIRE HYDRANT PAINT**:
Paint shall be applied using two (2) coats of the specified paint according to the manufacturer's recommendation. The final coat must be applied after final installation. All hydrant barrels shall be painted with **heavy-duty aluminum paint** for industrial or commercial-use, by Rustoleum, Glidden, Sherwin Williams, Tnemec, or equal.

Fire hydrants on 6-inch and 8-inch diameter mains shall have the nozzle caps and bonnet painted with industrial or commercial-use **alkyd paint,** safety yellow color by Rustoleum, Glidden, Sherwin Williams, Tnemec, or equal.

Fire hydrants on lines greater than 10-inch diameter shall have the nozzle caps and bonnet painted with industrial or commercial-use alkyd, safety green color by Rustoleum, Glidden, Sherwin Williams, Tnemec, or equal.

T-14.18 **REINFORCING STEEL**:
Reinforcing steel shall conform to ASTM A-615, Grade 60. The steel shall have the net sectional area shown on the plans and shall be of deformed bars unless otherwise specified. Welding of Reinforcing steel shall conform to AWS D12.1. Welded wire fabric shall conform to ASTM A-185.

T-14.19 **FORMS**:
Forming material shall be finished with tongue and grooved type, dressed on one side and of sufficient thickness as to prevent warping when the concrete is placed. Plywood may be used where applicable with proper bracing. Forms shall be so constructed as to ensure against misplacement and misalignment when filled. The cost of forms shall be included in the price for concrete unless otherwise shown in the proposal. Formwork shall conform to ACI 347, "Recommended Practice of Concrete-Formwork."

T-14.20 **CONCRETE MEMBRANE CURING COMPOUND (WHITE)**:
The membrane-curing compound used in concrete curing shall be as specified in AASHTO Specification M-148-49 for a white curing membrane.

T-14.20.1 **EXPANSION JOINT FILLER (FOR CONCRETE CONSTRUCTION)**:
Expansion joint filler for concrete construction shall be bituminous, preformed, non-extruding joint filler, as specified in AASHTO M-33-48.

T-14.21 **LUMBER**:
Lumber shall be straight and sound and free from shakes, racks, large or loose knots, and other defects impairing its strength or durability. It shall be squared to the desired dimensions when the work demands, or when requested by the Engineer. If plans or the Special Conditions section of the Specifications indicate the character of lumber to be used on specific structures, they are hereby made a part of this paragraph. Such lumber as is required in sheeting, shoring, bridging, etc. shall be included in the bid price for furnishing and installing the proposed improvements.

T-14.22 **GALVANIZING**:

T-14.22.1 **REQUIREMENTS AND METHODS OF TESTING**:

Galvanizing of structural shapes used in structures shall conform to the requirements of, and shall be tested in accordance with ASTM A-123-84/AASHTO M-111-87. Galvanizing of fasteners and hardware shall conform to, and shall be tested in accordance with ASTM A-153-87/AASHTO M-227-90.

T-14.22.2 **WORKMANSHIP AND FINISH**:
The zinc coating shall be adherent, smooth, continuous and thorough. It shall be free from such imperfections as lumps, blisters, gritty areas, uncoated spots, acid and black spots, dross and flux. The coating shall not be so loosely adhering as to be removable by any reasonable process of handling and erection. Light blows with a one-half (1/2) pound hammer shall not cause peeling of the coating adjacent to the area deformed by the hammer blow. The coating shall not interfere with the intended use of material.

After immersion in molten zinc, the structural shapes, plates or bars shall not be subjected to any process of scraping or wiping which will reduce the uniformity or the specified weight of the zinc coating.

T-14.23 **MANHOLES PRECAST**:
Precast manholes shall have shaped invert with 4-foot minimum diameter, unless specified different on the plans. Unless shown different on the plans the wall, base, and top shall be constructed of 4000 psi concrete in accordance with ASTM C-478.

The other material requirements are as follows:

a) H-20 Highway Loading.
b) One pour monolithic base section base extends 6 inches beyond outside wall for manholes smaller than 5 feet I.D., and all manholes deeper than 8 feet.
c) Reinforced steel - ASTM A-185.
d) Steel reinforced Copolymer Polypropylene Plastic steps for storm drain manholes only. Sanitary sewer manholes shall not be furnished with manhole steps unless directed by the Engineer.
e) Flexible boot connector ASTM C-928 with cast iron or stainless steel hardware.
f) Section joint sealant - Butyl rubber sealant AASHTO M-198, ASTM C-990,and Fed. Spec. SS-S-210A.

T-14.24 **BEDDING MATERIAL**:
Material for pipe bedding where required by the Engineer shall be well-graded crushed stone or crushed gravel meeting the requirements of ASTM designation C-33, gradation 57 (3/4-in. to No. 4**).**

T-14.25 **RESTRAINT GLAND for DIP**:
The mechanical joint gland style restraint for mechanical joint fittings used on ductile iron pipe may be used for fire hydrant installations and any other location required by the Engineer to be restraint joint fittings. This type of restraint system can be used in lieu the restraint system using tie bolts and restraining rods as shown on the standard detail SD 4-02. The gland style restraint shall be a follower gland, which uses a series of individual actuated gripping wedges to positively engage the pipe surface while allowing joint deflection both before and after installation. This wedging action offers high pressure restraint capacity for mechanical joint fittings, valves, hydrant and pipe with 3-inch through 16-inch being rated at 350 psi and larger size rated at 250 psi. All sizes are tested to a minimum of 2:1 safety factor. The mechanical joint restraint glands shall be equal to Megalug, Series 1100 manufactured by Ebaa Iron, Inc.,

Stargrip Series 3000 manufactured by Star Pipe Products, or RomaGrip by Romac Industries, Inc.

T-14.26 **RESTRAINT GLAND FOR PVC:**

The mechanical joint gland style restraint for mechanical joint fittings used on PVC pipe can be used at locations required by the Engineer to be restraint joint fittings. This type of restraint system may be used in lieu of the restraint system using tie bolts and restraining rods as shown on Standard Detail SD 4-02. The gland style restraint shall be a follower gland, which uses a series of individual actuated gripping wedges to positively engage the PVC pipe surface while allowing joint deflection both before and after installation. This wedging action offers high pressure restraint capacity for mechanical joint fittings, valves, and pipe with 3-inch through 16-inch being rated at 350 psi and larger size rated at 250 psi. All sizes are tested to a minimum of 2:1 safety factor. The mechanical joint restraint glands shall be equal to Megalug, Series 2000PV manufactured by Ebaa Iron, Inc., PVC Stargrip Series 4000 manufactured by Star Pipe Products, or PVC-RomaGrip by Romac Industries, Inc.

T-14.27 **BLOCKING TAPPING TEES on PVC or AC PIPE for fire hydrant installation**:

Bags of concrete mix may be used for blocking from the tee to undisturbed soil. Care shall be taken so as not to obstruct access to the nuts and bolts on the mechanical joints.

T-14.28 **GENERAL**:

Any material required, but not listed in this section or not specified elsewhere in the specifications, shall be subject to the approval of the Engineer.

SECTION TS-15: SPECIAL CONDITIONS

GENERAL

This section of specifications describes provisions unique to this project. The specifications, the plans, the special and general provisions, and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. In case of discrepancy or conflict, annotated dimensions shall govern over scaled dimensions; plans shall govern over technical specifications except for Section 15 of the Technical Specifications, Special Conditions. The Special Conditions, TS-15, always take precedence over plans and all other technical specifications. Technical specifications take precedence over general provisions.

TS-15.01 PROJECT DESCRIPTION:

The project generally consists of improvements to the 10th St and Grace St intersection. The work shall include, but is not limited to: excavation, grading, stone base course, asphalt paving, drainage, curb ramps, erosion control, grassing, and other incidentals.

TS-15.02 DRAWINGS AND INSTRUCTIONS:

The owner shall provide the Contractor with four (4) sets of plans, drawings, and specifications after the execution of the contract. If additional plans, drawings and specifications are required, the Contractor shall compensate the owner for same. The Engineer shall provide the Contractor with such revised plans, drawings and specifications as may be required to show any authorized changes or extra work. These plans, drawings, and specifications are the property of the City of Wilmington, North Carolina, and are furnished to the Contractor for the construction of the project under this contract only.

T-15.03 PROJECT TIMEFRAME:

All work included in this contract is to be completed within the time limit as set forth in the proposal.

Extensions to the contract may be approved for various reasons, such as changes in scope, unknowns, or inclement weather. Requests for extensions can be brought forward by either the Engineer or the Contractor. The Contractor shall have 21 days from the time of occurrence to submit written requests for consideration of time extensions. The guidelines are defined in the Project Proposal and General Provisions, most specifically in Sections G-1.46 and G-1.47.

T-15.04 LIQUIDATED DAMAGES:

Failure to complete the work within the contract time will result in damages due to public inconvenience, obstruction and delay to traffic, safety, and other considerations. For each consecutive calendar day in excess of the contract time specified, the Contractor shall pay, or have withheld monies due, a sum in accordance with the following:

Days in Excess of Contract Time	Sum per Day
0-14 Days	$ 250
15-22 Days	$ 500
23 Days and Beyond	$ 1,000

Liquidated damages will be adjusted and assessed on a monthly basis at the time of each partial payment request based on the Contractor's progress in comparison with the approved progress schedule.

T-15.05 MOBILIZATION:

The Contractor shall be paid a mobilization cost as bid in the proposal. The mobilization item shall include, but not be limited to, the Contractor's startup expenses, cost of insurance, permits, bonds, etc. and will be paid per the lump sum bid price. Partial payment for the item of "Mobilization" will be made in the first and second partial pay estimates paid on the contract, and will be made at the rate of 50 percent of the lump sum price for mobilization on each of these partial pay estimates, less the retainage provided for in the General Provisions, provided the amount bid for mobilization does not exceed 5 percent of the total amount bid for the contract.

When the amount bid for mobilization exceeds 5 percent of the total amount of the contract, 2 1/2 percent of the total amount bid will be paid on each of the first two partial payment estimates and that portion exceeding 5 percent will be paid on the final pay estimate.

When there is more than one section with payment for mobilization, the term payment for mobilization shall be figured based on each individual section rather than the total contract amount.

T-15.06 SUPERINTENDENT AND CONTACTS:

The Contractor shall have a Superintendent present on the job site at all times. Upon start of construction, the Contractor shall provide the Engineer with names, e-mail addresses, and telephone numbers of Superintendent(s) and two other representatives to be contacted after hours in case of emergency.

T-15.07 PROGRESS SCHEDULE, MEETINGS, AND REPORTS:

At the preconstruction conference, the Contractor shall submit to the Engineer for review a graphic schedule of the proposed construction operations. The progress schedule shall indicate the sequence of the work including the time of starting and the completion of each major task. The schedule should conform to the traffic control plan and address priorities of the City.

Monthly progress meetings are expected throughout the duration of the project and shall include:

A. Contractor's Project Manager
B. Contractor's Project Superintendent

C. City's designated Representatives(s)
D. Engineer's designated Representative(s)
E. Corresponding Subcontractors
F. NCDOT designated Representive(s)

The Engineer shall schedule monthly meetings at a minimum, for the most convenient time frame. The Engineer shall take meeting minutes, review previous minutes with participants at the meeting, and submit copies of meeting minutes to participants within 7 days. The Engineer shall have available at each meeting full chronological file of all previous meeting minutes.

The contractor shall provide and present monthly progress reports. Each progress report shall include:

A. Narrative that is sufficient to describe current and anticipated delaying factors, their effect on the progress schedule, and proposed corrective actions.
B. A copy of the accepted graphic schedule marked to indicate actual progress.

Any work reported complete, but which is not readily apparent to the Engineer, must be substantiated with satisfactory evidence. The Contractor may be requested to provide and present construction plan mark-ups for discussion.

If the work falls behind schedule, the Contractor shall submit additional progress reports at such intervals as the Engineer may request.

TS-15.08 MONTHLY QUANTITIES AND PAY REQUESTS:

No pay request (progress payments including mobilization) shall be processed by the City for payment to the Contractor until a corresponding progress meeting has occurred and sufficient documentation has been provided for the schedule and quantities of work completed for the preceding month and is reviewed by the Inspector(s), Engineer, and approved by the City.

Five (5) copies of each verified pay request shall be submitted for review by the engineering/project manager. Upon review and approval, three (3) copies will be processed by the City, one (1) copy will be returned to the contractor, and one (1) copy will be retained by the engineer. If the pay request submitted is found not to be accurate or out of compliance with the contract or lacking accurate supporting documentation (MBE-DBE/payroll/sub-contractor utilization/material tickets or reports, etc), the contractor will be notified and will be required to revise and resubmit the pay request. No separate measurement or payment will be made for this item.

TS-15.09 PUBLIC TRAFFIC:

Contractor shall notify property owners 72 hours in advance of the need to close a driveway during construction. Access to all properties shall be maintained throughout the project.

TS-15.10 NOTIFYING UTILITY COMPANIES:

The contractor's attention is hereby called to **Section G-1.52** of these specifications **and North Carolina's Underground Utility Damage Prevention Act 87-100** and the **City of Wilmington Municipal Code, Chapter 11, Article V**. Notification of the utility companies and departments shall be made prior to any excavation under this project. The Contractor is reminded that utility companies usually require a 72-hour notice. All services need to be located.

The following numbers are an aid to the contractor:

NC ONE CALL CENTER 1-800-632-4949 (requires 72 hour notice).

The following numbers are provided as an aid to the Contractor and in no way relieve the Contractor of his responsibility to provide required notices:

Utility	Phone Number
*Cape Fear Public Utility Authority	(901) 332-6550
*Duke Progress Energy	(800) 452-2777
* Piedmont Natural Gas Co	(800) 752-7504
*AT&T	(800) 288-2020
*Spectrum Cable	(888) 772-8252
*City Wilmington Traffic	(910) 341-7888
*NCDOT	(910) 341-2000

Prior to road closures, call 910-343-4255. This is the 911 Center.

TS-15.11 PROTECTION OF EXISTING UTILITIES:

The Contractor shall use the necessary precautions to protect existing water, sewer, gas, telephone, and storm drainage lines, etc. and service lateral during the course of construction. The cost of protecting such lines and services shall be considered incidental to the project and no additional payment will be allowed.

TS 15.12 CONSTRUCTION SURVEYING:

The contractor shall provide the construction stakeout required to construct the project.

TS-15.13 SHOP DRAWINGS

TS-15.13.1 GENERAL:

Engineering data covering all fabricated material that will become a permanent part of the work under this Contract shall be submitted to the Engineer for review. The

data shall include drawings and descriptive information in sufficient detail to show the kind, size, arrangement, and operation of component materials and devices; the external connections, anchorages, and supports required; performance characteristics; and dimensions needed for installation and correlation with other materials.

All submittals, regardless of origin, shall be stamped with the approval of the Contractor and identified with the name and number of this contract, Contractor's name, and references to applicable specification paragraphs and Contract Drawings. Each submittal shall indicate the intended use of the item in the work. When catalog pages are submitted, applicable items shall be clearly identified and inapplicable data crossed out. The current revision, issue number, and date shall be indicated on all drawings and other descriptive data.

Contractor's stamp of approval is a representation to the City and Engineer that Contractor accepts full responsibility for determining and verifying all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, and that he has reviewed and coordinated each submittal with the requirements of the work and the contract documents.

Contractor shall accept full responsibility for the completeness of each submission. When an item consists of components from several sources, Contractor shall submit a complete initial submittal including all components.

All deviations from the Contract Documents shall be identified on each submittal and shall be tabulated in Contractor's letter of transmittal. Such submittals shall, as pertinent to the deviation, indicate essential details of all changes proposed by the Contractor (including modifications to other facilities that may be a result of the deviation).

Electronic, portable document format (PDF), submittals of the shop drawings and engineering data shall be submitted to Engineer for review and distribution. Engineer will not accept submittals from anyone but the Contractor. Submittals shall be consecutively numbered in direct sequence of submittal and without division by subcontracts or trades.

TS-15.13.2 ENGINEER'S REVIEW OF DRAWINGS AND DATA:

Engineer's review of drawings and data submitted by the Contractor will cover only general conformity to the Drawings and Specifications, external connections, and dimensions, which affect the layout. Engineer's review does not indicate a thorough review of all dimensions, quantities, and details of the material, equipment, device, or item shown. Engineer's review of submittals shall not relieve the Contractor from responsibility for errors, omissions, or deviations, nor responsibility for compliance with the Contract Documents.

Engineer's submittal review period shall be 21 consecutive calendar days in length and shall commence on the first calendar day immediately following the date of arrival of the submittal or re-submittal in the Engineer's office. The time required to transmit the submittal or re-submittal back to the Contractor shall not be considered a part of the submittal review period.

When the drawings and data are returned marked "REJECTED" or "REVISE AND RESUBMIT", the corrections shall be made as noted thereon and as instructed by the Engineer and a revised PDF resubmitted.

When the drawings and data are returned marked "NO EXCEPTIONS TAKEN EXCEPT AS NOTED" or "NO EXCEPTIONS TAKEN", no additional copies need be furnished unless requested by the Engineer at time of review.

TS-15.13.3 RE-SUBMITTAL OF DRAWINGS AND DATA:

The Contractor shall accept full responsibility for the completeness of each re-submittal. The Contractor shall verify that all corrected data and additional information previously requested by the Engineer are provided on the re-submittal.

When corrected copies are re-submitted, the Contractor shall in writing direct specific attention to all revisions and shall list separately any revisions made other than those called for by the Engineer on previous submissions.

Requirements specified for initial submittals shall also apply to re-submittals. Re-submittals shall bear the number of the first submittal followed by a letter (A, B, etc.) to indicate the sequence of the re-submittal.

Re-submittals shall be made within 30 days of the date of the letter returning the material to be modified or corrected, unless within 14 days the Contractor submits an acceptable request for an extension of the stipulated time period, listing the reasons the re-submittal cannot be complete within that time.

Any need for more than one re-submission, or any other delay in obtaining the Engineer's review of submittals, will not entitle the Contractor or an extension of the Contract Times unless delay of the work is directly caused by a change in the work authorized by a change order or by failure of the Engineer to review any submittal within the submittal review period specified herein and to return the submittal to the Contractor.

TS-15.14 ENCROACHMENT:

Where existing fences, posts, walls, etc., are encroached on the City right-of-way and are to be removed, the contractor shall be required to coordinate the removal of said encroachments with the City and the affected property owners. The contractor shall remove the encroachments and place them on the property of the affected owner if the owner desires. If the owner has no preference, the contractor shall remove and dispose of such item. The cost of relocating or removing

encroachment items will be considered incidental to the project and no additional payment will be allowed.

TS-15.15 CONSTRUCTION VIDEO:

The Contractor shall video the project site in its entirety prior to construction, with emphasis on the adjoining properties, drives, trees, drainage, ditches, driveway pipes, cross pipes, shoulders, condition of roadway, and other distinguishing features. Appropriate narration will include location and description of property and physical features.

The Contractor shall provide one copies of the project video to the City at the preconstruction conference. No separate payment will be made for this work, and all associated cost will be considered incidental to other items in the contract.

TS-15.16 CONSTRUCTION ADMINISTRATION AND INSPECTIONS:

The Engineer shall provide construction administration services for the duration of the project. Inspection services will be provided by the City in conjunction with the Engineer. Contractor shall coordinate through Project Engineer and Inspector as required to facilitate the project. The key functions to be provided by the Engineer include, but are not limited to, the following:

A. Conduct weekly site inspections;
B. Conduct monthly progress meetings;
C. Direct communications with Contractor(s);
D. Provide lead role in communications between all parties;
E. Review and approve shop drawings;
F. Administer and develop change orders;
G. Review and certify pay applications;
H. Conduct substantial and final inspection walk-throughs and develop and track punch list items;
I. Assist and certify construction as-builts.

TS-15.17 DRAWINGS SHOWING CHANGES DURING CONSTRUCTION:

The Contractor shall maintain a set of plans and specifications marked "Construction Record Drawings". The Contractor shall keep a complete and up-to-date record in red pencil of any and all changes made during construction. This set of contract documents shall be submitted to the Engineer and approved by him prior to the Engineer recommending final payment.

TS-15.18 TEMPORARY TRAFFIC CONTROL:

The Contractor shall be responsible for maintaining an approved traffic control plan during the course of this work. The Traffic Control Plan implemented for this project shall be devised through a joint effort of the Engineer, City Traffic Engineer, City Project Manager, and the Contractor prior to construction. Traffic Management General Notes, Plan Sheet1-B, are provided with the project plans. In all instances, however, the Contractor shall be required to furnish, place and maintain all signs, barricades, cones and other traffic handling devices necessary to implement the

Traffic Control Plan meeting also the requirements of PSP-10 of the Project Special Provisions.

The Traffic Control Plan shall be submitted at the pre-construction meeting and shall be approved by the City prior to beginning construction. All traffic control devices shall conform to the requirements of the current version of the Manual on Uniform Traffic Control Devices (MUTCD). A copy of the MUTC is available for viewing in the City Engineer's Office.

The Contractor is hereby advised that non-compliance with the approved Traffic Control Plan as described above could result in a "stop work" order, with no work continuing until necessary corrective measures have been performed. Work stoppages shall be at the expense of the Contractor. No additional payment shall be allowed.

The cost of the temporary traffic control system and its implementation shall be included in the Lump sum price bid in the proposal.

TS-15.19 EMERGENCY SERVICES NOTIFICATION:

Prior to any street being closed to traffic, the Contractor shall notify the Emergency Services Dispatchers. The Contractor may call the 911 system at (910) 341-4247 and request that the Police and EMT personnel be notified, or the Contractor may call each service individually 24 Hours in advance.

The Contractor will make provisions for access to all parts of the work for emergency vehicles (police, rescue, fire) and will assist in providing personnel to deliver sanitary pickup cans and other materials as required to a point where the City crew or City's Contractor can load their carrier. The Contractor should include all cost incurred for this item in the unit price bid for each item in the proposal.

TS-15.20 NON-CITY UTILITIES:

The removal, repair or relocation of electric, cable TV, telephone, communications, and gas utilities will be performed by others. However, the Contractor is responsible for coordination of such relocation or removal, schedule his work to coincide with such, and pay any associated cost. No extra payment will be made to the Contractor for this work.

NOTE: Utilities as shown on the plans are based on best available information and exact locations shall be the responsibility of the Contractor.

TS-15.21 CLEAN-UP AND RESTORATION:

The Contractor, during the course of this work shall maintain and clean up the streets, side yards, pavements, drainage structures, etc. and shall schedule at the end of each day of work the removal of debris, grading of all disturbed areas and restoration to a usable state all means of access for the public and private property owners.

TS-15.22 USE OF A PORTION OF THE WORK:

Whenever, in the opinion of the Engineer, any portion of the work is completed, or is in an acceptable condition for use, it shall be used for the purpose intended. Such use shall not be held in any way as an acceptance of that portion of the work used, or as a waiver of any of the provisions of these specifications. Necessary repairs or renewals in any section of the work due to defective materials, defective workmanship, or natural causes, under the instructions of the Engineer shall be performed by the Contractor at no additional cost to the City.

TS-15.23 COMPLAINTS:

The City has a system of recording complaints that may be received from residents. The Engineers representative and representative of the Contractor will meet with the person registering a complaint within one day after complaints are logged in. During this meeting, a reasonable course of action will be arrived at between the property owner and the City. It is not the intent of the City to require the Contractor accomplish unreasonable tasks. However, if the Contractor has not satisfactorily acted on resolving complaints by the end of the month, that month's payment request will not be processed. The payment request will be processed as soon as corrective action is taken. The City of Wilmington also reserves the right to issue stop work order as stated in paragraph G-1.59 of the General Specifications if the Contractor's actions or non-action so dictates.

TS-15.24 INCIDENTAL RESTORATION:

At locations shown on the plans or designated by the Engineer, the Contractor shall remove and reset existing signs, fencing, mailboxes, outside lighting, hedges or shrubbery, masonry or wooden flower boxes, and all miscellaneous yard/driveway ornamentation, etc., in accordance with the following provisions.

A. The existing items will be removed and replaced at the locations indicated on the plans or designated by the Engineer;
B. After resetting, all items shall be in a condition equal to or better than existed before being removed. The Contractor will be required to replace any components that have been unnecessarily damaged by him.

The quantity of items reset to be paid for shall not be measured separately. All items shall be included in the unit price for items in the proposal.

TS-15.25 NOTIFICATION OF PROPERTY OWNERS:

The Contractor shall be required to submit a plan for systematic notification of affected property owners. Such notices shall include, but not be limited to, the following items: schedule of work; access to streets during construction; removal of vegetation and above ground items; replacements of streets and driveways; parking; location of services. Plan shall be approved by the Engineer and the City. Upon approval, the Contractor shall be required to provide all labor, materials, and other support in order to implement the plan.

TS-15.26 EROSION AND SEDIMENT CONTROLS:

The Contractor shall install the devices as required to comply with the erosion and sedimentation control measures shown on the plans and required by the NC Division of Energy, Mineral and Land Resources representatives. The devices shall be installed prior to any excavation or land disturbing activity and shall meet requirements set out in Division 16. All measures shall be properly maintained until such time as they can be removed. In the event that the Engineer or a representative of the NC Division Energy, Mineral and Land Resources determines that adequate measures have not been provided and or maintained, the Engineer shall give a stop work order on the project until protective measures have been taken. No additional time will be given the Contractor when the stop work is a result of his failure to comply with the N.C. Sedimentation Control Act.

All work done for erosion and sedimentation shall be included in the lump-sum unit prices for the erosion and sedimentation items in the proposal. Said work may include, but not be limited to: silt fences; berms; dikes; catch basin protection; seeding; mulching; and all other erosion control devices or methods.

TS-15.28 MATERIALS TESTING:

The City reserves the right to require certification or test any materials used, installed or stored on the project. The contractor is required to utilize approved materials and suppliers and shall facilitate the testing needs of the project through communication, coordination, and control of sub-contractors, during installation or delivery. Such efforts to provide assistance shall be deemed incidental to the project at no cost to the City.

Materials Testing, Inspection, and Quality Control protocol for the project will conform to the applicable NCDOT standards and guidelines. This plan shall be made available to personnel, sub-contractors, inspectors and technicians.

As needed, the City will engage the necessary resources to conduct on-site observation, record keeping, testing, sampling and laboratory analysis of construction methods and materials. The City will pay for quality control and materials testing services. However, the cost of any retests required because of failing tests will be the responsibility of the Contractor.

Sampling and Testing:

Materials testing will be conducted in accordance with the latest applicable methods and procedures such as ASTM, ACI, NCDOT, etc. Typical material testing procedures expected in this projects testing plan are:

Asphalt – cores for thickness, asphalt content and density (compaction), QC reports.

Concrete – cylinder molds with compressive strength breaks in 7 days, 14, or 28 days.

Soil – observation, proof roll, proctor tests and density tests for undercut, sub-base, trench, embankment, etc.

Stone – gradation, thickness, density testing for base.

Contractor is responsible to provide a "hot box" for on-site curing of concrete cylinders in a suitable and safe location.

Any materials or installations found out of compliance with the project specifications will require immediate suspension of construction and require contractor to submit and/or perform corrective action through repair, rework, or pay reduction factors using industry standards City specifications and NCDOT guidelines.

Materials Certification and Delivery:
Upon request of the Engineer the contractor shall make available to the City all documentation pertaining to the origin, manufacturing, job mix formula or delivery of materials to the job-site. All necessary documentation, whether original or signed must be provided in a legible and thorough manner to complete quantity verification and may include but not limited to shipping receipts, trucking delivery tickets, plant or quarry tickets, manufacturers certification, Buy America, shop drawings, etc. This may pertain to deliveries of asphalt (surface, intermediate, base, binder), cement, stone (ABC, #57, riprap), soils, mulch, castings (steel), pipe (RCP, PVC, ductile), fixtures, landscaping, seed, etc.

TS-15.29 SAWING EXISTING SIDEWALKS AND DRIVEWAYS:

Where it is necessary to remove existing sidewalks or driveways, the Contractor will be required to furnish a neat edge along the pavement retained by sawing a neat line approximately two inches deep, with a concrete saw, before breaking the adjacent pavement away.

TS-15.30 NOISE CONTROL:

The Contractor shall conduct all his work and use appropriate construction methods and equipment to prevent exceeding legal noise levels. The Contractor shall comply with Chapter 6, Article II -Noise Control of the Wilmington City Code. In addition, the Contractor shall provide baffles and/or enclosures on any dewatering pumps, by-pass pumps, or generators that must be operated after normal working hours. The Contractor should also consider noise reduction when placing such equipment in the project work areas.

TS-15.31 CATCH BASIN, MANHOLE AND JUNCTION BOXES - MEASUREMENT AND PAYMENT:

Catch basins, manholes and junction boxes shall be paid for as specified in the proposal for the actual quantity installed for the various types. Each structure shall be placed on eight inches of No. 57 stone. The cost of the stone shall be included in the unit price of the structure.

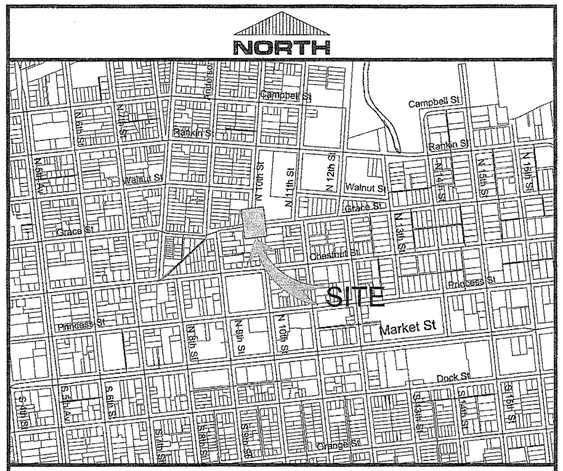
Payment for structure installation shall constitute full compensation for all labor, equipment, tools, supplies and incidentals necessary to complete all items of work, including excavation and backfill necessary to construct the structure, compaction of sub grade, hauling, construction of fills and embankments, spreading, rolling, wetting and disposal of all surplus and unsuitable materials, as indicated on the drawings and specified herein.

TS-15.32 FINAL CLEANUP:

The Contractor shall clear all streets, curbs, gutters, driveways and other contract items of all dirt and debris before final inspection will be made. The City will not inspect the improved areas until they are cleaned. Failure by the City to perform final inspection if the areas are not cleaned shall not relieve the Contractor of any liquidated damages. No extra payment will be allowed for this cleaning. The cost of the cleaning shall be included in each item bid in the proposal.

TS-15.34 PROJECT WORK TIMES:

Unless requested in writing and approved by the City in advance, the Contractor shall not be allowed to perform construction activities on weekends, City recognized holidays, or before 7:00 a.m. or after 6:00 p.m. on weekdays.



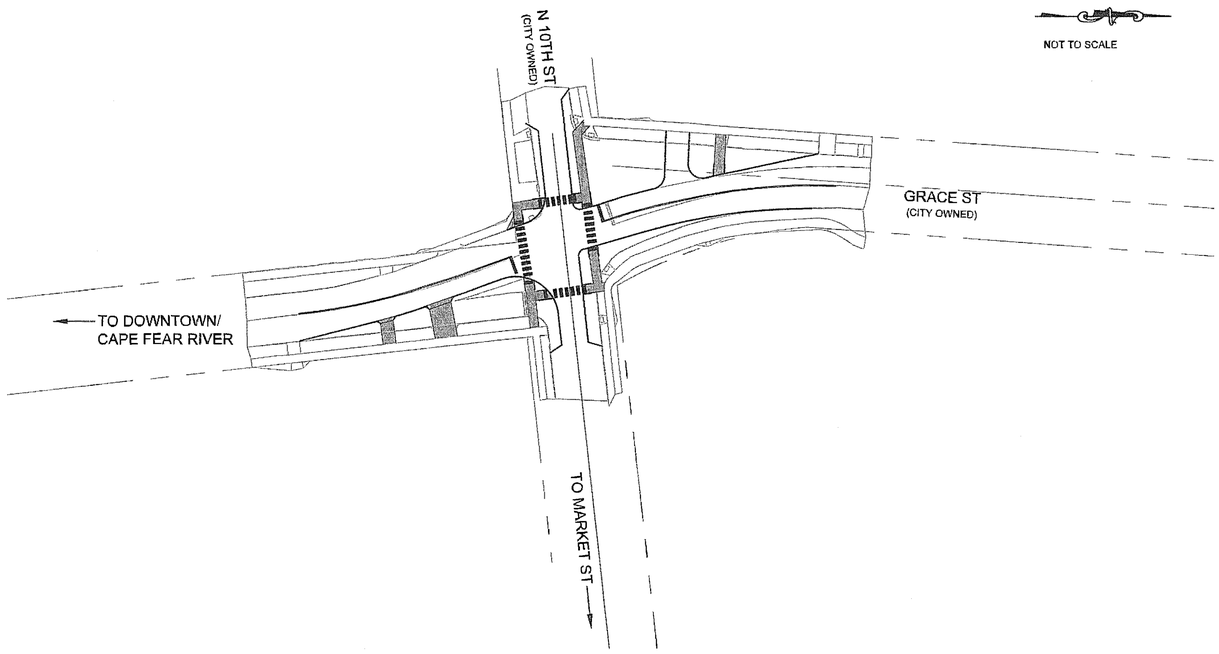
VICINITY MAP
NOT TO SCALE
NEW HANOVER COUNTY, NC

N. 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

COW PROJECT: 7DCEM2310

LOCATION: GRACE STREET @ N. 10TH STREET
TYPE OF WORK: BIO. CELL, GRADING, DRAINAGE, PAVING, SIDEWALK AND CURB RAMPS

ISSUED FOR BID



NOT TO SCALE

MAYOR - Bill Saffo

CITY MANAGER - Anthony Caudle

NOT FOR CONSTRUCTION

GRAPHIC SCALES

PLAN: 20' 10' 0 20'

PROFILE: 20' 10' 0 20' HOR.

2' 1' 0 2' VER.

DATE OF SURVEY:	JAN 11, 2023
SURVEY CREW CHIEF:	F. ASHLEY
DESIGNED:	FRED ROYAL, P.E./ZACH ROMAN, P.E.
DRAWN:	OCT 2, 2023 J. RHYNE
CHECKED:	—
PROJECT ENGINEER:	ZACH ROMAN, P.E.

DESIGN DATA

ADT 2023 = 2275 VPD
ADT 2040 = N/A VPD
DESIGN SPEED = 25 MPH
FUNC. CLASS: MAJOR COLLECTOR

CITY STANDARDS AND SPECS

ZACH ROMAN, P.E.
PROJECT ENGINEER

FRED ROYAL, P.E.
PROJECT DIRECTOR

PLANS PREPARED BY:

WILMINGTON NORTH CAROLINA
Engineering Department
212 Operations Center Dr. • Wilmington NC 28412 • (910) 341-7807

NORTH CAROLINA PROFESSIONAL SEAL 049509 ENGINEER ZACHARY P. ROMAN

Zach Roman P.E.
08/01/2024 DATE

COVER

N:\PROJECT FILES\STREET IMPROV-10TH AND GRACE\DESIGN\DRAWINGS\10TH & GRACE STREET IMPROV-DESIGN.DWG
MAY 22, 2024

LEGEND

PUE PUE PUE	PERMANENT UTILITY EASEMENT		FIRE HYDRANTS
TCE TCE	TEMPORARY CONSTRUCTION EASEMENT		POWER POLE
PDE PDE PDE	PROPOSED DRAINAGE EASEMENT	T	TELEPHONE PEDESTAL
W W	WATER LINE	1234	STREET ADDRESS LABEL
	STORM DRAIN LINE (SD)		SIGN
	SANITARY SEWER LINE (SS)		TRAVERSE NAIL SET
FO FO	FIBER OPTIC LINE	CS	CENTERSTONE
OHE OHE	OVERHEAD ELECTRIC LINE		CONCRETE MONUMENT
G	NATURAL GAS LINE		IRON PIPE FOUND
	EXIST RIGHT OF WAY LINE		OAK TREE
RW RW RW	PROPOSED RIGHT OF WAY LINE		CEDAR TREE
X X X	WOODEN FENCE		BIRCH TREE
O O O	CHAIN LINK FENCE		BRADFOR PEAR TREE
FO	FIBER OPTIC PEDESTAL		PALM TREE
	ELECTRIC METER		PINE TREE
MH	MANHOLE		SYCAMORE TREE
MB	MAIL BOX		CREPE MYRTLE
DI	DROP INLET		DOGWOOD TREE
	WATER VALVE		
	WATER METER		
C	CABLE TV PEDESTAL		

LIST OF STANDARD DRAWINGS

THE FOLLOWING CITY OF WILMINGTON STANDARDS IN THE CONSTRUCTION DETAILS SECTION OF THE PLANS ARE APPLICABLE TO THIS PROJECT.

STD NO.	DESCRIPTION
1-07	PIPE TRENCH TYPICAL
2-21	CATCH BASIN CASTING FOR 24" HOOD AND GRATE
2-23	PRECAST WAFFLE DRAINAGE STRUCTURE
2-23A	PRECAST WAFFLE DRAINAGE STRUCTURE GENERAL NOTES
3-08	PERPENDICULAR CURB RAMP ADJACENT TO PLAZA
3-10	SIDEWALK
3-11	CURBING
3-104	GUIDELINES FOR SEDIMENT CONTROL BMPS
11-01	PAVEMENT MARKINGS LINE TYPES
11-02	PAVEMENT MARKINGS OFFSETS
15-03	STREET AND TRAFFIC SIGNS REFERENCE DETAIL
15-07	GUIDELINES FOR TEMPORARY TRAFFIC CONTROL
15-15	TREE PLANTING
15-17	RESIDENTIAL STREET TREE STANDARDS

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
COVER	TITLE SHEET AND VICINITY MAP
2	LEGEND, INDEX OF SHEETS, LIST OF STANDARD DRAWINGS, AND GENERAL NOTES
3	CONSTRUCTION DETAILS
4	CONSTRUCTION DETAILS
5	CONSTRUCTION DETAILS
6	CONSTRUCTION DETAILS & NCG-01 PERMIT NOTES
7	EXISTING CONDITIONS PLAN
8	DEMOLITION PLAN
9	INTERSECTION LAYOUT PLAN
10	GRADING PLAN
11	STORMWATER DRAINAGE PLAN
12	LANDSCAPE PLAN
13	TRAFFIC CONTROL PLAN - FOR REFERENCE ONLY
14	EROSION CONTROL PLAN

GENERAL NOTES

SIDE ROADS:
THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE:

POWER - DUKE ENERGY	WAYNE AYCOCK - 910 620 1487
COMMUNICATION - SPECTRUM	ROBERT JOHN - 910 772 5757
COMMUNICATION - AT&T	CHRISSY COSTON - 910 341 7664
GAS - PIEDMONT NATURAL GAS	ROSS WILCOX - 910 251 2808
WATER/SEWER - CFPUA	DAVID DAILEY - 910 332 6626
SIGNALS - CITY OF WILMINGTON	DENYS VIELKANOWITZ - 910 341 4676
SIGNS AND PAVEMENT MARKINGS - CITY OF WILMINGTON	RANDALL GLAZIER - 910 341 0069

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

CURB RAMPS:
CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. THE MAXIMUM SLOPE IS 12:1 FOR ALL CURB RAMPS. CITY INSPECTOR TO REVIEW ALL RAMP FORMS BEFORE CONCRETE POURS.

SAFETY:
PEDESTRIAN AND BICYCLE SAFETY MUST BE MAINTAINED AT ALL TIMES BY ADEQUATE PROJECT LIMITS, FENCING, AND SIGNAGE.

EROSION CONTROL:
THE FINAL SIZE AND LOCATION OF ALL EROSION CONTROL DEVICES MAY BE ADJUSTED BY THE ENGINEER IN THE FIELD. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO PLACING EROSION CONTROL MEASURES.

TRAFFIC CONTROL:
TRAFFIC CONTROL GENERAL NOTES, DETAILS, AND A LIST OF STANDARDS ARE INCLUDED IN THIS PLAN SET.
ALL TRAFFIC CONTROL DEVICES AND OPERATIONS SHALL CONFORM TO NCDOT 2024 ROADWAY STANDARD DRAWINGS FOR TRAFFIC CONTROL.

OTHER:
CONTRACTOR SHALL COORDINATE WITH THE CITY OF WILMINGTON SIGNS AND MARKINGS FOR CITY INSTALLATION OR MODIFICATION OF PEDESTRIAN SIGNAGE FOR PROJECT.

ALL PAVEMENT MARKINGS MUST BE APPROVED BY CITY OF WILMINGTON SIGNS AND MARKINGS PRIOR TO TEMPORARY OR PERMANENT PLACEMENT.

CONTRACTOR SHALL MAINTAIN SAFE ACCESS TO EACH BUSINESS. BOARDWALKS, BARRICADES, SIGNAGE, ETC. SHALL BE UTILIZED TO SAFELY CHANNELIZE PEDESTRIAN TRAFFIC THROUGH A WORK ZONE. THIS WORK SHALL BE INCIDENTAL TO THE PROJECT AND THERE WILL BE NO PAY ITEM FOR THIS WORK.

CONTRACTOR SHALL WORK ONLY ON ONE SIDE OF THE ROAD AT A TIME.

THE CONTRACTOR SHALL KEEP THE ROADWAY AND SIDEWALKS CLEAN OF DEBRIS THROUGHOUT THE ENTIRE DURATION OF THE PROJECT. THE CITY WILL INSPECT THE STREETS AND SIDEWALKS PERIODICALLY TO ENSURE THIS IS BEING COMPLETED. THIS WORK WILL BE INCIDENTAL TO THE PROJECT AND THERE WILL BE NO PAY ITEM FOR THIS WORK.

CONTRACTOR SHALL COORDINATE ALL WATER AND SEWER WORK WITH THE CAPE FEAR PUBLIC UTILITIES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE POWER COMPANY FOR ANY ADDITIONAL SUPPORT OF EXISTING POWER POLES AS REQUIRED FOR TRENCH EXCAVATION. ALL COSTS OF SUCH WORK SHALL BE PAID BY THE CONTRACTOR.

THE CONTRACTOR SHALL INSTALL ALL STREET SIGNS AS REQUIRED BY CITY OF WILMINGTON SIGNS AND MARKINGS ALONG CITY STREETS.

ALL PAVEMENT CUTS SHALL BE SAW CUT ALONG A STRAIGHT CONTINUOUS LINE. CURBS AND CONCRETE DRIVEWAYS SHALL BE REPLACED TO THE FIRST EXPANSION JOINT BEYOND THE TRENCH EXCAVATION LIMITS AND TO THE FULL WIDTH. CURBS AND CONCRETE DRIVEWAYS SHALL MATCH EXISTING.

ALL MATERIAL CLEARED AND GRUBBED BY THE CONTRACTOR IN ORDER TO CONSTRUCT THE WORK, SUCH AS TREES, VEGETATION, FENCING, ETC., SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE PROPERLY DISPOSED OF OFF-SITE AT A STATE APPROVED DISPOSAL SITE, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL RECEIVE CITY APPROVAL FOR ANY LANDSCAPE REMOVAL NOT SHOWN ON PLANS.

CONTRACTOR SHALL MAINTAIN A MEANS FOR INGRESS/EGRESS TO EACH PROPERTY AT ALL TIMES.

CONTRACTOR SHALL NOTIFY BUSINESSES AT LEAST 7 DAYS PRIOR TO CONSTRUCTION THAT CONSTRUCTION ACTIVITY WILL TAKE PLACE IN THEIR AREA.

WHERE THE CONTRACTOR DETERMINES THAT ENCROACHMENT ONTO PRIVATE PROPERTY IS NECESSARY, AND AN EASEMENT HAS NOT BEEN PROVIDED, THE CONTRACTOR SHALL CONTACT INDIVIDUAL PROPERTY OWNERS AND OBTAIN WRITTEN APPROVAL FOR THAT ENCROACHMENT. A COPY OF THIS APPROVAL SHALL BE PROVIDED TO THE ENGINEER.

SEE NCDOT ENCROACHMENT AGREEMENT SPECIAL PROVISIONS FOR WORK IN THE NCDOT RIGHT OF WAY, IF APPLICABLE.

ALL DIMENSIONS ARE IN RADII, EDGE OF PAVEMENT, TO CENTERLINE, CENTER TO CENTER ON STRIPES, AND/OR TO FACE OF CURB, UNLESS OTHERWISE NOTED.

PROVIDE CONSTRUCTION JOINTS IN CONCRETE WALKWAYS PER CITY OF WILMINGTON SPECIFICATIONS.

CONCRETE PADS AND WALKWAYS; UNLESS OTHERWISE NOTED, ARE 3000 PSI, OF 4" THICKNESS.

CROSSWALKS SHALL BE CONSTRUCTED OF THERMOPLASTIC MATERIALS AND CONSTRUCTED IN ACCORDANCE WITH NCDOT SPECIFICATIONS. CONTRACTOR TO INSTALL CROSSWALKS IN SUCH A MANNER THAT CROSSWALKS ARE ALIGNED BETWEEN HANDICAP/WALKWAY ACCESS POINTS OR PERPENDICULAR TO THE ROADWAY/DRIVE LANE. REFER TO PAVEMENT MARKING PLANS FOR LOCATION, IF APPLICABLE.

ALL SIGNS AND PAVEMENT MARKINGS ARE TO MEET MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES) AND NCDOT STANDARDS.

CONTRACTOR TO GRADE FILL/CUT SLOPES TO TIE INTO EXISTING GROUND AND AVOID PONDING.

EXISTING UTILITIES AND STRUCTURES SHOWN, BOTH UNDERGROUND AND ABOVE, ARE BASED ON A FIELD SURVEY PERFORMED BY CITY OF WILMINGTON AND THE BEST AVAILABLE RECORD DRAWINGS. THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES, UNDERGROUND LINES, AND STRUCTURES AS NECESSARY TO AVOID DAMAGING OR DESTROYING EXISTING SERVICES.

ALL DEMOLITION, AND ANY SUBSEQUENT CONSTRUCTION, SHALL BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS SET FORTH AND APPROVED BY THE CITY OF WILMINGTON. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS. ALL TREE PROTECTION FENCING SHALL REMAIN IN PLACE DURING CONSTRUCTION.

TRAFFIC CONTROL FOR ANY WORK WITHIN THE PUBLIC RIGHT OF WAY SHALL BE PERFORMED IN COMPLIANCE WITH STANDARDS OF THE NORTH CAROLINA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ENGINEER AND/OR OWNER DISCLAIM ANY ROLE IN THE CONSTRUCTION MEANS AND/OR METHODS ASSOCIATED WITH THE PROJECT AS SET FORTH IN THESE PLANS.

THE CONTRACTOR, AT ALL TIMES, KEEP THE SITE FREE FROM ACCUMULATIONS OF WASTE MATERIALS OR RUBBISH CAUSED BY CONTRACTOR EMPLOYEES OR THEIR WORK. ALL DEBRIS SHALL BE REMOVED FROM THE PROJECT SITE ON A DAILY BASIS. DO NOT USE SIDEWALK TRASH CANS OR BUSINESS DUMPSTERS AROUND SITE.

IF DEPARTURES FROM THE DRAWINGS OR SPECIFICATIONS ARE DEEMED NECESSARY BY THE CONTRACTOR, DETAILS OF SUCH DEPARTURES AND REASONS THEREOF SHALL BE SUBMITTED TO THE OWNER FOR REVIEW. NO DEPARTURES FROM THE CONTRACT DOCUMENTS SHALL BE MADE WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE OWNER.

THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING THE ACTUAL AND EXACT LOCATION, SIZE AND MATERIAL COMPOSITION OF ANY EXISTING WATER OR SEWER SERVICE PROPOSED FOR CONNECTION OR USE ON THIS PROJECT. THE RELOCATION OF ANY UTILITY SERVICES REQUIRED TO COMPLETE ANY PORTION OF THESE CONSTRUCTION PLANS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

DEMOLITION NOTES

THE CONTRACTOR SHALL NOTIFY THE CITY PROJECT MANAGER AND CAPE FEAR PUBLIC UTILITY PRIOR TO STARTING WORK.

THE CONTRACTOR SHALL NOT MAKE ANY LANE CLOSURES OR CHANGES TO THE EXISTING TRAVEL PATTERNS ON ANY PUBLIC STREET WITHOUT PRIOR APPROVAL FROM THE CITY OF WILMINGTON.

THE CONTRACTOR IS RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE AND FEDERAL REQUIREMENTS REGARDING REMOVAL AND DISPOSAL OF MATERIALS AND DEBRIS.

ALL DEMOLITION WORK WILL BE COORDINATED BY CONTRACTOR.

CITY OWNED STREETLIGHTS TO BE REMOVED BY THE CITY OF WILMINGTON BUT STREETLIGHT FOUNDATIONS AND WAYFINDING SIGN FOUNDATIONS SHALL BE REMOVED BY THE CONTRACTOR DURING GRADING OPERATIONS.

RELOCATION OF EXISTING UTILITIES TO BE COORDINATED WITH THE LOCAL UTILITY PROVIDER(S).

CLEANOUTS AND METERS LOCATED IN AREAS OF DEMOLITION OR SUBSEQUENT CONSTRUCTION THAT ARE TO REMAIN, SHALL BE PROTECTED FROM DAMAGE AND RAISED TO FLUSH WITH NEW GRADE.

ALL ITEMS DESIGNATED TO BE REMOVED SHALL BE DISPOSED OF LEGALLY OFFSITE UNLESS OTHERWISE NOTED ON PLANS.

ALL PAVEMENT MARKINGS USED FOR PROJECT SHALL BE NCDOT STANDARD THERMOPLASTIC PAVEMENT MARKINGS UNLESS OTHERWISE NOTED ON PLANS.

ALL WORK MUST BE COMPLETED WITHIN CONSTRUCTION LIMITS SHOWN ON PLANS.

REMOVE EXISTING CONCRETE (WHERE REQUIRED) TO FIRST COLD JOINT OR SAWCUT TO OBTAIN A CLEAN EDGE FOR NEW CONSTRUCTION. SAW CUT EXISTING ASPHALT DRIVE AT LIMITS OF NEW CURBING TO OBTAIN A CLEAN EDGE.

CONTRACTOR SHALL RESTORE THE LAY-DOWN AND STAGING AREA TO ORIGINAL CONDITIONS AND TO THE SATISFACTION OF THE OWNER, PRIOR TO DEMOBILIZATION AT THE CONCLUSION OF THE PROJECT.

CLEAN SOILS SHALL BE UTILIZED FOR BACKFILL COMPACTION OF THESE SOILS PERFORMED IN ACCORDANCE WITH SPECIFICATIONS AND DRAWINGS.

ALL GRAVEL TO BE REMOVED (SURFACE OR SUBSURFACE) SHALL BE STOCKPILED AND REUSED ON SITE WHERE POSSIBLE IF IT CONFORMS TO SPECIFICATIONS AND DRAWINGS.

ALL ITEMS DESIGNATED TO BE REMOVED SHALL BE REMOVED COMPLETELY, INCLUDING ALL SUBGRADE MATERIALS DIRECTLY ASSOCIATED WITH ITEMS TO BE REMOVED.

UTILITY NOTES

CONTRACTOR SHALL NOTIFY "NORTH CAROLINA ONE CALL" (TELEPHONE 1-800-632-4949) AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION OR EXCAVATION TO HAVE EXISTING UTILITIES LOCATED. CONTRACTOR TO CONTACT LOCAL UTILITIES THAT PROVIDE THEIR OWN LOCATOR SERVICES INDEPENDENT OF "NORTH CAROLINA ONE CALL."

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND/OR RELOCATION OF ALL EXISTING UTILITIES IN COORDINATION WITH THE APPROPRIATE UTILITY, AGENCY, OR COMPANY.

ALL UTILITIES THAT ARE LOCATED WITHIN LIMITS OF DISTURBANCE SHALL BE SET SO THAT TOPS/RIMS ARE FLUSH WITH FINISHED GRADE OF ROADWAY AND SIDEWALK. LOCATIONS AND SIZES OF EXISTING PUBLIC AND PRIVATE UTILITIES SHOWN ON THESE PLANS ARE FROM CITY AND UTILITY COMPANY RECORDS ONLY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR FIELD LOCATING ALL UTILITIES AND FOR DAMAGES RESULTING FROM FAILURE TO DO SO.

CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE CITY AND CAPE FEAR PUBLIC UTILITIES FOR ANY ADDITIONAL INFORMATION ON EXISTING WATER AND SEWER UTILITIES.

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING EXACT LOCATION, ORIENTATION, AND ELEVATION OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION OR ORDERING MATERIALS. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS WORK.

CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY SHOULD ANY FIELD CONDITIONS BE ENCOUNTERED THAT VARY FROM THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS.

ISSUED FOR BID

NOT FOR CONSTRUCTION

REV. NO.	REVISIONS	DATE

DATE

PROJECT NUMBER 7DCEM2310

PLANS PREPARED BY:
CITY OF WILMINGTON NORTH CAROLINA
Engineering
212 Operations Center Dr. • Wilmington, NC 28412 • (910) 341 - 7807

NORTH CAROLINA PROFESSIONAL SEAL 049509 ENGINEER ZACHARY P. ROMAN

Zach Roman P.E.
08/01/2024 DATE

N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

NTS

LEGEND, INDEX OF SHEETS, LIST OF STANDARD DRAWINGS, AND GENERAL NOTES

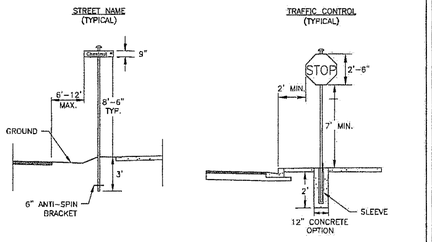
SHEET 02

N:\PROJECT FILES\STREET IMPROV-10TH AND GRACE\DESIGN\DRAWINGS\10TH & GRACE STREET IMPROV-DESIGN.DWG

MAY 22, 2024

ISSUED FOR BID

This Detail is for Reference Only. See Notes.



1) All signs and materials shall meet the requirements of MUTCD and City Traffic Engineering in effect at the time of construction. Designer and Contractor shall utilize the latest edition of "City of Wilmington Specifications for Installation of Street Name Signs, Traffic Control Signs and Signs Hardware" guideline. Special Designation signs (downtown, historic, parks, riverfront, cross city trail, etc.) shall adhere to COW Signage Plan and all associated policies.

2) Sign callouts, locations and dimensions are responsibility of the designer and shall be clearly indicated on a plan sheet. A Signs and Pavement Marking design sheet is necessary for larger projects, preferred to include a table with #units, MUTCD#, name, size, lettering, posts, material, color, intensity, etc.

3) In advance of fabrication, Contractor may provide a sign order/or proof sheet from the supplier to City Traffic Engineering for compliance review of material specifications only.

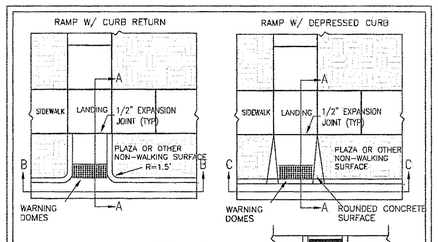
4) All non-standard (decorative) sign posts and hardware installations require a NON-STANDARD TRAFFIC SIGN HARDWARE & MATERIALS AGREEMENT to be executed prior to acceptance. Contact City Traffic Engineering.

5) Contractor shall contact City Inspector prior to sign installation and final acceptance. Modifications may be required for compliance. All signs that are removed and not reinstalled shall be salvaged and delivered to the City.

6) Street name and traffic control signs shall be installed when streets are opened to the public.

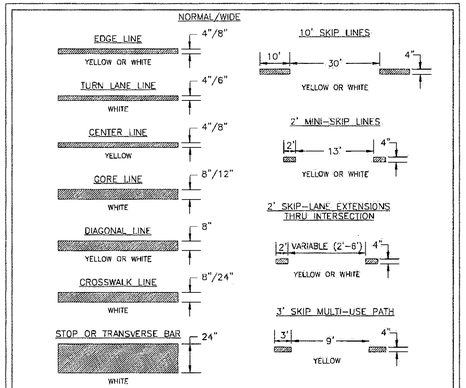
7) Developer/HOA is responsible for proper maintenance of all signs until accepted by the City.

DATE: FEBRUARY, 2019	STANDARD DETAIL STREET & TRAFFIC SIGNS REFERENCE DETAIL	CITY OF WILMINGTON NORTH CAROLINA CITY OF WILMINGTON ENGINEERING PO BOX 1810 WILMINGTON, NC 28402 (910) 341-7807
DRAWN BY JSR		
CHECKED BY BDR, P.E.		
SCALE NOT TO SCALE		SD 15-03



WARNING DOME NOTES:
1. USE CONTRASTING COLORS, RED OR BLACK ON WHITE PAVEMENT.
2. USE CAST IN PLACE PAVERS FOR NEW CONSTRUCTION.
3. RUBBER MATS ARE PERMITTED FOR RETROFITS.
4. LANDING AND RAMP WIDTH MAY BE REDUCED TO 3' WHERE SPACE IS LIMITED AND DESIGN IS APPROVED BY THE CITY ENGINEER.

DATE: DECEMBER, 2010	STANDARD DETAIL PERPENDICULAR CURB RAMP ADJACENT TO PLAZA	CITY OF WILMINGTON NORTH CAROLINA CITY OF WILMINGTON ENGINEERING PO BOX 1810 WILMINGTON N.C. 28402 (910) 341-7807
DRAWN: PB/JSR		
CHECKED: DEC		
SCALE NOT TO SCALE		SD3-08

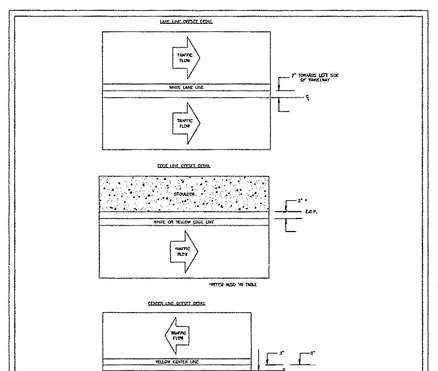


1-PAVEMENT MARKINGS AND SYMBOLS SHALL BE DESIGNED PER MUTCD WITH APPROVAL FROM CITY TRAFFIC ENGINEERING, AND INSTALLED IN ACCORDANCE WITH NCDOT DIVISION 12 SPECIFICATIONS.

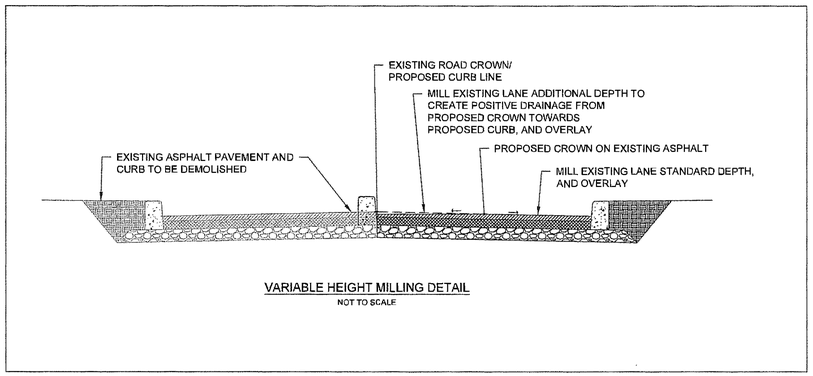
2-GENERALLY, PERMANENT MARKINGS WILL BE UNIFORM AND SMOOTH AND WILL CONSIST OF 120MIL OF THERMOPLASTIC FOR ALL LINES AND SYMBOLS; TEMPORARY MARKINGS SHALL CONSISTS OF 15 MIL PAINT, EVERY 6 MONTHS.

3-DURING APPLICATION THE EXISTING PAVEMENT SHALL NOT SHOW SIGNS OF MOISTURE AND BE CLEAN, FREE OF DIRT AND OIL, ETC. THERMOPLASTIC SHALL ONLY BE INSTALLED WHERE PAVEMENT IS 50° F AND RISING. PAINT SHALL ONLY BE INSTALLED WHERE PAVEMENT IS 40° F AND RISING.

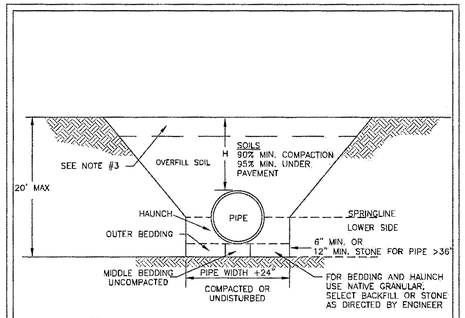
DATE: DECEMBER, 2011	STANDARD DETAIL PAVEMENT MARKINGS LINE TYPES	CITY OF WILMINGTON NORTH CAROLINA CITY OF WILMINGTON ENGINEERING PO BOX 1810 WILMINGTON, NC 28402 (910) 341-7807
DRAWN BY JSR		
CHECKED BY BDR, P.E.		
SCALE NOT TO SCALE		SD 11-01



DATE: 2003	STANDARD DETAIL PAVEMENT MARKINGS OFFSETS	CITY OF WILMINGTON NORTH CAROLINA CITY OF WILMINGTON ENGINEERING PO BOX 1810 WILMINGTON, NC 28402 (910) 341-7807
DRAWN BY RLD		
CHECKED BY RLB/BF		
SCALE NOT TO SCALE		SD 11-02



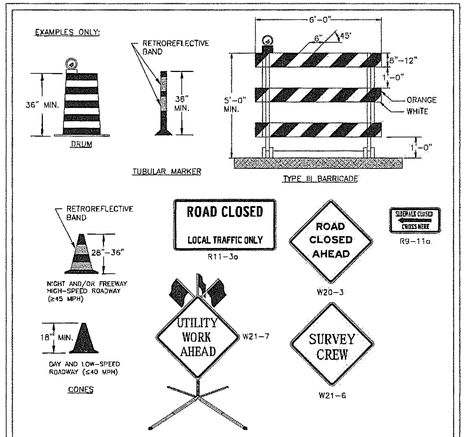
VARIABLE HEIGHT MILLING DETAIL
NOT TO SCALE



NOTES:

1. CONTRACTOR SHALL ENSURE BOTTOM OF TRENCH IS SUITABLE FOR PIPE INSTALLATION AND DOES NOT REQUIRE FOUNDATION CONDITIONING STONE.
2. CONTRACTOR TO INSTALL BEDDING AND PIPE BEFORE INSTALLING HAUNCH AND THEN OVERFILL. SOILS SHALL BE INSTALLED IN 6"-8" LIFTS AND COMPACTED TO MIN. 2% DENSITY AS DETERMINED BY THE STANDARD PROCTOR ASTM D-698-A METHOD.
3. WHERE IN PAVEMENT, CONTRACTOR SHALL ADHERE TO CITY STREET CUT POLICY AND SD 1-04 OR SD 1-05 FOR ROAD AND PAVEMENT REBUILD.
4. SOIL SHALL BE COMPACTED BY A MECHANIZED TAMP (I.E. JUMPING JACK). HOWEVER, VIBRATORY ROLLERS > 18" WIDTH MAY BE USED FOR LARGER EXCAVATIONS. THE PLATE TAMP METHOD SHALL NOT BE USED.
5. THIS DETAIL IS REPRESENTATIVE AND PIPE TRENCH DESIGN IS SUBJECT TO SPECIFIC SOIL CATEGORY (I, II, III), AND INSTALLATION TYPE (1, 2, 3, 4), AS DIRECTED BY THE ENGINEER AND SITE CONDITIONS.

DATE: MAY, 2013	STANDARD DETAIL PIPE TRENCH TYPICAL	CITY OF WILMINGTON NORTH CAROLINA CITY OF WILMINGTON ENGINEERING OFFICE 212 OPERATIONS CENTER DRIVE WILMINGTON N.C. 28412 (910) 341-7807
DRAWN: JSR		
CHECKED: BDR, P.E.		
SCALE: NOT TO SCALE		SD 1-07

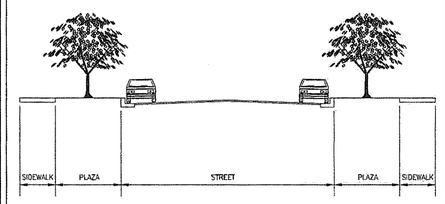


1-ALL CONSTRUCTION, MAINTENANCE AND UTILITY WORK IN THE RIGHT OF WAY SHALL BE PERMITTED AND FOLLOW MUTCD (PART 6) AND/OR NCDOT GUIDELINES FOR TEMPORARY TRAFFIC CONTROL (TTC).
2-A TTC PLAN SHALL CONSIDER SAFETY AND ACCESSIBILITY OF ALL MOTORISTS, BICYCLISTS AND PEDESTRIANS AND BE PERMITTED BY THE CITY PRIOR TO PLACING SIGNS, ETC.

DATE: DECEMBER, 2011	STANDARD DETAIL GUIDELINES FOR TEMPORARY TRAFFIC CONTROL	CITY OF WILMINGTON NORTH CAROLINA CITY OF WILMINGTON ENGINEERING PO BOX 1810 WILMINGTON, NC 28402 (910) 341-7807
DRAWN BY JSR		
CHECKED BY BDR, P.E.		
SCALE NOT TO SCALE		SD 15-07

RESIDENTIAL STREET TREE STANDARDS

1. Street trees shall be installed along residential streets after all driveways have been installed.
2. The developer shall notify Landscape Designer prior to installation to ensure proper tree selection and spacing.
3. Each tree shall be a minimum of two (2) caliper inches.
4. Phasing of a project shall be permitted, however, Street Trees on the same block shall be planted at the same time to avoid size irregularities.
5. Trees within the same block shall be the same species.
6. Street trees must be located a minimum of 10' from storm drain inlets and 15' from street lights.



RECOMMENDED STREET TREE SPACING ACCORDING TO PLAZA WIDTHS

4'-6'	6'-8'	GREATER THAN 8'
ex. CREPE MYRTLE HOLLY	ex. JAPANESE MAPLE ZELKOVA	ex. DARLINGTON OAK RED MAPLE
25'-30' SPACING	35'-40' SPACING	50' SPACING

DATE: FEBRUARY 14, 2019	STANDARD DETAIL RESIDENTIAL STREET TREE STANDARDS	CITY OF WILMINGTON NORTH CAROLINA CITY OF WILMINGTON ENGINEERING PO BOX 1810 WILMINGTON, NC 28402 (910) 341-7807
DRAWN BY JSR		
CHECKED BY B.P., P.E.		
SCALE NOT TO SCALE		SD 15-17

NOT FOR CONSTRUCTION

REV. NO.	REVISIONS	DATE

DATE

PROJECT NUMBER 7DCEM2310

PLANS PREPARED BY:
CITY OF WILMINGTON NORTH CAROLINA
Engineering
212 Operations Center Dr. • Wilmington, NC 28412 • (910) 341 - 7807

NORTH CAROLINA PROFESSIONAL SEAL 049509 ENGINEER ZACHARY P. ROMAN

Zack Roman P.E.
08/01/2024 DATE

N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

NTS

CONSTRUCTION DETAILS

SHEET 03

MAY 22, 2024

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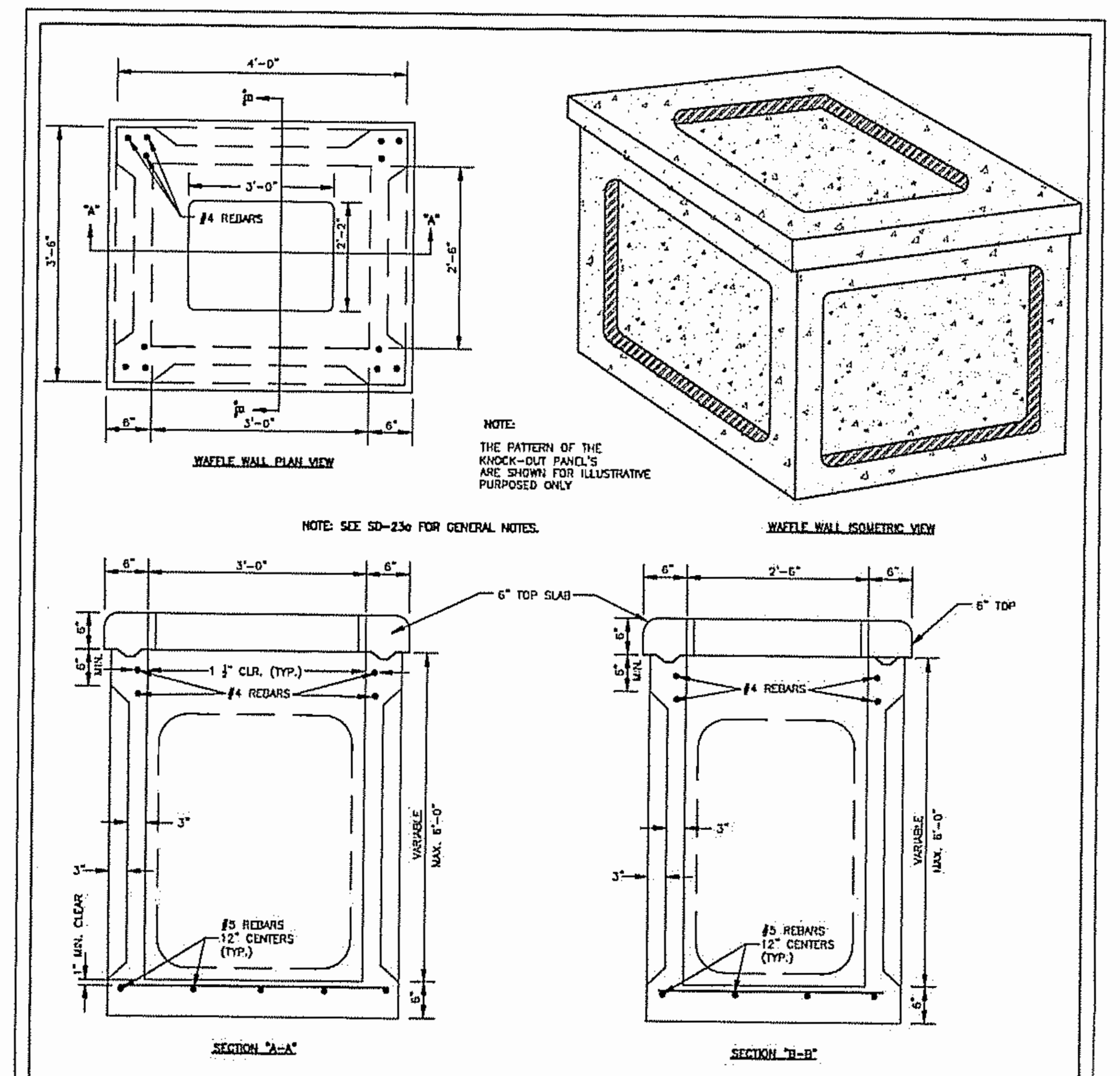


STANDARD DETAIL	
DATE: 2001	PRECAST WAFFLE DRAINAGE STRUCTURE
DRAWN BY JSR/CMR	
CHECKED BY B.P., P.E.	
SCALE NOT TO SCALE	

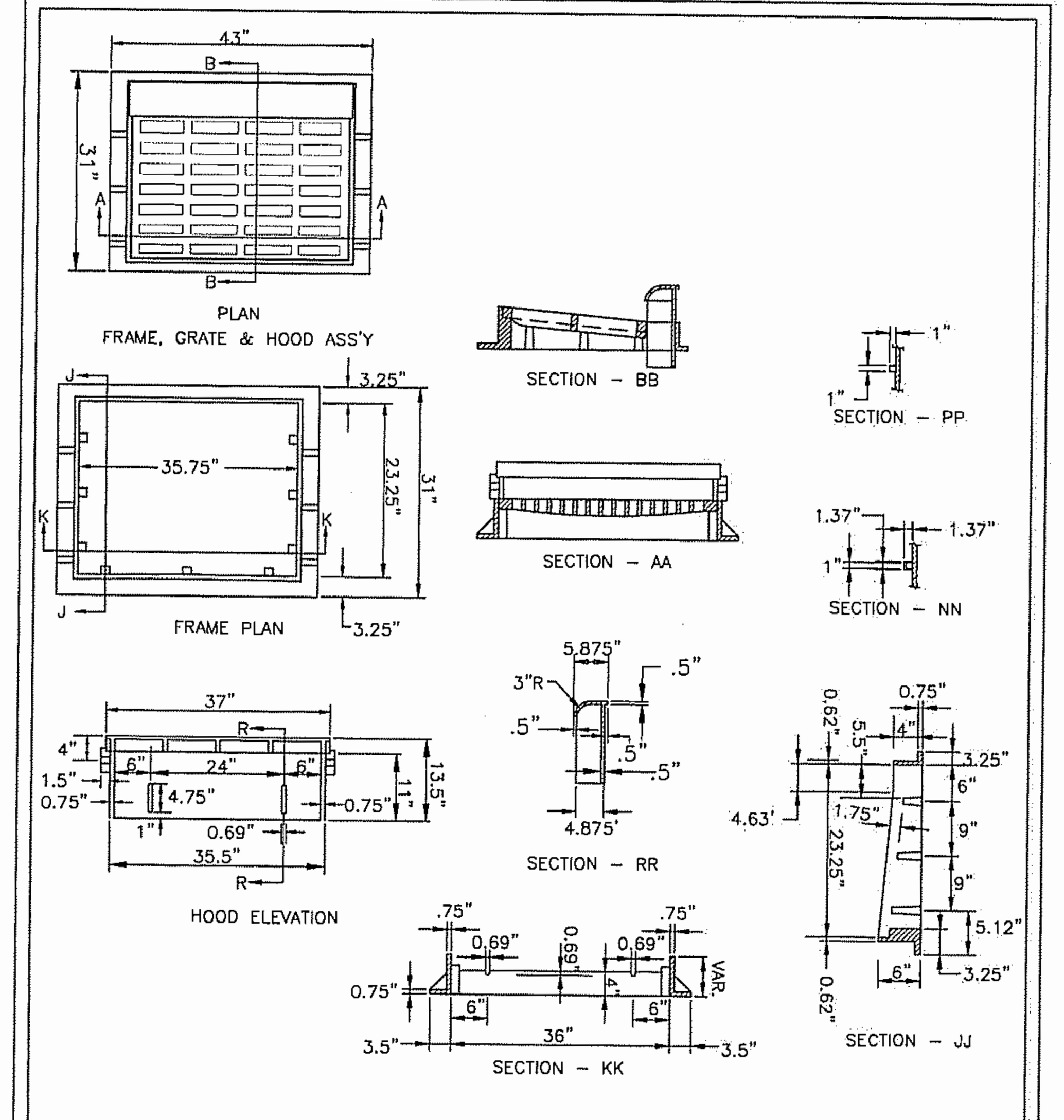
CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807
SD 2-23

GENERAL NOTES:

* USE 4000 PSI CONCRETE, PROVIDE FOR H-20 TRAFFIC LOADING.
* PROVIDE ALL REINFORCING STEEL WHICH MEETS ASTM A615 FOR GRADE 60 AND WELDED WIRE FAVRIC CONFORMING TO ASTM A185,
* LIMIT MAXIMUM DEPTH TO TOP OF BOTTOM SLAB FOR WAFFLE WALL STRUCTURE TO 6'-0".
* PLACE LIFT HOLES OR PINS IN ACCORDANCE WITH OSHA STANDARD 1926.704
* SAW CUT, CORE DRILL OR FORM OPENINGS, FOR PIPE TO PROVIDE REQUIRED SIZE AND LOCATION. ORIENT WAFFLE WALL STRUCTURES SO THAT PIPES ENTER THROUGH THE KNOCKOUT/WAFFLE PANELS ONLY. SEAL OPENINGS WITH HYDRAULIC CEMENT.
* ALL ELEMENTS PRECAST TO MEET ASTM C913.
* SET ON 6" WASHED STONE
* FRAME AND GRATE HEIGHT MAY BE ADJUSTED WITH BRICK.
* PROVIDE PRECAST STURCTURES OVER 4'-0" IN DEPTH WITH STEPS/LADDER INSTALLED IN ACCORDANCE WITH ASHA STANDARD 1910.27 AND AS FIELD CONDITIONS DICTATE.
* WELDED WIRE FABRIC MAY BE SUBSTITUTED FOR REBAR AS LONG AS THE SAME AREA OF STEEL IS PROVIDED,
* SEAL JOINTS WITH A FLEXIBLE BUTYL RUBBER BASE CONFORMING TO FEDERAL SPECIFICATION SS-S-21A, AASHTO M-19B, TYPE B - BUTYL RUBBER.
* LIMIT MAXIMUM STRUCTURE SIZE TO INSIDE CLEAR DEMENSIONS OF 2'- 6" x 3' - 0".
* USE FRAME AND GRATE AS PER SD 14-04
* GROUT INVERT TO PROVIDE SMOOTH FLOW

STANDARD DETAIL	
DATE: 08/2020	PRECAST WAFFLE DRAINAGE STRUCTURE GENERAL NOTES
DRAWN BY JSR/CMR	
CHECKED BY B.P., P.E.	
SCALE NOT TO SCALE	

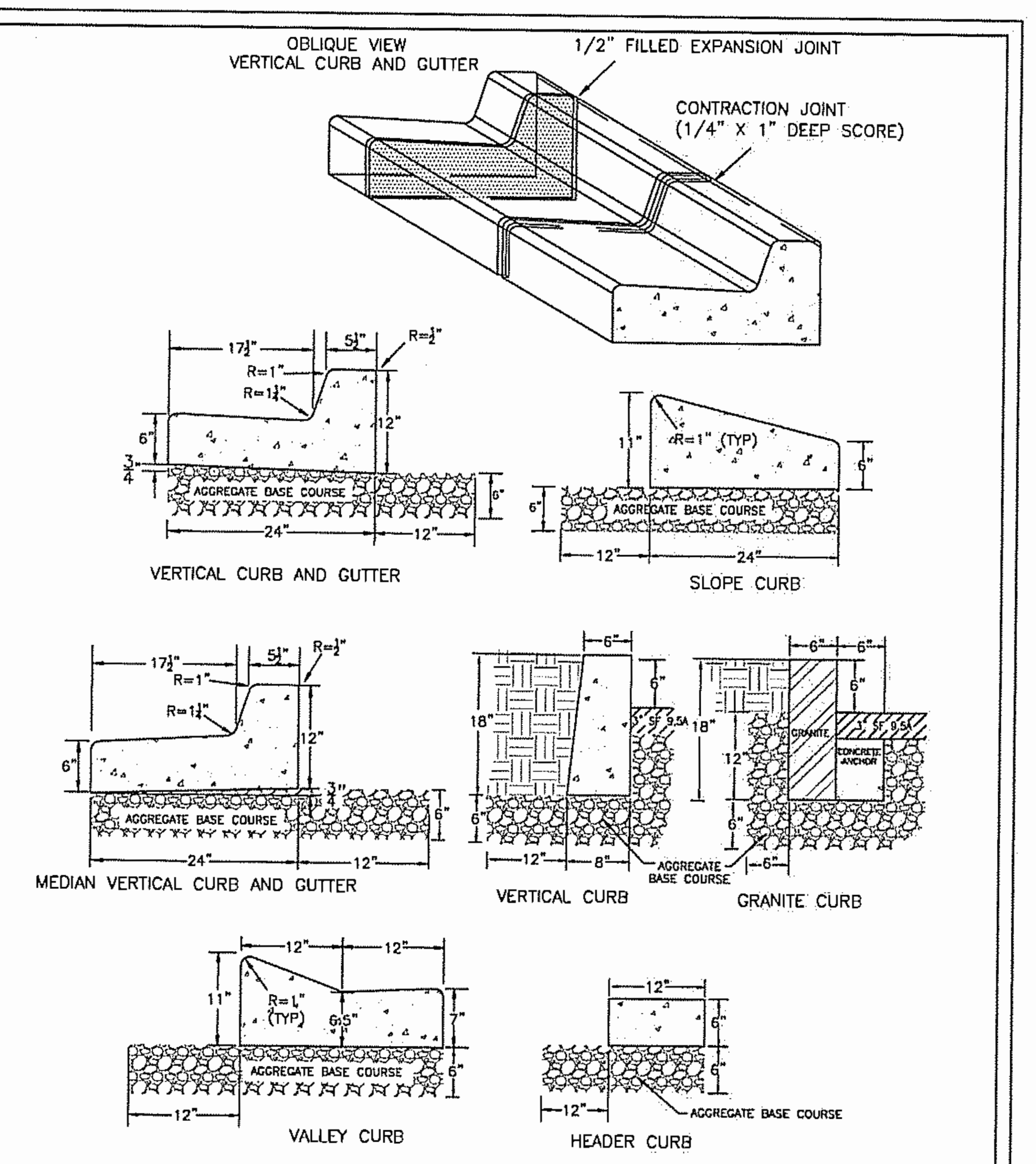
CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807
SD 2-23a



NOTE: USE TYPE "E","F",& "G" GRATE UNLESS OTHERWISE INDICATED

STANDARD DETAIL	
DATE: 2001	CATCH BASIN CASTING FOR 24" HOOD AND GRATE
DRAWN BY JSR/CMR	
CHECKED BY B.P., P.E.	
SCALE NOT TO SCALE	

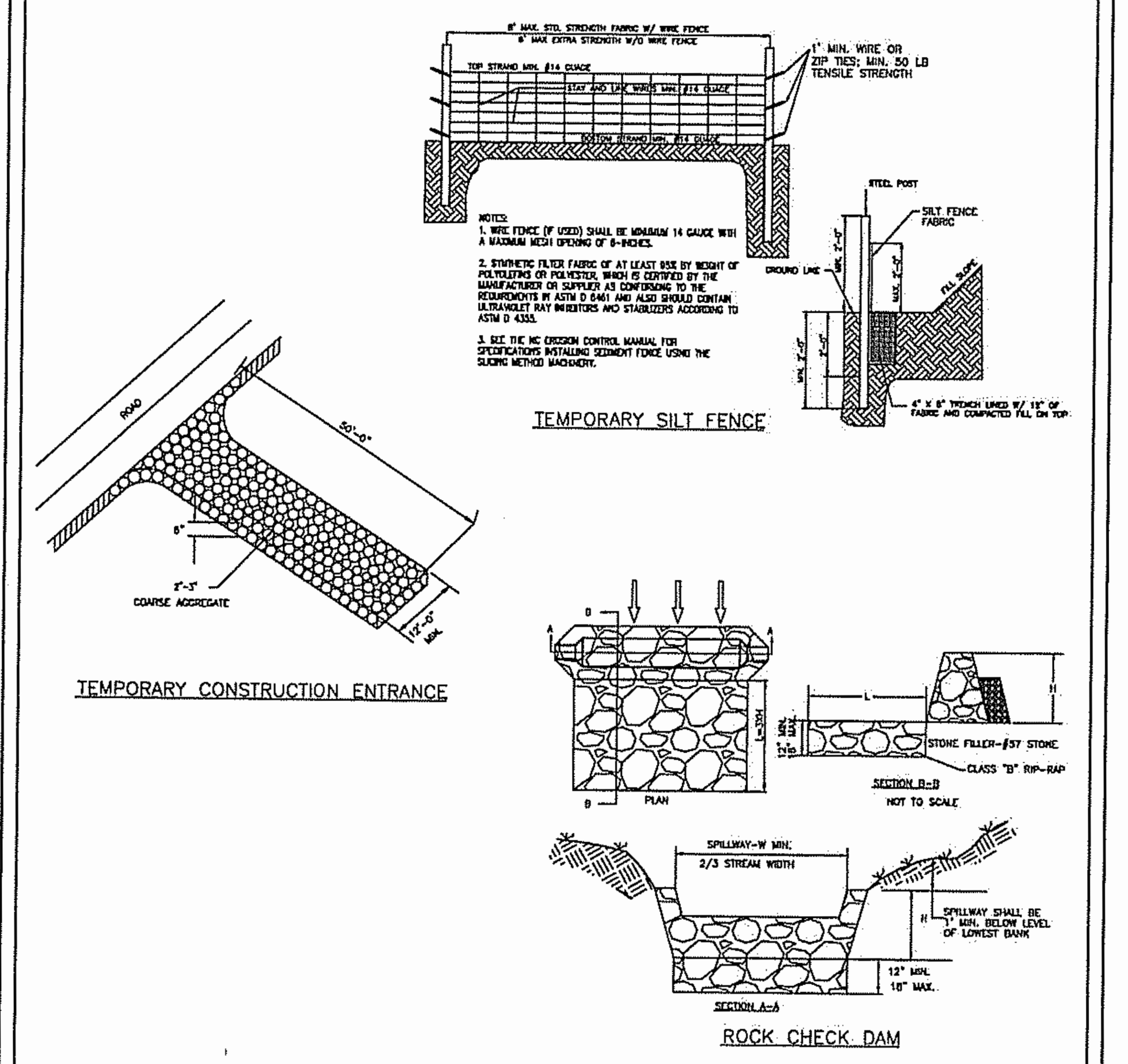
CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807
SD 2-21



NOTES:
1. EXPANSION JOINT MATERIAL TO COMPLY WITH CURRENT NCDOT STANDARDS
2. 50' MAX EXPANSION JOINT SPACING, 10' MAX CONTRACTION JOINT SPACING
3. MINIMUM INSTALLATION LENGTH IS 5 FT.
4. CONCRETE TO BE 3000 PSI MIN
5. VERTICAL CURB AND GUTTER BASE CAN BE SLOPED 3/4" OR USE A FLAT BASE

STANDARD DETAIL	
DATE: AUGUST, 2011	CURBING
DRAWN: PB/JSR	
CHECKED: DEC	
SCALE NOT TO SCALE	

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON N.C. 28402
(910) 341-7807
SD 3-11



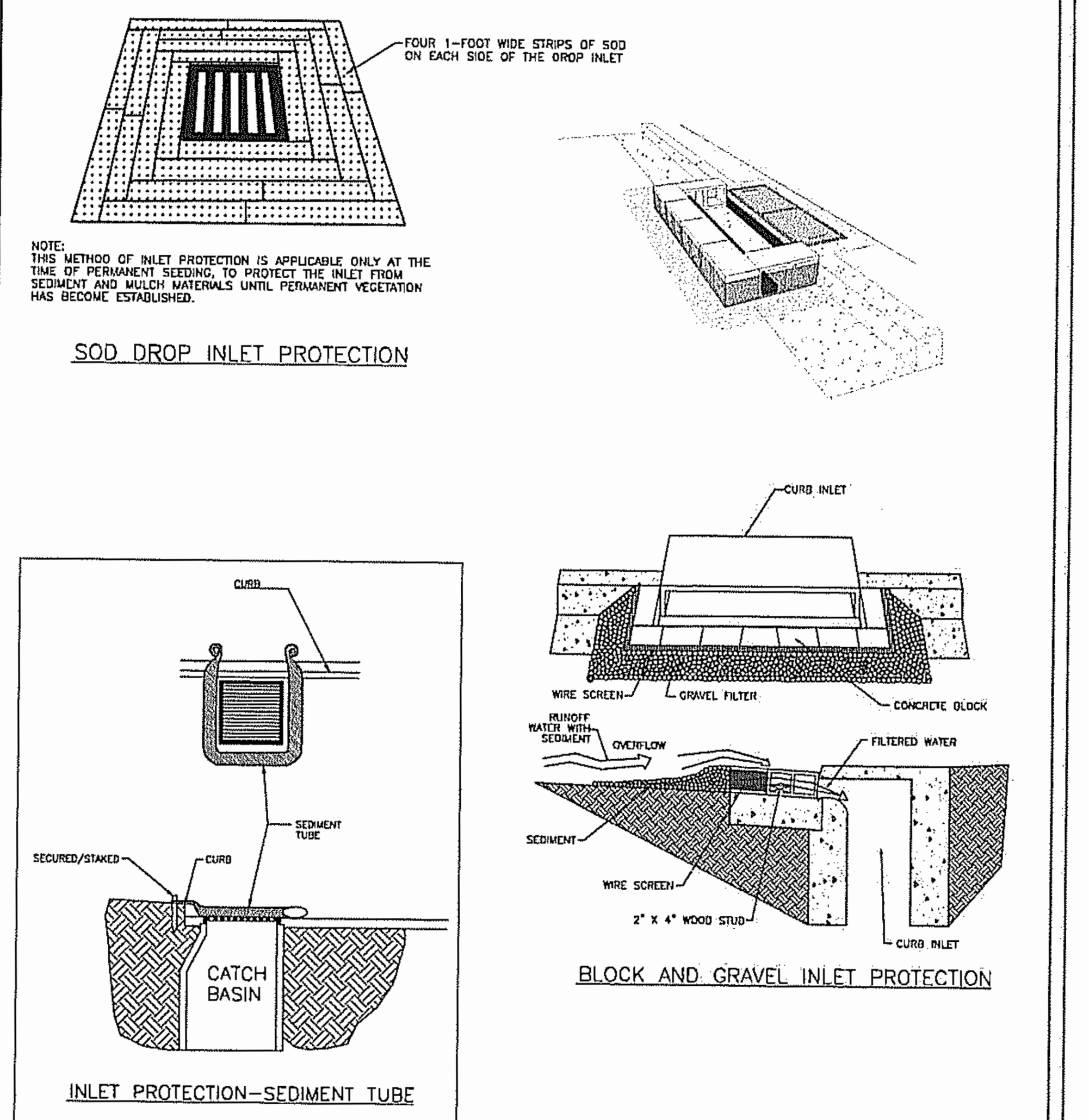
LAND DISTURBING ACTIVITIES MUST BE MANAGED TO AVOID SEDIMENT RUN-OFF AND POLLUTION FROM CONSTRUCTION SITES.

WHERE PERMITTED LOCALLY BY NEW HANOVER COUNTY, AN EROSION AND SEDIMENT CONTROL (E&SC) PLAN WILL CONTAIN DETAILS AND GUIDANCE. E&SC PLANS ARE PERFORMANCE BASED AND OFTEN REQUIRE ADJUSTMENTS OR REPAIRS.

AS PERMITTED BY NCDENR, DIVISIONS OF WATER QUALITY AND LAND RESOURCES, A STORMWATER PERMIT WILL REQUIRE SELF-MONITORING REPORTS (WEEKLY, >1" RAIN EVENT) OR SELF-INSPECTION REPORTS AFTER EACH CONSTRUCTION PHASE, BASED ON ELEMENTS OF THE E&SC PLAN.

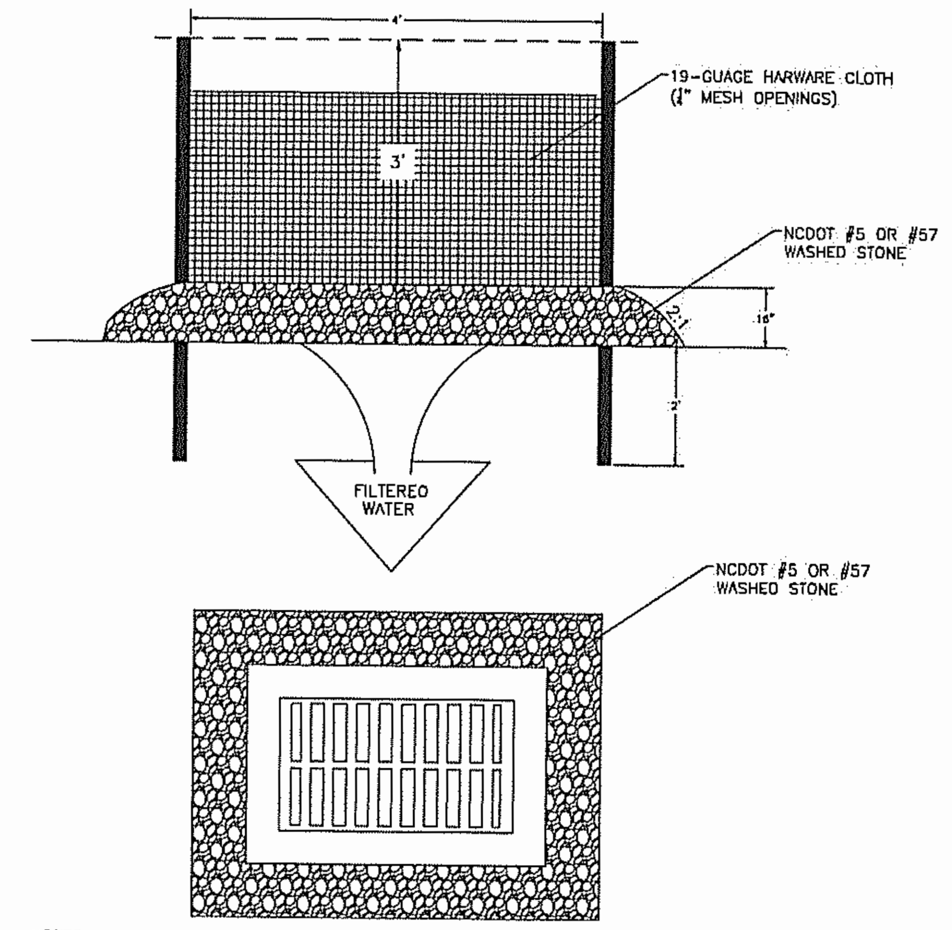
STANDARD DETAIL	
DATE: SEPTEMBER, 2012	GUIDELINES FOR SEDIMENT CONTROL BMPs
DRAWN BY JSR	
CHECKED BY DEC, P.E.	
SCALE NOT TO SCALE	SHEET 1 OF 3

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807
SD 3-104



STANDARD DETAIL	
DATE: MAY, 2018	GUIDELINES FOR SEDIMENT CONTROL BMPs
DRAWN BY JSR	
CHECKED BY DEC, P.E.	
SCALE NOT TO SCALE	SHEET 2 OF 3

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807
SD 3-104

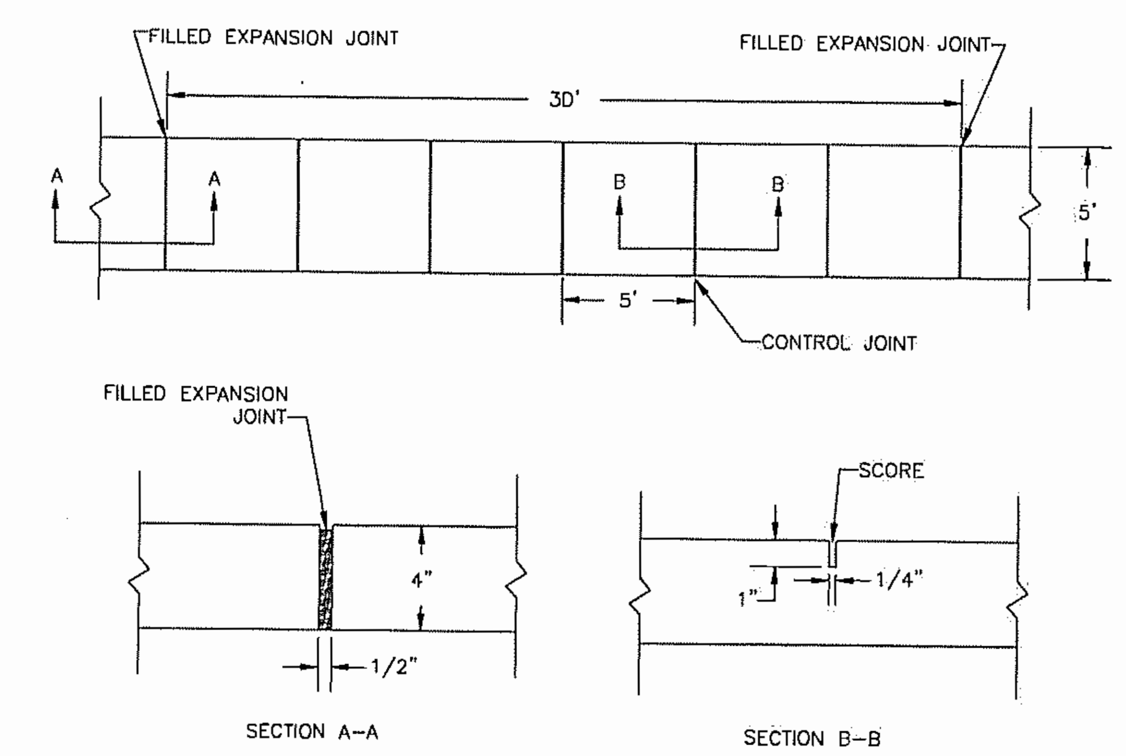


NOTES:
1. UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING INLET
2. DRIVE 5-FOOT STEEL POSTS (1.25 LB/LF) 2 FEET INTO GROUND SURROUNDING THE INLET. SPACE POSTS EVENLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.
3. SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE AND BOTTOM. PLACING A 2-FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL FOR ANCHORING IS RECOMMENDED.
4. PLACE CLEAN GRAVEL (NCDOT #5 OR #57 STONE) ON A 2:1 SLOPE WITH A HEIGHT OF 16 INCHES AROUND THE WIRE, AND SMOOTH TO AN EVEN GRADE.
5. ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.
6. COMPACT THE ARE PROPERLY AND STABILIZE IT WITH GROUNDCOVER.

HARDWARE CLOTH AND GRAVEL INLET PROTECTION

STANDARD DETAIL	
DATE: MAY, 2018	GUIDELINES FOR SEDIMENT CONTROL BMPs
DRAWN BY JSR	
CHECKED BY DEC, P.E.	
SCALE NOT TO SCALE	SHEET 3 OF 3

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON, NC 28402
(910) 341-7807
SD 3-104



NOTES:
1. JOINT MATERIAL TO COMPLY WITH CURRENT NCDOT STANDARDS.
2. SANITARY SEWER CLEAN-OUTS, WATER METERS, MANHOLES, AND VALVE LIDS TO BE LOCATED OUTSIDE SIDEWALK WHERE FEASIBLE.
3. MINIMUM SIDEWALK WIDTH TO BE 6' MINIMUM IF PLACED AT BACK OF CURB.
4. CONCRETE FOR ALL SIDEWALKS (EXCEPT ANY PORTION CONTAIN WITHIN A DRIVEWAY APRON) SHALL BE CLASS "A" - 3,000 PSI.
5. MINIMUM REPLACEMENT FOR REPAIRS IS A 5' X 5' PANEL
6. 4" STONE BASE MAY BE REQUIRED FOR POOR SOIL CONDITIONS
7. MINIMUM DEPTH FOR TUNNELING BELOW SIDEWALK IS 12"
8. MAX ADJACENT GROUND SLOPE WITHOUT RAILING IS 2:1
9. MIN GRADE FOR PROPER DRAINAGE IS 1% IN AT LEAST 1 DIRECTION. MAX CROSS SLOPE IS 2%. MAX LONGITUDINAL SLOPE IS 8.3%, 10% IF LIMITED BY EXISTING CONDITIONS, OR NO GREATER THAN THE SLOPE OF THE EXISTING ADJACENT ROAD.

STANDARD DETAIL	
DATE: OCTOBER, 2010	SIDEWALK
DRAWN: PB/JSR	
CHECKED: DEC	
SCALE NOT TO SCALE	

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON N.C. 28402
(910) 341-7807
SD 3-10

NOT FOR CONSTRUCTION

REV. NO.	REVISIONS	DATE

DATE
PROJECT NUMBER 7DCEM2310

PLANS PREPARED BY:
CITY OF WILMINGTON NORTH CAROLINA
Engineering
212 Operations Center Dr. • Wilmington, NC 28412 • (910) 341 - 7807

NORTH CAROLINA PROFESSIONAL SEAL 049509 ENGINEER ZACHARY P. ROMAN

Zach Roman P.E.
08/01/2024 DATE

N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

NTS

CONSTRUCTION DETAILS

SHEET 04

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

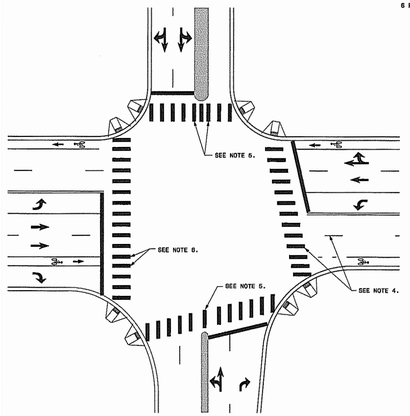
2-19

ENGLISH TYPICAL DRAWING FOR

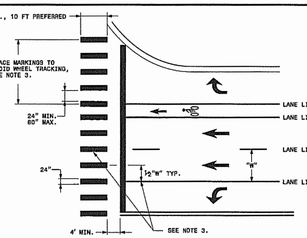
PAVEMENT MARKINGS

HI-VISIBILITY CROSSWALKS

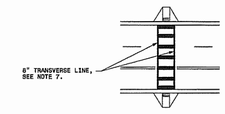
NO-TRACK MARKING GUIDANCE



CROSSWALK INTERSECTION DETAIL



CROSSWALK MARKING DETAIL



MID-BLOCK CROSSWALK DETAIL

GENERAL NOTES:

1- THE GUIDANCE IN THIS DETAIL IS TO BE USED WHEN NO-TRACK SPACING OF HI-VISIBILITY MARKINGS IS REQUESTED.

2- USE THE GUIDANCE SHOWN ON THE ABOVE DETAILS IN CONJUNCTION WITH PAVEMENT MARKING GUIDANCE SHOWN ON ROADWAY STANDARD DRAWINGS 1205.01 AND 1205.09.

3- PLACE MARKINGS TO AVOID WHEELPATH OF VEHICLES. MARKINGS TYPICALLY WILL BE LOCATED CENTERED AT THE LANE LINES AND EDGE LINES WITH ONE ADDITIONAL MARKING CENTERED IN THE MIDDLE OF THE LANE. AT WIDE LANE WIDTHS DUE TO TAPERS AND LARGE RADII, LOCATE MARKINGS AT BEST SPACING TO AVOID WHEEL TRACKING. THE SPACE BETWEEN MARKINGS SHALL NOT BE LESS THAN 24 INCHES OR GREATER THAN 60 INCHES.

4- WHERE THE CROSSWALK IS SKEWED TO THE LANE LINES, THE MARKINGS SHOULD BE PARALLEL TO THE LANE LINES.

5- PLACE MARKINGS ON BOTH EDGES OF THE NOSE OF A MEDIAN. FOR NARROW MEDIANS LESS THAN 4 FEET, A SINGLE MARKING MAY BE USED. FOR WIDE MEDIANS, INSTALL ADDITIONAL MARKINGS IN THE MEDIAN AREA. THE SPACE BETWEEN THE MARKINGS SHALL NOT TO BE LESS THAN 24 INCHES OR GREATER THAN 60 INCHES.

6- LOCATE MARKINGS CENTERED ON BICYCLE LANE LINES. MARKINGS SHALL NOT BE LOCATED IN THE CENTER OF THE BICYCLE PATH.

7- INCLUDE 6" TRANSVERSE LINES WITH 24" LONGITUDINAL MARKINGS AT MID-BLOCK CROSSINGS.

SHEET 1 OF 1

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

2-19

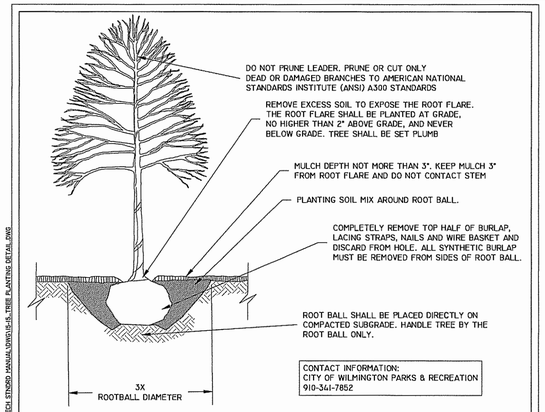
ENGLISH TYPICAL DRAWING FOR

PAVEMENT MARKINGS

HI-VISIBILITY CROSSWALKS

NO-TRACK MARKING GUIDANCE

SHEET 1 OF 1



NOTES:

1. TREES MUST MEET THE TREE QUALITY STANDARDS IN CH. 5 OF THE LAND DEVELOPMENT CODE (ANSI Z60.1).
2. CONTRACTOR IS RESPONSIBLE FOR ADEQUATE DRAINAGE OF ALL PLANTING PITS. WATER ROOT BALL AND PIT THOROUGHLY IMMEDIATELY AFTER INSTALLATION. (ENSURE POSITIVE DRAINAGE AWAY FROM PIT).
3. PREFERRED TREE PLANTING SEASON IS OCTOBER 1ST THROUGH APRIL 30TH.
4. ELECTRICAL OUTLETS AND OTHER UTILITIES ARE PROHIBITED IN THE PLANTING AREA IMMEDIATELY SURROUNDING THE TREE.
5. IF STAKING IS NEEDED, THE STAKING MUST BE REMOVED WITHIN ONE YEAR.
6. TREES WILL HAVE A MINIMUM 1 YEAR WARRANTY AFTER THE INITIAL PLANTING IS APPROVED BY THE CITY.

DATE: JULY 25, 2023	STANDARD DETAIL	CITY OF WILMINGTON NORTH CAROLINA
DRAWN BY JSR	TREE PLANTING	CITY OF WILMINGTON ENGINEERING PO BOX 1810 WILMINGTON N.C. 28402 (910) 341-7807
CHECKED BY RDG		SD 15-15
SCALE NOT TO SCALE		

HISTORICAL STANDARDS & CAPITAL SPECS\CITY DETAILS & PROVISIONS\20 CURRENT TECH STANDS MANUAL\DWGS\5-15 TREE PLANTING DETAIL.DGS

Date:

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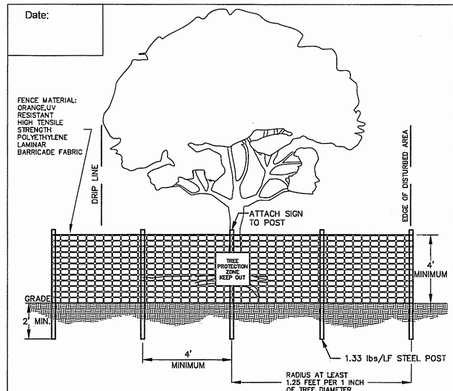


NOTES:

1. Leave critical areas (such as flood plains, steep slopes and wetlands) with desirable trees in their natural condition or only partially cleared.
2. Select trees to be preserved before siting roads, buildings or other structures.
3. Minimize trenching in areas with trees. Place several utilities in the same trench.
4. Prohibit or restrict access to tree protection zones(TPZ). Post "Keep Out" signs on all sides of fencing and do not store construction equipment or materials in TPZ.
5. Monitor trees using a professional or train your staff to monitor tree health during and after construction on a regular, frequent basis.
6. Assign a crew member to weekly TPZ fence integrity checks. Repair and replace TPZ fencing as needed.

MAINTENANCE:

1. Prune any damaged trees. In spite of precautions, some damage to protected trees may occur. In such cases, repair any damage to the crown, trunk, or root system immediately.
2. Repair roots by cutting off the damaged areas and painting them with tree paint. Spread peat moss or moist topsoil over exposed roots.
3. Repair damage to bark by trimming around the damaged area, taper the cut to provide drainage and paint with tree paint.
4. Cut off all damaged tree limbs above the tree collar at the trunk or main branch. Use three separate cuts to avoid peeling bark from healthy areas of the tree.

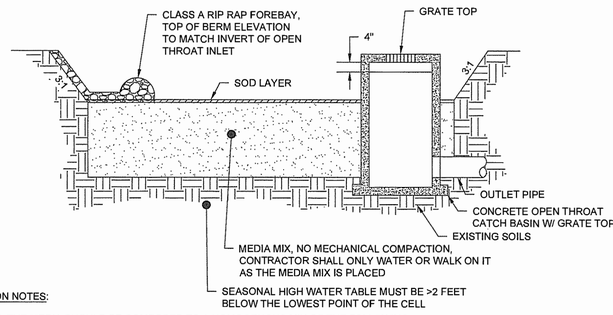
MATURE TREE PROTECTION ZONE RADIUS

TRUNK DIAMETER	GOOD PROTECTION	BETTER PROTECTION	BEST PROTECTION
8 INCHES	10 FEET	12 FEET	20 FEET
12 INCHES	15 FEET	18 FEET	30 FEET
16 INCHES	20 FEET	24 FEET	40 FEET
20 INCHES	25 FEET	30 FEET	50 FEET

NORTH CAROLINA *Environmental Quality*

EFFECTIVE DATE:11/12/2020

TREE PROTECTION



CONSTRUCTION NOTES:

- MEDIA MIX: THE MEDIA SHOULD BE COMPOSED TO A HOMOGENOUS MIX OF THE FOLLOWING:
  - 75-85% MEDIUM TO COARSE WASHED SAND
  - 8-10% FINES (SILT AND CLAY)
  - 5-10% ORGANIC MATTER (SUCH AS PINE BARK FINES)
- MINIMUM MEDIA DEPTH: 24 INCHES WITH NO IWS
- MEDIA P-INDEX: LESS THAN 50
- MEDIA MAINTENANCE: MAINTAIN MEDIA SUCH THAT INFILTRATION RATE IS AT LEAST 1 INCH PER HOUR
- SEE PLAN VIEW FOR ELEVATION INFORMATION
- CONTRACTOR SHALL NOTIFY ENGINEER ONCE EXCAVATION OF BIORETENTION CELL AREA IS COMPLETED. NO PLACEMENT OF MEDIA MIX IS PERMITTED PRIOR TO ENGINEER'S REVIEW AND APPROVAL OF SUBGRADE CONDITIONS WITHIN THE EXCAVATION AREA.

BIORETENTION CELL NOTES & DETAIL

NOT TO SCALE

Date:

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NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR SUMMER

SEEDING MIXTURE

Species	Rate
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Mountains - July 15- Aug 15
Piedmont - Aug 15 - Oct 15

Maintenance:
Indian Woodoats and Virginia Wild Rye are both sun and shade tolerant.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR FALL

SEEDING MIXTURE

Species	Rate
Hard Fescue	15 lbs/acre
Switchgrass	2.5-3.5 lbs/acre*
Indian Grass	5-7 lbs/acre*
Big Bluestem	5-7 lbs/acre*
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Mountains - Hard Fescue- Aug 1 - June 1
Mountains- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 15
Piedmont and Coastal- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 1
Coastal- Indian Woodoats and Virginia Wild Rye- Sept 1 - Nov 1

Maintenance:
Hard Fescue is not recommended for slopes > 5%. Prefers shade.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

SEEDING MIXTURE

Species	Rate
Centipede	5 lbs/acre
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Coastal or Eastern Piedmont for Centipede- Sept. 1 - May 1
Coastal and Piedmont for Indian Woodoats and Virginia Wild Rye- Feb 15 - April 1
Mountains for Indian Woodoats and Virginia Wild Rye- March 1 - May 15

Maintenance:
Significant maintenance may be required to obtain desired cover once centipede is planted. Acceptable for sodding.

SEED BED PREPARATION:

LIMING- Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1 to 1 ½ tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.

FERTILIZER- Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700-1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.

SURFACE ROUGHENING- If recent tillage operations have resulted in a loose surface additional roughening may not be required, except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by raking, harrowing, or other suitable methods for fine grading. The finished grade shall be a smooth even soil surface with a loosen uniformly fine texture. All ridges and depressions shall be removed and filled to provide the approved surface drainage. Planting is to be done immediately after finished grades are obtained and seedbed preparation is completed.

NOTES:

1. Permanent seeding, sodding or other means of stabilization are required when all construction work is completed according to the NPDES timeframe's table.
2. A North Carolina Department of Agriculture soils test (or equal) is highly recommended to be obtained for all areas to be seeded, sprigged, sodded or planted.
3. Use a seeding mix that will produce fast growing nurse crops and includes non-invasive species that will eventually provide a permanent groundcover. Soil blankets may be used in lieu of nurse crops. Mat, tack or crimp mulch, as needed to stabilize seeded areas until root establishment. Mulch must be applied uniformly over the soil with a cover density of at least 80%.
4. Ground cover shall be maintained until permanent vegetation is established and stable against accelerated erosion.

NORTH CAROLINA *Environmental Quality*

EFFECTIVE DATE: 11/12/2020

PERMANENT SEEDING RECOMMENDATIONS

ISSUED FOR BID

NOT FOR CONSTRUCTION

REV. NO.	REVISIONS	DATE

DATE

PROJECT NUMBER 7DCEM2310

PLANS PREPARED BY:

CITY OF WILMINGTON NORTH CAROLINA

Engineering

212 Operations Center Dr. • Wilmington, NC 28412 • (910) 341 - 7807

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 049509 ZACHARY P. ROMAN

Zack Roman P.E.

08/01/2024 DATE

N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

NTS

CONSTRUCTION DETAILS

SHEET 05

MAY 22, 2024

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GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes			
Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations	
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None	
(b) High Quality Water (HQW) Zones	7	None	
(c) Slopes steeper than 3:1	7	If slopes are 10 feet or less in length and are not steeper than 2:1, 14 days are allowed	
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed	
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope	

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
· Temporary grass seed covered with straw or other mulches and tackifiers. · Hydroseeding · Rolled erosion control products with or without temporary grass seed · Appropriately applied straw or other mulch · Plastic sheeting	· Permanent grass seed covered with straw or other mulches and tackifiers · Geotextile fabrics such as permanent soil reinforcement matting · Hydroseeding · Shrubs or other permanent plantings covered with mulch · Uniform and evenly distributed ground cover sufficient to restrain erosion · Structural methods such as concrete, asphalt or retaining walls · Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

PORTABLE TOILETS

1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

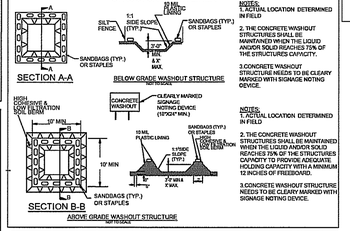
EARTHEN STOCKPILE MANAGEMENT

1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

HAZARDOUS AND TOXIC WASTE

1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



NOTES:
1. INITIAL LOCATION DETERMINED IN FIELD
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY.
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

NOTES:
1. INITIAL LOCATION DETERMINED IN FIELD
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

CONCRETE WASHOUTS

1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

NORTH CAROLINA *Environmental Quality*

EFFECTIVE DATE: 11/12/2020

NCG-01 GROUND COVER & MATERIALS HANDLING

Date:

Page:

PART II, SECTION G, ITEM (4)
DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

(a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,
(b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,
(c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems
(d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,
(e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
(f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING
SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend on holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those unattended days (this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "Zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours.	1. Identification of the measures inspected 2. Date and Time of the inspection 3. Name of the person performing the inspection 4. Indication of whether the measures were operating properly 5. Description of maintenance needs for the measure 6. Description, Evidence, and date of corrective actions taken
(3) Stormwater discharge outfalls(SDOs)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours.	1. Identification of the discharge outfalls inspected 2. Date and Time of the inspection 3. Name of the person performing the inspection 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration 5. Indication of visible sediment leaving the site 6. Description, Evidence, and date corrective actions taken
(4) Perimeter of Site	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours.	If visible sediment deposition is found outside site limits, then record of the following shall be made: 1) Actions taken to clean up or stabilize sediment that has left the site limits 2) Description, Evidence and date of corrective actions taken 3) An explanation as to the actions taken to control future releases
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours.	If the stream or wetland has increased visible sedimentation or has visible increased turbidity from the construction activity, then a record of the following shall be made: 1) Description, Evidence and date of corrective actions taken 2) Records of required reports to the appropriate Division Regional Office per Part III, Section C, Item(2)(a) of this permit
(6) Ground Stabilization Measures	After each phase of grading.	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING
SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be kept on site and available for inspection at all times during normal business hours.

Item to Document	Document Requirements
(a) Each E&SC measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC plan.	Initial and date each E&SC measure on a copy of the approved E&SC plan or complete, date and sign an inspection report that lists each E&SC measure shown on the approved E&SC plan. This documentation is required upon the initial installation of the E&SC measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC plan.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC measures.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation to be Kept on Site

In addition to the E&SC plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This General Permit as well as the Certificate of Coverage, after it is received.

(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING
SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.
(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.
(d) Anticipated bypasses and unanticipated bypasses.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

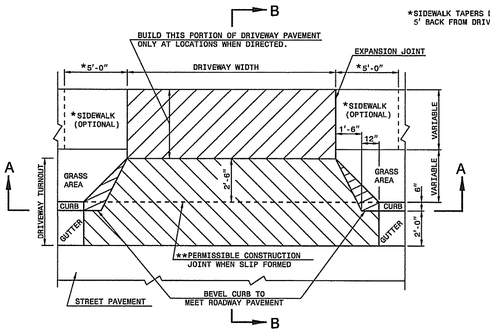
After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0368.

Occurrence	Reporting Timeframe (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• Within 24 hours, an oral or electronic notification. • Within 7 Calendar Days, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related caused, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per item 1(b)-(c) above	• Within 24 Hours, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• *A report at least ten days before the date of the bypass, if possible.* The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• Within 24 Hours, an oral or electronic notification • Within 7 calendar days, a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment [40 CFR 122.41(l)(7)]	• Within 24 Hours, an oral or electronic notification • Within 7 calendar days, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

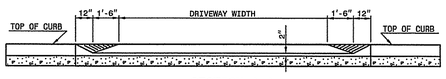
NORTH CAROLINA *Environmental Quality*

EFFECTIVE DATE: 11/12/2020

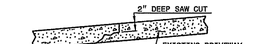
NCG-01 SELF INSPECTION



PLAN
DETAIL OF DRIVEWAY

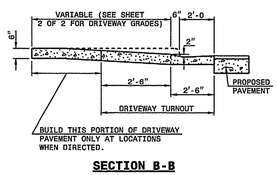


SECTION A-A



METHOD OF TIE IN

WHEN EXISTING DRIVEWAY PAVEMENT IS CONCRETE, SAW CUT 2" DEEP JOINT AT THE POINT OF TIE-IN. SAW JOINT PERPENDICULAR TO EDGE OF EXISTING DRIVEWAY PAVEMENT.



SECTION B-B

GENERAL NOTES:
**NO CONSTRUCTION JOINT WILL BE PERMITTED IF FORMS ARE USED TO CAST DRIVEWAY. SLIP FORMING OF CURB AND GUTTER PERMITS THE USE OF CONSTRUCTION JOINT.

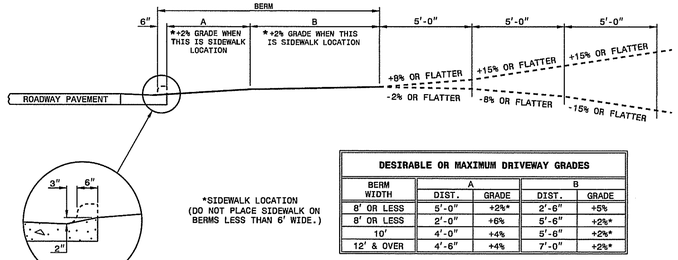
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

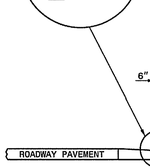
1-24

ROADWAY STANDARD DRAWING FOR
DRIVEWAY TURNOUT
DROP CURB TYPE

SHEET 1 OF 2
848.03

DESIRABLE DRIVEWAY GRADES





*SIDEWALK LOCATION (DO NOT PLACE SIDEWALK ON BERMS LESS THAN 6' WIDE.)

DESIRABLE OR MAXIMUM DRIVEWAY GRADES				
BERM WIDTH	A		B	
	DIST.	GRADE	DIST.	GRADE
8' OR LESS	5'-0"	+2%*	2'-6"	+5%
8' OR LESS	2'-0"	+6%	5'-6"	+2%*
10'	4'-0"	+4%	5'-6"	+2%*
12' & OVER	4'-6"	+4%	7'-0"	+2%*

MAXIMUM DRIVEWAY GRADES

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

ROADWAY STANDARD DRAWING FOR
DRIVEWAY TURNOUT
DRIVEWAY GRADES

SHEET 2 OF 2
848.03

ISSUED FOR BID

NOT FOR CONSTRUCTION

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MAY 22, 2024

REV. NO.	REVISIONS	DATE

DATE:

PROJECT NUMBER: *7DCEM2310*

PLANS PREPARED BY:

CITY OF WILMINGTON NORTH CAROLINA
Engineering
212 Operations Center Dr. • Wilmington, NC 28412 • (910) 341 - 7807

NORTH CAROLINA PROFESSIONAL SEAL 049509 ENGINEER ZACHARY P. ROMAN

Zack Roman P.E.
08/01/2024 DATE

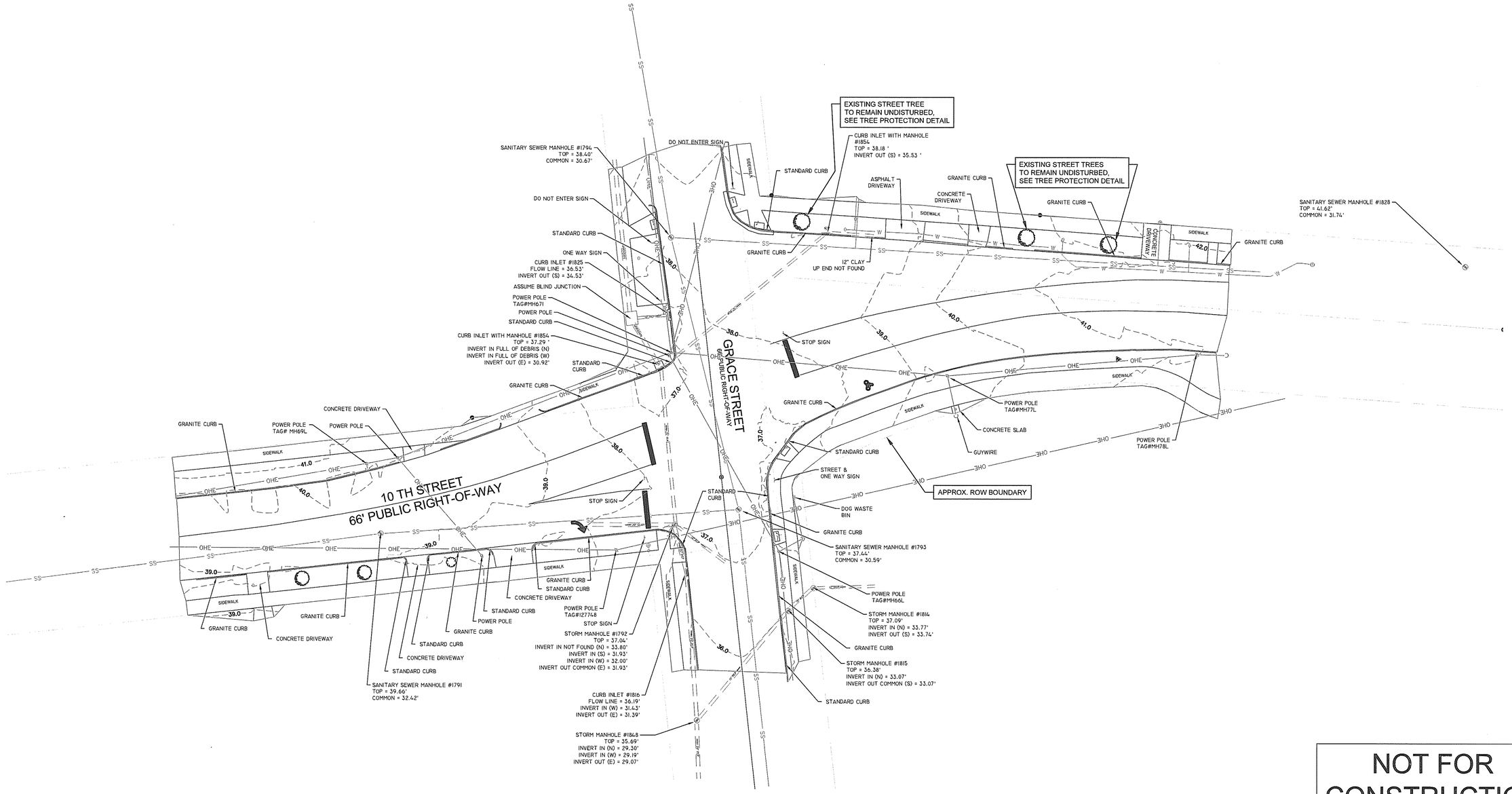
N 10TH STREET & GRACE STREET
INTERSECTION IMPROVEMENTS

NTS

CONSTRUCTION DETAILS & NCG-01 PERMIT NOTES

SHEET 06

ISSUED FOR BID



NOT FOR CONSTRUCTION

0 20 40 60

SCALE: 1" = 20'

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MAY 22, 2024

REV. NO.	REVISIONS	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 049509 ENGINEER ZACHARY P. ROMAN

Zack Roman P.E.

08/01/2024 DATE

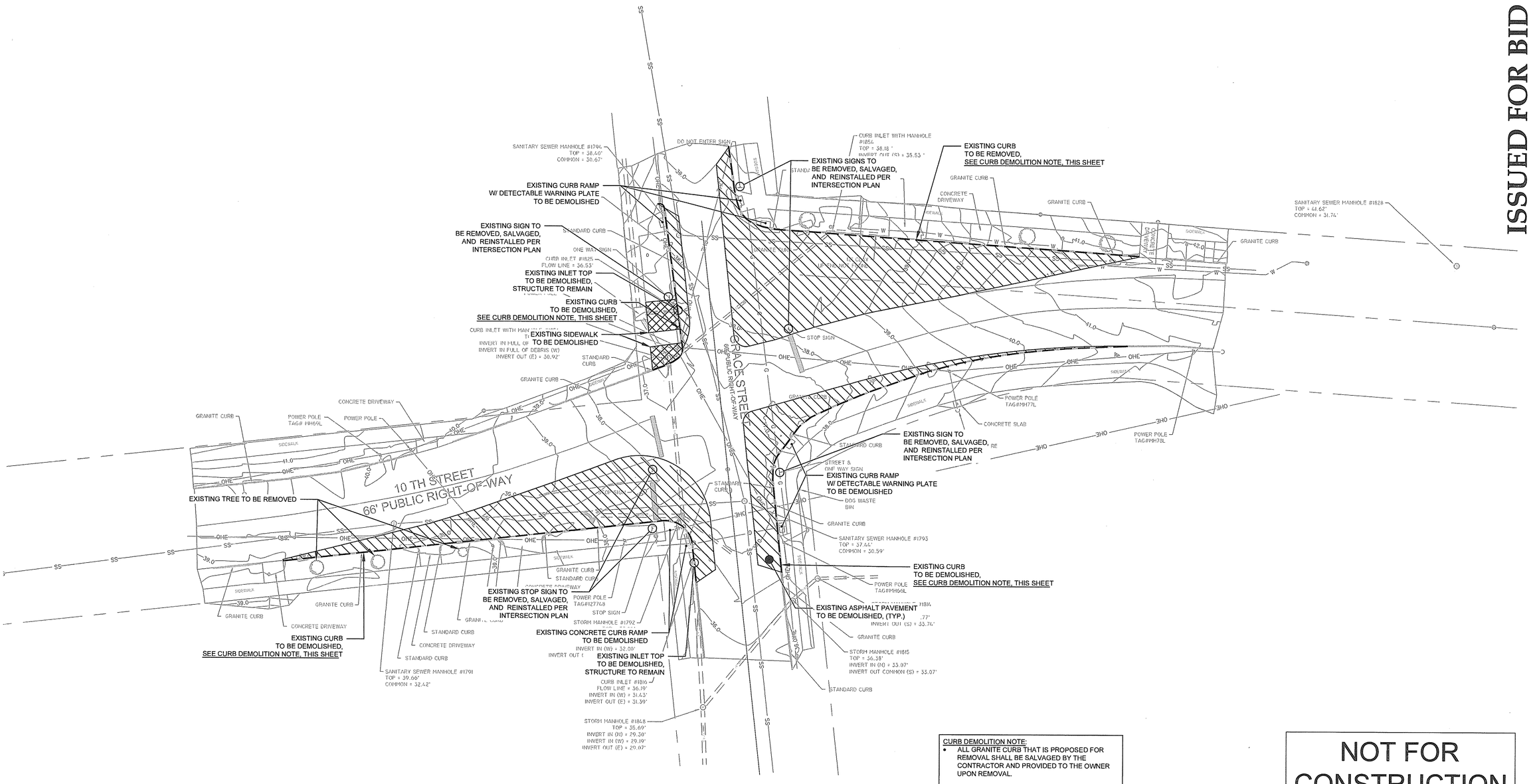
N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

EXISTING CONDITIONS PLAN

SCALE: 1"=20'

SHEET 07

ISSUED FOR BID



EXISTING ASPHALT TO BE DEMOLISHED

EXISTING SIDEWALK TO BE DEMOLISHED

CURB DEMOLITION NOTE:

- ALL GRANITE CURB THAT IS PROPOSED FOR REMOVAL SHALL BE SALVAGED BY THE CONTRACTOR AND PROVIDED TO THE OWNER UPON REMOVAL.
- OWNER SHALL BE RESPONSIBLE FOR REMOVING SALVAGED CURB OFF-SITE.
- NO GRANITE CURB SHALL BE DISPOSED OF AS PART OF THE PROJECT.
- ALL CONCRETE CURB PROPOSED FOR REMOVAL SHALL BE DEMOLISHED AND DISPOSED OF OFF-SITE.

NOT FOR CONSTRUCTION

0 20 40 60

SCALE: 1" = 20'

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Zack Roman P.E.

08/01/2024 DATE

N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

DEMOLITION PLAN

SCALE: 1"=20'

SHEET 08

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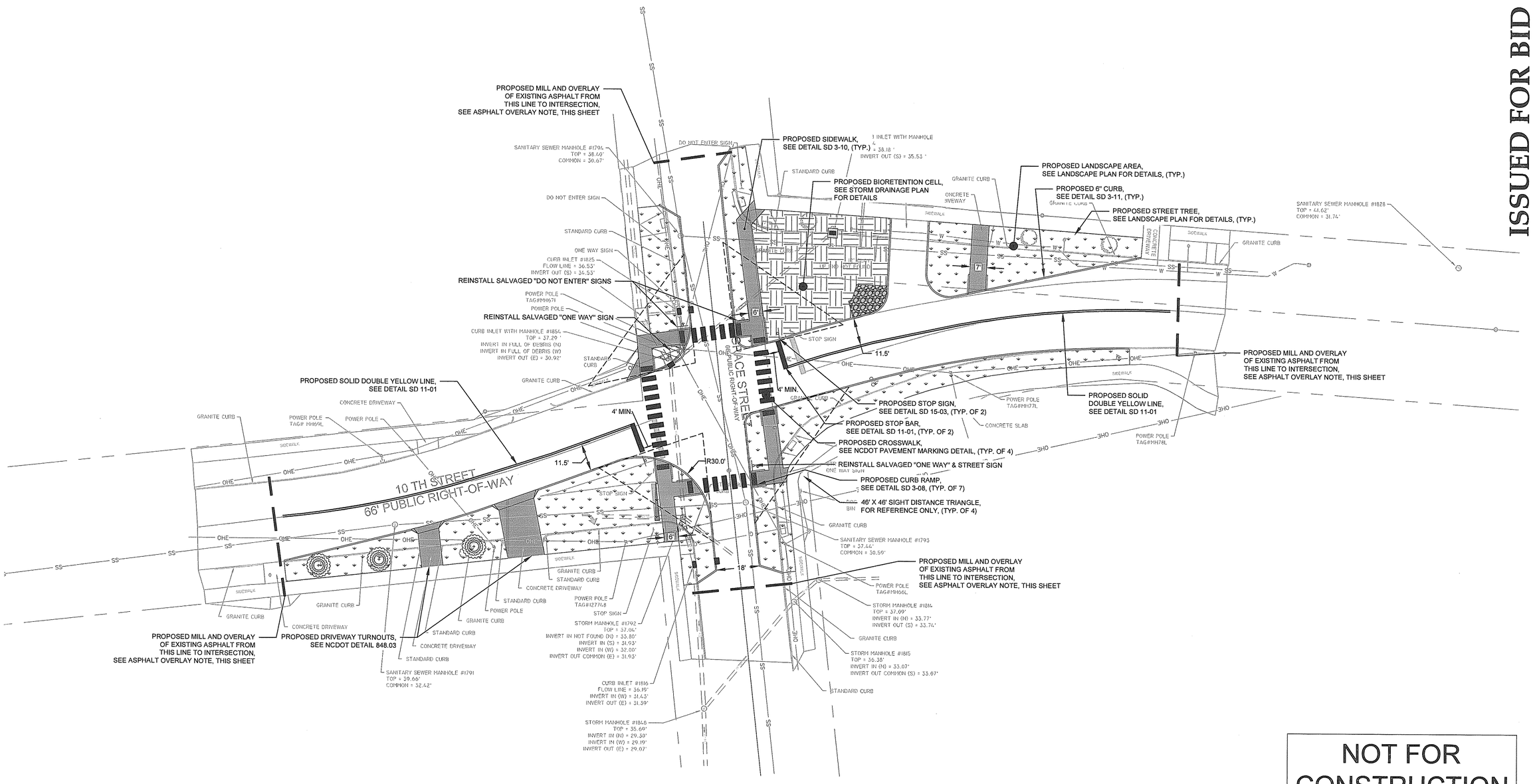
MAY 22, 2024

ISSUED FOR BID



ASPHALT OVERLAY NOTE:
- MATCH THICKNESS OF EXISTING ASPHALT (2" MIN.) SUPERPAVE SF9.5A (90% MIN.) OR S9.5B (92% MIN.) IN LIFTS
- CONTRACTOR SHALL CONDUCT EXTRA DEPTH MILLING AND ASPHALT WEDGING AS REQUIRED TO REACH GRADES SHOWN ON THE GRADING PLAN

NOT FOR CONSTRUCTION

0 20 40 60
SCALE: 1" = 20'

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DATE

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Zach Roman P.E.
08/01/2024 DATE

N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

INTERSECTION LAYOUT PLAN

SCALE: 1"=20'

SHEET 09

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MAY 22, 2024

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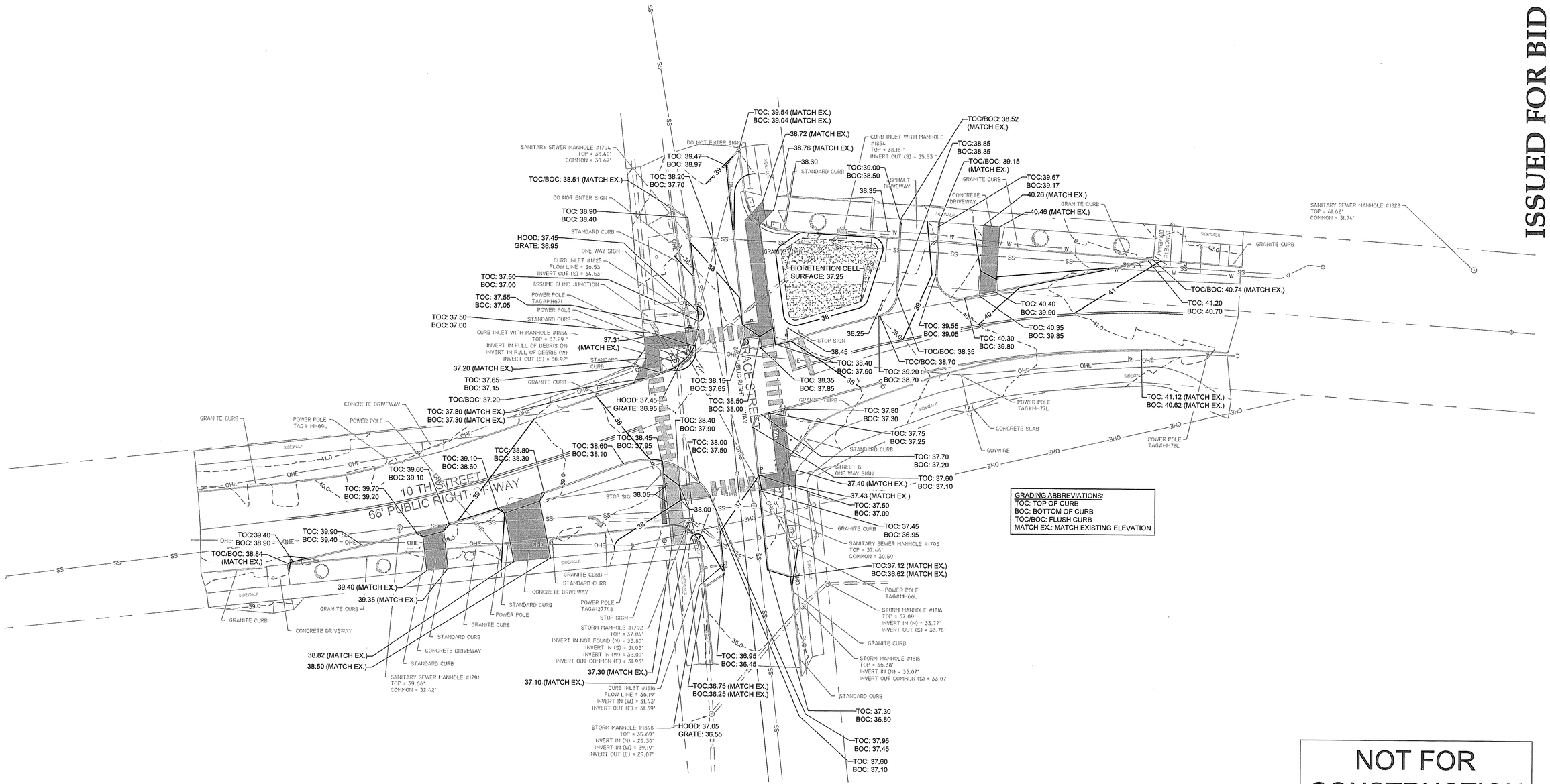

GRADING ABBREVIATIONS:
TOC: TOP OF CURB
BOC: BOTTOM OF CURB
TOC/BOC: FLUSH CURB
MATCH EX.: MATCH EXISTING ELEVATION

NOT FOR CONSTRUCTION

0 20 40 60
SCALE: 1" = 20'

MAY 22, 2024 N:\PROJECT FILES\STREET IMPROV-10TH AND GRACE\DESIGN\DRAWINGS\10TH & GRACE STREET IMPROV-DESIGN.DWG

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08/01/2024 DATE

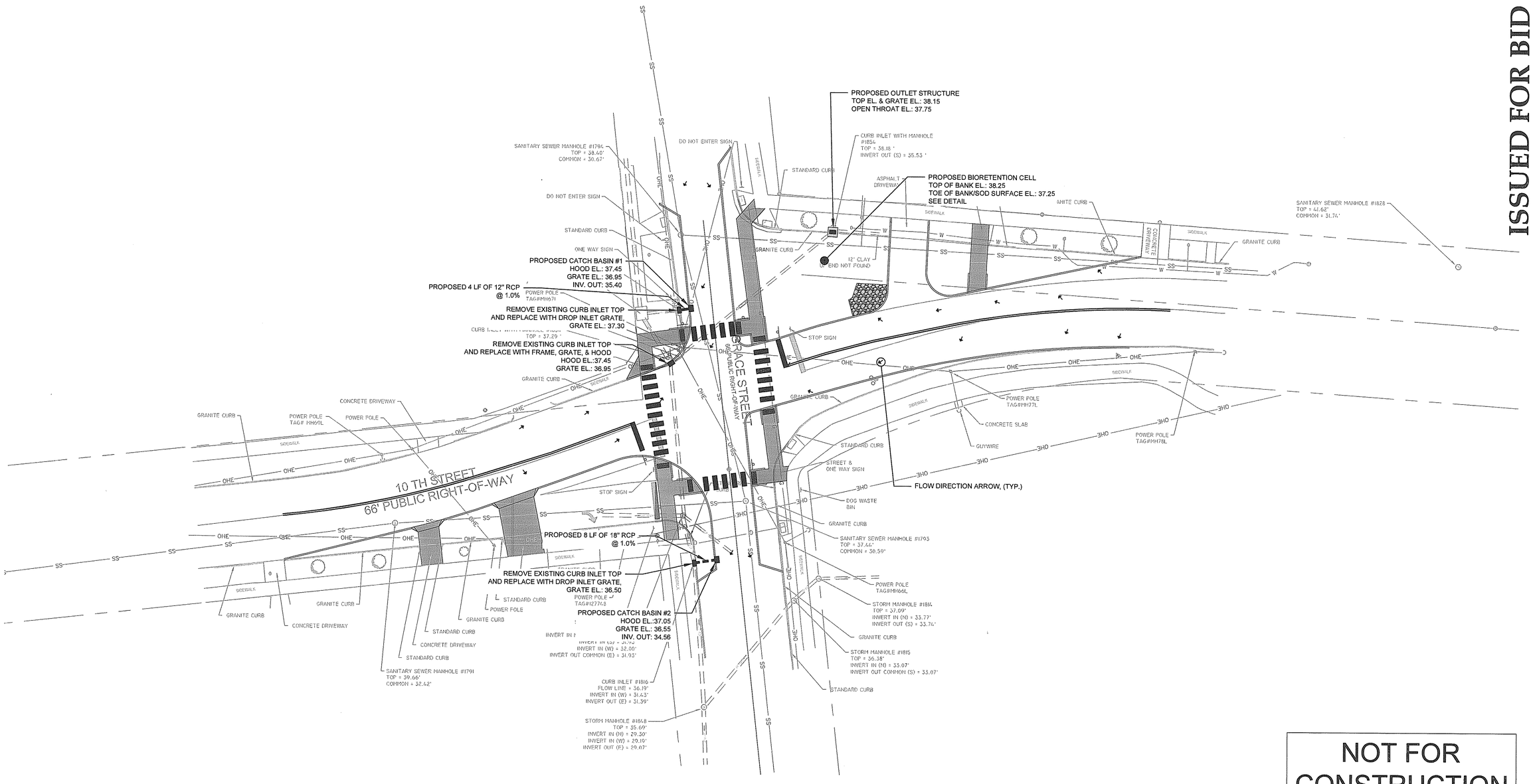
N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

GRADING PLAN

SCALE: 1"=20'

SHEET 10

ISSUED FOR BID



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SCALE: 1" = 20'

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N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

STORMWATER DRAINAGE PLAN

SCALE: 1"=20'

SHEET 11

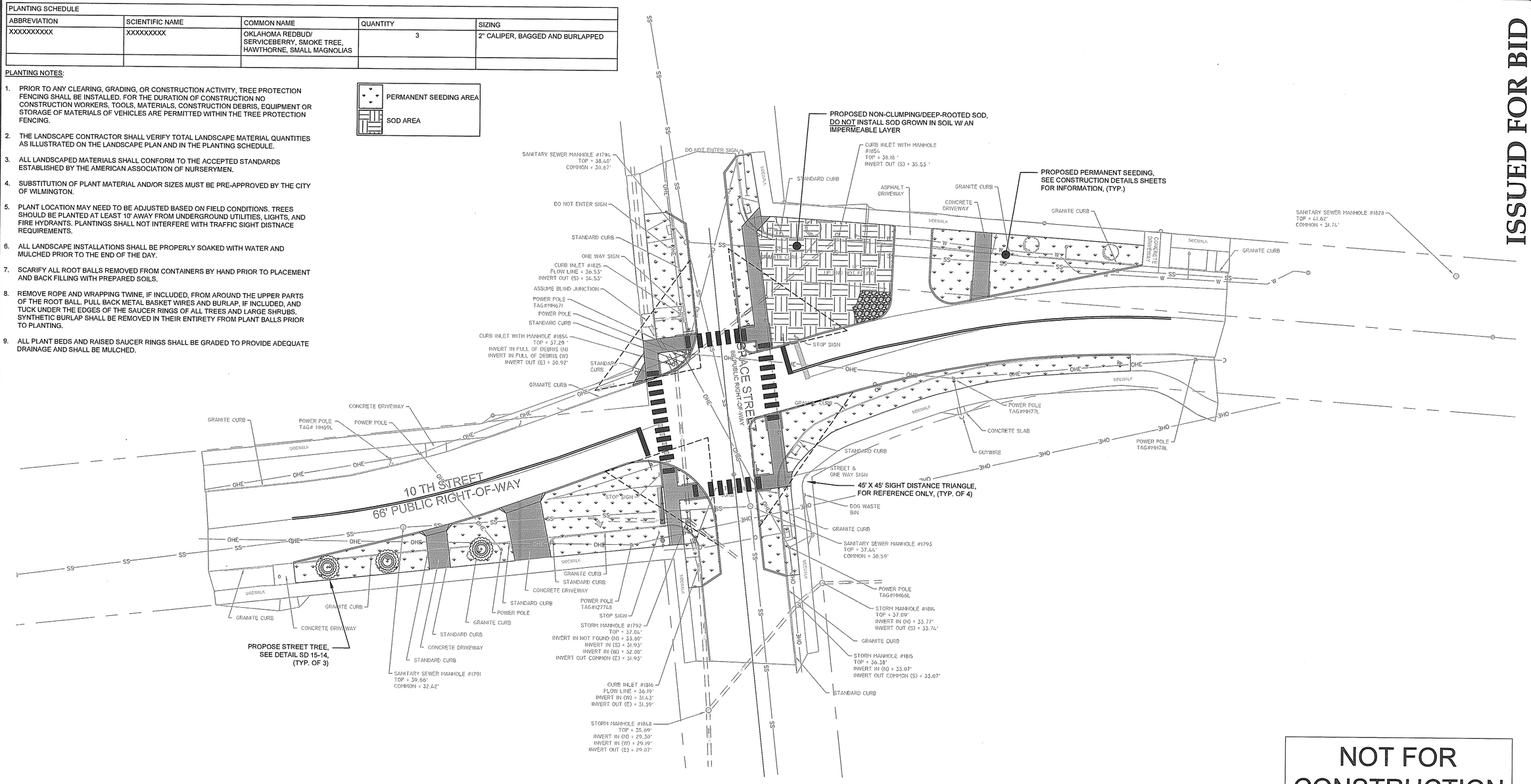
PLANTING SCHEDULE				
ABBREVIATION	SCIENTIFIC NAME	COMMON NAME	QUANTITY	SIZING
XXXXXXXXXX	XXXXXXXXX	OKLAHOMA REDBUD/ SERVICEBERRY, SMOKE TREE, HAWTHORNE, SMALL MAGNOLIAS	3	2" CALIPER, BAGGED AND BURLAPPED

PLANTING NOTES:

1. PRIOR TO ANY CLEARING, GRADING, OR CONSTRUCTION ACTIVITY, TREE PROTECTION FENCING SHALL BE INSTALLED. FOR THE DURATION OF CONSTRUCTION NO CONSTRUCTION WORKERS, TOOLS, MATERIALS, CONSTRUCTION DEBRIS, EQUIPMENT OR STORAGE OF MATERIALS OF VEHICLES ARE PERMITTED WITHIN THE TREE PROTECTION FENCING.
2. THE LANDSCAPE CONTRACTOR SHALL VERIFY TOTAL LANDSCAPE MATERIAL QUANTITIES AS ILLUSTRATED ON THE LANDSCAPE PLAN AND IN THE PLANTING SCHEDULE.
3. ALL LANDSCAPED MATERIALS SHALL CONFORM TO THE ACCEPTED STANDARDS ESTABLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. SUBSTITUTION OF PLANT MATERIAL AND/OR SIZES MUST BE PRE-APPROVED BY THE CITY OF WILMINGTON.
5. PLANT LOCATION MAY NEED TO BE ADJUSTED BASED ON FIELD CONDITIONS. TREES SHOULD BE PLANTED AT LEAST 10' AWAY FROM UNDERGROUND UTILITIES, LIGHTS, AND FIRE HYDRANTS. PLANTINGS SHALL NOT INTERFERE WITH TRAFFIC SIGHT DISTNACE REQUIREMENTS.
6. ALL LANDSCAPE INSTALLATIONS SHALL BE PROPERLY SOAKED WITH WATER AND MULCHED PRIOR TO THE END OF THE DAY.
7. SCARIFY ALL ROOT BALLS REMOVED FROM CONTAINERS BY HAND PRIOR TO PLACEMENT AND BACK FILLING WITH PREPARED SOILS.
8. REMOVE ROPE AND WRAPPING TWINE, IF INCLUDED, FROM AROUND THE UPPER PARTS OF THE ROOT BALL. PULL BACK METAL BASKET WIRES AND BURLAP, IF INCLUDED, AND TUCK UNDER THE EDGES OF THE SAUCER RINGS OF ALL TREES AND LARGE SHRUBS. SYNTHETIC BURLAP SHALL BE REMOVED IN THEIR ENTIRETY FROM PLANT BALLS PRIOR TO PLANTING.
9. ALL PLANT BEDS AND RAISED SAUCER RINGS SHALL BE GRADED TO PROVIDE ADEQUATE DRAINAGE AND SHALL BE MULCHED.

PERMANENT SEEDING AREA

SOD AREA



NOT FOR CONSTRUCTION

0 20 40 60

SCALE: 1" = 20'

ISSUED FOR BID

REV. NO.	REVISIONS	DATE

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PROJECT NUMBER 7DCEM2310

PLANS PREPARED BY:

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Engineering
212 Operations Center Dr. • Wilmington, NC 28412 • (910) 341 - 7807

NORTH CAROLINA PROFESSIONAL SEAL 049509 ENGINEER ZACHARY P. ROMAN

Zach Roma P.E.
08/01/2024 DATE

N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

LANDSCAPE PLAN

SCALE: 1"=20'

SHEET 12

MAY 22, 2024 N:\PROJECT FILES\STREET IMPROV-10TH AND GRACE\DESIGN\DRAWINGS\10TH & GRACE STREET IMPROV-DESIGN.DWG

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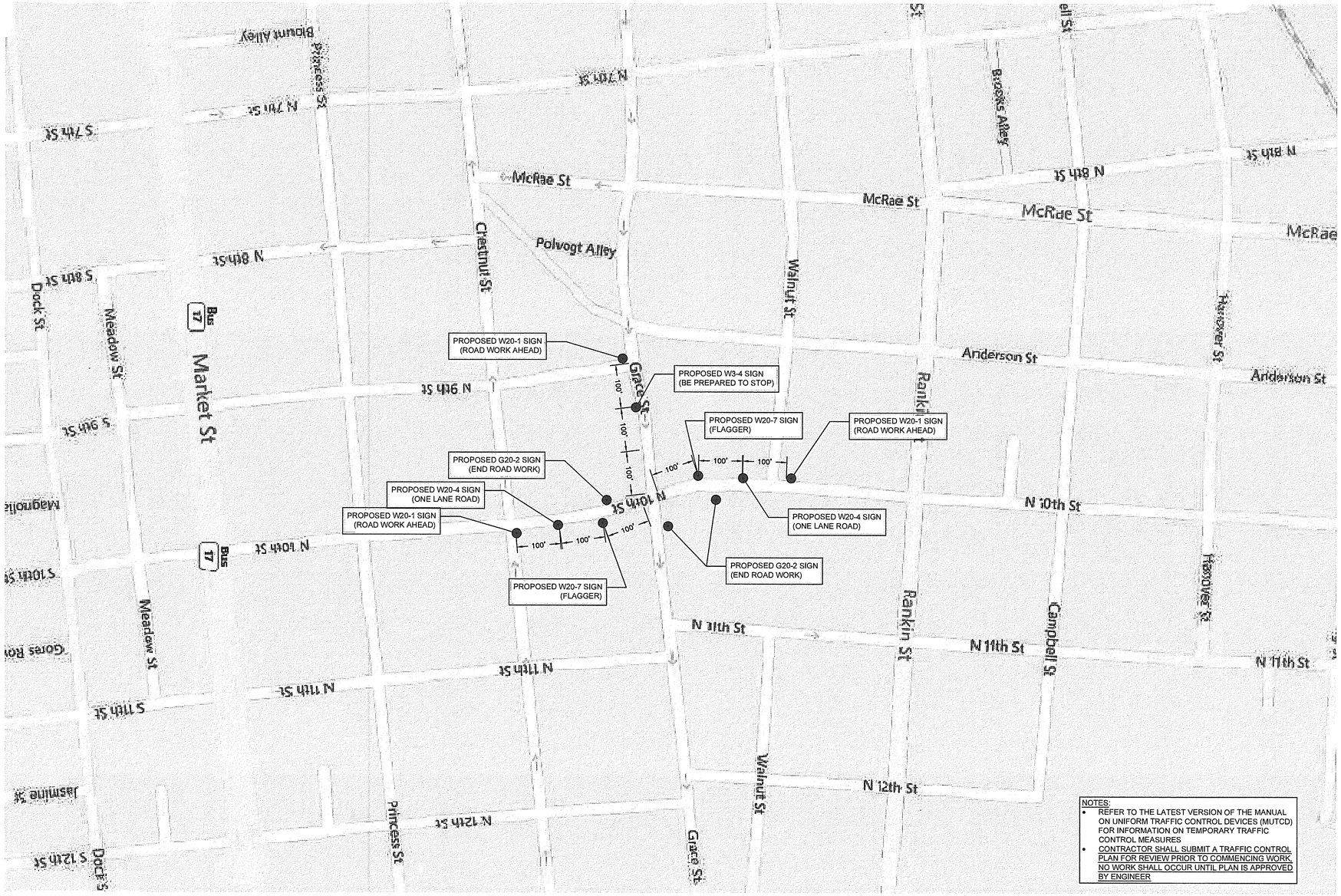

NOTES:
- REFER TO THE LATEST VERSION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR INFORMATION ON TEMPORARY TRAFFIC CONTROL MEASURES
- CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN FOR REVIEW PRIOR TO COMMENCING WORK. NO WORK SHALL OCCUR UNTIL PLAN IS APPROVED BY ENGINEER

NOT FOR CONSTRUCTION

0 150 300 450
SCALE: 1" = 150'

REV. NO.	REVISIONS	DATE

DATE

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 049509 ZACHARY P. ROMAN

P.E.
08/01/2024
DATE

N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

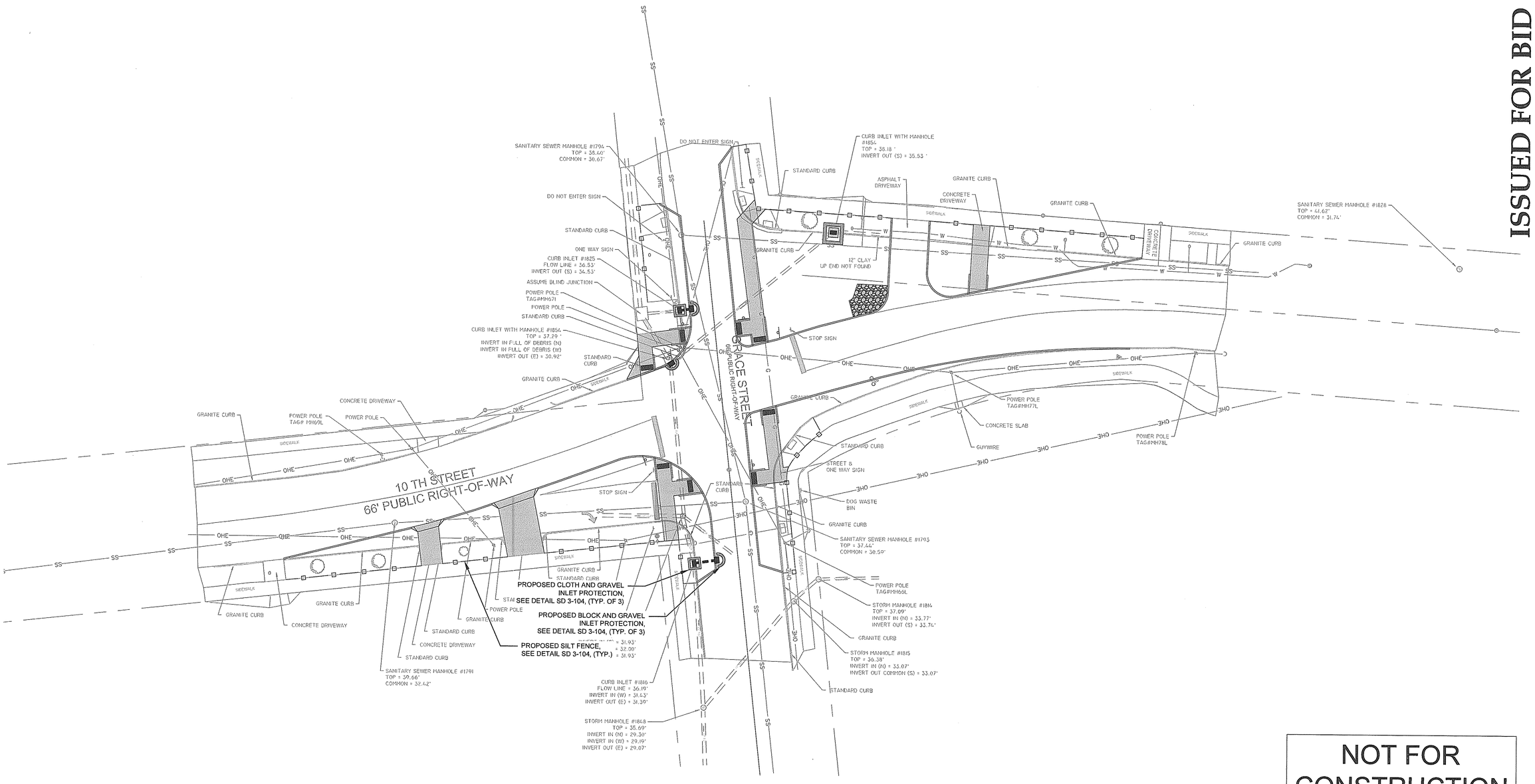
TRAFFIC CONTROL PLAN - FOR REFERENCE ONLY

SCALE: 1"=150'

SHEET 13

MAY 22, 2024 N:\PROJECT FILES\STREET IMPROV-10TH AND GRACE\DESIGN\DRAWINGS\10TH & GRACE STREET IMPROV-DESIGN.DWG

ISSUED FOR BID



NOT FOR CONSTRUCTION

NOTE:
SEE NCG01 NOTES IN CONSTRUCTION DETAILS SHEETS FOR MANDATORY CONDITIONS FOR LAND DISTURBANCE ACTIVITY

0 20 40 60
SCALE: 1" = 20'

REV. NO.	REVISIONS	DATE

DATE

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Zach Roman P.E.
08/01/2024 DATE

N 10TH STREET & GRACE STREET INTERSECTION IMPROVEMENTS

EROSION CONTROL PLAN

SCALE: 1"=20'

SHEET 14

MAY 22, 2024

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