

**CITY OF GRAHAM
REGULAR SESSION AGENDA
TUESDAY, DECEMBER 5, 2017
7:00 P.M.**

Meeting called to order by the Mayor
Invocation and Pledge of Allegiance

1. Honorary Resolution:

- Martha Johnson – Resolution of Commendation and Appreciation for 11 years 9 months service to the City of Graham

2. Old Business:

- a. Approval of Minutes – November 7, 2017 Regular Session

3. Acceptance of Certificate the Abstract of Canvassing from the Alamance County Board of Elections

4. Organizational Meeting of Council:

- a. Administer Oath of Office to Re-Elected Mayor Jerry Peterman
- b. Administer Oath of Office to Re-Elected City Council Member Chip Turner
- c. Administer Oath of Office to Newly Elected City Council Member Melody Wiggins
- d. Selection of Mayor Pro Tem
- e. Establish Regular Session Monthly Meeting Date and Time
- f. Discuss Council Member Appointments to Boards and Commissions

5. Consent Agenda:

- a. Tax Releases
- b. Approval of the Graham Historic Museum Advisory Board Enabling Ordinance
- c. Award contract for Whitsett Street and Staley Street Water and Sewer Improvements to Thomas Stanley Grading & Hauling Inc. and authorize the Mayor, City Manager, City Attorney and City Clerk to execute the contract on behalf of the City, subject to easement acquisitions and permit approvals
- d. Appoint Anne Maynard to the Graham Sports Hall of Fame Committee with term to expire June 30, 2023

6. Requests & Petitions from Citizens:

- a. Temporary Encroachment request by Jason Cox

7. Volunteer Fireman Call Compensation

8. Issues Not on Tonight's Agenda

**RESOLUTION OF COMMENDATION AND APPRECIATION TO
MARTHA JOHNSON**

FOR HER SERVICE TO THE CITY OF GRAHAM

WHEREAS, Martha Johnson diligently served the City of Graham Water Billing Department and Planning & Inspections Department from February 2, 2006 until November 30, 2017; and

WHEREAS, Martha retired as a Zoning and Inspection Technician at the City of Graham Planning & Inspections Department on November 30, 2017 with over 11 years of service; and

WHEREAS, her wisdom, care and dedication has commanded the utmost respect from her colleagues and employees; and

WHEREAS, it is the desire of the City Council to extend their deepest appreciation to Martha for the excellent time and service she has afforded the citizens of Graham and her fellow employees.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF GRAHAM THAT: Martha be commended for her outstanding public service to the City of Graham.

BE IT FURTHER RESOLVED THAT: an expression of appreciation be extended to Mrs. Martha Johnson in the form of this Resolution of Commendation and Appreciation, and that this Resolution become a part of the official records of the City of Graham for all of time, and the original thereof be presented to her in person.

This the 5th day of December 2017.

Jerry Peterman, Mayor
City of Graham

**CITY OF GRAHAM
REGULAR SESSION
TUESDAY, NOVEMBER 7, 2017
7:00 P.M.**

The City Council of the City of Graham met in regular session at 7:00 p.m. on Tuesday, November 7, 2017, in the Council Chambers of the Municipal Building located at 201 South Main Street.

Council Members Present:

Mayor Jerry Peterman
Mayor Pro Tem Jimmy Linens
Council Member Griffin McClure
Council Member Chip Turner
Council Member Lee Kimrey

Also Present:

Frankie Maness, City Manager
Aaron Holland, Assistant City Manager
Darcy Sperry, City Clerk
Keith Whited, City Attorney
Nathan Page, Planning Director
Alexa Powell, City Planner
Brian Faucette, Recreation & Parks Director

Mayor Jerry Peterman called the meeting to order and presided at 7:00 p.m. Mayor Pro Tem Jimmy Linens gave the invocation and everyone stood to recite the Pledge of Allegiance.

Consent Agenda:

- a. Approval of Minutes – October 3, 2017 Regular Session*
- b. Tax Releases & Refunds*

CITY OF GRAHAM RELEASE ACCOUNTS				
NOVEMBER COUNCIL MEETING				
<u>ACCT #</u>	<u>YEAR</u>	<u>NAME</u>	<u>REASON FOR RELEASE</u>	<u>AMOUNT RELEASED</u>
142329	2014-2017	STRIGO PLUMBING INC	PROPERTY SOLD AT BK AUCTION JAN 2014	526.11
68156	2009-2015	JOHN A SOMERS	MOVED TO BURLINGTON	174.29
507650	2017	SAMUEL CRAIG ANDREWS	DID NOT OWN BOAT JAN 2017	6.17
54063	2017	IRMA COLLINS	QUALIFIED FOR HOMESTEAD EXEMPTION	6.61
154642	2017	NELLIE RUTH WHITE	QUALIFIED FOR HOMESTEAD EXEMPTION	74.01
660253	2017	MARGARET ALLISON L/E	QUALIFIED FOR HOMESTEAD EXEMPTION	165.69

**CITY OF GRAHAM
REFUNDS**

NOVEMBER COUNCIL MEETING

<u>ACCT #</u>	<u>YEAR</u>	<u>NAME</u>	<u>REASON FOR REFUND</u>	<u>AMOUNT REFUNDED</u>
659452	2017	WIZARD INTERNATIONAL INC	LEASED EQUIPMENT NOT IN CITY	11.62
659452	2016	WIZARD INTERNATIONAL INC	LEASED EQUIPMENT NOT IN CITY	12.92

c. Report of Non-Substantial Changes to the Development Ordinance

d. Request by Alamance County to close the 200 Block of West Elm Street on December 8, 2017 from 2:30pm-4:30pm

Council Member Chip Turner made a motion to approve the Consent Agenda, seconded by Council Member Griffin McClure. All voted in favor of the motion.

Recommendations from Planning Board:

a. Public Hearing: AM1708 Overlay Access. Request from the Planning Board to address cross-access agreements for commercial development within the Overlay Districts

Planning Director Nathan Page explained that this is an amendment to both the Highway 54 and Highway 87 Overlay districts. He added that the intention of this amendment is to change the language to require internal connections between driveways within commercial development. Mr. Page stated that this proposed change will help alleviate traffic congestion and make for safer travel along the Overlay districts.

Following a brief discussion between Council Members and Staff regarding traffic congestion along these thoroughfares, Mayor Peterman opened the Public Hearing. With no comments forthcoming, he closed the Public Hearing.

Council Member Lee Kimrey made a motion that the text amendment be approved, the text amendment is consistent with the The Graham 2035 Comprehensive Plan and this action is reasonable and in the public interest for the following reason: It will help alleviate traffic congestion. Council Member Turner seconded the motion and all voted in favor of the motion.

Creative Give Back Program Presentation by Creative Economic Development Consulting:

Mr. Page explained that Graham was selected as the 2017 Creative Give Back winner by the Creative Economic Development Consulting firm. He added that this award is a way for this consulting group to give back to the field of economic development. Mr. Page introduced Ms. Crystal Morphis and Ms. Penny Whiteheart from Creative Economic Development Consulting.

Ms. Whiteheart presented Council with an overview of their program, the research they conducted and how it affects the City of Graham. She spoke of ways to spur downtown revitalization and entrepreneurship.

Ms. Whiteheart stated that during her firm's research, several businesses were interviewed and surveys conducted. Based on their results, the firm concluded that there is approximately \$150,000,000 being spent outside the City of Graham. She encouraged Council to continue to find ways to bring people to Graham and continue to be a "good partner".

Council Members thanked Creative Economic Development Consulting for selecting Graham and identifying ways for the City to continue to build economic growth in our downtown area. Mayor Peterman thanked Mr. Page for all of his hard work and asked City Manager Frankie Maness to put a "well done" letter in Mr. Page's employment file. In addition, Mayor Peterman asked Staff to draft a thank you letter and send it to the Co/Operative Extension in Graham for their effort in helping Graham secure this award.

Pine Street Bike Lanes:

a. First Reading: An Ordinance Of The City Council Of The City Of Graham, Amending Chapter 20, Article V, Sec. 20-142 Of The Code Of Ordinances Of The City Of Graham, North Carolina

Mr. Maness reminded Council that in May of 2017, the City Council authorized Staff to apply for funding assistance from Impact Alamance to establish bike lanes. He stated that Pine Street was identified for placement of bike lanes based on City owned right of ways and it's connectivity between neighborhoods and the downtown area. Mr. Maness advised that the final design of the bicycle lanes is complete but that clarification is now needed for parking within these lanes during a funeral.

Council Members and Staff discussed frequency of funerals at Linwood Cemetery, bike lane placement on the street and the effect bike lanes will have on traffic speed and home owners along Pine Street. Council Member Turner expressed some concern that lawn service providers and delivery trucks won't be able to park along Pine Street any longer. Staff advised that there are multiple side streets that can be used for parking of equipment and vehicles that might not fit into a driveway.

Ms. Jan Searls of 526 East Pine Street Graham stepped forward to address Council. She stated that she was under the impression that the bike lanes would only be on one side of the street, allowing for bikes to travel each way. Staff advised that the bike lanes will be placed on both sides of the street.

Ms. Marcy Green, program director at Impact Alamance thanked Mr. Page and Recreation and Parks Director Brian Faucette for their help with this grant. She encouraged Council to approve this proposed Ordinance amendment. Mayor Peterman thanked Ms. Green and asked her to thank Impact Alamance for selecting us.

Ms. Searls addressed Council again and asked for additional street lights if bike lanes are going to be placed on both sides of the street. Mayor Peterman agreed that more lights are needed.

Mr. Chap McQueen of 1002 East Willowbrook Drive Burlington sees this as a huge opportunity for Graham. Mr. McQueen advised that he is on the Board of Trustees for Impact Alamance and a former resident of Graham. He explained that Impact Alamance is all about children's health, education and welfare and sees this as a great way for children to get out and exercise in a safe manner.

Ms. Chelsea Dickey of 200 North Main Street Graham stepped forward on behalf of Co/Operative. She stated that they continue to see an increase in the number of bicycles in our downtown area and encouraged Council to approve this Ordinance amendment.

Council Member McClure indicated that he is a big proponent of the plan, stating millennials are looking for untraditional paths of travel. He stated he wished that Staff had been in better communication with property owners whose street frontage will be affected by these bike lanes.

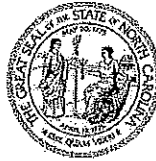
Mayor Peterman made a motion to approve Amending Chapter 20, Article V, Sec. 20-142 of the Code of Ordinances of the City Of Graham, seconded by Council Member McClure. All voted in favor of the motion.

Issues Not Included on Tonight's Agenda:

Mayor Pro Tem Linens mentioned a vehicle accident that recently occurred on Rogers Road and Lacy Holt Road. He asked Staff last month to reach out to NCDOT about the dangers this intersection poses, which Mr. Maness has done.

At 8:06 p.m. Council Member Turner made a motion to adjourn, seconded by Council Member Kimrey. All voted in favor of the motion.

Darcy Sperry, City Clerk



2017 MUNICIPAL ELECTION
11/07/2017
ABSTRACT OF VOTES
FOR
ALAMANCE COUNTY, NORTH CAROLINA

INSTRUCTIONS

The county board shall prepare abstracts of all the ballot items in triplicate originals. The county board shall retain one of the triplicate originals, and shall distribute one each to the city or town clerk for the municipality and the State Board of Elections. The State Board of Elections shall forward the original abstract it receives to the Secretary of State. (GS § 163-182.6)

**STATE OF NORTH CAROLINA
COUNTY OF ALAMANCE**

The County Board of Elections for said county, having opened, canvassed, and judicially determined the original returns of the election in the precincts in this county, held as above stated, do hereby certify that the above is a true abstract thereof, and contains the number of legal ballots cast in each precinct for each office or referendum named, the name of each person or choice voted for, their party affiliation (where applicable), and the number of votes cast for each person or choice for the item named.

This is the 17th day of November, 2017.

Douglas P. Fincannon
Chairman

Frenda A. Stout
Secretary

[Signature]
Member

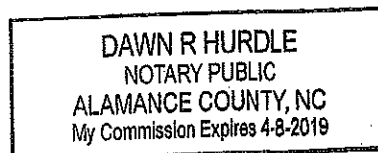
This day personally appeared before me, Douglas P. Fincannon, Chairman of the County Board of Elections, who being duly sworn, says the abstract of votes herein contained is true and correct, according to the returns made to said Board.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my notarial seal this the 17th day of November, 2017.

Dawn R. Hurdle
Official Signature of Notary Public

Dawn R. Hurdle
Printed/Typed Name of Notary Public

My Commission Expires: 4-8-2019



(Seal)

November 07, 2017 Municipal Election Results by Contest

Contest	Choice	Party	Total Votes	Election Day	One Stop	Abs Mail	Provisional
VILLAGE OF ALAMANCE MAYOR	Don Tichy		35	35	0	0	0
VILLAGE OF ALAMANCE ALDERMAN	Gayle Andrews		31	31	0	0	0
	Mike Baldwin		27	27	0	0	0
	Naydine Sharpe		32	32	0	0	0
CITY OF BURLINGTON MAYOR	Ian Baltutis		2,739	2,365	337	32	5
	Celo Faucette		2,192	1,944	228	11	9
CITY OF BURLINGTON COUNCIL	Jim Butler		2,193	1,954	218	14	7
	Patrick Mills		1,860	1,613	220	26	1
	Harold Owen		2,874	2,534	312	18	10
	John Thorpe		1,981	1,704	247	23	7
TOWN OF ELON MAYOR	Jerry Tolley		525	494	19	9	3
TOWN OF ELON ALDERMAN	Jim Chanas		230	215	11	4	0
	Davis Montgomery		364	343	14	6	1
	Emily Sharpe		488	460	20	5	3
TOWN OF GIBSONVILLE ALDERMAN	Jennifer Dean		45	45	0	0	0
	Shannon O'Toole		136	118	18	0	0
	Ken Pleasants		99	92	7	0	0
	Veronica Leath Revels		74	68	6	0	0
	Paul Thompson		72	62	10	0	0
CITY OF GRAHAM MAYOR	Jerry Peterman		729	468	257	3	1
	Jim Young		165	128	37	0	0
CITY OF GRAHAM COUNCIL	Larry E. Brooks		444	292	150	2	0
	Steven W. Sumner		243	168	73	2	0
	Chip Turner		494	324	166	3	1
	Melody L. Wiggins		474	325	147	1	1
TOWN OF GREEN LEVEL COUNCIL	Carissa A. Graves-Henry		108	106	2	0	0
	Michael Trollinger (Write-In)		92	91	1	0	0
	Tyra Francis (Write-In)		25	23	2	0	0
	William Larnee Haith		20	17	3	0	0
	Elgin Williams		41	36	5	0	0
TOWN OF HAW RIVER COUNCIL	Ashley Warren (Write-In)		9	9	0	0	0
	Kelly Allen		80	78	2	0	0
	Barbara Boggs (Write-In)		2	2	0	0	0
	Jeff Fogleman		56	53	3	0	0

Memorandum

To: Graham City Council
cc: Frankie Maness
From: Darcy Sperry
Date: 12/5/2017
Re: Board Appointments



Below is the current listing of City Council Member appointments to various Boards and Commissions. The organizational meeting is an opportunity to discuss and/or make any changes to these appointments.

<u>Board</u>	<u>Name</u>	<u>Term Expiration Date</u>
Alamance County Community Services Agency	Mayor Jerry Peterman	City Council Term
Alamance County Economic Development Committee	Mayor Jerry Peterman	City Council Term
Appearance Commission	Council Member Griffin McClure	City Council Term
Audit Committee	Mayor Jerry Peterman	City Council Term
Cemetery Advisory Committee	Council Member Chip Turner	City Council Term
Fireman Pension Fund	Mayor Jerry Peterman	City Council Term
Graham Historical Museum	Mayor Jerry Peterman	City Council Term
Historic Resources Commission	Mayor Pro Tem Jimmy Linens	City Council Term
Piedmont Triad Regional Council	Council Member Chip Turner	City Council Term
Piedmont Triad Regional Council, Alternate	Council Member Lee Kimrey	City Council Term
Recreation Commission	Mayor Pro Tem Jimmy Linens	City Council Term
TAC	Council Member Lee Kimrey	City Council Term
TAC, Alternate	Council Member Griffin McClure	City Council Term

**CITY OF GRAHAM
RELEASE ACCOUNTS**

DECEMBER COUNCIL MEETING

<u>ACCT #</u>	<u>YEAR</u>	<u>NAME</u>	<u>REASON FOR RELEASE</u>	<u>AMOUNT RELEASED</u>
505485	2011-2015	BASTYS, RYAN LEE	BOAT NOT LOCATED IN THE CITY OF GRAHAM	103.25
524049	2017	MOORE, RICKY MCCLELLAN	VEHICLE NOW TAGGED	20.48
644599	2017	MARTIN, EMMETT WESLEY	DID NOT OWN JAN 2017	5.01
656053	2017	PUMPKIN HILL MILL LLC	HISTORIC EXEMPTION APPLIED	8,088.70

TOTAL RELEASES ***8217.44***



ENABLING RESOLUTION

Graham Historic Museum Advisory Board

(Draft)

ARTICLE I: PURPOSE

The purpose of the Graham Historical Museum Advisory Board is to serve as advisors to the City Council as it relates to the operation of the City's historical museum and artifacts housed therein.

The mission of the Graham Historical Museum Advisory Board is to:

- Create an environment that displays artifacts in a well-organized and visually appealing setting.
- Catalog items stored and displayed in the Graham Historical Museum.
- Maintain records by serving as administrator for current gifts and contributions of artifacts relevant to Graham's history.
- Serve as responsible stewards and representatives of the Graham History Museum.
- Encourage community involvement by promoting the museum through educational programs, special events, and partnerships with local businesses, civic organizations and municipal government.

ARTICLE II: APPOINTMENT

The City Council will appoint seven (7) members to serve three (3)-year staggered terms. Members shall maintain permanent residence within the City of Graham or its territorial jurisdiction. Members may be appointed to successive terms without limitation. A member shall be automatically removed for failure to attend two (2) consecutive regular meetings of the Board without prior excuse granted from the Board.

ARTICLE III: MEETINGS

The Graham Historical Museum Board shall hold regularly scheduled meetings on a day and time agreed upon by a majority of the members.

ARTICLE V: VOTING

A majority of the members shall constitute a quorum and the concurring vote of at least a majority of those members present shall be required before any recommendation is made on any matter considered.

ARTICLE VI: OFFICERS

The Historical Museum Board shall elect a Chair, Vice-Chair, and Secretary by a majority vote of Board members present.

Officers may succeed themselves for an indefinite period based on approval and subsequent voting by the Museum Board provided they continue to meet all criteria of membership.

An officer can be removed from his/her position by a membership vote that is two-thirds of quorum. Advance notice of the motion to remove an officer must be given to the officer seven (7) days prior to the meeting at which the vote on the motion will take place.

Revised: November 8, 2017



STAFF REPORT

SUBJECT:	AWARD CONTRACT FOR WHITSETT STREET AND STALEY STREET WATER AND SEWER IMPROVEMENTS
PREPARED BY:	FRANKIE MANESS, CITY MANAGER

REQUESTED ACTION:

Award contract for Whitsett Street and Staley Street Water and Sewer Improvements to the lowest responsive bidder.

BACKGROUND/SUMMARY:

The City has long recognized the need to upgrade and replace the water and sewer lines along E. Whitsett and Staley Street due to age and insufficiency in design. In fact, the project was identified as an improvement in the City's Capital Improvement Plan for FY 2007-2008. Some of the lines in the area are believed to be inherited from local industry, where lines were installed on private property and have remained the only source of service for some of the properties.

The project includes the installation of approximately 550 LF of 8" DIP sanitary sewer line and 315 LF of 6" DIP water line as well as service reconnections for both. An appropriation was made in the FY 2017-2018 operating budget in the amount of \$335,000 to cover the project. Bids (based on unit price) were taken on November 21, 2017, with the lowest responsive bid being that of Thomas Stanley Grading & Hauling Inc. in the amount of \$262,610. The project calls for contract period of 120 days.

FISCAL IMPACT:

The anticipated cost for the entire project is \$335,000.

STAFF RECOMMENDATION:

Approval.

SUGGESTED MOTION(S):

I move we award the contract for Whitsett Street and Staley Street Water and Sewer Improvements to Thomas Stanley Grading & Hauling Inc. and authorize the Mayor, City Manager, City Attorney and City Clerk to execute the contract on behalf of the City, subject to easement acquisitions and permit approvals.



November 22, 2017

Mr. Frankie Maness
City of Graham
City Manager
201 South Main Street
Graham, North Carolina 27253

Subject: Whitsett Street and Staley Street Water and Sanitary Sewer Improvements
AWCK Project No. 16125

Dear Mr. Maness,

Bids for the subject work were received on Tuesday, November 21, 2017 at 2:00 P.M. at Graham City Hall. A total of five bids were received. Attached with this letter is a copy of the Tabulation of Bids showing the bids ranging from \$262,610.00 to \$469,000.00.

We have reviewed the bids for conformity with bid specification and applicable legal requirements. Thomas Stanley Grading & Hauling, Inc. of Stokesdale, North Carolina, submitted the lowest responsive bid in the amount of \$262,610.00. Thomas Stanley Grading & Hauling, Inc. has been in business and incorporated since 1992 and have successfully completed several projects for municipalities, NCDOT and private developers within the Piedmont, North Carolina.

The contract includes the replacement of aged water and sewer mains with the installation of approximately 550 LF of 8" DIP sanitary sewer service reconnections and approximately 315 LF of 6" DIP water line and appurtenances with service reconnections. The contract time is 120 calendar days.

We recommend that the Council tentatively award a contract to Thomas Stanley Grading & Hauling, Inc. in the amount of \$262,610.00 as they were the lowest responsive bidder. The award should be contingent upon all easements being acquired and permit approvals.

We appreciate the opportunity to be of service to the City of Graham and we look forward to working with the City and Contractor during the construction phase of this project.

Should you have any questions, please let us know.

Sincerely,

ALLEY, WILLIAMS, CARMEN & KING, INC.

S. Kyle Smith, P.E.

encl. Tabulation of Bids

TABULATION OF BIDS

City of Graham

Whitsett St. & Staley St. Water and Sanitary Sewer Improvements

Tuesday, November 21, 2017 at 2:00 PM

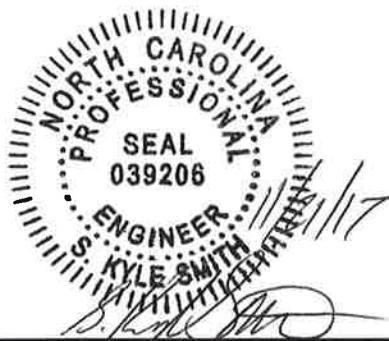
Graham City Hall Building, 201 South Main Street, Graham, North Carolina

Project No. 16125

CONTRACTOR	N.C. LICENSE NO.	BID SECURITY	TOTAL BID AMOUNT
Breece Enterprises, Inc.	19819	5% Bid Bond	\$ 271,380.00
C&J Utilities, Inc.	20826	Certified Check	\$ 267,970.00
Pipeline Utilities, Inc.	13040	5% Bid Bond	\$ 469,000.00
Thomas Stanley Grading & Hauling, Inc.	59544	5% Bid Bond	\$ 262,610.00
Triangle Grading & Paving, Inc.	17456	5% Bid Bond	\$ 302,299.99

Bids Opened By: Kyle Smith, PE, Project Engineer

Witnessed By: Frankie Maness, City Manager



THIS IS CERTIFIED TO BE A TRUE COPY OF BIDS RECEIVED

alley, williams, carmen, and king, inc



SPECIFICATIONS AND BID DOCUMENTS

FOR

CITY OF GRAHAM WHITSETT STREET & STALEY STREET WATER AND SANITARY SEWER IMPROVEMENTS

OWNER: City of GRAHAM
Graham, North Carolina

Mayor: Jerry Peterman

Council Members:

Jimmy Linens
Griffin McClure
Lee Kimrey
Chip Turner

City Manager – Frankie Maness

City Attorney – Keith Whited

Utilities Director – Tonya Mann

Water and Sewer Distribution Superintendent – Ladd Nall

Prepared by:



alley, williams, carmen & king, inc.
engineers and architects
740 chapel hill road - post office box 1179
burlington, north carolina 27216-1179



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ADVERTISEMENT FOR BIDS

City of Graham
Whitsett Street and Staley Street Water and Sanitary Sewer Improvements
Graham, North Carolina

Sealed bids for Whitsett Street and Staley Street Water and Sanitary Sewer Improvements will be received by the City of Graham at the Graham City Hall Building, 201 South Main Street, Graham, North Carolina 27253 until **2:00 P.M., Tuesday, November 21, 2017** and then publicly opened and read aloud.

The work will include the following items:

Approximately 550 LF of 8" DIP Sanitary Sewer
Approximately 315 LF 6" DIP Water Line and Appurtenances

Plans and specifications are on file for inspection at the City Hall, City of Graham, North Carolina and at the office of the Engineers in Burlington, North Carolina. Blank forms of Proposal, with Specifications and Plans, may be obtained from Alley, Williams, Carmen & King, Inc. upon request or may be downloaded from the following link:

<http://www.awck.com/resources/bidding-plans/>

Consideration will be given only to bids of Contractors who submit evidence that they are licensed under "An Act to Regulate the Practice of General Contracting", ratified by the General Assembly of the State of North Carolina on March 10, 1925, and as subsequently amended, when such Act is applicable.

Each Proposal shall be accompanied with a deposit of cash or CERTIFIED CHECK 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, said check to be made payable to the City of Graham.

In lieu of the above cash or CERTIFIED CHECK, the bidder may execute a Bid Bond for the same amount.

A Pre-bid meeting will be held at the Graham City Hall Building, 201 South Main Street, Graham, North Carolina 27253 on November 9th at 10:00 AM. All bidders are strongly encouraged to attend.

No Bidder may withdraw his bid within 60 days after the actual date of the opening thereof. The City reserves the right to reject any or all bids and to waive informalities.

ENGINEER:

Alley, Williams, Carmen & King, Inc.
Post Office Box 1179 (27216-1179)
740 Chapel Hill Road
Burlington, North Carolina 27215

Jerry Peterman, Mayor

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS. Terms used in these Instructions to Bidders shall have the meanings assigned to them in the General Conditions and the Supplementary Conditions. Additional terms are defined as follows:

Successful Bidder - The lowest, qualified, responsible, and responsive Bidder to whom Owner (on the basis of Owner's evaluation as herein provided) makes an award.

2. COPIES OF BIDDING DOCUMENTS. Bidding Documents may be obtained from Alley, Williams, Carmen & King, Inc., Post Office Box 1179/740 Chapel Hill Road, Burlington, North Carolina 27216-1179.

Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misrepresentations resulting from the use of incomplete sets of Bidding Documents.

Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

EXAMINATION OF CONTRACT DOCUMENTS AND SITE. It is the responsibility of each Bidder, before submitting a Bid, to (a) thoroughly examine the Contract Documents, (b) visit the site to become familiar with local conditions that may affect cost, progress, performance or furnishing of the Work. (c) consider Federal, State and Local Laws and Regulations that may affect cost, progress, performance, or furnishing of the work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors, or discrepancies discovered by Bidder in the Contract Documents.

Subsurface Information. A report of Subsurface Exploration has not been prepared for this project. The Bidder, at Bidder's own expense, is encouraged to perform subsurface investigations within accessible areas. The Bidder, by way of establishing a unit price for the work within the contract agreement's price schedule or by otherwise submitting a bid on this project, has acknowledged that he is aware of the limited subsurface information or data, and has satisfied himself that his established unit price is sufficient to ensure the proper completion of the project and the conditions which may effect the work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials; rock excavation; water tables or similar conditions at the site; availability of labor, water, electric power, roads, and uncertainties of weather, river stages, or similar conditions at the site; and the character of equipment and facilities needed preliminary to and during prosecution of the work. Any failure by the CONTRACTOR to acquaint himself with these facts will not relieve him from responsibility for work. The OWNER and ENGINEER assume no responsibility nor will be liable for any conclusions or interpretations made by the CONTRACTOR on the basis of the information made available by the OWNER/ENGINEER.

On request 72 hours in advance, Owner will provide each Bidder access to the site to conduct limited explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall not create any holes, bore, or clear any land and restore the site to its former conditions upon completion of such explorations. Arrangements for site visits shall be made by calling the Engineer.

- 3.02 Easements. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction ingress and egress or storage of materials and equipment are to be provided by Contractor. See Division 1, Section “Project Requirements” for additional information.
- 3.03 Bidder’s Representation. The submission of a Bid will constitute and incontrovertible representation by Bidder the Bidder has complied with every requirement concerning examination of the Contract Documents and the site, that without exception the Bid is premised upon performing and furnishing the work required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
4. INTERPRETATIONS AND ADDENDA. All questions about the meaning or intent of the Bidding Documents and the Contract Documents shall be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda, mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than 10 days prior to the date for opening of Bids may not be answered. Only answers issued by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
5. CONTRACT TIMES. The number of days within which, or the dates by which, the work is to be substantially complete and also completed and ready for payment are set forth in the Bid Form.
6. LIQUIDATED DAMAGES. Provisions for liquidated damages are set forth in the Supplementary Conditions. The amount of liquidated damages set forth is \$400.00 per calendar day for each day work is not completed beyond the completion date.
7. SUBSTITUTE OR “OR-EQUAL” ITEMS. The procedure for submission of any application for review of substitute or “or-equal” items by Contractor and consideration by Engineer is set forth in Paragraph 6.05 of the General Conditions and may be supplemented in the project requirements section of Division 1, General Requirements. The Contract, if awarded, will be on the basis of materials and equipment indicated on the Drawings or specified in the Specifications. Application for review of substitute or “or equal” materials or equipment will not be considered by Engineer unless received by Engineer within 15 working days prior to the bid opening. Judgment concerning substitutes and “or-equal” reviews will be determined by the sole discretion of the Engineer.
8. BID FORM. The Bid Form for Contract 1 is included in the Bidding Documents and must be completed in ink.

Bids by corporations must be executed in the corporate name by the president or vice-president (or other corporate officers accompanied by evidence of authority to sign for the corporation). Bids by partnerships must be executed in the partnership name and signed by a partner. Bids by joint ventures shall be signed by each participant in the joint venture or by a representative of the joint venture accompanied by evidence of authority to sign for the joint venture.

All blanks in the Bid Form shall be filled. A bid price shall be indicated for each section, bid item, alternative, adjustment unit price items, and unit price item listed therein, or the words “No Bid”, “No Charge” “No Change”, or other appropriate phrase shall be entered.

The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers and dates of which shall be filled in on the Bid Form.

No alterations in Bids, or in the printed forms, by erasures, interpolations, or otherwise will be acceptable unless each such alteration is signed or initialed by the Bidder; if initialed, Owner may require the Bidder to identify any alteration so initialed.

9. **BID SECURITY**: Each bid must be accompanied by cash, certified check of the bidder, or a bid bond prepared on the Form of Bid Bond attached hereto, duly executed by the bidder as principal and having as surety thereon a Surety Company approved by the Owner, in the amount of 5% of the bid. Such cash, checks or bid bonds will be returned to all except the three lowest bidders within three days after the opening of bids, and the Owner and accepted bidder have executed the contract, or, if no award has been made within 60 days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he/she has not been notified of the acceptance of his/her bid.
10. **MODIFICATION AND WITHDRAWAL OF BIDS**. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.
 - 10.1 **Telegraphic Modification**: Telegraphic modification of bids is not permitted.
 - 10.2 **Bid Withdrawal**: Withdrawal of a bid, after bids are opened, will only be permitted under the provisions of laws and regulations.
11. **OPENING OF BIDS**. Bids will be publicly opened and read aloud. An abstract of the amount of the Base Bids and major alternatives (if any) will be made available to Bidders after the opening of Bids.
12. **BIDS TO REMAIN SUBJECT TO ACCEPTANCE**. All Bids will remain subject to acceptance for the number of days set forth in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the bid security prior to that date.
13. **AWARD OF CONTRACT**. Owner reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced, or conditional Bids, and to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of Owner to make an award to that Bidder. Owner also reserves the right to waive informalities.

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

Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. Owner also may consider the operating costs, maintenance requirements, performance data, and guarantees of major items of materials and equipment

proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

If the Contract is to be awarded, it will be awarded to the lowest Bidder whose evaluation by Owner indicates to the Owner that the award will be in the best interests of Owner.

13. SIGNING OF AGREEMENT. When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by three (3) unsigned counterparts of the Agreement with all other written Contract Documents attached. Within the number of days set forth in the Bid Form, the Successful Bidder shall sign, leaving the dates blank, and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds and Power of Attorney. Within twenty (20) days thereafter, Owner shall execute all copies of the Agreement and other Contract Documents submitted by Contractor (Successful Bidder); shall insert the date of contract on the Agreement, Bonds, and Power of Attorney; and shall return all copies to Engineer for review and distribution. Distribution of signed copies shall be as stipulated in the Agreement. Each counterpart is to be accompanied by a complete set of the Drawings with appropriate identification.
14. SALES AND USE TAX. Provisions for sales and use taxes are set forth in the General and Supplementary Conditions. The Contractor will be required to submit statements on sales tax paid to the Owner as outlined in Division 1 "Applications for Payment".

15. INSURANCE. Insurance requirements for the project shall be provided as follows:

CONTRACT 1 INSURANCE REQUIREMENTS LIMITS OF LIABILITY IN THOUSANDS (000)

	<u>Each Person</u>	<u>Each Occurrence</u>	<u>Aggregate</u>
<u>GENERAL LIABILITY</u>			
Personal Injury (Including Bodily Injury)	\$ 1,000	\$ 1,000	
Property Damage		\$ 1,000	\$ 1,000
Or			
Personal Injury (Including Bodily Injury) and Property Damage Combined		\$ 1,000	\$ 2,000
<u>AUTOMOBILE LIABILITY</u>			
Bodily Injury	\$ 1,000	\$ 1,000	
Property Damage		\$ 1,000	
Or			
Bodily Injury and Property Damage Combined		\$ 1,000	\$ 2,000
<u>OWNER'S PROTECTIVE LIABILITY*</u>			
Personal Injury (Including Bodily Injury)	\$ 1,000	\$ 1,000	
Property Damage		\$ 1,000	\$ 1,000
Or			
Personal Injury (Including Bodily Injury) and Property Damage Combined		\$ 1,000	\$ 2,000

- This is a special additional policy written for this project alone which specifically indemnifies the City of Graham as the Owner of this project.

** Note: THE CITY OF GRAHAM MUST BE NAMED AS AN ADDITIONAL NAMED INSURED ON THE CONTRACTOR'S POLICY. A WAIVER OF SUBROGATION SHALL ALSO APPLY TO THE ABOVE POLICIES.

WORKMEN'S COMPENSATION As required by law.

SPECIAL HAZARD Blasting (as required).

NOTE: WRITTEN NOTICE OF CANCELLATION MUST BE 30 DAYS AND STATED ON THE CERTIFICATE OF INSURANCE.
AGGREGATE AMOUNT MAY NOT INCLUDE EXCESS COVERAGES.

16. SAFETY. Within five (5) calendar days following the bid opening, the apparent low bidder shall submit to the Owner the following documents as evidence of the safety record of the Contractor:

- A. OSHA 200 Log for the Bidder's Firm for the last 5 years.
- B. Current Worker's Compensation Rating for Bidder's firm.

Review of these records shall be a part of evaluating the bidder's qualifications and a poor safety record may be cause for rejection of bid.

17. QUANTITIES AND UNIT PRICES. Owner reserves the right to delete any bid item or items in the bid prior to awarding the contract, except such deletions shall not reduce the total bid by more than 25% unless mutually agreed upon.

The Owner/Engineer reserves the right to make at any time after award of the contract such changes in quantities as are necessary to complete the project. Such changes in quantities shall not invalidate the contract nor release the surety, and the Contractor agrees to perform the work as changed at the unit prices agreed to in the Proposal.

The non-utilization or partial utilization of any bid item shall not serve as a claim for any contract or unit price adjustment as the Contractor shall be paid the unit price bid for the number of units actually installed.

18. SUBMISSION OF BIDS. Bids shall be submitted at the time and place indicated in the Invitation to Bid, or the modified time and placed indicated by Addendum. Bids shall be enclosed in an opaque sealed envelope or wrapping, addressed to:

City of Graham
P.O. Drawer 357
201 South Main Street
Graham, NC 27253

Bids shall be marked with the name, license number, and address of the Bidder and shall be accompanied by the bid security and other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed with the notation "BID ENCLOSED" on the face of it.

Each bid envelope shall be identified on the outside as to the appropriate bid submitted.

Bidders shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

Bids received after the time and date for receipt of Bids will be returned unopened.

Oral, telephone, facsimile, or telegraph Bids are invalid and will not receive consideration.

No Bidder may submit more than one Bid per contract. Multiple Bids under different names will not be accepted from one firm or association.

END OF SECTION

BID FORM FOR CONTRACT 1
City of Graham
Whitsett Street and Staley Street Water and Sanitary Sewer Improvements

PROJECT IDENTIFICATION:

City of Graham
Whitsett Street and Staley Street
Water and Sanitary Sewer Improvements

THIS BID IS SUBMITTED TO:

City of Graham
201 South Main Street
Graham, NC 27353

1. The undersigned bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with the Owner in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents within the specified time and for the amount indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
2. Bidder accepts all of the terms and conditions of the invitation to Bid and the Instructions to Bidders, including without limitation those dealing with the disposition of bid security. This Bid will remain subject to acceptance for 60 days after the day of bid opening. Bidder will sign and submit the Agreement with the Bonds and other documents required by the Bidding Documents within 10 days after the date of Owner's Notice of Award.
3. In submitting this Bid, Bidder represents that:
 - a. Bidder has examined copies of all the Bidding Documents and of the following addenda (receipt of all which is hereby acknowledged):

No. _____ Dated _____	No. _____ Dated _____
No. _____ Dated _____	No. _____ Dated _____
No. _____ Dated _____	No. _____ Dated _____
 - b. Bidder has visited the site and become familiar with and satisfied itself as to the general, local and site conditions that may affect cost, progress, performance and furnishing of the Work.
 - c. Bidder is familiar with and has satisfied itself as to all Federal, State and Local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.
 - d. Bidder acknowledges that Owner and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to underground facilities at or contiguous to the site.

- e. Bidder is aware of the general nature of Work to be performed by Owner and others at the site that relates to Work for which this Bid is submitted as indicated in the Contract Documents.
- f. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.
- g. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Bidder, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.
- h. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm or corporation to obtain for itself any advantage over any other Bidder or over Owner.

4. Bidder will complete the Work for the following prices:

Item No.	Description	Estimated Quantity	Unit	Unit Price	Bid Amount
1	Mobilization	Lump Sum	LS	\$	\$
2	Traffic Control	Lump Sum	LS	\$	\$
3	Wattles – including installation, maintenance and removal	25	LF	\$	\$
4	Silt Fence, including stone, storage excavation, maintenance and removal	400	LF	\$	\$
5	Clearing, grubbing, debris removal, and limb clearing	Lump Sum	LS	\$	\$
6	Clean Stone for Erosion Control Devices, complete in place	10	Tons	\$	\$
7	Class B Rip Rap for Erosion Control Devices, complete in place	15	Tons	\$	\$
8	Orange Construction Fence, complete in place including maintenance and removal	225	LF	\$	\$
9	Stabilization Fabric for Temporary Access Road, complete in place including removal	330	SY	\$	\$
10	ABC Stone for Temporary Access Road, complete in place including removal	90	Tons	\$	\$
11	Permanent Chain Link Fence, complete in place	50	LF	\$	\$

Item No.	Description	Estimated Quantity	Unit	Unit Price	Bid Amount
12	Seeding and Mulching, including repair seeding	Lump Sum	LS	\$	\$
13	Stabilization Stone, including undercut excavation below pipe bedding as authorized by Engineer	60	Tons	\$	\$
14	Incidental Stone, complete in place	125	Tons	\$	\$
15	6" DIP Water Main, Class 50, including asphalt/concrete removal, excavation, backfill, and testing complete in place	315	LF	\$	\$
16	Fire Hydrant, complete in place, including hydrant tee, hydrant valve, mega lugs, concrete thrust block, stone, 6" DIP hydrant leg, painting of hydrant, testing, and chlorination	1	EA	\$	\$
17	Compact Ductile Iron Fittings, complete in place	100	LBS	\$	\$
18	6" Gate Valve, complete in place	1	EA	\$	\$
19	6" x 6" Full Body Tapping Sleeve and 6" Tapping Valve, complete in place	1	EA	\$	\$
20	Class B Concrete Blocking, complete in place	5	CY	\$	\$
21	¾" Water Service Connection, including piping, fittings, valves, meter setter and meter box, complete in place	7	EA	\$	\$
22	Connection of New Water Service to Existing Water Service, including piping, fittings, and any other items necessary to make connection, complete in place	7	EA	\$	\$
23	Abandon Existing Water Main, complete in place	Lump Sum	LS	\$	\$
24	8" DIP Class 50 Sanitary Sewer Main including bedding, backfill, and testing complete in place.	550	LF	\$	\$
25	4' Diameter Precast Concrete Doghouse Manhole with ring and cover, complete in place, including testing	1	EA	\$	\$
26	4' Diameter Precast Standard Concrete Manhole with ring and cover, complete in place, including testing	4	EA	\$	\$
27	4' Diameter Precast Outside Drop Concrete Manhole with ring and cover and outside drop connections including piping and fittings, complete in place, including testing	1	EA	\$	\$
28	4" Sanitary Sewer Service Connection, including piping, bedding, fittings, cleanout, and cap complete in place	11	EA	\$	\$

Item No.	Description	Estimated Quantity	Unit	Unit Price	Bid Amount
29	Connection of New Sewer Service to Existing Sewer Service, including piping, bedding, fittings, cleanouts, and any other items necessary to make connection, complete in place	7	EA	\$	\$
30	Rock Excavation, including disposal of unsuitable material and replacement with suitable material, blast monitoring, pre and post blast survey, \$30 CY minimum bid	50	CY	\$	\$
31	Borrow Material including Disposal, & compaction, complete in place	640	CY	\$	\$
32	Removal of Existing Sanitary Sewer Manholes, including disposal and replacement material, complete in place	2	EA	\$	\$
33	Flowable Fill for Sanitary Sewer Line Abandonment, including pumping and plugging of existing sewer main, complete in place	5	CY	\$	\$
34	Bituminous Concrete Intermediate Course Type I19.0 B	200	Tons	\$	\$
35	Contingency Allowance	Lump Sum	LS	\$10,000.00	\$10,000.00

TOTAL BID - Contract 1

5. Bidder agrees that the Work covered by the section or sections included in the contract award will be completed within the following number of days after the date when the Contract time commences to run as provided in Paragraph 14.04 of the General Conditions. Completion shall mean completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions.

Completion

Contract 1

120 Days

Bidder also agrees that should the bidder fail to accept a contract if awarded to them, or default on any other provisions of a contract award, the cash, certified check, or bid bond attached hereto shall become the property of the City of Graham as ascertained as liquidating damages for such default.

6. Communications concerning this Bid shall be sent to Bidder at the following address:

7. The terms used in this Bid, which are defined in the General Conditions included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.
8. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities provided, determined as provided in the contract documents.
9. Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the work within the times specified above, which shall be stated in the Agreement. Bidder agrees that as liquidated damages for delay (but not as a penalty), Bidder shall pay Owner **Four Hundred Dollars (\$400.00)** for each day that expires after the time specified and in accordance with the Agreement.
10. The contract to be awarded for the proposed work may be extended fifty (50%) percent of the contract price without consent or permission of the contractor and 50% with the consent or permission of the contractor for a total of one hundred 100%. The Owner reserves the right to add or delete items as deemed necessary.
11. **The following documents are attached to and made a condition of the Bid:**
- A. **Required Bid security in the form of Bid Bond – Certified Check (circle type of security provided);**
 - B. **Bidder is instructed to complete the Contractor’s Qualification Statement; see pages CQS-1 to CQS-3;**
 - C. **Bidder is instructed to complete the Affidavit of Compliance with N.C. E-Verify Statues; see page 000500-1.**
 - D. **Bidder is instructed to complete the Iran Divestment Act Certification; see page IDA-1.**

SIGNATURE OF BIDDER

Contractor's License Number _____

License Expiration Date _____

If an Individual

By _____
(Signature of Individual)

doing business as _____

Business address _____

Phone No. _____ Date _____, 20_____

If a Partnership

By _____
(Firm Name)

(signature of general partner)

Business address _____

Phone No. _____ Date _____, 20_____

If a Corporation

By _____
(Corporation Name)

(signature of authorized person)

(title)

Business address _____

Phone No. _____ Date _____, 20_____

Fax No. _____

END OF SECTION

CONTRACTOR'S QUALIFICATION STATEMENT

Regarding Project: City of Graham
Whitsett Street and Staley Street Water and Sanitary Sewer
Improvements

Submitted by:

Name _____ Corporation

Firm _____ Partnership

Address _____ Individual

_____ Joint Venture

Telephone _____ Other

North Carolina License No. _____

A. How many years has your organization, under its present business name, been in business as a licensed contractor? _____

B. Under what other or former names has your organization operated during the past ten years?

Explain! _____

C. If a corporation, provide the following information:

Date of incorporation _____

State of incorporation _____

President's name _____

Secretary's name _____

Treasurer's name _____

D. If an individual, partnership, etc., provide the following information:

Date of organization _____

Names of all partners or principals

E. Please list the projects (and locations) that your organization has completed in the past two years that are similar in scope to the project named above.

F. Please give the name of the proposed field supervisor on the above named project and provide a summary of this person's experience and qualifications for such work.

Name _____

Qualifications _____

G. What percentage of the above named project do you anticipate completing through the utilization of subcontractors? _____%.

Please list the areas of work and the names of subcontractors that you anticipate utilizing on the above named project.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

H. Have you ever failed to satisfactorily complete any work awarded to you? If so, note when, where and why?

I. Name of Bonding Company and name and address of agent.

Company _____

Agent _____

Address _____

Dated on this _____ day of _____, 2017

Name of Organization: _____

By: _____

Title: _____

NORTH CAROLINA

_____ COUNTY

I, _____, a Notary Public for the said County and State, do hereby

certify that _____ personally appeared before me this day and acknowledged the answers to the foregoing questions and all statements therein contained are true and correct.

Witness my hand and official seal, this the _____ day of _____, 20____.

Notary Public

(SEAL)

My Commission Expires:

CONSTRUCTION CONTRACT: CONTRACT 1
City of Graham – Whitsett Street & Staley Street Water and Sanitary Sewer Improvements

THIS AGREEMENT, made the ____ day of _____ in the year 2017 by and between _____
_____ the Party of the First Part, hereinafter called the
CONTRACTOR, and the City of Graham, the Party of the Second Part, hereinafter called the
OWNER.

WITNESSETH:

That for and in consideration of the payments and agreements to be made and performed by the OWNER,
the CONTRACTOR at its own proper cost and expense and with skill and diligence, will construct and
complete all work included in a Construction Contract for the construction of:

Whitsett Street and Staley Street Water and Sanitary Sewer Improvements

Graham, North Carolina

In the Amount of \$

in accordance with Contract Documents, and in full compliance with this Agreement and the
CONTRACTOR agrees to receive the prices stated in the Proposal attached to be full compensation for
furnishing all labor, materials and equipment necessary to execute all the work contemplated in this
Construction Contract.

The work on the site is to be commenced when directed by the ENGINEER, and to be diligently
prosecuted to completion within 120 calendar days.

It is agreed by and between both parties to this Construction Contract that the ENGINEER shall in all
cases determine the quantity of the several kinds of work and materials which are to be paid for under this
Construction Contract, and he shall determine all questions in relation to lines, levels and dimensions of
the work and as to the interpretation of the plans and specifications. Payment shall be made in
accordance with provisions as outlined in the Proposal.

The Contract Documents shall consist of the following:

- Table of Contents
- Bidding Requirements
- Contract forms
- Conditions of Contracts
- Specifications
- Division 1 – General Requirements
- Division 2 – Site Work
- Drawings Entitled: Whitsett Street and Staley Street Water and Sanitary Sewer Improvements

Cover Sheet and Sheets 2 – 7

IN WITNESS WHEREOF the Parties hereto have executed this Agreement on the day and date first above written in three (3) counterparts, each of which shall, without proof or accounting for other counterparts, be deemed an original Construction Contract.

FOR THE CONTRACTOR

WITNESS:

Proprietorship or Partnership

OR

ATTEST:

TITLE _____
(Corporate Secretary or
Assistant Secretary only)

(Contractor)

By _____

TITLE _____
(Owner, Partner, or
Corporate President or
Vice-President only)

CORPORATE SEAL

FOR THE OWNER

WITNESS:

Proprietorship or Partnership

OR

ATTEST:

TITLE _____
(Corporate Secretary or Assistant Secretary only)

City of Graham
(Owner)

By _____

TITLE _____

CITY SEAL

PERFORMANCE BOND: CONTRACT 1

Date of Execution: _____

Name of Principal: _____
(Contractor)

Name of Surety: _____

Name of Contracting Body: City of Graham
201 South Main Street, Graham, NC 27253

Amount of Bond: \$ _____

Project: Whitsett Street and Staley Street

Water and Sanitary Sewer Improvements

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

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

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

Whenever Contractor shall be, and declared by Contracting Body to be in default under the Contract, the Contracting Body having performed Contracting Body's obligations thereunder, the Surety may promptly remedy the default, or shall promptly

- 1) Complete the Contract in accordance with its terms and conditions, or

2) Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or, if the Contracting Body elects, upon determination by the Contracting Body and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Contracting Body, and make available as Work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price", as used in this paragraph, shall mean the total amount payable by Contracting Body to Contractor under the Contract and any amendments thereto, less the amount properly paid by the Contracting Body to Contractor.

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

Executed in three (3) counterparts.

Witness:

(Proprietorship or Partnership)

Attest: (Corporation)

By: _____

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

Witness:

Countersigned:

N. C. Licensed Resident Agent

Name and Address - Surety Agency

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

Contractor: (Trade or Corporate
Name)

By: _____

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

(Corporate Seal)

(Surety Company)

By: _____

Title: _____
(Attorney in Fact)

(Surety Corporate Seal)

PAYMENT BOND: CONTRACT 1

Date of Execution: _____

Name of Principal: _____
(Contractor)

Name of Surety: _____

Name of Contracting
Body: _____ City of Graham

_____ 201 South Main Street, Graham, NC 27253

Amount of Bond: \$ _____

Project: _____ Whitsett Street and Staley Street

_____ Water and Sanitary Sewer Improvements

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

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

NOW THEREFORE, if the principal shall promptly make payment to all persons supplying labor 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.

All persons supplying labor and material in the prosecution of the work, known as claimant, shall be defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.

The above named Principal and Surety hereby jointly and severally agree with the Contracting Body that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Contracting Body shall not be liable for the payment of any costs or expenses of any such suit.

No suit or action shall be commenced hereunder by any claimant:

a) unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: The Principal, The Contracting Body, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Contracting Body or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.

b) After the expiration of one (1) year following the date on which Principal ceased Work on said Contract, it being understood, however, that if any limitation embodied in this bond prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the Project, or any part thereof, is situated, or in the United States District Court for the district in which the Project, or any part thereof, is situated, and not elsewhere.

The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against said improvements, whether or not claim for the amount of such lien be presented under and against this bond.

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

Executed in _____ counterparts.

Witness:

(Proprietorship or Partnership)

Attest: (Corporation)

By: _____

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

Witness:

Countersigned:

N. C. Licensed Resident Agent

Name and Address - Surety Agency

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

Contractor: (Trade or Corporate Name)

By: _____

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

(Corporate Seal)

(Surety Company)

By: _____

Title: _____
(Attorney in Fact)

(Surety Corporate Seal)

CERTIFICATE OF FINANCE OFFICER

Provisions for the payment of the moneys to fall due under this agreement has been made by appropriation duly made or by bonds or notes duly authorized, as required by the "Municipal Fiscal Control Act".

Finance Officer

Date

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned, Keith Whited, the duly authorized and acting

Legal representative of: City of Graham do hereby certify as follows:

I have examined the foregoing contract and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

Keith Whited, City Attorney

Date: _____

CERTIFICATE OF INSURANCE

(Attach to this sheet)

NOTICE OF AWARD

TO: _____

PROJECT DESCRIPTION: City of Graham – Whitsett Street and Staley Street
Water and Sanitary Sewer Improvements
AWCK Job No. 16125

Advertisement for Bids dated October 2017 and Instructions to Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$ _____

You are required by the Instructions to Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) Calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date Of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S Acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be Entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____ 2017.

City of Graham
Owner
By _____
Frankie Maness
Title _____
City Manager

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO AWARD is hereby acknowledged by _____

This the _____ day of _____ 2017.

By: _____

Title: _____

NOTICE TO PROCEED

TO: _____ DATE: _____
 _____ PROJECT: City of Graham
 _____ Whitsett Street and Staley Street
 _____ Water and Sanitary Sewer Improvements

You are hereby notified to commence WORK in accordance with the Agreement dated _____
 on or before _____, and you are to complete WORK within
 _____ 120 _____ consecutive calendar days thereafter. The date of completion of all WORK is

 City of Graham
 Owner
 By _____
 Frankie Maness
 Title City Manager

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED
 is hereby acknowledged by _____

 This the _____ 2017.

By: _____

Title: _____

Employer Identification
 Number: _____

**STATE OF NORTH CAROLINA
E-VERIFY AFFIDAVIT
COUNTY OF ALAMANCE – CITY OF GRAHAM**

NOW COMES Affiant, first being sworn, deposes and says as follows:

- 1. I have submitted a bid for contract or desire to enter into a contract with the City of Graham;
- 2. As part of my duties and responsibilities pursuant to said bid and/or contract, I attest that I am aware of and in compliance with the requirements of E-Verify, Article 2 of Chapter 64 of the North Carolina General Statutes, to include (mark which applies):

After hiring an employee to work in the United States I verify the work authorization of said employee through E-Verify and retain the record of the verification of work authorization while the employee is employed and for one year thereafter; or

I employ less than twenty-five (25) employees in the State of North Carolina.

- 3. As part of my duties and responsibilities pursuant to said bid and/or contract, I attest that to the best of my knowledge any subcontractors employed as a part of this bid and/or contract are in compliance with the requirements of E-Verify, Article 2 of Chapter 64 of the North Carolina General Statutes, to include (mark which applies):

After hiring an employee to work in the United States the subcontractor verifies the work authorization of said employee through E-Verify and retain the record of the verification of work authorization while the employee is employed and for one year thereafter; or

Employ less than twenty-five (25) employees in the State of North Carolina.

Specify subcontractor: _____

This the _____ day of _____, 2017.

Affiant

Sworn to and subscribed before me, this the _____ day of _____, 2017.

[OFFICIAL SEAL]

_____, Notary Public

My Commission Expires: _____

RFP Number (if applicable): _____

Name of Vendor or Bidder: _____

**IRAN DIVESTMENT ACT CERTIFICATION
 REQUIRED BY N.C.G.S. 147-86.59**

As of the date listed below, the vendor or bidder listed above is not listed on the Final Divestment List created by the State Treasurer pursuant to N.C.G.S. 147-86.58.

The undersigned hereby certifies that he or she is authorized by the vendor or bidder listed above to make the foregoing statement.

 Signature Date

 Printed Name Title

Notes to persons signing this form:

N.C.G.S. 147-86.59(a) requires this certification for bids or contracts with the State of North Carolina, a North Carolina local government, or any other political subdivision of the State of North Carolina. The certification is required at the following times:

- When a bid is submitted
- When a contract is entered into (if the certification was not already made when the vendor made its bid)
- When a contract is renewed or assigned

N.C.G.S. 147-86.59(b) requires that contractors with the State, a North Carolina local government, or any other political subdivision of the State of North Carolina must not utilize any subcontractor found on the State Treasurer's Final Divestment List.

The State Treasurer's Final Divestment List can be found on the State Treasurer's website at the address www.nctreasurer.com/iran and will be updated every 180 days.

CONTRACT CHANGE ORDER NO. _____

Project: City of Graham-Whitsett Street and Staley Street Water and Sanitary Sewer Improvements

Location: _____

TO (Contractor)

┌ _____ ┐
| _____ |
| _____ |
| _____ |
└ _____ ┘

ALLEY, WILLIAMS, CARMEN & KING, INC.
ARCHITECTS & ENGINEERS
PO BOX 1179 - 740 CHAPEL HILL ROAD
BURLINGTON, NORTH CAROLINA 27216

ARCH./ENG. PROJECT NO. 16125
Date: _____

CONTRACT FOR: Water and Sanitary Sewer Improvements
Graham, North Carolina

CONTRACT DATE: _____

You are hereby requested to comply with the following changes from the contract plans and specifications:

ITEM NO.	DESCRIPTION OF CHANGES (Supplemental Plans and Specifications Attached)	DECREASE In Contract Price	INCREASE in Contract Price
		\$	\$
TOTALS			
NET CHANGES IN CONTRACT PRICE			

JUSTIFICATION:

The original Contract Sum was - - - - - \$ _____

Net change by previous Change Orders - - - - - \$ _____

The Contract Sum prior to this Change Order was - - - - - \$ _____

The Contract Sum will be (increased) (decreased) (unchanged) by this Change order - - - - - \$ _____

The new Contract Sum including this Change Order will be - - - - - \$ _____

The Contract Time will be (increased) (decreased) (unchanged) by (calendar) (working) - - - - - () Days

The Date of Completion as of the date of this Change Order therefore is _____

This document shall become an amendment to the contract and all provisions of the contract will apply hereto.

Recommended _____ (Architect/Engineer) _____ (Date)

Accepted _____ (Contractor) _____ (Date)

Approved _____ (Owner) _____ (Date)

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by



AMERICAN COUNCIL OF ENGINEERING COMPANIES

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PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A Practice Division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Endorsed by



CONSTRUCTION SPECIFICATIONS INSTITUTE

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an

addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
 2. a preliminary Schedule of Submittals; and
 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on

Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;
2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

- A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:
1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
 2. is of such a nature as to require a change in the Contract Documents; or
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

- B. *Engineer’s Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner’s obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer’s findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor’s cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and

contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

- c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the

consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also

meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

- a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:
1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
 2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
 3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
 4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
 5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
 6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
 2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors,

members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's

interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
 - 3) it has a proven record of performance and availability of responsive service.
- b. Contractor certifies that, if approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
 - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

- c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and
 - 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be

required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner,

Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought

by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 1. all persons on the Site or who may be affected by the Work;
 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and

shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is

required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

- a. Submit number of Samples specified in the Specifications.
 - b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.
- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
 6. any inspection, test, or approval by others; or
 7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
1. written notice thereof will be given to Contractor prior to starting any such other work; and
 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 3. the extent of such authority and responsibilities will be provided.

- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

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

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or

continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. *Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise*

or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data

shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
 2. approve the Claim; or
 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of

said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not

limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.
- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:*
1. Contractor agrees that:
 - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance:*
1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to

the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

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

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

12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

- C. *Contractor's Fee*: The Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

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

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or

neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

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

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

13.01 Notice of Defects

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

13.02 Access to Work

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

13.03 *Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

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

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or
 2. correct such defective Work; or
 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

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

13.09 *Owner May Correct Defective Work*

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

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

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

14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an

Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or

- involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
- b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
 5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

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

D. *Reduction in Payment:*

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

14.03 *Contractor's Warranty of Title*

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

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before

final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

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

14.07 *Final Payment*

A. *Application for Payment:*

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

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

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying

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

C. *Payment Becomes Due:*

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

14.08 *Final Completion Delayed*

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

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
 2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

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

15.02 *Owner May Terminate for Cause*

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

so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

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

15.03 *Owner May Terminate For Convenience*

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

15.04 *Contractor May Stop Work or Terminate*

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

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

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

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

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

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

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

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

17.02 *Computation of Times*

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

17.03 *Cumulative Remedies*

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

17.04 *Survival of Obligations*

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

17.05 *Controlling Law*

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

17.06 *Headings*

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

SUPPLEMENTAL GENERAL CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (No. EJCDC C-700, 2007 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplemental Conditions will have the meanings indicated in the General Conditions. Additional terms used in these Supplemental Conditions have the meanings indicated below, which are applicable to both the singular and plural thereof.

1. Paragraph 2.03.A shall be revised as follows:
 - A. The bids are good for 60 calendar days from the bid opening. The City will make a contract award within this 60-day period. After being notified of the award, the contractor will have 20 days to submit bonds and insurance to owner and execute the contracts. Upon receipt, the Owner has 20 days to execute the contract. Notice to Proceed will be issued no later than the 40th day from the contract award.
2. Delete paragraph 2.05.A.3 in its entirety.
3. Delete paragraph 2.07.A.3 in its entirety.
4. Add the following new paragraphs immediately after paragraph 4.02.B:
 - C. In the preparation of Drawings and Specifications, ENGINEER or ENGINEER's Consultants relied upon the following reports of exploration and tests of subsurface conditions at the Site:
 1. None
 - D. In the preparation of Drawings and Specifications, ENGINEER or ENGINEER's Consultants relied upon the following drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the Site:
 1. None
5. Add the following sub-paragraph to the end of paragraph 4.05.A:
 1. Replacement of property monuments or irons disturbed by the contractors operation shall be reestablished by a licensed registered Land Surveyor in the State of North Carolina.
6. Add the following new paragraphs immediately after paragraph 4.06.A:
 1. In the preparation of Drawings and Specifications, ENGINEER or ENGINEER's Consultants relied upon the following reports of Hazardous Environmental Conditions at the Site:
 - a. None
 2. In the preparation of Drawings and Specifications, ENGINEER or ENGINEER's Consultants relied upon the following drawings of Hazardous Environmental Conditions which are at or contiguous to the Site:
 - a. None.

7. Revise paragraph 5.03.A to read as follows:
 - A. CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, Certificate of Insurance (and other evidence of insurance requested by owner or any other additional insured; specifically including but not limited to copies of insurance policies) which CONTRACTOR is required to purchase and maintain in accordance with paragraph 5.04. OWNER shall deliver to CONTRACTOR, with copies to each additional insured identified in the Supplementary Conditions Certificates of Insurance (and other evidence of insurance requested by CONTRACTOR or any other additional insured) which OWNER is required to purchase and maintain.

8. Add the following paragraph immediately after 5.04.B:
 - C. Contractor shall provide general and automobile liability insurance coverage to the limits as shown in Instructions to Bidders, Section 19, Insurance.

9. Revise paragraph 5.06.A to read as follows:
 - A. Owner, at Owner's option and expense, may purchase property insurance as will protect Owner against claims which may arise from operations under this contract.

10. Delete paragraphs 5.07 thru 5.10 INCLUSIVE FROM THE "General Conditions".

11. Add the following new paragraph immediately after paragraph 6.06.G:
 - H. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by a particular Subcontractor or Supplier.

12. Paragraph 6.10.A shall be revised to read as follows:
 - A. CONTRACTOR shall include in his bid all costs for all sales and use tax applicable to the project. CONTRACTOR shall submit to the OWNER an Itemized list of the quantity and value of materials and rentals used on the project and the amount of sales and use tax paid on such materials and rentals. Itemized list shall be submitted monthly to the ENGINEER. ENGINEER will not authorize monthly pay requests to CONTRACTOR until sales and use tax report has been submitted to the ENGINEER. See Section 01027 for additional information.

13. Add the following paragraph immediately after 6.11 D:
 - E. Contractor shall not use owner's property except in performing the work specified in the contract documents.

14. Paragraph 8.11.A. shall be revised to read as follows:
 - A. Owner shall execute Certificate of Finance Officer form and document will be an exhibit to the Form of Agreement. See page CFO-1.

15. Add the following new paragraphs immediately after paragraph 9.03.A:
- B. The Resident Project Representative (RPR) will be Engineer's employee or agent at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions. RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall be through or with the full knowledge and approval of Contractor. The RPR shall:
1. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and schedule of values prepared by Contractor and consult with Engineer concerning acceptability.
 2. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.
 3. Liaison:
 - a. Serve as Engineer's liaison with Contractor, working principally through Contractor's authorized representative, assist in providing information regarding the intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
 4. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
 5. Shop Drawings and Samples:
 - a. Record date of receipt of Samples and approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 6. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.

7. Review of Work and Rejection of Defective Work:
 - a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress will not produce a completed Project that conforms generally to the Contract Documents or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
8. Inspections, Tests, and System Startups:
 - a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
 - b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.
9. Records:
 - a. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
 - b. Maintain records for use in preparing Project documentation.
10. Reports:
 - a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.
 - b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.

- c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition.
 11. Payment Requests: Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the schedule of values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.
 12. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.
 13. Completion:
 - a. Substantial Completion inspection, assist in the determination of Substantial Completion and the preparation of lists of items to be completed or corrected.
 - b. Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final list of items to be completed and deficiencies to be remedied.
 - c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the Notice of Acceptability of the Work.
- C. The RPR shall not:
 1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
 3. Undertake any of the responsibilities of Contractor, Subcontractors, Suppliers, or Contractor's superintendent.

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work unless such advice or directions are specifically required by the Contract Documents.
 5. Advise on, issue directions regarding, or assume control over safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
 7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
 8. Authorize Owner to occupy the Project in whole or in part.
16. Paragraph 11.03.D shall be revised to read as follows:
- D. The Owner reserves the right to increase or decrease the estimated quantities in the contract as necessary to complete the project. Such changes in quantities from the estimated quantity shall not invalidate the contract nor release the surety, and the Contractor agrees to perform the work at the unit prices established in the contract. Overruns and under runs of estimated quantities shall not constitute a basis for any claims under this contract.
17. Add the following new paragraph 11.03.E:
- E. The Owner reserves the right to eliminate any item from the contract and such action will in no way invalidate the Contract. Payment will be made for the remaining items in the contract at the unit price established in the Contract. The elimination of any items from the contract shall not constitute a basis for any claims under this contract
18. Add the following new paragraph 11.03.F.
- F. The contract to be awarded for the proposed work may be extended fifty (50%) of the contract price without consent or permission of the Contractor, and an additional fifty (50%) with the consent of the Contractor. Total extensions shall not to exceed one hundred (100%) percent of the contract price.
19. Delete paragraph 15.04.A. in its entirety.
20. Delete Article 16 in its entirety.
21. Add paragraph 18.0 to the "General Conditions".

ARTICLE 18 - LIQUIDATED DAMAGES

- A. The date of beginning and the time of completion of the WORK are ESSENTIAL CONDITIONS of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on the available date specified in the Supplemental General Conditions.
- B. The contractor will proceed with the work at such rate of progress to insure full completion within the contract time. It is expressly understood and agreed, by and between the Contractor and the Owner, that the contract time for the completion of the work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work.
- C. If the Contractor shall fail to complete the work within the contract time or extension of time granted by the Owner, then the Contractor will pay the Owner of the amount of liquidated damages as specified in the Bid Form for each calendar day that the Contractor shall be in the default after the time stipulated in the contract documents.
- D. The Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to the following, and the Contractor has promptly given WRITTEN NOTICE of such delay to the Owner or Engineer.
1. To any preference, priority of allocation order duly issued by the Owner.
 2. To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, or of the public enemy, act of the Owner, acts of another contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and
 3. To any delays of subcontractors occasioned by any of the causes specified in paragraphs (a) and (b) of this article.
- E. PROVIDED FURTHER, that the Contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of contract, notify the Owner, in writing, of the cause of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.
- F. It is further agreed that, if default is made in completion, the City shall default as liquidated damages, the sum of four hundred dollars (\$400.00) per day for each and every calendar day completion is delayed in excess of the contract time set forth in the Bid Form. This amount is agreed upon as reasonable due to the effect of each section of the work on the time of completions of the entire project.

END OF SECTION

MATERIAL SPECIFICATIONS

1. General Conditions
2. Cement
3. Sand
4. Coarse Aggregate
5. Water
6. Concrete
7. Steel for Reinforcement
8. Joint Material
9. Mortar
10. Brick
11. Brick Masonry
12. Structural Steel
13. Storm Sewers
14. Catch Basin Frames & Covers
15. Ductile Iron Pipe
16. Gate Valves
17. Swing Check Valves
18. Tapping Sleeves
19. Tapping Valves
20. Valve Boxes
21. Fire Hydrants
22. Mechanical Joint Restraint
23. Manhole Ring & Covers
24. Manhole Steps
25. Precast Manholes
26. Small Iron Pipe
27. Air Release Valve
28. Steel Encasement Pipe
29. Carrier Pipe
30. PVC Gravity Sewer Pipe
31. Sewer Force Mains
32. Aggregate Base Course
33. Asphalt Concrete Binder Course
34. Asphalt Concrete Surface Course
35. Prime Coat
36. Tack Coat
37. Pavement Replacement
38. Stabilization Stone for Pavement Cuts
39. Stabilization Stone for Ditches
40. Concrete Curb & Gutter
41. Rip Rap

Note: Shop drawings for water, sewer, & storm drainage related materials are to be submitted to the City for review approval prior to installation. Additional material specifications may be required at times.

1. General Conditions. The following Specifications cover the material under the applicable documents. Unless otherwise specified, all materials used in the work under this contract shall conform to the requirements of the current specifications of the American Society for Testing Materials, and shall be tested in accordance with the current specifications or current methods of testing of ASTM, where specifications and methods of testing have been adopted, revised, or proposed for such materials. No materials shall be used on the work until accepted by the Engineer, and all materials rejected by the Engineer as unsuitable, or not in conformity with the Plans or Specifications, or failing to pass the required tests, shall be removed immediately from the work at no expense to the City. Failure to condemn materials on preliminary inspection shall not be grounds for acceptance if future defects are found. All materials and equipment shall be new and free from all flaws or defects.

2. Cement. All cement used in mortar, or concrete shall conform to Specifications for Portland Cement of ASTM C-150. Brand of cement proposed for use by the Contractor will be subject to the approval of the Engineer. Type II shall be used in all work unless approved by the Engineer.

3. Sand. All sand used in mortar or concrete shall be clean, sharp, practically free from loam, clay or organic matter, and so graded as to insure workability and water tightness when mixed with other ingredients. Sand will conform to ASTM Specifications C-33 and when made into mortar will have a compressive strength at 7 and 28 days of not less than 100% of mortar made with standard sands.

4. Coarse Aggregate. Coarse aggregate will consist of broken stone, sound, hard and tough, and will conform to the specifications of coarse aggregate given in ASTM Specification C-33. Stone will be broken to the sizes hereinafter specified under "Concrete" for the various classes of concrete, and grading will be well within the limits specified.

5. Water. Water used for mixing concrete and mortar will be clean, and free from deleterious amounts of acids, alkalis, and organic materials.

6. Concrete. All concrete shall be made of Portland cement, water and aggregates as hereinbefore specified, and shall further be in accordance with the following definite requirements for the various classes.

A design of the mix made by an independent laboratory, approved by the Engineer, for each class of concrete, shall be submitted for approval before concreting is started.

During progress of the work, standard compressive strength test specimens shall be made and cured by the Contractor in accordance with ASTM Standard Method, Designation C-31, and tested - by an independent testing laboratory in accordance with ASTM Standard Method, Designation C-39. At least 3 cylinders will be made for each test. Tests results shall be submitted for each thirty- (30) cubic yards, or fraction thereof, for each class of concrete used. Should there be any evidence that concrete is not up to standard, a strength test may be required at any time and the cost paid by the contractor.

If 100 LF of sidewalk is poured, at least one (1) test must be performed. Test on less than 100 ft. may be done at Engineer's request.

Class A concrete shall have a 28-day compressive strength of not less than 3,000 lbs. per square inch and a slump of from 3 to 5 inches and a maximum water-cement ratio of 0.48.

Coarse aggregate for all classes of concrete shall be commercial 1-inch stone, all of which shall pass a 1-1/2" screen.

All concrete used shall be "ready-mixed" concrete made in accordance with ASTM Standard Method Designation C-94. Cement, aggregate, water and design of mixes shall be as above specified. Elapsed time for placing concrete, between adding the mixing water to the mix and placing the concrete in the forms, shall not exceed that set forth in Table 1000-2.

TABLE 1000-2 ELAPSED TIME FOR PLACING CONCRETE		
Air or Concrete Temperature Whichever is Higher	Maximum Elapsed Time	
	No Retarding Admixture Used	Retarding Admixture Used
90°F or above	30 minutes	1 hour 15 minutes
80°F through 89°F	45 minutes	1 hour 30 minutes
79°F or below ^A	60 minutes	1 hour 45 minutes
70°F through 79°F ^B	60 minutes	1 hour 45 minutes
69°F or below ^B	1 hour 30 minutes	2 hour 15 minutes

^A Applicable to Class AA, A, and Drilled Pier Concrete

^B Applicable to Class B Concrete

The concrete temperature at the time of placing in the forms shall not be less than 50°F nor more than 95°F except where other temperatures are required by N.C. State Highway Commission's "Standard Specifications for Roads and Structures", January, 2012 as amended.

Do not place concrete without permission when the air temperature measured at the location of the concrete operation, in the shade away from artificial heat is below 35°F. When such permission is granted, uniformly heat the aggregates and/or water to a temperature not higher than 150°F. Do not place heated concrete in the forms if the temperature is less than 55°F or more than 80°F.

Deliver concrete to any monolithic unit of a structure at a rate that will permit proper handling, placing, and finishing of the concrete. Regulate the delivery so that the maximum interval between the placing of batches at the work site does not exceed 20 minutes.

All concrete materials and installation shall comply with the N.C. State Highway Commission's "Standard Specifications for Roads and Structures", January, 2012 as amended.

7. Steel for Reinforcement. All reinforcement steel will fulfill the Standard Specifications for Billet Steel Concrete Reinforcement Bars, Designation A615 of ASTM. Intermediate Grade 60 will be used.

All steel will be free from rust, scale, or other coatings which would reduce or destroy the bond when placed in forms and the Contractor will provide such protection as is necessary to insure that the steel will not be injured during the construction period.

8. Joint Materials. Joint filler, hot applied joint sealer, low modulus silicone sealant, and bond breaker materials shall comply with Section 1028, Joint Materials of the N.C. State Highway Commission's "Standard Specifications for Roads and Structures", January, 2012 as amended.

All joint filler shall be sealed unless otherwise specified by the engineer.

9. Mortar. Unless otherwise provided, cement mortar will be Type M only. Type M mortar will consist of Portland cement and sand mixed in the proportion of one part cement to two parts sand with not more than 6-1/2 gallons of water per bag of cement. This mixture may be varied to increase workability only by reducing the amount of sand or blending one or more sands. Mortar in which cement has been placed for more than one hour will not be used.

10. Brick. All brick used on the work will be hard, tough, sound clay or shale brick, of first class quality, thoroughly vitrified and especially suitable to the class of work for which it is to be used. Brick used in manholes shall conform to ASTM Specifications C-216, grade SW.

11. Brick Masonry. All brick masonry will be constructed using Type M mortar and brick as specified.

12. Structural Steel.

a. General. The American Institute of Steel Construction's "Specifications for the Design, Fabrication and Erection of Structural Steel for Building", latest edition, and the American Institute of Steel Construction's "Code of Standard Practice for Steel Buildings and Bridges", latest edition, are hereby made a part of these Specifications to the same extent as if they were written herein, except that they may be amended or superseded by these Specifications or the Drawings.

b. Materials.

- (1) Structural steel shall conform to "Specifications for Structural Steel", ASTM A-36, latest edition.
- (2) Bolts, nuts, and circular washers - where required - shall conform to the requirements of the latest edition of "Specifications for High-Strength Carbon Steel Bolts for Structural Steel Joints: ASTM A-325 in exposed areas. For buried conditions or when used for sewer components, use 304 Stainless Steel.
- (3) Bolt and nut dimensions shall conform to the current requirements of the American Standards Association for heavy hex structural bolts and nuts, ASA Standard B18.2.1.

13. Storm Sewers. Reinforced concrete pipe (RCP) shall conform to AASHTO Specifications M-170, Table III, Class III. High Density Polyethylene (HDPE) double wall corrugated smooth interior drainage pipe shall conform with NCDOT's current "Standard Specifications for Roads and Structures" and AASHTO M-294 Type S for sizes 15" through 48".

14. Catch Basin Frames and Covers. All catch basin frames and covers shall be of cast iron of superior quality, tough and of even grain, and shall possess a tensile strength of not less than 18,000 psi. Dimensions of the ring and cover shall conform to the Construction Details shown on the attached Drawings. All rings and covers shall be thoroughly cleaned and given two coats of an approved bituminous paint.

15. Ductile Iron Pipe and Fittings. Ductile Iron Pipe shall be manufactured in accordance with ASA Specification 21.50 and 21.51 of the AWWA as amended, and shall be designed for type 2 laying condition with the wall thickness determined by the depth of cover and a working pressure of 150 psi. Pipe wall thickness shall be calculated in accordance with ASA Specification A21.50.

Joints for ductile iron pipe shall be manufactured in accordance with ASA Specification 21.11, push-on joint or mechanical joint. Flanges, where required shall be American Standard Class 125.

Ductile iron fittings through 12" shall be manufactured in accordance with ASA Specification 21.10. Joints for fittings shall be mechanical joint conforming to ASA Specification 21.11. Flanged fittings, where required, shall conform to ASA Specification B16.1.

Pipe and fittings shall have a cement lining in accordance with ASA Specification 21.4.

D.I. Pipe shall be Class 50, unless pressure or depth requires a higher class of pipe.

16. Gate Valves. Gate valves shall be of the resilient wedge type, iron body, bronze mounted, non-rising stem type designed to work equally well with pressure on either side of the gate. All valves shall conform to the requirements of the latest revision of AWWA Standard C-500 for "Gate Valves for Ordinary Water Works Service". The minimum designed working water pressure shall be 175 psi for valves with diameters of 12" or less.

All buried valves shall be supplied with a 2" square operating nut and shall be opened by turning the operating nut in a counterclockwise direction. Ends shall be mechanical joint.

All inside gate valves shall be handwheel operated with flanged ends.

All gate valves 12" and smaller shall be supplied with double "O" ring seals in lieu of the conventional stuffing box.

Gate valves shall be manufactured by Mueller, Clow, Darling, or equal.

17. Swing Check Valves. Swing check valves shall have weight and lever. Check valves shall have an iron body with bronze seat and disc rings, and shall be approved by Underwriters Laboratories, Inc. Valves shall have a pressure rating of 175 psi and be American-Darling, Clow, Mueller, or equal.

18. Tapping Sleeves. Tapping sleeves shall be of ductile iron, of the split sleeve type with mechanical joint ends, and with a Class 125 outlet flange. The end gaskets shall be Duck-Tipped Rubber Gaskets and all end and side gaskets shall be totally confined to eliminate cold flow. The tapping sleeves shall be as manufactured by Mueller Company, Decatur, Illinois; American-Darling Valve Company; Clow, or equal.

19. Tapping Valves. Tapping valves shall be equal in all respects to the gate valves hereinbefore specified except that they shall come equipped with one end having a Class 125 Flange and the other end having a mechanical joint.

20. Valve Boxes. Valve boxes shall be of cast iron conforming to ASTM Specification A048, Class 35. They shall be of the extension type of a pattern approved by the Engineer. Size of valve box shall be suitable for size valve it is to serve and it's bury. Valve boxes shall be as manufactured by James B. Clow Company, or equal, and shall have the word "WATER/SEWER" cast on the top of the lid.

21. Fire Hydrants. Fire hydrants shall be cast iron bodied, fully bronze mounted, suitable for a working pressure of 150 psi and shall conform to the requirements of the latest revision of AWWA Standard C-502 for "Fire Hydrants for Ordinary Water Works Service". Hydrants shall be constructed to permit withdrawal of internal working parts without disturbing the barrel or casing. Main valves, when closed, shall be reasonably tight when upper portion of the barrel is broken off. For water mains less than 12" in size, main valve opening shall be 4-1/2". For water mains 12" and greater in size fire hydrants shall have main valve opening of 5-1/4". The main valve

facing shall be made of rubber. There shall be no chattering under any condition of operation. The hydrants shall be of the compression type, with main valve opening against the pressure and closing with the pressure.

Each hydrant shall be equipped with two (2) 2-1/2" hose connection and one (1) pumper connection. Hose nipples shall be bronze or non-corrosive metal. Threads shall be approved by the City prior to placement of order for the hydrants.

Hydrants shall be American Darling, Mueller, or Clow and painted to city standard color scheme.

22. Mechanical Joint Restraint. Mechanical joint restraint shall be manufactured of ductile iron conforming to ASTM A536-80 such that the device can be used with standardized mechanical joint pipe and conform to ANSI/AWWA A 21.531 C153 and shall be EBAA Iron, Inc., Megalug or Uni Flange Corporation. Megalugs will be installed on all fittings, valves, bends, plugs, and on all pipe sections on hydrant legs. Concrete blocking is not required.

23. Manhole Rings and Covers. Manhole rings and covers shall be made of cast iron of superior quality, tough and of even grain, and will possess a tensile strength of not less than 18,000 psi. Rings and covers shall be manufactured in accordance with ASTM A-48 Class 30. Rings will weigh not less than 190 lbs., and covers will weigh not less than 120 lbs. The rings will be a maximum of 7 1/2" high, and have a minimum opening of 1'-10". See Detail SS-4 for the wording that shall be cast in the covers. The finished rings and covers shall have the bearings surfaces machined or ground so that there will be no variation that will permit rocking or rattling and the diameter of the covers shall be such as to fit the rings without wedging. All rings and covers will be thoroughly cleaned and given two coats of an approved bituminous paint. Rings shall have a solid cover on street work, and perforated on outfalls.

24. Manholes Steps. Steps shall be constructed of a reinforced molded copolymer polypropylene plastic shell. Reinforcing shall be a single 1/2" steel bar ASTM designation A615 grade 60 and equal in all respects to step PS1-PF as manufactured by M.A. Ind., Inc.

25. Precast Manholes. Precast manholes shall be constructed of reinforced concrete and shall comply with the requirements of ASTM Designation C-478 "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS".

Shop drawings shall be submitted for approval prior to manufacture. Manholes shall be constructed with a monolithic base with the side wall extending at least 48" above the base; appropriate openings left in the side wall to receive the sewer pipe; barrel or riser sections with a 48" maximum length; and a conical top section having a 24" diameter opening offset in such a manner that the edge of the opening is on a vertical line with the edge of the barrel or riser section.

Manhole steps for precast manholes, unless otherwise approved by the Engineer, shall be as hereinbefore specified and shall be set at a spacing of 12" on centers, with one extra step set in the opposite wall of the conical section.

Manhole rings and covers for precast manholes shall be as hereinbefore specified. Precast manholes shall be as constructed by N. C. Products Corporation, Raleigh, North Carolina, or approved equal.

Precast manholes, shall be parged w/ non-shrink grout at every joint. Block manholes shall be parged from top to bottom.

26. Small Size Pipe. Small size of (2" to 4") pipe will be as follows: 3" or 4" pipe shall be D.I.P., Class 50 minimum. 2" pipe shall be Type "K", soft copper.

27. Air Release Valve. Air release valves shall be as manufactured by G.A. Industries, Clow Corporation, or equal, of size, number, and location as shown on the Drawings depending on the type of service.

28. Steel Encasement Pipe. Wherever a line must be encased under a highway or railway, it must be encased in a steel pipe that has been manufactured in conformance with the standards of AWWA C-202. Joints, coatings, and method of installation shall be in conformance with the requirements of the N.C. State Highway Commission. In general, the encasement pipe will be installed by boring with an auger so as not to displace material on the outside of the casing.

29. Carrier Pipe in Encasement. Wherever a water line or sewer line must be encased under a highway, it shall be of ductile iron as hereinbefore specified and all joints shall be restrained.

30. PVC Gravity Sewer Pipe. PVC (Poly Vinyl Chloride) Gravity Sewer pipe shall be made of PVC plastic conforming to ASTM D-3034 SDR35. Rubber gaskets shall comply in all respects with the physical requirements specified in ASTM D-3212. The bell shall be an integral part of the pipe and the spigot ends shall be supplied from factory with bevels. The Contractor shall furnish the Owner with an affidavit from the manufacturer that the materials furnished comply with these specifications.

31. Sewer Force Mains. Sewer Force Mains 3" or larger in size shall be of Ductile Iron Pipe, Class 50 as hereinbefore specified. For force mains less than 3" in size, the material shall be PVC C-900, minimum pressure Class 150.

32. Aggregate Base Course. The materials used in the construction of the aggregate base course shall comply with Section 520, Aggregate Base Course, of the N.C. State Highway Commission's "Standard Specifications for Roads and Structures", January, 2012 as amended.

33. Asphalt Concrete Binder Course. The materials used in the construction of the bituminous concrete base course shall comply with Section 610, Asphalt Concrete Binder Course - Type I 19.0B, of the N.C. State Highway Commission's "Standard Specifications for Roads and Structures", January, 2012 as amended.

34. Asphalt Concrete Surface Course. The materials used in the construction of the bituminous concrete surface course shall comply with Section 610, Asphalt Concrete Surface Course – Type SF 9.5, of the N.C. State Highway Commission's "Standard Specifications for Roads and Structures", January, 2012 as amended.

35. Prime Coat. The prime coat shall comply with Section 600 of the N.C. State Highway Commission's "Standard Specifications for Roads and Structures", January, 2012 as amended.

36. Tack Coat. The tack coat shall comply with Section 605 of the N.C. State Highway Commission's "Standard Specifications for Roads and Structures", January, 2012 as amended.

37. Pavement Replacement.

a. Wherever asphalt type pavement has been ordered by the Engineer or the Owner to be cut and replaced, it shall be replaced with 6" Type I-190B, and 1" thick asphalt concrete surface course in conformance with N.C. State Highway Commission's "Standard Specifications for

Roads and Structures", January, 2012 (as amended). Any tack coat used shall conform to same standards.

b. Wherever concrete type pavement has been ordered by the Engineer or Owner to be cut and replaced, it shall be replaced with Class A concrete poured 8" thick.

38. Stabilization Stone for Pavement Cuts. The stone used in stabilizing pavement cuts shall conform to the Aggregate Base Course as described in the N.C. State Highway Commission's "Standard Specifications for Roads and Structures", January, 2012 as amended.

39. Stabilization Stone for Ditches. The stone used in stabilizing ditch bottoms, prior to the installation of storm sewer pipe in the said ditch, shall conform to the requirements of Size No. 67 Aggregate as described in the N.C. State Highway Commission's "Standard Specifications for Roads and Structures", January, 2012 as amended.

40. Concrete Curb and Gutter. Concrete used in curb and gutter shall be 3,000 psi concrete as hereinbefore specified.

41. Rip Rap. Rip Rap shall be Class 1 quarry stone as described in Section 1042 of the N.C. State Highway Commission's "Standard Specifications for Roads and Structures", January, 2012 as amended. (Class A & B to be used where specified.)

WATER MAINS: DETAILED SPECIFICATIONS FOR INSTALLATION

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1. General Provisions. The following Specifications cover work which is to be furnished and installed under the document containing water mains.
2. Scope of Work. The work to be performed under this Contract includes the Water Mains shown on the Drawings complete with all appurtenant items, as shown on the accompanying Plans and as Described in these Specifications.
3. Clearing of Rights-of-Way. Where clearing and grubbing is required, the area to be cleared shall be grubbed of all stumps and shall be left free of all stumps, brush and rubbish resulting from the clearing operation.
4. Excavation for Pipelines. All excavation shall be of one classification regardless of the material encountered, unless a rock clause is included in the supplemental conditions. All trenches shall be excavated in open cut from the surface, except as otherwise provided for herein, and in close conformity to the lines given by the engineer. The contractor shall be responsible for staking water line alignment in streets where curb and gutter will be installed to insure proper alignment and depth.

In order that there be sufficient room for properly laying and jointing the pipe, trench widths shall be a minimum of 24" plus the outside pipe diameter. In order to safeguard the pipe, however, the maximum trench width shall not exceed 36" plus the outside pipe diameter unless approval to the contrary is given by the Engineer. Trench widths will be measured between faces of the cut at the top of the pipe.

Where no special bedding is required, trench bottoms may be machine excavated to slightly above grade and cut down to pipe grade by hand in the fine-grading operation. Should the trench bottom be inadvertently cut below grade, it shall be filled to grade with #67 stone tamped.

Length of trench open ahead of pipe laying shall be no more than 300 feet, and no less than 20 feet unless approval is obtained from the Engineer. Contractor shall open no more trench than can be covered by end of working day.

Wet trenches or those of unstable subgrade shall be stabilized by the use of No. 67 stone.

The Contractor shall keep all trenches free from water during excavation for pipelines. The water shall be pumped out of the ditch or dams built to keep it out of the ditch in such a manner as not to cause injury to the public health, private property, or the work in progress.

Portable bridges shall be erected across trenches, wherever the Engineer deems them necessary to permit the passage of vehicular and/or pedestrian traffic.

The Local Fire Department and 911 shall be notified at least 24 hours before any street is blocked by the opening of a trench. The fire department and 911 shall also be notified when the street is once again open to traffic.

Sheeting or bracing shall be used wherever necessary to prevent caving of the trench banks. The removal of sheeting shall be done in such a manner as to minimize the loss of friction between the trench walls and the backfill. Sheeting shall be cut off and left in place where its removal will adversely affect the pipeline installation.

5. Rock Excavation in Trenches. Should rock be encountered in the trenches, the excavation shall be carried to a depth of 6" below the body of the pipe and the trench shall be brought back to grade with No. 67 stone properly compacted.

Should rock be encountered in the trenches and blasting is required for its removal, then all blasting operations shall be conducted in strict accordance with existing ordinances and accepted safe practices relative to the storage and use of explosives.

No rock excavated from trenches larger than 3" in diameter shall be used to backfill such trenches and no rock is allowed in the first 24" above the top of pipe. The Items named for the various sizes and classification of pipe to be installed shall include the removal and disposal of such excavated rock material. The Contractor shall secure, haul, and place in the trench sufficient suitable backfill material. Suitable backfill material is defined as stabilization stone, sand, or native material free from rocks and of optimum moisture content in order to compact to 95% of standard proctor. The use of native material shall be subject to the sole approval by the Engineer or his representative.

6. Pavement Cutting and Removal. Wherever it becomes necessary to cut pavement, the cuts shall be confined to a maximum width of the nominal pipe diameter plus 24". No pavement shall be cut wider than these Specifications without authorization from the Engineer. All pavement to be removed shall be marked for cutting by chalk line or other acceptable method. After marking, bituminous pavement shall be sawed to its full depth to a neat and true line along the mark. Concrete pavement shall be sawed to a minimum depth necessary for a smooth cut when broken out. All pavement cut shall be removed from the site of the work and shall not be used to backfill trenches.

7. Backfilling Trenches. Trenches shall be filled in layers six inches (6") deep and thoroughly compacted with mechanical compactors to attain 95% of standard proctor, except the top 12" to be 100% of standard proctor. Dry material used in refilling will be sufficiently moistened so that after compacting, future settlement will be at a minimum. Flooding will not be permitted and excess water from any cause will be removed from the ditch. Material left over from the trench shall be hauled away or disposed of as the Engineer may direct and no extra compensation will be allowed for such disposal. If native soil from the trench is unsuitable to attain a stable, unyielding trench; the contractor shall provide suitable backfill at his own expense as defined in paragraph 6.

Compaction tests in the trenches shall be provided by a certified testing firm as further provided under Section 10 and 27 in the Street and Site Improvements specifications.

The top twelve inches (12") of all trenches where pavement has been cut, and where directed by the Engineer, shall be backfilled with crushed stone placed in layers six inches (6") deep and thoroughly compacted. This stone shall be Aggregate Base Course meeting the requirements of the N.C. State Highway Commission's "Standard Specifications for Road Structures", dated January, 2012 (as amended). It shall be the Contractor's responsibility to maintain all pavement cuts until paved or accepted by the City.

Wherever pipelines are laid in or across unpaved roads or streets, or along the shoulders of paved roads, backfilling shall be accomplished in the same manner as hereinbefore described for trenches in paved roads or streets except that the trench shall be filled its full depth with earth.

8. Pipe Laying - General Provisions. The Contractor shall be responsible for all material which may become a part of the finished work until it is finally in place, tested and accepted by the City, except as otherwise provided for herein, and shall remove from the lines any cracked or defective pipe or fittings and shall replace them with new pipe or fittings without extra compensation. Great care must be exercised by the Contractor in handling lined pipe so as not to injure the linings. A damaged lining in a piece of pipe or a fitting will be deemed sufficient reason for its rejection by the City.

Should any pipe be cracked or defective, the City may allow the Contractor to cut off the cracked or defective portion and lay the remainder of the pipe if, in the City and the Contractor's opinion, the cutting off of the cracked or defective end will not injure the balance of the pipe. Permitting such cutting off of cracked or defective ends, however, will not absolve the Contractor from any of his responsibility toward the work. Cutting pipe will only be allowed at ends or with special permission of City staff.

All pipe shall be thoroughly cleaned of earth and rubbish before being placed in the trench, and so kept until final completion and acceptance of the work. Every open end of the pipe shall be securely plugged when pipe laying is not in progress.

All pipe shall be laid on lines and grades as directed by the Engineer and as shown on the Drawings. All pipe shall be placed on a firm foundation so as to prevent subsequent settlement, and the trenches shall be carefully excavated to the proper grade, except where rock excavation is encountered, so that it will be unnecessary to fill in under the pipe. Bell holes shall be provided for all pipe laying modes and special care shall be exercised in obtaining full barrel support.

9. Pipelines Crossing Gravel Drives. Wherever a water line crosses a gravel drive, it shall be backfilled as hereinbefore described in backfilling trenches for crossing paved roads, except the top six inches (6") shall be filled with thoroughly compacted aggregate base course (ABC).

10. Pipe Laying - Cast Iron Water Main. The installation of cast iron pipe for water main shall be performed in accordance with the appropriate sections and subsections of AWWA C600. Minimum cover for water mains 10" diameter and smaller shall be 3 feet. Minimum cover for water mains 12" and larger shall be 4 feet. Pipe shall be installed as shown on the Plans and as directed by the Engineer.

Handling of pipe and accessories shall at all times be done in such a manner as to prevent damage to lining of body. All pipe, fittings, valves and hydrants shall be lowered into the trench by approved methods. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.

Pipe shall be swabbed clean before it is laid and any pipe which cannot be cleaned with a swab shall be removed and cleaned with suitable apparatus. Any pipe showing evidence of oil, tar or grease shall be permanently marked and removed from the job and shall not be returned until it has been cleaned to the satisfaction of the Engineer.

Laying of pipe shall be done in accordance with section 7 of AWWA C600, with care being taken to provide uniform bearing for the pipe. The laying of pipe on wood or other blocking will not be permitted. Bell ends shall face direction of laying unless otherwise directed by the Engineer. For lines on an appreciable slope, the Engineer may require that bell ends face upgrade. Bell and spigot of pipe shall be thoroughly cleaned and properly lubricated where a mechanical joint or a "push on" type of joint is employed.

Open ends of pipe shall be plugged with a standard plug or cap at all times when pipe laying is not in progress. Trench water shall not be permitted to enter the pipe.

Pipe cutting, where required, shall be done in a neat and workmanlike manner without damage to the pipe. Pipe cutting shall be done only with equipment especially designed and fabricated for that purpose. The use of chisels and cleavers will not be permitted.

Water mains shall be installed at the locations shown on the Plans or as directed by the Engineer.

Cast Iron Water Mains may only be installed with special permission from the City of Graham.

11. Pipe Laying - Ductile Iron Water Main. The installation of ductile iron pipe for water main shall be performed in accordance with the appropriate sections and subsections of AWWA C600. Minimum cover for water mains 8" diameter and smaller shall be 3 feet. Minimum cover for water mains 10" and larger shall be 4 feet. Pipe shall be installed as shown on the Plans and as directed by the Engineer.

Handling of pipe and accessories shall at all times be done in such a manner as to prevent damage to lining of body. All pipe, fittings, valves and hydrants shall be lowered

into the trench by approved methods. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.

Pipe shall be swabbed clean before it is laid and any pipe which cannot be cleaned with a swab shall be removed and cleaned with suitable apparatus. Any pipe showing evidence of oil, tar or grease shall be permanently marked and removed from the job and shall not be returned until it has been cleaned to the satisfaction of the Engineer.

Laying of pipe shall be done in accordance with section 7 of AWWA C600, with care being taken to provide uniform bearing for the pipe. The laying of pipe on wood or other blocking will not be permitted. Bell ends shall face direction of laying unless otherwise directed by the Engineer. For lines on an appreciable slope, the Engineer may require that bell ends face upgrade. Bell and spigot of pipe shall be thoroughly cleaned and properly lubricated where a mechanical joint or a "push on" type of joint is employed.

Open ends of pipe shall be plugged with a standard plug or cap at all times when pipe laying is not in progress. Trench water shall not be permitted to enter the pipe.

Pipe cutting, where required, shall be done in a neat and workmanlike manner without damage to the pipe. Pipe cutting shall be done only with equipment especially designed and fabricated for that purpose. The use of chisels and cleavers will not be permitted.

Water mains shall be installed at the locations shown on the Plans or as directed by the Engineer.

12. Setting Valves and Valve Boxes. Gate valves shall be set at locations shown on the Plans or as directed by the Engineer. The installation shall be made in accordance with Section 10 of AWWA C600. Each valve shall be equipped with a valve box accurately positioned over the wrench nut. Each valve box shall have a 6" thick x 24" diameter - Class A Concrete collar.

13. Setting Fire Hydrants. Fire Hydrants shall be set at locations shown on the Plans or as directed by the Engineer. In general, hydrants shall be located in a manner to provide complete accessibility and to minimize possibility of damage from vehicles or injury to pedestrians. The installation shall be made in accordance with Section 11 and 12 of AWWA C600 except as amended herein.

Drainage for hydrants shall be in accordance with subsections 11.4 and 11.5 of AWWA C600.

Each hydrant shall be set plumb and shall be restrained from the hydrant tee through the gate valve to the hydrant using mega-lug mechanical joint restraints. All valves installed on hydrant legs shall be securely anchored to the main line tee with mega-lugs.

Before a hydrant is set, it shall be carefully examined and all dirt and other foreign matter shall be removed from it.

Fire Hydrants shall be on water mains less than 12" in size, main valve opening shall be 4-1/2" with 3-6" bury. For water mains 12" and greater in size fire hydrants shall have main valve opening of 5-1/4" with 4'-6" bury.

Fire hydrants shall be repainted after installation - using paint furnished by hydrant supplier, to the City Standard colors.

14. Setting Ductile Iron Fittings. Ductile iron fittings shall be set at locations shown in the Plans or as directed by the Engineer. The installation of fittings shall be made in accordance with Section 10 of AWWA C600. Special care shall be taken to properly bell-up the joints and to support the body of the fitting. All fittings shall be restrained using mega-lug mechanical joint restraints.

15. Joint Restraint. All cast iron or ductile iron fittings, hydrants, valves, fittings, and other water main components subject to hydrostatic thrust shall be securely restrained by use of mega-lug mechanical joint restraints.

16. Blowoffs. All dead end water mains, not provided with hydrants reasonably close to such dead ends, shall be equipped with blowoff facilities as provided for in Section 10 of AWWA C-600. Blowoffs shall be installed per details.

17. Testing of Water Mains. All water mains (including services), before final acceptance shall be tested by filling the main with water, care being taken to expel all air. As a part of this operation, the main to be tested shall be flushed by opening the terminal valve hydrant or blowoff. A temporary tail ditch shall be provided to carry the flushing water to the nearest drain ditch. A pressure of 150 psi shall be applied to the main at the test pump and shall be maintained at that pressure for a minimum period of 2 consecutive hours. All defective material found shall be replaced by the Contractor. All leaking joints shall be made tight. The pipe installation will not be accepted unless and until the leakage, evaluated on the pressure test of 150 psi for a minimum of 2 hours, does not exceed 10.0 gallons per day per mile of pipe per inch of nominal diameter. Test pump drawings shall be approved by Engineer.

In general, the pressure test and the leakage test shall be performed in the manner set forth in Section 13 of AWWA Standard C600, except that the Contractor shall furnish his own pressure gauges. The pressure test and the leakage test shall be performed by the Contractor and witnessed by the City Engineer.

18. Chlorination of Water Mains. All additions to the water system shall be sterilized by chlorination before being placed in service. Such chlorination must be made under the observation of the Engineer. Chlorination of water mains and Dechlorination of water mains shall be carried out in the following manner:

a. Taps shall be made at the control valve at the upstream end of the line and at all extremities of the line. These taps shall be located in such a manner as to allow HTH solution to be fed into all parts of the main.

b. A solution of water containing high test hypochlorite (70% available chlorine) shall be introduced into the main by regulated pumping at the control valve tap. The solution shall be of such concentration that the water in the main will have at least 50 ppm total chlorine residual immediately after chlorination. The following chart shows the required quantity of 70% HTH compound to be contained in solution in each 1,000 foot section of pipe to produce the desired concentration of 50 ppm:

<u>Pipe Size</u>	<u>Pounds 70% HTH Per 1,000 Ft. of Pipe</u>
6"	0.88
8"	1.56
10"	2.42
12"	3.50

c. The HTH solution shall be circulated in the pipelines by opening the control valve and systematically manipulating hydrants and taps at the main extremities until a uniform concentration has been produced throughout the pipe.

d. The HTH solution shall remain in the main for not less than 24 hours. At the end of this time, the residual chlorine shall be at least 10 ppm. Should the chlorine residual be found to be less than 10 ppm, then the pipelines shall be rechlorinated.

e. Following satisfactory chlorination, the pipelines shall be flushed. Flushing shall continue until only a normal chlorine residual, as determined by the ortho-tolidine test, is present in the water.

f. The Contractor shall be responsible to dechloramine or dechlorinate any water before it is released to the ground. The Contractor shall use an apparatus that injects or mixes EPA approved chemicals containing one of the following chemicals (absorbic acid, sodium sulfite or sodium thiosulfate) with the discharged water to neutralize the chloramine or chlorine before it is released to the ground. Approved chemicals for use are: (Vita-D-Chlor Tablets, D-Chlor Tablets, No-Chlor Dechlorination Grade Calcium Thiosulfate Solution, or pre-approved equivalent). Approved dechlorination units are: (Pollard Water LPD250 Diffuser with tablet screen and Dechlorination System, the H2O Neutralizer manufactured by Measurement Technologies, Inc., or pre-approved equivalent), or as directed by the Engineer. Total chlorine residual levels shall be reduced and maintained between a minimum of 1.0 parts per million (1.0mg/l) to a maximum of 4.0 parts per million (4.0mg/l). The Contractor shall test the discharge at 15 minute intervals to insure that acceptable levels of neutralization are maintained. Discharge shall be stopped if chlorine levels exceed 4.0 parts per million (4.0mg/l). The Contractor under the supervision of the Engineer shall perform the dechloramination and/or dechlorination.

All procedures shall be in accordance with manufacturers recommendations and as approved by the Engineer.

Only in cases where this method is not practical for unique reasons will the City consider allowing the water to be released into the collections system. In those cases, the Contractor will need to make a request at least 48 hours in advance in order for the City to determine the acceptability of the downstream collection facilities.

g. Following the flushing of the pipelines, samples shall be taken at various points along the line designated by City for bacteriological analyses. If test results are satisfactory, the pipelines may be placed in service. If test results are not satisfactory, rechlorination shall be undertaken at once.

All chlorination of the water system shall be performed by the Contractor at no cost to the Owner.

Provide a copy of acceptable test results to the City.

All water samples must be taken prior to 12 PM (noon) on Wednesday.

19. Connections to Existing Water Mains. Connections to existing water mains shall be made as detailed on the plans, using material hereinbefore specified or as shown on the Drawings. No connection to existing water main without approval of the City shall be made.

20. Pipelines Under State Highway Pavement. Where shown on the Plans, or as directed by the Engineer, ductile iron water mains shall be installed under State Highway pavement by encasing in a larger pipe. The carrier pipe shall be of restrained joint ductile iron and the encasement pipe shall be steel.

The encasement pipe shall be installed true to line and grade and in conformance with the requirements of the N.C. State Highway Commission. The size of the encasement and carrier pipes will be as shown on the Drawings.

Following the installation of the carrier pipe, the ends of the encasement pipe shall be suitably protected against the entrance of foreign material, but shall not be tightly sealed. In general, this may be accomplished by the use of the same stone specified for trench stabilization. The ductile iron carrier pipe shall extend approximately 5.0 feet beyond each end of the encasement pipe.

Pipelines installed under this section shall not be undertaken without the express approval of the appropriate N.C. State Highway Commission's Division Engineer.

21. Pavement Replacement. All pavement cut and removed from publicly maintained roads, streets, or highways as authorized by the Engineer, shall be replaced by the Contractor. Pavement cuts shall be maintained by the Contractor until such time as the pavement has been replaced, but such replacement shall be done as promptly as weather permits. Pavement shall be replaced within 48 hours of being cut. No pavement cuts are allowed on Friday.

22. Existing Pipes, Conduits, and Cables - Care of. Special care must be exercised by the Contractor, in the installation of the lines and improvements, in passing under or over existing storm sewers, sanitary sewers, water lines, gas lines, and telephone or power conduits or cables. All aforementioned lines, cables, conduits, or structures broken or ruptured by the Contractor must be immediately repaired or replaced by him.

23. Responsibility for Damages. The Contractor shall be held responsible for all damages claimed, as a result of the installation of this project, to all utility poles, driveways, yards, shrubbery and plantings, drain ditches, and pipes, pavement, sidewalks, water lines, gas lines, telephone or power conduits or cables, buildings, fences, etc., and will be required to make satisfactory adjustment of all claims arising from the installation of the work contemplated.

24. Signs and Barricades. The Contractor shall provide, erect, maintain, and illuminate, where necessary, all barricades, warning signs and local detour signs required. The contractor shall be held responsible for all damages to the project due to the failure of the signs and barricades to properly protect the work from traffic, pedestrians, animals, and from all other sources.

25. Cleanup. Upon installation of the specified improvements, the Contractor shall remove all excess materials, earth, debris, etc., along the line of his work and shall cleanup and leave, in its original or better condition, all affected property. The contractor shall clean up all work to the point of construction activity not less than weekly.

26. Erosion Control.

A. Reference to Other Documents. The General Conditions, Supplementary Conditions, Material Specifications, and Detailed Specifications for Installation contain requirements relevant to the work covered by this Section. Clearing and Grubbing, Site Grading, Clearing of rights of ways, excavating and backfilling, and Spoil Disposal will be subject to the applicable requirements of this Section.

B. General Requirements. Control of erosion and sedimentation resulting from land disturbing activities is subject to the requirements of the North Carolina Sedimentation Control Commission. Any authorized representative or agent of the commission shall be granted entry or access for purposes of inspection; he shall not be obstructed, hampered, or interfered with while he is in the process of carrying out his official duties. The requirements for erosion and sedimentation control apply to areas which are involved in borrow, waste disposal, and topsoil storage activities; and to areas which are directly involved with the construction of buildings, paving, curb, gutter, and to areas where storm drainage, water, and sewer lines and structures are installed. No Construction shall take place until erosion control permit is in hand and erosion control devices are installed.

Land disturbing activities shall be planned and carried out to achieve the following objectives:

- 1) Expose minimum sized areas at any one time
- 2) Limit exposures of areas to the shortest possible time
- 3) Control surface water run-off to reduce erosion and sediment loss
- 4) Hold off-site erosion and sedimentation damage to a minimum

With reference to requirement No. 2, portions of the site on which land disturbing activities have been undertaken, but upon which no further active construction takes place for a period of 15 working days, shall be planted or otherwise provided with a ground cover sufficient to restrain erosion.

The Contractor shall be responsible for maintaining all temporary and permanent erosion and sedimentation measures and facilities until the project is accepted by the City, or until removal of facilities and cessation of control measures is authorized by the Engineer.

C. Work Included. This Section includes the labor, materials, equipment, and related services required for the installation of berms, drainage structures, storm water drains, straw barriers, vegetative covers, and other devices or methods for control of erosion and sedimentation shown on the Drawings or specified herein.

D. Facilities and Measures for Erosion and Sedimentation Control.

- 1) Phased Construction. The installation of improvements shall be done in phases as specified on the construction drawings.

This phasing of construction will help limit erosion caused during the installation of the improvements, and will act as an erosion control measure.

- 2) Clearing and Grubbing. The Contractor is to clear the entire width of the permanent easement of trees, stumps, shrubs, and brush. The natural vegetative cover is to remain intact until the installation of the line begins, except that which has to be removed during the clearing and grubbing operation. Stumps, brush, and rubbish resulting from the clearing operation shall not be disposed of by placing on adjoining privately owned property unless the Contractor has a written instrument from the property owner. All other spoil is expected to be trucked off to the sanitary landfill for disposal.

- 3) Rip Rap. Rip Rap shall be installed at locations as shown on plans or as directed by the Engineer per the NC DENR erosion control manual.

- 4) Berms. Drainage berms and ditches shall be installed as shown on the Drawings per the NC DENR erosion control manual.

- 5) Silt Fence. Silt fences shall be installed as shown on the Drawings or when directed by the Engineer per the NC DENR erosion control manual.

6) Excelsior Matting. Matting shall be installed at location shown on the Drawings and shall be in compliance with "Standards and Specifications for Soil Erosion and Sediment Control" by the Land Quality Section of NCDENR per the NC DENR erosion control manual.

7) Utility Line Installation. Soil resulting from trench excavation to be used as backfill material shall be placed on the uphill side of the trench. This will prohibit runoff directly into the creek. No excavation shall be placed in the creek or on the bank at any time. Rock encountered during excavation shall be removed from the site, and shall not be disposed of by placing on adjoining privately owned property.

8) Permanent Vegetative Cover. Prepare seedbed by ripping, chiseling, harrowing or plowing to depth of six inches so as to produce a loose, friable surface. Remove all stones, boulders, stumps or debris from the surface which would prohibit germination or plant growth per the NC DENR erosion control manual.

Incorporated into the soil 800 to 1,000 pounds of 10-10-10 fertilizer plus 500 pounds of twenty percent (20%) Superphosphate per acre and two tons of dolomitic lime per acre unless soil tests indicate that a lower rate can be used.

Mulch after seeding with 2.0 tons of grain straw per acre and either crimp straw into soil or tack with liquid asphalt at 400 gallons per acre or emulsified asphalt at 300 gallons per acre.

PERMANENT SEEDINGS

<u>PLANTS & MIXTURE</u>	<u>PLANTING RATE/ACRE</u>	<u>PLANTING DATES</u>
TALL FESCUE (LOW MAINTENANCE)	100-150 LBS.	AUG. 15 - OCT. 15 FEB. 15 - MAY 1
TALL FESCUE WATERWAYS AND LAWNS (HIGH MAINTENANCE)	200-250 LBS.	AUG. 15 - OCT. 15 FEB. 15 - MAY 1
BLEND OF TWO TURF-TYPE TALL FESCUES (90%) AND TWO OR MORE IMPROVED KENTUCKY BLUEGRASS VARIETIES (10%) (HIGH MAINTENANCE)	200-250 LBS.	AUG. 15 - OCT. 15 FEB. 15 - MAY 1
TALL FESCUE AND KOBE OR KOREAN LESPEDEZA	100 LBS. & 20-25 LBS.	FEB. 15 - MAY 1 AUG. 15 - OCT. 15
TALL FESCUE AND SERICEA LESPEDEZA	50 LBS. 60 LBS./ACRE	NOV. 1 - FEB. 1 (UNSCARIFIED)

TALL FESCUE AND GERMAN MILLET OR SUNDANGRASS	70 LBS. AND 40 LBS.	JULY AND AUGUST
TALL FESCUE AND RYEGRAIN	70 LBS. AND 25 LBS.	NOV. 1 - JAN. 30
COMMON BERMUDAGRASS	8 LBS. (HULLED) 15-20 LBS. (UNHULLED)	APRIL 15 - JUNE 30 FEB. 1 - MARCH 30

Permanent Seeding Notes:

1. For spring seedlings, use scarified lespedeza seed. For late fall and winter seedings, use unscarified seed.
2. Annuals such as millet, sundangrass and ryegrain must be kept at 10-12" maximum height. The use of annual rye grass is not permitted.

The preceding permanent cover requirements pertain to all areas disturbed during the project construction including road shoulders, temporary access roads, spoil areas, building sites, rights-of-way, easements and line work.

27. Bonds and Permits Required by N.C. State Highway Commission. The Contractor, at his own expense, will secure from the N.C. State Highway Commission, the "Encroachment Agreement" required prior to the installation of that portion of this project that lies within the right-of way of the said Commission. Any or all other bonds and/or permits required by the said Commission in connection with this project shall be provided by the Contractor. This relates especially to the "Permit to Open Pavement" and the performance bond.

28. Guarantee. The Contractor shall guarantee that if any materials, equipment or workmanship covered by these Specifications and the accompanying Drawings proves defective within one year after final acceptance, such defects shall be made good by him. The Engineer shall provide a letter to the City indicating the start of the 12-month guarantee period. Provide State required certifications and "As Builts" with guarantee letter.

29. Testing Notice. Notice to the City, for any testing related to water line work, will be required of the Contractor 48-hours in advance of testing.

30. Damaged Piping. Should any piping be damaged prior to acceptance by the City, the whole joint will be replaced.

SANITARY SEWER LINES: DETAILED SPECIFICATIONS FOR INSTALLATION

1. General Provisions
2. Scope of Work
3. Lines and Grades for Sanitary Sewer Lines
4. Clearing of Rights-of-Way
5. Excavation for Pipelines
6. Rock Excavation in Trenches
7. Pavement Cutting and Removal
8. Backfilling Trenches
9. Pipelines Crossing Gravel Drives
10. Pipe Laying - General Provisions
11. Pipe Laying - Vitrified Clay Pipe
12. Pipe Laying - PVC Sewer Pipe
13. Pipe Laying - Ductile Iron Pipe Sanitary Sewer Mains
14. Precast Concrete Manholes
15. Drop Manholes
16. Connections to Existing Sewage Collection System
17. Testing Sewer Lines and Force Mains
18. Setting Ductile Iron Fittings
19. Joint Restraint
20. Concrete Encasement
21. Cast Iron Soil Pipe Stacks
22. Pipelines Under State Highway Pavement
23. Pavement Replacement
24. Existing Pipes, Conduits, and Cables - Care of
25. Responsibility for Damages
26. Signs and Barricades
27. Cleanup
28. Erosion Control
29. Bonds and Permits Required by N. C. State Highway Commission
30. Guarantee
31. Manhole Testing
32. Video Inspection
33. Testing Notice
34. Damaged Pipe

1. General Provisions. The following Specifications cover work which is to be furnished and installed under the document containing Sanitary Sewer Improvements.

2. Scope of Work. The work to be performed under this Contract includes the Sanitary Sewer Improvements shown on the Drawings, complete with all appurtenant items, as shown on the accompanying Plans and as described in these Specifications.

3. Lines and Grades for Sanitary Sewer Lines.

The Contractor shall furnish the following material, equipment, and services:

(a) All intermediate lines, grades, hubs, measurements, etc., required for the actual construction;

(b) Suitable laser equipment for installing the pipe at the indicated grade. Installation by batter boards will not be allowed.

(c) Both a transit and leveling instrument with appurtenances, all meeting the Engineer's approval, shall be kept on the construction site and a person skilled in their operation shall be employed or obtained whenever necessary to give or check elevations, levels, alignment, etc., in the work as the Contractor may need and as the Engineer may request;

(d) Two (2) copies of a daily record of the approximate lineal feet and depth of sewer trench opened per pipe size, the lineal feet of each size of pipe installed at the various incremental pay depths, the number and depth of manholes completed, and the completion of all other pay items. This daily record shall also record the time and location of any blasting. Locations of all work and blasting shown on the daily record shall be identified by station numbers.

4. Clearing of Rights-of-Way. The necessary rights-of-way for all lines crossing privately owned property will be secured by the owner. The permanent and temporary construction easements are of size and location as shown on the drawings. The entire width of the permanent right-of-way shall be cleared by the Contractor to its full width and will be left free of all stumps, brush, and rubbish. The temporary construction easement may be cleared in part to aid in the installation of the line.

All clearing operations conducted by the Contractor on the temporary construction easement shall be performed in exactly the same manner as that performed on the permanent easement.

Stumps, brush, and rubbish resulting from the clearing operation shall not be disposed of by placing on adjoining privately owned property unless the owner of the property in question approves of such disposal, and the Contractor furnishes the Engineer two (2) copies of a written instrument attesting to the said approval signed by the owner of the property.

5. Excavation for Pipelines. All trenches will be excavated in open cut from the surface, except as otherwise provided for herein, and in close conformity to the lines given by the Engineer.

In order that there be sufficient room for properly laying and jointing the pipe, trench widths shall be a minimum of 24" plus the outside pipe diameter. In order to safeguard the pipe, however, the maximum trench width shall not exceed 36" plus the outside pipe diameter unless approval to the contrary is given by the Engineer. Trench widths will be measured between faces of the cut at the top of the pipe.

Where no special bedding is required, trench bottoms may be machine excavated to slightly above grade and cut down to pipe grade by hand in the fine-grading operation. Should the trench bottom be inadvertently cut below grade, it shall be filled to grade with #67 washed stone tamped.

Length of trench open ahead of pipe laying shall be not more than 300 feet, and no less than 20 feet unless approval is obtained from the City and Engineer. Contractor shall open no more trench than can be covered by end of working day.

Wet trenches or those with unstable subgrade shall be stabilized by the use of No. 67 stone.

The Contractor shall keep all trenches free from water during excavation for pipelines. The water shall be pumped out of the ditch or dams built to keep it out of the ditch in such a manner as not to cause injury to the public health, private property, or the work in progress.

Portable bridges shall be erected across trenches, wherever the City deems them necessary to permit the passage of vehicular and/or pedestrian traffic.

The local Fire Department and 911 shall be notified at least 24 hours before any street is blocked by the opening of a trench. The Fire Department shall also be notified when the street is once again open to traffic. The contractor shall provide all temporary signage and barricades which may be required by the Fire Department or the Department of Transportation.

Sheeting or bracing shall be used wherever necessary to prevent caving of the trench banks. The removal of sheeting shall be done in such a manner as to minimize the loss of friction between the trench walls and the backfill. Sheeting shall be cut off and left in place where its removal will adversely affect the pipeline installation.

6. Rock Excavation in Trenches. Should rock be encountered in the trenches, the excavation shall be carried to a depth of 6" below the body of the pipe and the trench shall be brought back to grade with No. 67 Stone properly compacted. Suitable backfill material shall be defined as stabilization stone, sand, or native material free from rocks of optimum moisture content in order to obtain a compaction of 95% standard proctor. The use of native material shall be subject to the sole approval of the Engineer or his representative.

Should rock be encountered in the trenches and blasting is required for its removal, then all blasting operations shall be conducted in strict accordance with existing ordinances and accepted safe practices relative to the storage and use of explosives.

No rock excavated from trenches larger than 3" diameter shall be used to backfill such trenches and no rock is allowed in the first 24" above the top of the pipe. The items named for the various sizes and classifications of pipe to be installed shall include the removal and disposal off site of such excavated rock material. The contractor shall secure, haul, and place in the trench sufficient suitable backfill material. Suitable backfill material is defined as stabilization stone, sand or native material free from rocks of optimum moisture content in order to compact to 95% of standard proctor.

The use of native material shall be subject to the sole approval by the Engineer or his representative.

7. Pavement Cutting and Removal. Wherever it becomes necessary to cut pavement, the cuts shall be confined to a maximum width of the nominal pipe diameter plus 24". No pavement shall be cut wider than the Specifications without authorization from the City. All pavement to be removed shall be marked for cutting by chalk line or other acceptable method. After marking, bituminous pavement shall be sawed to its full depth to a neat and true line along the mark. Concrete pavement shall be sawed to a minimum depth necessary for the smooth cut when broken out. All pavement cut shall be removed from the site of the work and shall not be used to backfill trenches.

8. Backfilling Trenches. Trenches shall be filled in layers six inches (6") deep and thoroughly compacted with mechanical compactors to attain 95% standard proctor. Dry material used in refilling shall be sufficiently moistened so that after compacting future settlement will be at a minimum. Flooring will not be permitted and excess water from any cause shall be removed from the ditch. Material left over from the trench shall be hauled away and no extra compensation will be allowed for such disposal. If native soils from the trench are unsuitable to attain a stable, unyielding trench; the contractor shall provide suitable backfill material as defined in paragraph 6.

The top twelve inches (12") of all trenches where pavement has been cut, and where directed by the City, shall be backfilled with crushed stone placed in layers six inches (6") deep and thoroughly compacted. This stone shall be Aggregate Base Course stone meeting the requirements of the N. C. State Highway Commission's "Standard Specifications for Roads and Structures", January 1, 2012 (as amended). It shall be the Contractor's responsibility to maintain all pavement cuts until paved or accepted by the Owner.

Wherever pipelines are laid in the shoulders of paved roads, backfilling shall be accomplished in the same manner as hereinbefore described for trenches in paved roads or streets except that the trench shall be filled to its full depth with earth.

9. Pipelines Crossing Gravel Drives. Wherever a sewer line crosses a gravel drive, it shall be backfilled as hereinbefore described in backfilling trenches for crossing paved roads, except the top six inches (6") shall be filled with thoroughly compacted ABC Aggregate. It shall be the Contractor's responsibility to maintain all drives until accepted by the City.

10. Pipe Laying - General Provisions. The Contractor shall be responsible for all material which may become a part of the finished work until it is finally in place, tested and accepted by the City, except as otherwise provided for herein, and shall remove from the lines any cracked or defective pipe or fittings.

Great care must be exercised by the Contractor in handling lined pipe so as not to injure the linings. A damaged lining in a piece of pipe or a fitting will be deemed sufficient reason for its rejection by the Engineer.

Should any pipe be cracked or defective, the City may allow the Contractor to cut off the cracked or defective portion and lay the remainder of the pipe if, in the City and Contractor's opinion, the cutting of the cracked or defective end will not injure the balance of the pipe. Permitting such cutting off of cracked or defective ends, however, will not absolve the Contractor from any of his responsibility toward the work. Cutting of pipe shall only be done at the end of the pipe unless special permission is given by the City.

All pipe shall be thoroughly cleaned of earth and rubbish before being placed in the trench and so kept until final completion and acceptance of the work. Every open end of the pipe shall be securely plugged when pipe laying is not in progress.

All pipe shall be thoroughly flushed and cleaned after installation but prior to acceptance. All connections to existing lines or manholes shall be plugged to prevent mud and water from entering the existing system during construction.

All pipe shall be laid on lines and grades as directed by the Engineer and as shown on the Drawings. All pipe shall be placed on a firm foundation so as to prevent subsequent settlement, and the trenches will be carefully excavated to the proper grade, except where rock excavation is encountered, so that it will be unnecessary to fill in under the pipe. Bell holes shall be provided for all pipe laying modes and special care shall be exercised in obtaining full barrel support.

11. Pipe Laying – Vitrified Clay Pipe. Vitrified clay pipe may only be installed with special permission of the City. All materials for laying and jointing the pipe in the trench shall conform to the specifications for such materials hereinbefore given, and will be furnished by the Contractor. Grade lines for aligning and grading the pipe in the trench will be established by the Engineer, and all material and labor required will be furnished by the Contractor.

Previous to being lowered into the trench, each pipe shall be inspected by the pipe foreman, and faulty pipe rejected and removed from the work. No pipe shall be laid in the trench until the Engineer has been notified of the intention of the Contractor to lay pipe, giving the Engineer sufficient time to check the lines and grades before pipe laying is begun. The Contractor shall notify the Engineer at least three days before work is to begin.

Extra strength Vitrified Clay Pipe, as hereinbefore specified, shall be used regardless of the depth of trench in which it is to be installed.

Class "B" Bedding shall be used in trench depths between 0 feet and 24 feet. All pipe installed in trenched greater than 24 feet shall be installed using Class "A" Bedding.

Upon completion of the work, all lines shall present a clean and unbroken barrel, true to line and grade, and any defective lines shall be repaired and any deposits removed by the Contractor at his own expense.

12. Pipe Laying - PVC Sewer Pipe. PVC gravity sewer pipe shall be installed using a Class "B" bedding as shown on the plans with a select backfill material to the springline of the pipe. Minimum cover over PVC sewer pipe shall be 3-feet to any subgrade elevation.

Select backfill material is defined as stabilization stone (Size No. 67)

PVC Sewer Pipe shall be installed in accordance with ASTM D221 - Standard Recommended Practice for Underground Installation for Flexible Thermoplastic Sewer Pipe. PVC Sewer Pipe shall be tested by the contractor for deflection. The pipe shall be mandrelled with a rigid device sized to be cylindrical in shape and constructed with 9 to 10 evenly spaced arms. The mandrel shall be hand pulled by the contractor through all sewer lines. Any sections of sewer not passing the mandrel shall be uncovered and the contractor shall reround or replace the sewer and retest that section of line. The contractor shall submit mandrel drawings and testing schedule to the engineer for approval. The mandrel shall be sized for a 5% deflection allowance.

Previous to being lowered into the trench, each pipe shall be inspected by the pipe foreman, and faulty pipe rejected and removed from the work. No pipe shall be laid in the trench until the Engineer has been notified of the intention of the Contractor to lay pipe, giving the Engineer sufficient time to check the lines and grades before pipe laying is begun. The Contractor shall notify the Engineer at least three days before work is to begin.

13. Pipe Laying - Ductile Iron Pipe Sanitary Sewer Mains. Wherever, in the laying of sanitary sewer lines, the pipe must be supported on piers, where the pipe crosses surface waters, under a highway that cannot be open cut, or in shallow trenches where insufficient cover conditions exist, the Sanitary sewer lines shall be of ductile iron pipe. The material for laying and jointing the pipe shall conform to the specifications hereinbefore given for Ductile Iron Pipe. The ductile iron will be paid for at the unit price bid for the different sizes of pipe installed in the various pipe laying conditions. Force mains shall be of size and type as shown on the drawings and shall be installed in conformance to "Pipe Laying - General Provisions".

Previous to being lowered into the trench, each pipe shall be inspected by the pipe foreman, and faulty pipe rejected and removed from the work. No pipe shall be laid in the trench until the Engineer has been notified of the intention of the Contractor to lay pipe, giving the Engineer sufficient time to check the lines and grades before pipe laying is begun. The Contractor shall notify the Engineer at least three days before work is to begin.

14. Precast Concrete Manholes. Precast concrete manholes shall be built where shown on the plans or as directed by the Engineer. The inside diameter of the manholes shall be at least four feet (4'). Inverts will be built up to a depth of three-quarters (3/4) of the diameter of the pipeline as directed to properly take care of the flow through the manholes and to ease the drop from one pipe to the other. Benches shall be sloped for drainage, as shown of the Plans. Manholes shall be provided with flexible sleeves sealed with stainless steel bands at each pipe entering or exiting a manhole.

Joints between sections of the precast manhole shall be sealed with a Neophrene "O" Ring Gasket and bitumastic rope. Manholes shall be bedded on layer of crushed stone. The stone shall be the same as that specified for stabilizing ditches (Size No. 67), and shall be spread in a layer at least six inches (6") thick.

The manholes shall be capped with cast iron manhole frames and covers with the frames set in mortar with even bearing. The C.I. Frame shall be anchored to the manhole wall as shown on the plans. After completion, all manholes will be cleaned out and left in a neat condition with all jointing material protruding from joints shall be removed. All riser joints shall be parged with non-shrink grout. Any infiltration into the manhole will not be allowed.

15. Drop Manholes. Drops in manholes greater than 6" but less than or equal to 30", indicate a concrete slide. If the drop exceeds 30" provide an outside drop manhole. The outside drop manhole shall have a special drop pipe built into the manhole. This drop shall consist of a T-branch in the main sewer where it enters the manhole and a vertical drop pipe down the side of the manhole and supported therefrom and terminating at the bottom by a quarter bend into the manhole. All piping and fittings shall be of ductile iron pipe.

Drop pipe shall be Ductile Iron Pipe and fittings strapped to manhole wall with 1" stainless steel straps and masonry anchor bolts.

16. Connections to Existing Sewage Collection System. Connections to existing sewage collection systems shall be made where shown on the Plans or as directed by the Engineer.

Where the connection is made at an existing manhole, it will be necessary to reconstruct the existing invert(s) to accommodate the new line.

No connection to existing manholes or sewer lines shall be made until remaining project construction has been completed and tested.

17. Testing Sewer Lines and Force Mains. After the sewer lines are completed, but prior to their acceptance and before any sewage is permitted to enter, the following test shall be made by the Contractor to determine the watertightness of the lines, including the manholes. The Engineer will determine whether the test to be made shall be for infiltration or exfiltration. If ground conditions are such that an infiltration test would give no significant results, then an exfiltration test shall be made in the manner hereinafter described. The sewer line shall be filled with water to a level equal to the top of the lowest manhole in the section to be tested. At no point in the sewer line shall the head of the pipe reach more than 10 feet of water. The test will not be deemed conclusive, however, unless the head on the pipe reaches at least 3 feet of water at the upper end of the section being tested. Tests shall be run on the lines in separate sections so that the head on the pipe is at least 3 feet of water but does not exceed 10 feet.

Under the exfiltration method the line shall be tested for six hours (6) after filling and the leakage will be carefully measured. Allowable leakage shall be 100 gallons per inch of internal diameter per mile of pipe per 24 hours. If the leakage exceeds this limit the line shall be drained, repaired, and retested. The manholes shall be included in the test.

In the event the Engineer elects to test the sewer line by the infiltration method, the allowable infiltration shall be 10 gallons per inch of internal diameter per mile of pipe per 24 hours. If the infiltration exceeds this limit, the line shall be repaired and retested.

All sewer lines must pass the test requirements prior to their acceptance by the City. Excessive leakage or infiltration in any one section shall be corrected even though the total may come within the allowable limits.

Force mains shall be tested in the manner set forth in Section 13 of AWWA Standard C600, except the Contractor shall furnish his own gauges and perform the test at no cost to the Owner. Before final acceptance, the force main shall be filled with water, care being taken to expel all air.

A pressure test of 150 psi shall be applied to the line at the test pump and shall be maintained at that pressure for a minimum period of two consecutive hours.

All defective material found shall be replaced by the Contractor. All leaking joints shall be made tight. The pipe installation will not be accepted unless and until leakage, evaluated on the pressure test of 150 psi for 2 hours, does not exceed 10.0 gallons per day per mile of pipe per inch of nominal diameter. The contractor has the option of using an air test method in lieu of the exfiltration method in testing the sewer line. The following requirements apply.

Air Test:

Low-Pressure Air Test for Sanitary Sewers:

*Introduction - Numerous laboratory and field air tests have been devised over the years since the early 1960's. Much of the information contained in these tests was utilized by the American

Society for Testing and Materials (ASTM) when preparing ASTM C828, a low-pressure air test for sanitary sewers.

Described below is the procedure for air testing sewer lines to demonstrate the integrity of the installed material and the construction methods.

*Summary of Method - The section of the sewer line to be tested is plugged. Low-pressure air is introduced into the plugged line. The amount and rate of air loss is used to determine the acceptability of the section being tested.

*Preparation of the Sewer Line - Flush and clean the sewer line prior to testing, thus serving to wet the pipe surface as well as clean out any debris. A wetted interior pipe surface will produce more consistent results. Plug all pipe outlets to resist the test pressure. Give special attention to stoppers and laterals. Testing to include all completed sewers including sewer services if included as a part of the work.

*Procedures - Determine the test duration for the section under test by computation from the applicable equations shown in ASTM C828, or from prepared air test tables. The pressure-holding time is based on an average holding pressure of 3 psi (21 kPa) gage or a drop from 3.5 psi (24 kPa) to 2.5 psi (17 kPa) gage.

Add air until the internal air pressure of the sewer line is raised to approximately 4.0 psi (28 kPa) gage. After an internal pressure of approximately 4.0 psig is obtained, allow time for the air pressure to stabilize. The pressure will normally show some drop until the temperature of the air in the test section stabilizes.

When the pressure has stabilized and is at or above the starting test pressure of 3.5 psi (24 kPa) gage, commence the test. Before starting the test, the pressure may be allowed to drop to 3.5 psig. Record the drop in pressure for the test period. If the pressure has dropped more than 1.0 psi (7 kPa) gage during the test period, the line is presumed to have failed. The test may be discontinued when the prescribed test time has been completed even though the 1.0 psig drop has not occurred.

*Safety - The air test may be dangerous if, because of lack of understanding or carelessness, a line is improperly prepared.

It is extremely important that the various plugs be installed and braced in such a way as to prevent blowouts. Inasmuch as a force of 250 lb. (1112N) is exerted on an 8-in. (203-mm) plug by an internal pipe pressure of 5 psi (34 kPa), it should be realized that sudden expulsion of a poorly installed plug or of a plug that is partially deflated before the pipe pressure is released can be dangerous.

As a safety precaution, pressurizing equipment may include a regulator or relief valve set at perhaps 10 psi (69 kPa) to avoid over-pressurizing and damaging an otherwise acceptable line. No one shall be allowed in the manholes during testing.

*Table - The air test table below has been prepared utilizing applicable equations from ASTM C828. It is based on an allowable air loss of $0.003 \text{ ft}^3/\text{min}\cdot\text{ft}^2$ of internal pipe surface, a maximum air loss per test section of $3.5 \text{ ft}^3/\text{min}$ and a minimum significant air loss per test section of $2.0 \text{ ft}^3/\text{min}$. (Test sections of such length that an air loss of $3.5 \text{ ft}^3/\text{min}$ would be exceeded using the allowable loss of air per square foot of internal pipe surface may be tested

in segments where total air loss would be between 2.0 and 3.5 ft³/min.). It applies when testing one pipe diameter only and for convenience ignores 4" and 6" lateral sewers, which in most instances create only insignificant differences in test time.

AIR TEST TABLE

Based on Equations from ASTM C828

SPECIFICATION TIME (min:sec) REQUIRED FOR PRESSURE DROP FROM 3-1/2 TO 2-1/2 PSIG

WHEN TESTING ONE PIPE DIAMETER ONLY

PIPE DIAMETER, INCHES

LENGTH OF LINE, FEET	4	6	8	10	12	15	18	21	24
25	0:04	0:10	0:18	0:28	0:40	1:02	1:20	2:01	2:38
50	0:09	0:20	0:35	0:55	1:19	2:04	2:58	4:03	5:17
75	0:13	0:30	0:53	1:23	1:59	3:06	4:27	6:04	7:55
100	0:18	0:40	1:10	1:50	2:38	4:08	5:56	8:05	10:34
125	0:22	0:50	1:28	2:18	3:18	5:09	7:26	9:55	11:20
150	0:26	0:59	1:46	2:45	3:58	6:11	8:30	-	-
175	0:31	1:09	2:03	3:13	4:37	7:05	-	-	-
200	0:35	1:19	2:21	3:40	5:17	-	-	-	12:06
225	0:40	1:29	2:38	4:08	5:40	-	-	10:25	13:36
250	0:44	1:39	2:56	4:35	-	-	8:31	11:35	15:07
275	0:48	1:49	3:14	4:43	-	-	9:21	12:44	16:38
300	0:53	1:59	3:31	-	-	-	10:12	13:53	18:09
350	1:02	2:19	3:47	-	-	8:16	11:54	6:12	21:10
400	1:10	2:38	-	-	6:03	9:27	13:36	18:31	24:12
450	1:19	2:50	-	-	6:48	10:38	15:19	20:50	27:13
500	1:28	-	-	5:14	7:34	11:49	17:01	23:09	30:14

18. Setting Ductile Iron Fittings. Ductile iron fittings shall be set at locations shown in the Plans or as directed by the Engineer. The installation of fittings shall be made in accordance with Section 10 of AWWA C600. Special care shall be taken to properly bell-up the joints and to support the body of the fitting. All fittings shall be restrained using mega-lug mechanical joint restraints.

19. Joint Restraint. All cast iron or ductile iron fittings, hydrants, valves, fittings, and other water line components subject to hydrostatic thrust shall be surely restrained by use of mega-lug mechanical joint restraints.

20. Concrete Encasement. Wherever in the laying of the sanitary sewer line the pipe is in a shallow trench where insufficient cover conditions exist, or where shown on the Drawings, or as directed by the Engineer, the pipe shall be completely encased in Class "C" concrete. This encasement shall conform to the typical section shown on the drawings. Delivery tickets on the

concrete thus shall be turned in to the Engineer no later than the following working day after delivery was made.

21. Cast Iron Soil Pipe Stacks. The cast iron soil pipe stacks shall be installed where shown on the Drawings and to material specifications as hereinbefore specified.

The stack shall be installed as detailed on the Drawings. Care must be taken to properly tamp the earth around stack as the pipe is laid.

The concrete pad is to be poured on undisturbed soil under the 1/4 bend to size as detailed on the Drawings.

22. Pipelines Under State Highway Pavement. Where shown on the Plans, or as directed by the Engineer, ductile iron sewer mains shall be installed under State Highway pavement by encasing in a larger pipe. The carrier pipe shall be of restrained joint ductile iron and the encasement pipe shall be of steel.

The encasement pipe shall be installed true to line and grade and in conformance with the requirements of the N. C. State Highway Commission. The size of the encasement and carrier pipes shall be as shown on the Drawings.

Following the installation of the carrier pipe, the ends of the encasement pipe shall be suitably protected against the entrance of foreign material, but shall not be tightly sealed. In general, this may be accomplished by the use of the same stone specified for trench stabilization. The ductile iron carrier pipe shall extend approximately 5.0 feet beyond each end of the encasement pipe.

Pipelines installed under this Section shall not be undertaken without the express approval of the appropriate N. C. State Highway Commission's Division Engineer.

23. Pavement Replacement. All pavement cut and removed from publicly maintained roads, streets or highways as authorized by the Engineer, shall be replaced by the Contractor. Pavement cuts shall be maintained by the Contractor until such time as the pavement has been replaced, but such replacement shall be done as promptly as weather permits. Pavement shall be replaced within 48 hours after being cut. No pavement cuts are allowed on Friday.

24. Existing Pipes, Conduits and Cables - Care of. Special care must be exercised by the Contractor, in the installation of the storm sewers, in passing under or over existing storm sewers, sanitary sewers, water lines, gas lines and telephone or power conduits or cables. All aforementioned structures broken or ruptured by the Contractor must be immediately repaired or replaced by him. It shall be the contractor's responsibility to verify the location of all underground lines before construction.

25. Responsibility for Damages. The Contractor shall be held responsible for all damages claimed, as a result of the installation of this project, to all utility poles, driveways, yards, shrubbery and planting, drain ditches and pipes, pavement, sidewalks, water lines, gas lines, telephone or power conduits or cables, buildings, fences, etc., and will be required to make satisfactory adjustment of all claims arising from the installation of the work contemplated in this contract prior to final settlement.

26. Signs and Barricades. The Contractor shall provide, erect, maintain and illuminate, where necessary, all barricades, warning signs and local detour signs required. The Contractor shall be held responsible for all damages to the project due to the failure of the signs and barricades

to properly protect the work from traffic, pedestrians, animals, and from all other sources. Signs and barricades shall comply with Manual on Uniform Traffic Control Devices for Streets and Highways as amended by the N. C. Department of Transportation.

27. Cleanup. Upon installation of the specified improvements, the Contractor shall remove all excess materials, earth, debris, etc., along the line of his work and shall cleanup and leave, in its original or better condition, all affected property. The contractor shall clean up all work to the point of construction activity not less than weekly.

28. Erosion Control.

A. Reference to Other Documents. The General Conditions, Supplementary Conditions, Material Specifications, and Detailed Specifications for Installation contain requirements relevant to the work covered by this Section. Clearing and Grubbing, Site Grading, Clearing of rights of ways, excavating and backfilling, and Spoil Disposal will be subject to the applicable requirements of this Section.

B. General Requirements. Control of erosion and sedimentation resulting from land disturbing activities is subject to the requirements of the North Carolina Sedimentation Control Commission. Any authorized representative or agent of the commission shall be granted entry or access for purposes of inspection; he shall not be obstructed, hampered, or interfered with while he is in the process of carrying out his official duties. The requirements for erosion and sedimentation control apply to areas which are involved in borrow, waste disposal, and topsoil storage activities; and to areas which are directly involved with the construction of buildings, paving, curb, gutter, and to areas where storm drainage, water, and sewer lines and structures are installed. No Construction shall take place until erosion control permit is in hand and erosion control devices are installed.

Land disturbing activities shall be planned and carried out to achieve the following objectives:

- 1) Expose minimum sized areas at any one time
- 2) Limit exposures of areas to the shortest possible time
- 3) Control surface water run-off to reduce erosion and sediment loss
- 4) Hold off-site erosion and sedimentation damage to a minimum

With reference to requirement No. 2, portions of the site on which land disturbing activities have been undertaken, but upon which no further active construction takes place for a period of 15 working days, shall be planted or otherwise provided with a ground cover sufficient to restrain erosion.

The Contractor shall be responsible for maintaining all temporary and permanent erosion and sedimentation measures and facilities until the project is accepted by the City, or until removal of facilities and cessation of control measures is authorized by the Engineer.

C. Work Included. This Section includes the labor, materials, equipment, and related services required for the installation of berms, drainage structures, storm water drains, straw barriers, vegetative covers, and other devices or methods for control of erosion and sedimentation shown on the Drawings or specified herein.

D. Facilities and Measures for Erosion and Sedimentation Control.

- 1) Phased Construction. The installation of improvements shall be done in phases as specified on the construction drawings.

This phasing of construction will help limit erosion caused during the installation of the improvements, and will act as an erosion control measure.

2) Clearing and Grubbing. The Contractor is to clear the entire width of the permanent easement of trees, stumps, shrubs, and brush. The natural vegetative cover is to remain intact until the installation of the line begins, except that which has to be removed during the clearing and grubbing operation. Stumps, brush, and rubbish resulting from the clearing operation shall not be disposed of by placing on adjoining privately owned property unless the Contractor has a written instrument from the property owner. All other spoil is expected to be trucked off to the sanitary landfill for disposal.

3) Rip Rap. Rip Rap shall be installed at locations as shown on plans or as directed by the Engineer per the NC DENR erosion control manual.

4) Berms. Drainage berms and ditches shall be installed as shown on the Drawings per the NC DENR erosion control manual.

5) Silt Fence. Silt fences shall be installed as shown on the Drawings or when directed by the Engineer per the NC DENR erosion control manual.

6) Excelsior Matting. Matting shall be installed at location shown on the Drawings and shall be in compliance with "Standards and Specifications for Soil Erosion and Sediment Control" by the Land Quality Section of NCDENR per the NC DENR erosion control manual.

7) Utility Line Installation. Soil resulting from trench excavation to be used as backfill material shall be placed on the uphill side of the trench. This will prohibit runoff directly into the creek. No excavation shall be placed in the creek or on the bank at any time. Rock encountered during excavation shall be removed from the site, and shall not be disposed of by placing on adjoining privately owned property.

8) Permanent Vegetative Cover. Prepare seedbed by ripping, chiseling, harrowing or plowing to depth of six inches so as to produce a loose, friable surface. Remove all stones, boulders, stumps or debris from the surface which would prohibit germination or plant growth per the NC DENR erosion control manual.

Incorporated into the soil 800 to 1,000 pounds of 10-10-10 fertilizer plus 500 pounds of twenty percent (20%) Superphosphate per acre and two tons of dolomitic lime per acre unless soil tests indicate that a lower rate can be used.

Mulch after seeding with 2.0 tons of grain straw per acre and either crimp straw into soil or tack with liquid asphalt at 400 gallons per acre or emulsified asphalt at 300 gallons per acre.

PERMANENT SEEDINGS

<u>PLANTS & MIXTURE</u>	<u>PLANTING RATE/ACRE</u>	<u>PLANTING DATES</u>
TALL FESCUE (LOW MAINTENANCE)	100-150 LBS.	AUG. 15 - OCT. 15 FEB. 15 - MAY 1
TALL FESCUE WATERWAYS AND LAWNS (HIGH MAINTENANCE)	200-250 LBS.	AUG. 15 - OCT. 15 FEB. 15 - MAY 1
BLEND OF TWO TURF-TYPE TALL FESCUES (90%) AND TWO OR MORE IMPROVED KENTUCKY BLUEGRASS VARIETIES (10%) (HIGH MAINTENANCE)	200-250 LBS.	AUG. 15 - OCT. 15 FEB. 15 - MAY 1
TALL FESCUE AND KOBE OR KOREAN LESPEDEZA	100 LBS. & 20-25 LBS.	FEB. 15 - MAY 1 AUG. 15 - OCT. 15
TALL FESCUE AND SERICEA LESPEDEZA	50 LBS. 60 LBS./ACRE	NOV. 1 - FEB. 1 (UNSCARIFIED)
TALL FESCUE AND GERMAN MILLET OR SUNDANGRASS	70 LBS. AND 40 LBS.	JULY AND AUGUST
TALL FESCUE AND RYEGRAIN	70 LBS. AND 25 LBS.	NOV. 1 - JAN. 30
COMMON BERMUDAGRASS	8 LBS. (HULLED) 15-20 LBS. (UNHULLED)	APRIL 15 - JUNE 30 FEB. 1 - MARCH 30

Permanent Seeding Notes:

1. For spring seedlings, use scarified lespedeza seed. For late fall and winter seedings, use unscarified seed.
2. Annuals such as millet, sundangrass and ryegrain must be kept at 10-12" maximum height. The use of annual rye grass is not permitted.

The preceding permanent cover requirements pertain to all areas disturbed during the project construction including road shoulders, temporary access roads, spoil areas, building sites, rights-of-way, easements and line work.

29. Bonds and Permits Required by N. C. State Highway Commission. The Contractor, at his own expense, will secure from the N. C. State Highway Commission, the "Encroachment Agreement" required prior to the installation of that portion of this project that lies within the right of way of the said Commission. Any or all other bonds and/or permits required by the said Commission in connection with this project shall be provided and paid for by the Contractor. This relates especially to the "Permit to Open Pavement" and the performance bond.

30. Guarantee. The Contractor shall guarantee that if any materials, equipment or workmanship covered by these Specifications and the accompanying Drawings proves defective within one year after final acceptance, such defects shall be made good by him. The Engineer shall provide a letter to the City indicating the start of the 12-month guarantee period. Provide State required certifications and "As Built" with guarantee letter.

31. Manhole Testing. This section is to supplement the manhole specifications. All manholes shall be tested using either the exfiltration test or vacuum test as specified below. Manholes shall be tested by plugging the inlet and outlet lines with airtight plugs prior to performing the manhole test.

- a. **Exfiltration:** Fill the manhole to the rim with water and allow the level to equalize due to saturation.

Refill the manhole and mark the level to begin the test. The test shall last at least 2 hours and allowable leakage shall be 3 gallons per hour. Manholes that fail the test shall be repaired as necessary and retested until they pass.

- b. **Vacuum Air:** The manhole shall be sealed at the top of the rim with the test rig and shall have 10-inches of mercury applied through the rig. The time for the mercury to drop from 10-inches to 9-inches shall be measured. The minimum test time for the specified drop shall not be less than that shown in the following table. All manholes on the project shall be tested. If any manhole fails, it shall be repaired as necessary and retested until it passes.

<u>Manhole Depth</u>	<u>Diameter of Manhole</u>		
	48" Ø	60" Ø	72" Ø
≤ 10 ft.	60 sec.	75 sec.	90 sec.
> 10 ft. but < 15 ft.	75 sec.	90 sec.	105 sec.
> 15 ft.	90 sec.	105 sec.	120 sec.

32. Video Inspection. All sewers shall be video inspected by the Contractor and a copy of such tape delivered to the City. Prior to the video of the sewers, all lines shall be pressured cleaned and flushed. All defects noted during the video inspection shall be corrected by the Contractor. The Contractor shall provide 48 hours' notice to the City prior to the video inspection in the event the City desires to witness the inspection.

33. Testing Notice. Notice to the City, for any testing related to sewer line work, will be required of the Contractor 48-hours in advance of testing.

34. Damaged Piping. Should any piping be damaged prior to acceptance by the City, the whole joint will be replaced.

SECTION 01015 - PROJECT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of these Contracts, including General and Supplementary Conditions and other Division 1-16 Specification Sections, apply to this Section.

1.2 COORDINATION

- A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, operation and maintenance.

1.3 CONSTRUCTION STAKEOUT

- A. On behalf of Owner, Engineer will provide construction stakeout for proposed sewer improvements as shown on the drawings. Two offset stakes will be provided for all manhole locations to provide horizontal and vertical control. Tees, and horizontal bends, locations will be staked for water main improvements.
- B. Contractor will be responsible for scheduling Engineer to have improvements staked. A 48-hour minimum notice to Engineer will be required. Restaking will be paid for by the Contractor at the Engineer's current Hourly Rates.

1.4 EASEMENTS AND RIGHTS-OF-WAY

- A. The easements (temporary or permanent) and rights-of-way for the pipelines will be provided by Owner. Contractor shall confine his construction operations within the limits indicated on the drawings. Contractor shall use due care in placing construction tools, equipment, excavated materials, and pipeline materials and supplies in order to avoid damage to property and interference with traffic.
- B. Bidders are advised that easements not obtained by Owner prior to award of contract will be obtained by the Power of Eminent Domain and will be available within 60 days from date of issuance of Notice to Proceed. Bidders shall not seek any compensation from Owner as a result of Owner not having all easements within 60 days from issuance date of Notice to Proceed.
- C. Easements (temporary or permanent) across private property are indicated on the drawings. Contractor shall set stakes to mark the boundaries of construction easements across private property. Contractor shall furnish, without charge, competent persons from his force and such tools, stakes, and other materials as may be required to stake out the boundaries of construction easements. The stakes shall be protected and maintained until completion of construction and cleanup.

- D. Contractor shall not enter any private property outside the designated construction easement boundaries without written permission from the owner of the property. Contractor shall provide one (1) copy of such written permission to the Owner and Engineer.

1.5 OPERATION OF EXISTING FACILITIES

- A. Contractor shall provide temporary facilities and make temporary modifications as necessary to keep the existing facilities in operation during the construction period.
- B. Prior to connecting to the existing water and sewer system, Contractor shall coordinate with and Engineer.

1.6 LOCATION OF EXISTING UTILITIES

- A. Prior to beginning work, Contractor shall notify all existing utility companies and have all existing utilities located.
- B. All utility conflicts shall be brought to the attention of the Engineer immediately. Engineer will promptly review utility conflicts and advise Contractor as to how to proceed.

1.7 NOTICES TO OWNERS AND AUTHORITIES

- A. Contractor shall, as provided in General Conditions, notify Owners of adjacent property and utilities when prosecution of the work may affect them.
- B. When it is necessary to temporarily deny access to property, or when any utility service connection must be interrupted, Contractor shall give notice sufficiently in advance to enable the affected persons to provide for their needs. Notices will conform to any applicable local ordinance and, whether delivered orally or in writing, will include appropriate information concerning the interruption and instructions on how to limit inconvenience caused thereby.
- C. Utilities and other concerned agencies shall be contacted at least 48 hours prior to cutting or closing streets or other traffic areas or excavating near underground utilities or pole lines.

1.8 LINES AND GRADES

- A. All work shall be done to the lines, grades and elevations shown on the construction drawings.
- B. Owner will periodically check the lines and grades for compliance with the construction drawings. Any discrepancy will be brought to the attention of the Owner, Engineer and Contractor immediately and will be resolved prior to proceeding with additional construction. This check does not relieve Contractor from providing his own quality control.

1.9 UNFAVORABLE CONSTRUCTION CONDITIONS

- A. During unfavorable weather, wet ground, or other unsuitable construction conditions, Contractor shall confine his operations to work, which will not be affected adversely by such conditions. No portion of the work shall be constructed under conditions, which would affect adversely the quality or efficiency thereof, unless special means or precautions are taken by Contractor to perform the work in a proper and satisfactory manner. No additional cost will be made for such special means taken by the Contractor.

- B. Contractor shall review local weather forecasts and take necessary precautions to remove or relocate equipment, materials, supplies, etc. when precipitation is predicted which may result in the inundation of the work area. Contractor will not make a claim against the Owner or Engineer in the event a rainfall event or events occur and the Contractor's equipment, materials, supplies temporary work areas or completed work are damaged or lost due to flooding or other disaster. It is the Contractor's responsibility to repair or replace any lost or damaged item resulting from such flooding or such other disaster.

1.10 CLEAN-UP

- A. Contractor shall keep the premises free at all times from accumulations of waste materials and rubbish.
- B. Contractor shall neatly stack construction materials such as concrete forms, pipe, etc. when not in use. Contractor shall promptly remove spattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solutions from surfaces to prevent marring or other damage.
- C. Volatile wastes shall be properly stored in covered metal containers and removed daily.
- D. Wastes shall not be buried or burned on the site or disposed of into storm drains, sanitary sewers, streams, or waterways. All wastes shall be removed from the site and disposed of in a manner complying with local ordinances and anti-pollution laws.
- E. Adequate cleanup will be a condition for recommendation of progress payment applications.

1.11 REFERENCE STANDARDS

- A. Reference to standards, specifications, manuals or codes of any technical society, organization, or association, or to the laws regulations of any governmental authority, whether such reference be specified or by implication, shall mean the latest standard specification, manual, code or laws or regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated. However, no provision of any referenced standard, specifications, manual, or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of Owner, Contractor, Engineer, or any of their Consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Engineer, or any of Engineer's Consultants, agents, or employees, any duty or authority to supervise or direct the furnishing of performance of the work.

1.12 PRECONSTRUCTION CONFERENCE

- A. Prior to commencement of work at the site, a Preconstruction conference will be held at a mutually agreed time and place. The conference shall be attended by:
 - 1. Contractor and his superintendent.
 - 2. Principal Subcontractors.
 - 3. Representatives of principal Suppliers and manufacturers as appropriate.
 - 4. Engineer and his Resident Project Representative.
 - 5. Representative of Owner.
 - 6. Governmental representatives as appropriate.
 - 7. Others as required by Contractor, Owner, or Engineer.

- B. Unless previously submitted to Engineer, Contractor shall bring to the conference a preliminary schedule for each of the following:
 - 1. Progress
 - 2. Shop drawings and other submittals.
- C. The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The agenda will include:
 - 1. Contractor's preliminary schedules.
 - 2. Transmittal, review, and distribution of Contractor's submittals.
 - 3. Processing Applications for Payment.
 - 4. Maintaining record documents.
 - 5. Critical work sequencing.
 - 6. Field decisions and Change Orders.
 - 7. Use of premises, storage areas, security, housekeeping, and Owner's needs.
 - 8. Material deliveries and priorities.
 - 9. Contractor's assignments for safety and first aid.
- D. Engineer will preside at the conference and will arrange for keeping the minutes and distributing the minutes to all persons in attendance.

1.13 PROGRESS MEETINGS

- A. Contractor shall schedule and hold regular progress meetings at least monthly and at other times as requested by Engineer or required by progress of the Work. Contractor, Engineer, and all Subcontractors active on the site shall be represented at each meeting. Contractor may at his discretion request attendance by representatives of his Suppliers, manufacturers, and other subcontractors.
- B. Meeting minutes will be prepared and distributed by the Engineer. The purpose of the meetings will be to review the progress of the work, maintain coordination of efforts, discuss changes in scheduling, and resolve other problems, which may develop.

1.14 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed for the Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
- C. At Project closeout, credit unused amounts remaining in the contingency allowance to the Owner by Change Order.

1.15 TESTING AND INSPECTION

- A. The Owner will be responsible for providing personnel to verify test results performed by the Contractor.

- B. The Contractor shall test all work as specified in the Contract Documents.
- C. The Contractor shall furnish all apparatus and personnel required to conduct the testing and pay for all costs connected therewith.
- D. When required by the Contract Documents, geotechnical or other independent testing is required, the Owner will pay for said services; however, whenever retesting is required due to failed testing, Contractor will be responsible for payment of retesting fees.

1.16 SITE ADMINISTRATION

- A. Contractor shall be responsible for all areas of the site used by him and all Subcontractors in the performance of the work. Contractor will exert full control over the actions of all employees and other persons with respect to the use and preservation of property and existing facilities, except such controls as may be specifically reserved to Owner or others. Contractor has the right to exclude from the site all persons who have no purpose related to the work or its inspection.

1.17 OSHA'S REVISED STANDARD FOR EXCAVATION

- A. Contractor shall be responsible for complying with OSHA'S revised standard for excavation, as amended. See sheets OSHA-1 and OSHA-2 at end of this section.

1.18 STORMWATER INSPECTIONS

- A. Contractor shall inspect all erosion control measures on a weekly basis and within 24 hours of a 0.5-inch rainfall event (within a 24-hour period) and complete the STORMWATER INSPECTIONS FOR GENERAL PERMIT NCG010000 –LAND DISTURBING ACTIVITIES (Form attached at end of Section).
 - 1. Contractor shall maintain a file of said report and submit copies of report to Owner and Engineer on a monthly basis.
- B. Any repairs or required maintenance on erosion control measures noted during inspection are to be made prior to continuing with any construction activities.

END OF SECTION 01015

NOTE: The registered Professional Engineer referred to in this document is the RPE secured by the Contractor and not the design RPE for this water or sewer project.

FACT SHEET: OSHA'S REVISED STANDARD FOR EXCAVATIONS
29 CFR PART 1926 OCTOBER 31, 1989

I. SCOPE

Covers all open excavations; defines excavation to include trenches.

II. GENERAL REQUIREMENTS

Protection of employees in excavations against cave-ins except when the excavation is in stable rock or less than five feet deep and examination by a competent person provides no evidence that a cave-in should be expected; and against falling rock, soil or material by use of an 'adequate' system. -The latter operation includes scaling to remove loose rock or soil, installation of protective barricades and other 'equivalent protection. Material or equipment which might fall or roll into an excavation must be kept at least two feet from the edge of excavations, or have retaining devices, or be prevented from falling with a combination of both precautions.

Daily inspections of excavations, adjacent areas, and protective systems by a competent person and the removal of exposed employees if-evidence –of possible cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions until necessary precautions have been taken.

Removal of, or neutralization of surface encumbrances which may create a hazard.

Estimate location of underground installations (sewer, telephone, electrical, fuel and other lines; storage tanks, etc.) prior to digging; pinpoint actual locations as estimated locations are approached.

Ramps, runways, ladders or stairs as means of access/egress must be within 25 feet of an employee work area if a trench is four feet or more deep.

Warning system for mobile equipment including barricades, hand or mechanical signals, or stop logs.

Testing and Controls for hazardous atmospheres including emergency rescue equipment and daily inspections for potentially hazardous conditions by a 'competent person'. Controls include respirators or additional ventilation, if needed, and individually attended lifelines during descent into bell-bottom pier holes or similar excavations.

-Support systems such as shoring & bracing or underpinning to ensure the stability of adjacent structures such as buildings, walls or sidewalks.

III. REQUIREMENTS FOR PROTECTIVE SYSTEMS

Sloping and benching systems - four options:

1. A slope of 34 degrees or less, in lieu of soil classification. A slope of this gradation or less is considered safe for any type of soil.

2. Maximum allowable slopes and allowable configurations for sloping and benching systems will be determined through use of Appendices A (Soil Classification) and B (Sloping and Benching).
3. Designs of sloping or benching shall be selected from and be in accordance with data provided in written form, the text to identify: Criteria that affect the selection, the limits of use of the data and sufficient explanatory data as necessary to assist in making a correct choice of a protective system.

At least one copy of the tabulated data identifying the Registered Professional Engineer who approved the information shall be maintained at the job site during the time the work is being carried out.

4. Excavations can be designed by a Registered Professional Engineer, put in written form and kept at the work site, but must include, at least, the magnitude and configuration of the slopes determined to be safe for the project and the name of the RPE who approved the plan.

Support, shield and other protective systems - four options:

1. Designs for timber shoring in trenches set in accordance with the conditions and requirements determined by using Appendices A and C (timber shoring for trenches). For aluminum hydraulic shoring Appendices A and D can be used if manufacturer's tabulated data is not available.
2. Designs using manufacturer's tabulated data may be used, deviation allowed only with specific, written approval of the manufacturer.
3. Designs using other tabulated data may be used provided the data is in writing and includes: Explanatory information to aid the user in making a selection, the criteria determining the selection, and the limits on the use of the data. At least one copy of the information, including the identity of the RPE, kept at the work Site during construction of the protective system.
4. Design by a Registered Professional Engineer. Design systems not using any of the three previously cited options must be approved by a RPE, shall be in writing and include the identity of the RPE and details such as sizes, types and configurations of the materials to be used. At least one copy of the plan is to be at the job site during construction.

The standard allows an employer to use a trench box or shield that is either designed or approved by a registered professional engineer (RPE), or is based on tabulated data prepared or approved by an RPE.

The standard allows construction workers to remain inside trench shields that are being repositioned, provided that the shields are moved horizontally only and the shields are not lifted.

According to the new standard, information necessary for the safe installation, placement, use and removal of any trench support system must be available at the work site at all times, but a written log or record of inspections is not necessary.

This final standard goes into effect 60 days after publication in the Federal Register.

PROJECT: _____
 MONITORING FOR THE WEEK BEGINNING: _____

RAINFALL:

Date Of Rain	Amount (inches)	Initials

By this signature, I certify (in accordance with Part II Section B, 10 of the NCG010000 permit) that this report is accurate and complete to the best of my knowledge:

(Signature of Permittee or Designee)

EROSION AND SEDIMENTATION CONTROL FACILITIES INSPECTED: (At least once [twice, if on 303(d) listed stream for construction related parameters*] per seven calendar days Or within 24 hours of a rainfall of 0.5 inches per 24 hours)

Facility Identification	Date of inspection	Operating Properly (Y/N)	Describe corrective actions taken (may need to attach additional information)

OBSERVATIONS OF RUNOFF AT STORMWATER DISCHARGE OUTFALLS: (At least once [twice, if on 303(d) listed stream for construction related parameters *] per seven calendar days Or within 24 hours of a rainfall of 0.5 inches per 24 hours)

Stormwater Discharge Outfall Identification	Date	Clarity	Floating solids	Suspended Solids	Oil sheen	Other obvious indicators of stormwater pollution (list & describe)	Visible sediment leaving the site? (Y/N)	If yes, describe actions taken to prevent future releases (may need to attach additional information)	Describe measures taken to clean up sediment outside of the disturbed limits (may need to attach additional information)

Clarity: Choose the number which best describes the clarity of the discharge where 1 is clear and 10 is very cloudy

Floating Solids: Choose the number which best describes the amount of floating solids in the discharge where 1 is no solids and 10 the surface is covered in floating solids

Suspended Solids: Choose the number which best describes the amount of suspended solids in the discharge where 1 is no solids and 10 is extremely muddy

Oil Sheen: Is there an oil sheen in the stormwater discharge? Y or N

* 303(d) listed streams for construction related parameters – The latest approved list may be obtained from the Division of Water Quality, or from the following website location:
<http://h2o.enr.state.nc.us/su/construction303d>

SECTION 01025 – MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 1 and 2 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies the measurement and payment of the contract unit prices for the project.
- B. Related Sections include the following:
 - 1. “Bid Form” for unit price quantities and bid amounts.
 - 2. Division 1 Section "Application for Payment”.
 - 3. Division 2 – all Sections.

1.3 GENERAL

- A. The bid items shown in the Bid Form have been created solely for the purpose of comparison of bids and for use in the preparation of monthly Applications for Payment. Quantities shown thereon must be considered as approximate only.
- B. Basis for payment and unit of measurement for the work under this contract shall be in accordance with the following and shall include furnishing all labor, tools, equipment and materials required to construct the improvements in the manner specified including but not limited to all types of excavation, trenching, shoring, pumping, pipe installation, testing, backfilling, repairs, surface restoration and all other items necessary to complete the work as specified.
- C. All work shown on the plans herein specified or implied in any way on the drawings or specifications shall be done regardless of whether or not the work is specifically defined in any bid item.
- D. The non-utilization or partial utilization of any bid item shall not serve as a claim for any contract or unit price adjustment as the Contractor shall be paid the unit price bid for the number of units actually incorporated and accepted into the work.
- E. Payment and measurement will be based on this Section.
- F. Payment for lump sum items will be paid based on a percent complete basis determined by the Engineer.

1.4 PAY ITEMS

A. Item No. 1 – Mobilization

1. Payment for Mobilization will be paid for at the contract lump sum price for “Mobilization”. No additional payment will be made for insurance, bonds or additional items associated with project start-up, etc. since the work is considered to be included in the lump sum bid for Mobilization.
2. Partial payments for the item of “Mobilization” will be made with the first and second Application for Payments paid on the contract, and will be made at the rate of 50% of the lump sum price for “Mobilization” on each of these Application for Payments, provided the amount bid does not exceed 5% of the total amount bid for the project. Where the amount bid for “Mobilization” exceeds 5% of the total bid, 2-1/2% of the total amount bid will be paid on each of the first two Applications for Payment, and that portion exceeding 5% will be paid on the final Application for Payment.

B. Item No. 2 – Traffic Control

1. Payment for traffic control will be paid for at the contract unit price for “Traffic Control” and will be full compensation for all work described in the contract documents. The contractor shall provide new signs or signs in very good and legible condition. The contractor shall provide radios for the flaggers for traffic control.
2. The contractor shall abide by N.C.D.O.T. and MUTCD standards and guidelines. The contractor shall provide and maintain and other devices necessary for traffic control including, but not limited to: stop/slow paddles, vests, cones, barrels, arrow boards as required, and any other resources, equipment or personnel to safely route traffic around the contractors work zone.

C. Item No. 3 – Wattle

1. Measurement for the installation of wattles for erosion control will be based on the actual number of linear feet of wattle incorporated and accepted into the work and measured to the nearest linear foot.
2. No additional payment will be made for overlapping wattles, wooden stakes, anchor pins, etc. as it is considered incidental to the work and is to be included in the unit price bid.
3. Payment for wattles will be made at the contract unit price per linear foot for “Wattle” incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

D. Item No. 4 – Silt Fence

1. Payment for silt fence will be based on the actual number of linear feet incorporated and accepted into the work and measured to the nearest 1.0 foot.
2. No additional payment will be made for storage excavation, stone, wire, post, ties, maintenance and removal since the work is considered incidental to the work and is to be included in the unit price bid.
3. Payment for silt fence will be made at the contract unit price per linear foot for “Silt Fence” incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

E. Item No. 5 – Clearing, Grubbing, Debris Removal, and Limb Clearing

1. Payment for clearing and grubbing will be paid for at the contract lump sum price for “Clearing, Grubbing, Debris Removal, and Limb Clearing” and will be full compensation for all work described in the contract documents. Removal and disposal of existing fences is considered incidental to the work being paid for at the contract lump sum price for “Clearing and Grubbing and Debris Removal”.

F. Item Nos. 6 and 7 – Clean Stone and Rip Rap for Erosion Control Devices

1. Clean stone and rip rap used to construct sediment traps, stone filter outlets, rock silt screens, rip rap and gravel pipe inlet protection devices and stone check dams will be paid for at the contract unit price per ton “Clean Stone or Rip Rap for Erosion Control Devices” incorporated and accepted into the work.
2. Payment will be based on the actual number of tons based on quarry tickets. Quarry tickets shall be given to inspector at time of delivery and pay item will be marked on ticket. Tickets not given to inspector will not be paid for. Stone wasted or not used in the opinion of the inspector shall be deducted from the quarry tickets.
3. When directed by the Engineer, Contractor shall remove erosion control devices. Rip rap from removed erosion control devices may be used to stabilize the outlets of storm sewer pipes as directed by the Engineer.
4. No additional payment for permanent rip rap installation at outlets of storm sewer pipes will be made as the work since the work is considered incidental to the work and is to be included in the unit price bid.
5. No additional payment will be made excavation of accumulated sediment, maintenance of erosion control devices and removal of erosion control devices since the work is considered incidental to the work and is to be included in the unit price bid.
6. Payment for stone for erosion control devices will be made at the contract unit price per ton for “Rip Rap for Erosion Control Devices” or “Clean Stone for Erosion Control Devices” incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

G. Item No. 8 – Orange Construction Fence

1. Payment for orange construction fence will be based on the actual number of linear feet incorporated and accepted into the work and measured to the nearest 1.0 foot.
2. No additional payment will be made for clearing, post, ties, maintenance and removal since the work is considered incidental to the work and is to be included in the unit price bid.
3. Payment for orange construction fence will be made at the contract unit price per linear foot for “Orange Construction Fence” incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

H. Item No. 9 – Stabilization Fabric

1. Measurement for geotextile fabric for stabilization will be based on the actual square yards of geotextile fabric placed and accepted into the work and will be measured to the nearest square yard.
2. Payment for geotextile fabric will be based on the actual number of square yards of geotextile fabric installed and accepted into the work.

3. No additional payment will be made for overlapping geotextiles, sewing seams, wire staples, anchor pins, etc. as it is considered incidental to the work and is to be included in the unit price bid.

I. Item Nos. 10, 13 and 14 – ABC, Stabilization, and Incidental Stone

1. Incidental stone is defined as any NCDOT approved stone type used to repair driveways, roadways or stone installed as directed by the engineer. Stone type shall be either ABC or a clean stone type. For gravel drives, the stone type shall match the existing gravel type.
2. Stabilization Stone is defined, as stone installed below the bedding stone required for pipe installation and where in the opinion of the Engineer, the soil is unsuitable and ordered removed. Bedding stone used to bed the sanitary sewer main will be considered Stabilization Stone and paid in accordance with this paragraph.
3. Payment will be based on the actual number of tons based on quarry tickets. Quarry tickets shall be given to inspector at time of delivery and pay item will be marked on ticket. Tickets not given to inspector will not be paid for. Stone wasted or not used in the opinion of the inspector shall be deducted from the quarry tickets.
4. No additional payment will be made to undercut the proposed water or sewer main or to dispose of the unsuitable materials since the work is considered incidental to the work and is to be included in the unit price bid.
5. Payment for installation of ABC stone will be paid for at the contract unit price per ton for “ABC Stone” incorporated and accepted into the work and will be full compensation for all work described in the contract documents.
6. Payment for installation of stabilization stone will be paid for at the contract unit price per ton for “Stabilization Stone” incorporated and accepted into the work and will be full compensation for all work described in the contract documents.
7. Payment for installation of incidental stone will be paid for at the contract unit price per ton for “Incidental Stone” incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

J. Item No. 11 – Permanent Chain Link Fence

1. Payment for permanent chain link fence will be based on the actual number of linear feet incorporated and accepted into the work and measured to the nearest 1.0 foot.
2. No additional payment will be made for clearing, post, ties, or anchors since the work is considered incidental to the work and is to be included in the unit price bid.
3. Payment for chain link fence will be made at the contract unit price per linear foot for “Permanent Chain Link Fence” incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

K. Item No. 12 – Seeding and Mulching

1. Payment for seeding and mulching will be paid for at the contract lump sum price for “Seeding and Mulching”. No additional payment will be made for seedbed preparation, seed, fertilizer, lime, or repair seeding since the work is considered incidental to the work and is to be included in the contract lump sum price.

L. Item No. 15 – Ductile Iron Water Main

1. Payment for Ductile Iron Water Main will be based on the actual number of linear feet of ductile iron pipe incorporated and accepted into the work and measured to the nearest 0.1 linear foot.
2. No additional payment will be made for saw cutting pavements, excavation including for rock excavation, backfilling, dewatering, etc., testing or chlorination required to install the ductile iron pipe, since the work is considered incidental to the work and is to be included in the unit price bid.
3. Payment for Ductile Iron Water Mains will be made at the contract unit price per linear foot incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

M. Item No. 16 – Fire Hydrant

1. Payment for fire hydrant installation will be based on the actual number of fire hydrants incorporated and accepted into the work. Payment will be full compensation for all worked described in the Contract Documents.
2. Fire hydrant installation shall include a fire hydrant with 4 ½" valve opening (4' - 6" bury), excavation, connection to existing pipe stubbed off main, Class "B" concrete collar and blocking, stone, 10' of 6" DIP Class 50 pipe (max), 6" mega lugs, and painting of hydrant after installation.
3. Hydrant extensions, above the 4' - 6" bury depth, required to install the hydrant at proper grade will be paid for at a negotiated price for hydrant extension required.
4. Payment for fire hydrant installation will be paid for at the contract unit price for each "Fire Hydrant" incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

N. Item No. 17 – Compact Ductile Iron fittings

1. Payment for ductile iron compact fittings will be based on the following weights for each type of fitting and will be based on the actual number of fittings incorporated and accepted into the work.

<u>Description</u>	<u>Weight</u>	<u>Description</u>	<u>Weight</u>
30" - 90° Bend	1690#	6" - 22.5° Bend, Compact	33#
30" - 45° Bend	1380#	6" - 11.25° Bend, Compact	31#
30" - 22.5° Bend	1400#	30" x 8" Tee, Compact	1745#
30" - 11.25° Bend	1410#	30" x 16" Tee, Compact	1820#
24" - 90° Bend Compact	695#	24" x 16" Tee, Compact	625#
24" - 45° Bend Compact	475#	24" x 6" Hyd. Tee, Compact	454#
24" - 22.5° Bend Compact	460#	16" x 16" Tee, Compact	323#
24" - 11.25° Bend Compact	457#	16" x 6" Hyd. Tee, Compact	229#
16" - 90° Bend Compact	264#	12" x 6" Hyd. Tee, Compact	128#
16" - 45° Bend Compact	202#	6" x 6" Hyd. Tee, Compact	60#
16" - 22.5° Bend Compact	179#	12" x 6" Tee, Compact	113#
16" - 11.25° Bend Compact	159#	12" x 8" Tee, Compact	123#
12" - 90° Bend Compact	124#	12" x 12" Tee, Compact	165#

12" - 45° Bend Compact	101#	30" Sleeve	1085#
12" - 22.5° Bend Compact	85#	12" Sleeve, Compact	56#
12" - 11.25° Bend Compact	73#	6" Sleeve, Compact	37#
8" - 90° Bend, Compact	61#	30" Plug, Compact	660#
8" - 45° Bend, Compact	49#	24" Plug, Compact	214#
8" - 22.5° Bend, Compact	44#	16" Plug, Compact	100#
8" - 11.25° Bend, Compact	40#	12" Plug, Compact	53#
6" - 90° Bend, Compact	44#	8" Plug, Compact	30#
6" - 45° Bend, Compact	37#	6" Plug, Compact	19#

2. No additional payment will be made for excavation, bedding, megalugs, backfilling, testing, chlorination, etc., since the work is considered incidental to the work and is to be included in the unit price bid per pound.
3. Payment for compact ductile iron fittings will be paid for at the contract unit price per pound for "Compact Ductile Iron Fittings" (based on the above unit weights) incorporated and accepted into the work and will be full compensation for all work described in the Contract Documents. The Owner reserves the right to change the fittings as necessary to accommodate field conditions, or to add fittings using the above unit weights as basis for payment.

O. Item No. 18 – Gate Valves

1. Payment for ___" gate valves will be paid for at the contract unit price for each size gate valve incorporated and accepted into the work. Payment will be full compensation for all work described in the contract documents.
2. No additional payment will be made for excavation, bedding, megalugs, backfilling, setting of valve box, concrete collar, testing, chlorination, etc. since the work is to be included in the unit price bid.
3. Payment for Gate Valves will be made at the contract unit price per each incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

P. Item No. 19 – Full Body Tapping Sleeve and Tapping Valve

1. Payment for full body tapping sleeve and valve will be paid for at the contract unit price for each tapping sleeve and valve incorporated and accepted into the work. Payment will be full compensation for all work described in the contract documents.
2. No additional payment will be made for excavation, bedding, megalugs, backfilling, setting of valve box, concrete collar, testing, chlorination, etc. since the work is to be included in the unit price bid.
3. Payment for Full Body Tapping Sleeve and Tapping Valve will be made at the contract unit price per each incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

Q. Item No. 20 - Class B Concrete Blocking

1. Payment for Class B concrete blocking will be based on the actual number of cubic yards of Class B concrete blocking incorporated and accepted into the work. Payment will be full compensation for all work described in the Contract Documents.
2. No additional payment will be made for excavation or backfill, since the work is considered incidental to the work and is to be included in the unit price bid.
3. Payment will be based on the actual number of cubic yards based on delivery tickets. Delivery tickets shall be given to inspector at time of delivery and pay item will be marked on ticket. Tickets not given to inspector will not be paid for. Concrete wasted or not used in the opinion of the inspector shall be deducted from the delivery tickets.
4. Payment for Class B concrete blocking will be paid for at the contract unit price per cubic yard for "Class B Concrete Blocking" incorporated and accepted into the work and will be full compensation for all work described in the Contract Documents.

R. Item No. 21 and 22 – ¾" Water Service Connection and Connection of New Water Service

1. Payment for water connections will be based on the actual number of connections incorporated and accepted into the work. Payment will be full compensation for all work described in the Contract Documents.
2. No additional payment will be made for saw cutting pavements, excavation, piping, bedding, fittings, valves, meter setters, meter boxes, or other items needed to connect to the existing water services since the work is considered incidental to the work and is to be included in the unit price bid.
3. Payment for "¾" Water Service Connection" and "Connection of New Water Service to Existing Water Service" will be paid for at the contract unit price per each incorporated and accepted into the work and will be full compensation for all work described in the Contract Documents.

S. Item No. 23 – Abandon Existing Water Main

1. Payment for water main abandonment will be based on the actual number of abandonments incorporated and accepted into the work. Payment will be full compensation for all work described in the Contract Documents.
2. No additional payment will be made for excavation, fittings, backfill, cutting pipe, sleeves, or removal of valve and valve box since the work is considered incidental to the work and is to be included in the unit price bid.
3. Payment for "Abandon Existing Water Main" will be paid for at the contract unit price per each incorporated and accepted into the work and will be full compensation for all work described in the Contract Documents.

T. Item No. 24 – Ductile Iron Sewer Main

1. Payment for Ductile Iron Sewer Main will be based on the actual number of linear feet of ductile iron pipe incorporated and accepted into the work and measured to the nearest 0.1 linear foot. Measurements will be made from centerline of manhole to centerline of manhole.
2. No additional payment will be made for saw cutting pavements, excavation including for rock excavation, backfilling, dewatering, etc., or testing required to install the ductile iron pipe, since the work is considered incidental to the work and is to be included in the unit price bid.

3. Payment for Ductile Iron Sewer Mains will be made at the contract unit price per linear foot incorporated and accepted into the work and will be full compensation for all work described in the contract documents.
- U. Item Nos. 25, 26, and 27 – Precast Concrete Doghouse, Standard, and Outside Drop Manholes
1. Payment for installation of precast concrete manholes will be based on the actual number of manholes incorporated and accepted into the work. Payment will be full compensation for all work described or shown in the contract documents.
 2. No additional payment will be made for excavation, backfilling, ring and covers, flexible boot connections, precast invert, manhole steps, joint materials, doghouse connections, outside drop piping, fittings, straps, stone, concrete, or vacuum testing since the work is considered to be included in the unit price bid.
 3. Payment for precast concrete manholes will be made at the contract unit price for each “Precast _____ Concrete Manhole” incorporated and accepted into the work and will be full compensation for all work described in the contract documents.
- V. Item No. 28 and 29 – 4” Sanitary Sewer Service Connection and Connection of New Sewer Service
1. Payment for sewer service connections will be based on the actual number of connections incorporated and accepted into the work. Payment will be full compensation for all work described in the Contract Documents.
 2. No additional payment will be made for locating existing services, saw cutting pavements, excavation, piping, bedding, fittings, bends, cleanouts, or other items needed to connect to the existing water services since the work is considered incidental to the work and is to be included in the unit price bid.
 3. Payment for “4” Sanitary Sewer Service Connection” and “Connection of New Sewer Service to Existing Sewer Service” will be paid for at the contract unit price per each incorporated and accepted into the work and will be full compensation for all work described in the Contract Documents.
- W. Items No. 30 - Rock Excavation
1. Payment for rock excavation will be based on the actual number of cubic yards incorporated and accepted into the work and measured to the nearest 0.1 cubic yard.
 2. The inspector will measure Rock Excavation. Computations will be based on the length multiplied by the average depth (including 6-inches below pipe invert) multiplied by the width (actual average width up to four-feet (4’) maximum).
 3. Measurement of manholes and structures will be the average depth (including 6-inches below bottom of manhole) multiplied by the square of the average width (3 feet beyond the outside wall of the structure).
 4. No additional payment will be made for pre or post blast survey, monitoring blasting operations and/or trench rock excavation beyond the limits indicated above without written approval of the Engineer since the work is considered incidental to the work being paid for at the contract unit price.
 5. No additional payment will be made for providing suitable off-site borrow excavation to backfill trenches where rock has been removed, since the work is to be included in the unit price bid for trench rock excavation.

6. Payment for trench rock excavation will be made at the contract unit price per cubic yard for “Rock Excavation” incorporated and accepted into the work and will be full compensation for all work described in the contract documents. **The Contractor’s unit price bid shall not be lower than \$30.00 per cubic yard.**

Rock not measured by and verified by the inspector will not be eligible for payment.

X. Item No. 31 – Borrow Material

1. Payment for borrow material will be based on the actual number of cubic yards of borrow material incorporated and accepted into the work. The volume of borrow material will be established by the Engineer based on measurements of the material brought to the site. A correction factor may be made to account for compaction if the volume of material is measured prior to being installed and compacted.
2. Should rock, screenings or other material from a quarry be approved as borrow material, the volume of borrow material will be established by the engineer based on truck tickets. Truck tickets are to be given to the project inspector at the time of delivery of the borrow material. Material installed without providing truck tickets to the Engineer will not be eligible for payment.
3. Payment will be made at the contract unit price per cubic yard for “Borrow Material” and will be full compensation for all work described in the contact documents.
4. No additional payment will be made for removal and disposal of existing material, placement, compaction, delivery or other work required to complete the work since the work is considered to be included in the contract unit price.
5. Borrow material that is installed and left exposed to elements and is no longer considered suitable material due to neglect of the contractor per the opinion of the engineer shall be replaced by the contractor at no additional cost to the owner.
6. Borrow material shall be approved by the geotechnical engineer in advance of delivery to site.

Y. Item No. 32 – Removal of Existing Sanitary Sewer Manholes

1. Payment for manhole removal will be based on the actual number of manholes removed and accepted into the work.
2. No additional payment will be made for excavation, demolition, hauling, disposal, or replacement material since the work is considered incidental to the work and is to be included in the unit price bid.
3. Payment will be made at the contract unit price for “Removal of Existing Sanitary Sewer Manholes” incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

Z. Item No. 33 – Flowable Fill for Sanitary Sewer Line Abandonment

1. Payment for flowable fill will be based on the actual number of cubic yards of flowable fill incorporated and accepted into the work.
2. No additional payment will be made for excavation, plugging lines, or pumping since the work is considered incidental to the work and is to be included in the unit price bid.
3. Payment will be based on the actual number of cubic yards based on delivery tickets. Delivery tickets shall be given to inspector at time of delivery and pay item will be marked on ticket. Tickets not given to inspector will not be paid for. Flowable fill wasted or not used in the opinion of the inspector shall be deducted from the delivery tickets.
4. Payment will be made at the contract unit price for “Flowable Fill for Sanitary Sewer Line Abandonment” incorporated and accepted into the work and will be full compensation for all work described in the contract documents.

AA. Item No. 34 – Bituminous Concrete Intermediate Course Type I-19.0 B

1. Measurement for asphalt pavement will be based on the actual tons of asphalt placed and accepted into the work. Work includes fine grading, excavation, removal of temporary stone, saw cutting existing pavement and placement of new pavement.
2. Payment for asphalt will be based on the actual number of tons of asphalt and placed and accepted into the work.
3. Asphalt placement will be paid at the contract unit price per ton for “Bituminous Concrete Intermediate Course Type I-19.0B” based on tickets provided by the asphalt supplier to the nearest 0.01 ton.
4. No additional payment will be made for proof roll, tack coat, testing or other work described in the contract documents.

BB. Item No. 35 – Contingency Allowance

1. A contingency allowance of \$10,000 is included in the bid. This allowance may be used at the discretion of the owner to pay for additional work items, if necessary. Use of the contingency allowance will require a signed work order or a change order.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 01025

SECTION 01027 - APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
 - 1. Bid Form for unit price quantities and bid amounts.
 - 2. Division 1 – All Sections
 - 3. Division 2 – All Sections

1.3 SCHEDULE OF VALUES

- A. The estimated quantities and unit prices established on the Bid Form shall be the basis for the schedule of values.
- B. Format and Content: The Application for Payment shall consist of two (2) components. The first shall be a summary sheet and the second will be an itemized quantity and value sheet.
 - 1. The following information shall be on the summary sheet:
 - a. Identification:
 - 1) Project name and location
 - 2) Name and address of Engineer
 - 3) Project number
 - 4) Contractor's name and address
 - 5) Date of submittal
 - 6) Application for Payment Number and Period Covered
 - b. Summary of Payment Request
 - 1) Contract sum
 - 2) Construction to date
 - 3) Less retainage
 - 4) Amount construction to date
 - 5) Plus material inventory
 - 6) Gross amount due
 - 7) Percent complete

- c. Certification Statements
 - 1) Contractor to certify that work has been completed in accordance with Contract Documents, that all amounts have been paid for items which previous Applications for Payments were issued and payments received, and that the current payment is now due. Funds hereby received will be used to pay herein listed items to the extent needed.
 - 2) Certification statement is to be notarized.
 - 3) Engineer's certification statement.
 - a) In our opinion, the above application for payment by the contractor is a substantially correct statement of performance in accordance with the Contract Documents and the contractor is entitled to payment as requested.
- 2. The following information shall be on the itemized quantity sheet:
 - a. Identification:
 - 1) Project name and location
 - 2) Name of Engineer
 - 3) Project number
 - 4) Contractor's name
 - 5) Application for payment number and period covered.
 - b. Arrange the scheduled values in tabular form with separate columns to indicate the following information:
 - 1) Item number
 - 2) Description of work
 - 3) Scheduled quantity and unit
 - 4) Unit price and scheduled value
 - 5) Previous quantity and amount
 - 6) Current quantity and amount
 - 7) To date quantity and amount
 - 8) Remaining quantity and amount
 - 9) Totals for previous, current, to date and remaining amounts
 - c. A material inventory statement is to be provided for which payment request includes stored materials not incorporated into the work. The following information is to be provided.
 - 1) Project name and location
 - 2) Date
 - 3) Item description
 - 4) Previous on hand quantity
 - 5) Delivered quantity
 - 6) Quantity incorporated into work
 - 7) Quantity on hand this application
 - 8) Unit price
 - 9) Amount due
 - 10) Copies of statements or invoices from suppliers shall be submitted.
 - d. See Sample Application for Payment page 01027-5 & 6

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Engineer and paid for by the Owner.
 - 1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.
- B. Payment-Application Times: The date for each progress payment is the 25th day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period.
- C. Payment-Application Forms: Use forms approved by the Engineer for Applications for Payment which includes the information described in Section 1-3.
- D. Application Preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. Verify quantities with inspector. The Engineer will return incomplete applications without action.
 - 1. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
- E. Transmittal: Submit 4 signed and notarized original copies of each Application for Payment to the Engineer. One copy shall be complete, including waivers of lien and similar attachments, when required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Engineer.
- F. Initial Application for Payment: Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, include the following:
 - 1. List of subcontractors.
 - 2. List of principal suppliers.
 - 3. Contractor's Construction Schedule (preliminary if not final).
 - 4. Certificates of insurance and insurance policies.
 - 5. Performance and payment bonds.
 - 6. Shop drawings and product data sheets.
- G. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
 - 1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
 - 2. Administrative actions and submittals that shall precede or coincide with this application include:
 - a. Warranties (guarantees) and maintenance agreements.
 - b. Final cleaning.
 - c. Application for consent of surety.
 - d. List of incomplete Work, recognized as exceptions to Engineer's Certificate of Substantial Completion.

H. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:

1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Ensure that unsettled claims will be settled.
4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
5. Transmittal of required Project construction records to the Owner.
6. Proof that taxes, fees, and similar obligations were paid.
7. Removal of temporary facilities and services.
8. Removal of surplus materials, rubbish, and similar elements.

1.5 RETAINAGE

A. An amount equal to 5% of the total contract amount due on the Application for Payment will be deducted and retained by the owner until the work is complete.

1.6 SALES TAX STATEMENT

A. Sales tax statement shall accompany all Applications for Payment. If no sales tax was paid during the application period, contractor shall submit sales tax statement stating no sales tax was paid. Sales tax statement shall have the following information:

1. Identification:
 - a. Project name and location
 - b. Name of engineer
 - c. Project number
 - d. Contractor's name and address
 - e. Date
 - f. Period covered
2. Sales Tax Information:
 - a. Invoice date and number
 - b. Supplier
 - c. County material purchased
 - d. Net cost
 - e. State tax amount
 - f. County tax amount
3. Certification Statement
 - a. I hereby certify that the above listed materials have been or will be used on the subject project and that the information provided is correct to the best of my knowledge.
4. See sample sales tax sheet page 01027-7

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01027

alley, williams, carmen & king, inc.
engineers and architects
740 chapel hill road
burlington, north carolina 27215



APPLICATION FOR PAYMENT NO. _____

For the period _____ to _____

ARCH./ENG. PROJECT No. _____

DATE: _____

PROJECT: _____

CONTRACTOR: _____

LOCATION: _____

CONTRACT FOR: _____

CONTRACT DATE: _____

TO (Owner):

┌ _____

└ _____

Application is made for Payment, as shown below, and as itemized in the attached pages in connection with this Contract.

CONTRACT SUM.....	\$
Construction to Date.....	\$
Less: _____ % Retainage.....	\$
Total Construction to Date.....	\$
Plus: _____ % Material Inventory...	\$
GROSS AMOUNT DUE.....	\$
Less: Previous Payments.....	\$
NET AMOUNT DUE.....	\$
Percentage Complete _____ %	

State of:
County of:

The undersigned certifies that the Work herein has been completed in accordance with the Contract Documents, that all amounts have been paid for items for which previous Applications for Payment were issued and payments received, and that the current payment is now due. Funds hereby received will be used to pay herein listed items to the extent needed.

Contractor

Address

By _____ Date _____

In our opinion, the above application for payment by the contractor is a substantially correct statement of performance in accordance with the contract documents and the contractor is entitled to payment as requested.

ALLEY, WILLIAMS, CARMEN & KING, INC.

Subscribed and sworn to before me this _____ day of _____, 2017
Notary Public: _____

By _____ Date _____

My Commission Expires:

This document is not negotiable. It is payable only to the payee named herein and its issuance, payment and acceptance are without prejudice to any rights of the Owner or Contractor under their Contract.

alley, williams, carmen & king, inc.
 engineers and architects
 740 chapel hill road
 burlington, north carolina 27215



APPLICATION FOR PAYMENT

No. _____ For the Period _____ to _____

Project _____ ENG Project No. _____

Item No.	Description of Items	Unit	Quantities			Unit Price	Total Amount
			Previous	Current	Total		
Total Amount							

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740 chapel hill road
burlington, north carolina 27215



Statement of SALES TAX PAID on Materials used for:

Project _____ Contract for _____

Period Ending _____

Date	Supplier	County	Invoice No.	Material Invoiced	Net Cost	N.C. Tax	County Tax
TOTALS							

I hereby certify that the above listed material is to be used on the subject project and that the information and quantities are correct to the best of my knowledge.

Name _____ Date _____

Company _____

Address _____

SECTION 01039

COORDINATION AND MEETINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions (if included), and other Division 1 Specifications Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Coordination and project conditions.
- B. Staking.
- C. Preconstruction conference.
- D. Progress meetings.

1.3 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of the various Sections of the Specifications in compliance with the requirements of the General Conditions to ensure efficient and orderly sequence of installation of interdependent construction elements.
- B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing to, and placing in service, such equipment.
- C. Coordinate space requirements, supports, and installation of mechanical and electrical Work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion.
- F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.4 STAKING

- A. Engineer has provided base line reference control and staking plan and bench mark at the site. Engineer will stake one time all manholes, hydrants, valves, bends, bore pits, some centerline alignment, clearing limits, and erosion control and provide offset hubs and cut sheets. At the end of the project the Engineer will provide as-builts. All other staking to be provided by Contractor.
- B. Confirm drawing dimensions and elevations.
- C. Establish elevations, lines, and levels from reference points, utilizing recognized engineering survey practices.
- D. During construction, furnish stakes and competent Engineer's helpers for checking elevations, lines, and levels deemed necessary by Engineer.

1.5 PRECONSTRUCTION CONFERENCE

- A. Owner will schedule a conference after Notice of Award.
- B. Attendance Required: Owner, Engineer, Contractor, Contractor's Superintendent, and major Subcontractors.
- C. Agenda:
 - 1. Submission of insurance certificates.
 - 2. Distribution of Contract Documents.
 - 3. Submission of list of Subcontractors, schedule of values, schedule of Shop Drawings and Sample Submittals, and progress schedule.
 - 4. Designation of personnel representing the parties in Contract, Engineer, and others as appropriate.
 - 5. Procedures and processing of field decisions, submittals, substitute and "or equals", applications for payments, Change Orders, and Contract closeout procedures.
 - 6. Scheduling.
 - 7. Use of premises by Owner and Contractor.
 - 8. Baseline staking and building offset layout.
 - 9. Security and housekeeping procedures.
 - 10. Procedures for testing.
 - 11. Procedures for maintaining record documents.
 - 12. Requirements for start-up of equipment.
 - 13. Inspection and acceptance of equipment put into service during construction period.
 - 14. Contractor's safety representative.
 - 15. Owner's safety policies and training.
- D. Engineer will record minutes and distribute copies within three working days after meeting to participants, and those affected by decisions made.

1.6 PROGRESS MEETINGS

- A. Engineer to schedule and administer meetings throughout progress of the Work at maximum monthly intervals or as otherwise deemed necessary by Owner or Engineer.
- B. Engineer to make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, give 72 hours prior notice.
- C. Attendance Required: Contract 1: Contractor's job superintendent and office representative managing job, major subcontractors and suppliers, Owner, Engineer, as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems which impede planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.
 - 13. Other business related to Work.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions (if included), and other Division 1-16 Specifications Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Shop drawings

1.3 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Engineer accepted form.
- B. Identify Project, Contractor, Subcontractor or Supplier; pertinent drawing and detail number, and specification section number, as appropriate.
- C. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of materials and equipment required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- D. Schedule submittals to expedite the Project, and deliver to Engineer at business address. Coordinate submission of related items.
- E. For each submittal for review, allow a minimum of 15 working days excluding delivery time to and from the Contractor.
- F. Identify variations from Contract Documents and material, equipment or system limitations which may be detrimental to successful performance of the completed Work.
- G. Provide space for Contractor and Engineer review stamps.
- H. When revised for resubmission, identify all changes made since previous submission.
- I. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- J. Submittals not requested will not be recognized or processed.

1.4 CONSTRUCTION PROGRESS SCHEDULES

- A. Each Contractor to develop and maintain progress schedule in compliance with all of the General Conditions, and the following:
 1. Submit four copies of preliminary progress schedule at preconstruction conference.
 2. Revise and resubmit as required.
 3. Submit revised schedule with each Application for Payment, identifying changes since previous version.
 4. Submit network analysis diagram using the critical path method, as outlined in Associated General Contractors of America (AGC) publication "The Use of CPM in Construction – A Manual for General Contractors and the Construction Industry".
 5. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
 6. Indicate estimated percentage of completion for each item of Work at each submission.

1.5 SHOP DRAWINGS

- A. Submit working drawings of piping; detail drawings of steel reinforcing, both bars and mesh, showing size and arrangement; details of machinery, apparatus and materials; dimensional drawings, ladder-type schematic diagrams, connection diagrams and other data for all electrically operated equipment, and all communication, instrumentation, control and related equipment; and layout drawings of the complete electrical work. Drawings shall designate the complete installation and shall be suitable for coordinating work of the various trades. As a minimum, Shop Drawings are required for those items as indicated in the Equipment and Material Checklist included at the end of Section 01600 (pages CL-1 thru CL-4). Shop Drawings for additional items shall be submitted when deemed necessary by Engineer.
- B. Layout drawings for electrical work shall include all underground, concealed, and exposed conduits, and shall show locations and sizes of conduit runs, sizes and number of wires, pull and junction boxes, outlets, lighting fixtures, panelboards, motor starter switchboards, motor controls, switches, control stations, disconnects, etc., and will be used by Engineer to verify the location and size of conduit, wire and equipment. Layout drawings shall be submitted early. No work shall proceed until such drawings have been returned (with review stamp affixed) by Engineer.
- C. Shop Drawings shall include all information on electrical components and characteristics, appropriate curve data at various operating and efficiency levels, manufacturer's motor data sheets, hardware accessories. Electrical characteristics include electrical power supply required and electrical loading information. Shop Drawings will not be reviewed and returned until all such information is received.
- D. Submit the number of copies which the Contractor requires, plus two copies which will be retained by the Engineer. Shop Drawing submittals in the form of prints, such as piping layouts, steel reinforcing, structural steel, miscellaneous metals, electrical layouts, etc., at Contractor's option, may include two copies – one reproducible transparency and one opaque reproduction. The reproducible transparency will be returned with Engineer's comments noted. The use of reproducible transparencies is encouraged whenever possible.
- E. Contractor may utilize contract Drawings with necessary details marked thereon for electrical conduit layout drawings. However, the drawings must have Contractor's title block in lieu of Engineer's title block.
- F. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information specific to this Project.
- G. For factory primed and factory finished materials and equipment to be field painted, indicate coatings manufacturer and type; for completely factory finished materials and equipment not to be field painted, indicate coatings manufacturer and type, and include full range of manufacturer's standard colors for finish color selection by Owner.
- H. After review, distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01700 – Contract Closeout.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions (if included), and other Division 1-16 Specifications Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Quality assurance – control of installation.
- B. Tolerances.
- C. References and standards.
- D. Testing services.
- E. Manufacturer's field services.
- F. Examination.
- G. Preparation.

1.3 QUALITY ASSURANCE – CONTROL OF INSTALLATION

- A. Monitor quality control over Suppliers, manufacturers, materials, equipment, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturer's instructions, including each step in sequence.
- C. Should manufacturer's instructions conflict with Contract Documents, manufacturer's instructions shall take precedence.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure materials and equipment in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.4 TOLERANCES

- A. Monitor fabrication and installation tolerance control of materials and equipment to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturer's tolerances. Should manufacturer's tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Adjust materials and equipment to appropriate dimensions; position before securing in place.

1.5 REFERENCES AND STANDARDS

- A. For materials, equipment, or workmanship specified by association, trade, or other consensus standards, complies with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

- B. Conform to reference standard by date of issue current on date for receiving bids, except where a specific date is established by code.
- C. Obtain copies of standards where required by specification sections.
- D. Neither the contractual relationships, duties, nor responsibilities of the parties in Contract nor those of the Engineer shall be altered from the Contract Documents by mention or inference otherwise in any reference document.
- E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations", published by Gale Research Co., available in most libraries.

1.6 TESTING SERVICES

- A. Owner will appoint, employ, and pay for specified services of an independent firm to perform testing.
- B. The independent firm will perform tests and other services specified in individual specification sections and as required by the Engineer.
- C. Testing and source quality control may occur on or off the project site.
- D. Reports will be submitted by the independent firm to the Engineer and Contractor, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Engineer and independent firm prior to expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- F. Contractor shall be responsible for, and shall pay for:
 - 1. Additional testing expenses resulting from Contractor's failure to advise Engineer and independent firm hours in advance of operations.
 - 2. Additional testing expenses resulting from changes in Contractor's schedule after independent firm has been notified that testing is required, canceled, or modified.
- G. Testing does not relieve Contractor to perform Work to contract requirements.
- H. Re-testing required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for re-testing will be charged to the Contractor by deducting testing charges from the Contract Price.

1.7 MANUFACTURER'S FIELD SERVICES

- A. When specified in individual Specifications Sections, require material or equipment suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, and quality of workmanship as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.
- C. Prior to leaving the Project and for each visit, complete a Manufacturer's Service Representative's Report as included at the end of this Section. Copies of the Report will be available for use on the Project.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.

- D. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.2 PREPARATION

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

END OF SECTION

SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Divisions 1-16 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes requirements for construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Temporary electric power and light.
 - 2. Telephone service.
 - 3. Sanitary facilities, including drinking water.
 - 4. Storm drainage.
- C. Support facilities include, but are not limited to, the following:
 - 1. Field offices and storage sheds. (Optional).
 - 2. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities include, but are not limited to, the following:
 - 1. Temporary fire protection.
 - 2. Barricades, warning signs, and lights.
 - 3. Environmental protection.

1.3 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
 - 1. Building code requirements.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police, fire department, and rescue squad rules.
 - 5. Environmental protection regulations.
 - 6. Manual Uniform Traffic Control Devices
- B. Standards: Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."

1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code."
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.4 PROJECT CONDITIONS

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.
- B. Traffic Control: Contractor shall provide traffic control measures in accordance with NCDOT standard details and in accordance with NCDOT regulations. All traffic control devices shall be in condition satisfactory to NCDOT personnel and Engineer for the intended use of the device.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. If acceptable to the Engineer, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.
- B. Water: Provide potable water approved by local health authorities.

2.2 EQUIPMENT

- A. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- B. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.
1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.
 - 1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
 - 3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.
 - 4. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Engineer. Neither the Owner nor Engineer will accept cost or use charges as a basis of claims for Change Orders.
- B. Temporary Telephones: Provide temporary telephone service throughout the construction period for all personnel engaged in construction activities.
 - 1. Provide mobile telephone for construction crew foreman.
- C. Sanitary facilities include temporary toilets and drinking-water fixtures. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
 - 1. Provide toilet tissue, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.
- D. Drinking-Water Facilities: Provide containerized, tap-dispenser, bottled-water drinking-water units, including paper supply.
- E. Temporary Drainage Provisions: Contractor shall provide for the drainage of storm water and such water as may be applied or discharged on the site in performance of the work. Drainage facilities shall be adequate to prevent damage to the work, the site, and adjacent property.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Field Offices: Not required.
- B. Temporary Paving: Not required for temporary facilities.
- C. Construction Aids: Contractor for each Section shall furnish, install, maintain, and operate all construction aids required by him and his Subcontractors in the performance of the work, except as otherwise provided herein.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."
 - 1. Locate fire extinguishers where convenient and effective for their intended purpose.
 - 2. Maintain unobstructed access to fire extinguishers and other access routes for fighting fires.
- B. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- C. Security Enclosure and Lockup: Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
 - 1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- D. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.
 - 1. Contractor shall take responsible measures to avoid unnecessary noise. Such measures shall be appropriate for the normal ambient sound levels in the area during working hours. All construction machinery and vehicles shall be equipped with practical sound muffling devices, and operated in a manner to cause the least noise consistent with efficient performance of the work.
 - 2. Contractor shall take reasonable measures to prevent unnecessary dust. Earth surfaces subject to dusting shall be kept moist with water or by application of a chemical dust suppressant. When practicable, dusty materials in piles or in transit shall be covered to prevent blowing.
 - 3. Contractor shall prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris, and other substances resulting from construction activities. No sanitary wastes will be permitted to enter any drain or watercourse other than sanitary sewers. No sediment, debris, or

other substance will be permitted to enter sanitary sewers, and reasonable measures will be taken to prevent such materials from entering any drain or watercourse.

- E. Traffic Control: Provide traffic control protection to traveling public and workers in accordance with NCDOT, and OSHA requirements. All traffic control operations shall be conducted in a method that will minimize impacts to the traveling public.
 - 1. Contractor will be allowed to close the lane adjacent to the curb when work operations require work within the shoulder area.
 - 2. Contractor shall relocate temporary traffic control devices as work progresses along shoulder.
 - 3. Contractor shall remove temporary traffic control devices at the end of each days work operations. Temporary signs are to be laid face down or removed when not in use.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Termination and Removal: Unless the Engineer requests that it be maintained longer, remove each temporary facility when the need has ended, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are the Contractor's property.
 - 2. Remove temporary roads not intended for or acceptable for integration into permanent use. Where the area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at the temporary entrances, as required by the governing authority.

END OF SECTION 01500

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions (if included), and other Division 1-16 Specifications Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutes and “or equal” items.
- F. Equipment and Material Checklist.

1.3 PRODUCTS

- A. Do not use secondhand or salvaged materials and equipment whether removed from existing premises or from another source.
- B. Provide interchangeable components of the same manufacture for components being replaced.

1.4 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer’s instructions.
- B. Promptly inspect shipments to insure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.5 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturer’s instructions.
- B. Store with seals and labels intact and legible.
- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior of storage of fabricated products, place on sloped supports above ground.
- E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- G. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- H. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.
- I. Provide lubricants and perform initial lubrication and all subsequent lubrication until Substantial Completion. Lubricants and lubrication shall be in accordance with equipment manufacturer’s instructions.

1.6 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming Manufacturers: Products of manufacturers named in the Specifications or included by Addenda as an “or equal” prior to receipt of Bids, no options or substitutions allowed except as permitted under following Article 1.7.

1.7 SUBSTITUTES AND “OR EQUAL” ITEMS

- A. Engineer will consider requests for substitute and “or equal” items after date of Owner-Contractor Agreement only if the specified item becomes unavailable through no fault of Contractor.
- B. Submit written application for use of substitute and “or equal” items. Written application shall be by completion of an APPLICATION FOR USE OF “OR EQUAL” ITEM or an APPLICATION FOR USE OF SUBSTITUTE ITEM, as applicable and as included at the end of this Section.

1.8 EQUIPMENT AND MATERIAL CHECKLIST

- A. Refer to EQUIPMENT AND MATERIAL CHECKLIST at end of this Section (pages CL-1 thru CL-4) for items requiring shop drawings, manufacturer’s start-up services, spare parts, and operation and maintenance manuals. Requirements over and above those included in the General Conditions and this and other Sections of Division 1 shall be as included in the individual specification sections.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

Section 01620 - Project Special Provisions

1. Video of Gravity Sewer

All sanitary sewer lines shall and services be videotaped prior to acceptance and placement into service. The contractor shall be responsible for taping and all costs associated with taping for all projects. A DVD format disc shall be furnished by the contractor at the initial inspection and upon the completion of any repairs. The video shall be clear and well lit, with the top of pipe in the top of the screen. A written inspection log for all video inspections shall accompany each tape. Logs shall accurately measure distances measured from center point of each manhole and shall clearly show location in relation to the manhole all points of significance in the sewer line. As a minimum, each log shall include the location and left/right orientation of all service laterals, location and depth of sags, offset pipes, or any other points of significance. Additionally, each record shall accurately describe the above ground location of the manhole section including street name, direction revealed (north, south, etc.) direction of flow, adjoining house numbers, and any other landmarks that will clearly and quickly identify the section. All defects and deficiencies discovered in the inspection shall be corrected by the contractor to the satisfaction of the Engineer and at the contractor's expense. Once the defects and deficiencies are corrected the sanitary sewer shall be videotaped again to show that the defect and deficiencies have been resolved.

2. Concrete Reaction Blocking and Concrete Thrust Restraint

All ductile iron fittings, valves and other components subject to hydrostatic thrust shall be securely anchored by use of concrete reaction blocks, or concrete thrust ring restraint poured in place unless otherwise directed by the Engineers. The reaction areas required for these thrust blocks shall conform to Section 12AWWA C-600. 2.5 mil Polyethylene shall be wrapped around fittings and bolts.

Material for blocking shall be 3000 psi concrete minimum.

3. Safety and Trench Shoring Design

The contractor shall follow all OSHA guidelines related to construction safety and follow industry, locate, state and other standards related to safety. The contractor shall pay for and provide sealed engineering design for shoring for the bore and any manhole installations over 15' in depth or as required by OSHA, or as otherwise specified by State or Local code/regulation.

4. Section 01039 Page 2 1.4 Staking.

The Engineer will stake one time all manholes, horizontal bends. Additional or restaking will be paid for or provided by the contractor.

5. Section 03410 Precast Concrete Structures – Part 2 2.1 9.

The contractors precaster shall provide for design and buoyancy calculations for manholes. The precast design shall be sealed by a North Carolina Registered Engineer.

6. General Provisions

The City of Graham Standard Specifications and Details shall be used should any items not be covered in these specifications. Should any item appear to be in conflict the more restrictive shall be used. The Engineer will make the final determination on any discrepancy.

7. E-Verify Background Checks

“Background Checks. The Contractor shall conduct or arrange to have conducted, at its own expense, checks on each of its employees, agents, ownership personnel, contract employees, subcontractors, materials suppliers or others who will engage in any service on or delivery of goods for this Project, to verify that those individuals may legally work in the United States and that they are not registered sex offenders. For the Contractor’s convenience, the required registry checks may be completed by accessing the United States Citizenship and Immigration Services ‘E-Verify’ website at <http://www.uscis.gov>. The Contractor shall provide certification that the registry checks were conducted on each of its contractual personnel providing services or delivering goods prior to commencement of such services or the delivery of such goods. The Contractor shall conduct a current initial check of the registries not more than 30 days prior to the start of Work. In addition, the Contractor agrees to conduct the registry checks and provide a supplemental certification before any additional contractual personnel are used to deliver goods or provide services pursuant to this Project. The Contractor further agrees to conduct annual registry checks of all contractual personnel and provide annual certifications at each Contract anniversary date. The Contractor shall not assign any individual to deliver goods or provide services for this Project if said individual is not legally eligible to work in the United States. The Contractor agrees that it will maintain all records and documents necessary to demonstrate that it has conducted a thorough check of the registries as to each contractual person, and agrees to provide such records and documents upon school system request. The Contractor specifically acknowledges that the Owner retains the right to audit these records to ensure compliance with this section at any time, at the Owner’s sole discretion. The Owner reserves the right to prohibit any contractual personnel of the Contractor from delivering goods or providing services relative to this Project if the Owner determines, in its sole discretion, that such contractual personnel may pose a threat to the safety or well-being of the public. Failure to comply with the terms of this provision shall be deemed a material breach of the Agreement.”

8. Proof Rolling.

1. After the utility line installation is backfilled and completed and prior to placing new asphalt, the exposed subgrade shall be proofrolled with a loaded dump truck or similar pneumatic tire vehicle (minimum loaded weight of 30 tons to identify areas requiring surface repair).
2. The proofrolling shall consist of complete passes of the equipment over the subgrade. Areas of the subgrade that rut or deflect excessively in the opinion of the Engineer shall be repaired.

3. Contractor shall proofroll the areas as many times as necessary to produce acceptable results. No additional payment will be made for proofrolling, since the work is considered incidental to the work being paid for under other contract items.

9. Patching

1. Existing asphalt shall be saw cut providing a neat edge.
2. Existing asphalt shall be tacked prior to patching.
3. Utility trenches may be backfilled to existing surface to provide safe passage until the contractor can install patching. Incidental stone may be provided at the direction of the engineer to provide a traversable surface for local traffic. Utility trenches shall be patched back within 2 weeks of excavation.
4. Asphalt shall be installed in accordance with the NCDOT Standard Specifications for Roads and Structures.
5. Payment will be made at the contract unit price per ton for “Bituminous Concrete Intermediate Course Type I-19.0B” and will be full compensation for all work described in the Contract Documents.
6. Copies of all delivery tickets will be given to the Engineer and the Contractor will certify that the materials have been incorporated into the work. Payment will not be provided for stone without delivery tickets.
7. Compaction shall meet NCDOT specifications and shall be field verified by the geotechnical engineer.

10. Water and Sewer Service Connections

The contractor will be responsible for locating existing water and sewer services and potential alignments for new services prior to installing water and sewer lines. Notify engineer if there are any potential conflicts with service connections. The contractor shall install new water and sewer services as shown on plans. Once new lines have passed all testing requirements and have been certified, the contractor may proceed with connecting to existing services. 24 hour notification to residents shall be provided prior to disruption of service. The cost of all fittings, piping, and other items needed to make connections shall be included in the unit prices for connections to existing services.

11. Water and Sewer Abandonment

Once all water and sewer service connections have been made, the contractor may proceed with the abandonment of the existing water and sewer lines. The existing 6” sanitary sewer line shall be plugged with a brick and mortar plug and filled with flowable fill. Once lines are filled the contractor shall demo the existing manholes and backfill. Return manhole rings and covers to the City of Graham. Existing water services to be abandoned shall be capped at the existing meter and meter box, setter, and meter removed and returned to the City of Graham. The existing 2” water main shall be demoed by removing the 2” connection and valve and installing a DIP sleeve on the existing 6” main. The existing 2” valve and valve box shall be removed and returned to the City of Graham. Residents shall be provided with a minimum 24 hours notification prior to shutting down water and sewer services. No additional payment will be made for saw cutting pavements, excavation, fittings, plugging, backfill, demo, hauling, etc. since the work is considered incidental to the work and is to be included in the unit price bid.

SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Divisions 1-16 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project record document submittal.
 - 3. Operation and maintenance manual submittal.
 - 4. Submittal of warranties.
 - 5. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate Sections.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
 - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.
 - a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
 - 2. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
 - 3. Submit record drawings, damage or settlement surveys, property surveys, and similar final record information.
 - 4. Discontinue and remove temporary facilities from the site, along with construction tools, and similar elements.
 - 5. Complete final cleanup requirements.

- B. Inspection Procedures: On receipt of a request for inspection, the Engineer will either proceed with inspection or advise the Contractor of unfilled requirements. The Engineer will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
 - 1. The Engineer will repeat inspection when requested and assured that the Work is substantially complete.
 - 2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
 - 1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted.
 - 2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
 - 3. Submit a certified copy of the Engineer's final inspection list of items to be completed or corrected, endorsed and dated by the Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Engineer.
 - 4. Submit consent of surety to final payment (see attached sample at end of Section).
 - 5. Submit Contractor's Affidavit of Payment of Debts and Claims (see attached sample at end of Section).
 - 6. Submit Contractor's Affidavit of Release of Liens (see attached sample at end of Section).
 - 7. Submit a final liquidated damages settlement statement, if any.
 - 8. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Reinspection Procedure: The Engineer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Engineer.
 - 1. Upon completion of reinspection, the Engineer will prepare a certificate of final acceptance. If the Work is incomplete, the Engineer will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 - 2. If necessary, reinspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Engineer's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation

varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil.
 - a. Show distance between centers of manholes to the nearest tenth of a foot.
 - b. Show centerline invert elevations to the nearest hundredth of a foot.
 - c. Show top elevation of manhole to nearest tenth of a foot.
 - d. Show vent elevation to nearest tenth of a foot.
 - e. Show correct stationing for manholes.
 - f. Show horizontal angles between manholes to the nearest quarter of a minute.
 2. Note related change-order numbers where applicable.
 3. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.
1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
 2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
 3. Note related record drawing information and Product Data.
 4. Upon completion of the Work, submit record Specifications to the Engineer for the Owner's records.
- D. Record Product Data: Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.
1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
 2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
 3. Upon completion of markup, submit complete set of record Product Data to the Engineer for the Owner's records.
- E. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Engineer for the Owner's records.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. Remove waste, surplus materials, excess spoil, rubbish, erosion control measures and construction facilities from the site.
- B. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.

END OF SECTION 01700

**CONSENT OF SURETY
COMPANY TO FINAL
PAYMENT**

- OWNER
- ENGINEER
- CONTRACTOR
- SURETY
- OTHER

PROJECT: City of Graham
 Whitsett Street & Staley Street
 Water & Sanitary Sewer Improvements
 AWCK Project No. 16125

Agreement Date: _____

TO: City of Graham
 201 S. Main Street
 Graham, North Carolina
 27253

CONTRACTOR: _____

In accordance with the provisions of the Agreement between the Owner and Contractor as indicated above,
 the (here insert name and address of Surety Company)

SURETY COMPANY

on bond of (here insert name and address of Contractor)

CONTRACTOR

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall
 not relieve the Surety Company of any of its obligations to (here insert name and address of Owner)

OWNER

as set forth in the said Surety Company's bond.

IN WITNESS WHEREOF,
 the Surety Company has hereunto set its hand this _____ day of _____, 20____

 Surety Company

Attest
 (Seal)

 Signature of Authorized Representative

 Title

**CONTRACTOR'S
AFFIDAVIT OF
RELEASE OF LIENS**

OWNER
ENGINEER
CONTRACTOR
SURETY
OTHER

PROJECT: City of Graham
Whitsett Street & Staley Street
Water & Sanitary Sewer Improvements
AWCK Project No. 16125

Agreement Date: _____

TO: City of Graham
201 S. Main Street
Graham, North Carolina 27253

CONTRACTOR: _____

State of: _____

County of: _____

The undersigned, pursuant to the General Conditions of the Construction Contract; hereby certifies that to the best of his knowledge, information and belief, except as listed below, the Release or Waivers of Liens attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of work, labor or services who have or may have liens against any property of the Owner arising in any manner out of the performance of the Agreement referenced above.

EXCEPTIONS: (If none, write "NONE". If required by the Owner, the Contractor shall furnish bond satisfactory to the Owner for each exception).

SUPPORTING DOCUMENTS ATTACHED
HERETO:

1. Contractor's Release of Waiver of Liens, conditional upon receipt of final payment.

CONTRACTOR: _____
Address: _____

BY: _____

Subscribed and sworn to before me this
____ day of _____, 20__

Notary Public: _____

My Commission Expires: _____

**CONTRACTOR'S
AFFIDAVIT OF PAYMENT
OF DEBITS AND CLAIMS**

OWNER
ENGINEER
CONTRACTOR
SURETY
OTHER

PROJECT: City of Graham
Whitsett Street & Staley Street
Water & Sanitary Sewer Improvements
AWCK Project No. 16125

Agreement Date: _____

TO: City of Graham
201 S. Main Street
Graham, North Carolina 27253

CONTRACTOR: _____

State of: _____

County of: _____

The undersigned, pursuant to the General Conditions of the Construction Contract; hereby certifies that, except as listed below, Contractor has paid in full or has otherwise satisfied all obligations for all materials and equipment furnished, for all work, labor and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Agreement referenced above for which the Owner or his property might in any way be held responsible.

EXCEPTIONS: (If none, write "NONE". If required by the Owner, the Contractor shall furnish bond satisfactory to the Owner for each exception).

SUPPORTING DOCUMENTS ATTACHED
HERE TO:

- 1. Consent of Surety to Final Payment
- 2. Contractor's Affidavit of Release of Liens

The following supporting documents should be attached hereto if required by the Owner:

- 1. Contractor's Release of Waiver of Liens, conditional upon receipt of final payment.

CONTRACTOR: _____

Address: _____

BY: _____

Subscribed and sworn to before me this
____ day of _____, 20__

Notary Public: _____

My Commission Expires: _____

SECTION 01740 - WARRANTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.3 WARRANTY REQUIREMENTS

- A. The Contractor shall guarantee that if any materials, equipment or workmanship covered by these specifications and the accompanying drawings proves defective within one (1) year after final acceptance, such defects shall be made good by Contractor without cost to the Owner.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01740

SUBSURFACE INVESTIGATION

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Soils investigation report.
 - 1. **No report has been prepared.**
- B. Use of data:
 - 1. Bidders should visit the site and acquaint themselves with existing conditions.
 - 2. Prior to bidding, bidders may make their own surface investigations to satisfy themselves as to site conditions, but such investigations may be performed only under time schedules and arrangements approved in advance by the Engineer.

1.2 QUALITY ASSURANCE

- A. A soil engineer will be retained by the Owner to observe performance of work in connection with excavating, trenching, filling, backfilling, and grading, and to perform compaction tests.
- B. Contractor will be responsible for costs associated with excessive retesting by the Soil Engineer.
- C. Readjust work performed that does not meet technical or design requirements, but make no deviation from the Contract Documents without specific and written approval from the Engineer.

END SUBSURFACE INVESTIGATION

SECTION 02230 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-16 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Existing Utilities.
2. Clearing and grubbing.
3. Pavement removal.

- B. Related Sections include the following:

1. Division 1 Section "Measurement and Payment" for schedule of unit prices. (N/A)
2. Division 1 Section "Construction Facilities and Temporary Controls" for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and environmental protection measures during site operations.
3. Division 2 Section "Trenching for Utilities" for soil materials, excavating, backfilling, trenches and grading the easement areas.
4. Division 2 Section "Lawns and Grasses" for finish grading, including placing and preparing topsoil for lawns and planting.
5. Division 2 Section "Erosion Control" for temporary erosion control measures.

1.3 MATERIALS OWNERSHIP

- A. Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.

- B. Locate and clearly flag trees and vegetation to remain.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Engineer or Owner of property if damage occurs outside easements shown on drawings.

3.2 EXISTING UTILITIES

- A. The contractor shall be responsible for making a field inspection of existing utilities prior to the bid opening. The Contractor shall be responsible for any damage to existing utilities resulting from his work. Approximate locations are shown on the plan view of each sheet.
- B. The contractor shall excavate and expose all existing underground lines in advance of trenching operations to assure that there will be no conflicts with the proposed grade and alignment. All water and sewer connections damaged during construction shall be repaired by the Contractor.
- C. The contractor shall comply with the Underground Damage Prevention Act, G.S. Chapter 87.

3.3 CLEARING AND GRUBBING

- A. The work of clearing and grubbing shall consist of the cutting, removal and satisfactory disposal of all vegetation and surface debris within the temporary easement as shown on the plans.
 - 1. Trees inside the temporary construction easement but outside the permanent easement will not be required to be removed. The contractor may at his option leave in place a tree which in contractor's opinion will not interfere with trench excavation or backfilling operations. If tree is damaged to an extent as to destroy the value for shade or other landscaping purposes the tree shall be removed and disposed of by contractor without additional compensation, when so directed by the Engineer.
- B. Clearing and grubbing operations shall be completed sufficiently in advance of trenching operations as may be necessary to prevent any of the debris from clearing and grubbing operations from interfering with the trench excavation or backfilling operations.
- C. All work shall be performed in a manner which will cause a minimum of soil erosion. The contractor shall perform such erosion control work, temporary or permanent as may be directed by the Engineer, in order to satisfactorily minimize erosion resulting from clearing and grubbing operations.
- D. The contractor shall conduct his operations in a manner to prevent limb, bark, or root injuries to trees, shrubs, or other types of vegetation that are to remain growing and also to prevent damage to adjacent property. When any such injuries unavoidably occur, all rough edges of scarred areas shall first be made reasonably smooth in accordance with generally accepted horticultural practice, and the scars then thoroughly covered with an asphaltum base tree paint. Any such plants that are damaged by any construction operations to such an extent as to destroy their value for shade or other landscape purposes shall be cut and disposed of by the contractor, without extra compensation, when so directed by the Engineer.

- E. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding 8-inch loose depth, and compact each layer to a density equal to adjacent original ground.

3.4 PAVEMENT REMOVAL

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. All pavement to be removed shall be marked for cutting by chalk line or other acceptable method. After marking, bituminous pavement shall be cut to its full depth to a neat and true line along the mark. Concrete pavement shall be sawed to a minimum depth necessary for a smooth cut when broken out. Saw-cut faces vertically.
 - 2. The cuts should be the width of the required trench (a minimum width of fifty-four (54") inches, unless otherwise directed by the Engineer) plus one (1) foot of pavement removal on each side of the trench.
 - 3. All pavement cut shall be removed from the site of the work and shall not be used to backfill trenches. Following compaction of the backfill material, ten (10") inches of ABC stone shall be placed and compacted within all excavated areas and brought to an elevation as determined in the field by the Engineer.
 - a. Contractor shall maintain all pavement cuts with ABC stone as necessary until the pavement cut is replaced with pavement.

3.5 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's easement.

END OF SECTION 02230

SECTION 02240 - DEWATERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-16 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes construction dewatering.
- B. Related Sections include the following:
 - 1. Division 1 Section "Construction Facilities and Temporary Controls."
 - 2. Division 2 Section "Trenching for Utilities" for excavating, backfilling, and site grading.
 - 3. Division 2 Section "Excavation Support and Protection."

1.3 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: Design, provide, test, operate, monitor, and maintain a dewatering system of sufficient scope, size, and capacity to control ground-water flow into excavations and permit construction to proceed on dry, stable subgrades.
 - 1. Work includes removing dewatering system when no longer needed.
 - 2. Maintain dewatering operations to ensure erosion is controlled, stability of excavations and constructed slopes is maintained, and flooding of excavation and damage to structures are prevented.
 - 3. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 4. Accomplish dewatering without damaging existing buildings adjacent to excavation.

1.4 PROJECT CONDITIONS

- A. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.
- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by the Owner or others unless permitted in writing by the Engineer and then only after arranging to provide temporary utility services according to requirements indicated.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 - 1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
 - 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

3.2 DEWATERING

- A. Provide an adequate system to lower and control ground water to permit excavation, pipe installation, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of sewers, and other excavations.
 - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
- B. Dispose of water removed from excavations in a manner to avoid endangering public health, property, and portions of work under construction or completed. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- C. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

END OF SECTION 02240

SECTION 02260 - EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-16 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes excavation support and protection systems.
- B. Related Sections include the following:
 - 1. Division 1 Section "Construction Facilities and Temporary Controls."
 - 2. Division 2 Section "Trenching for Utilities" for excavating and backfilling.

1.3 PERFORMANCE REQUIREMENTS

- A. Design, provide, monitor, and maintain an anchored and braced excavation support and protection system capable of resisting soil and hydrostatic pressure and supporting sidewalls of excavations.
 - 1. Work includes removing excavation support and protection systems when no longer needed.
 - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 3. Install excavation support and protection systems without damaging existing buildings, pavements, and other improvements adjacent to excavation.

1.4 SUBMITTALS

- A. Shop Drawings: An excavation support and protection system for excavations which exceed fifteen (15') feet in depth shall be prepared by or under the supervision of a qualified professional engineer. System design and calculations must be acceptable to authorities having jurisdiction.

1.5 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by the Owner or others unless permitted in writing by the Engineer and then only after arranging to provide temporary utility services according to requirements indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials need not be new but must be in serviceable condition.
- B. Structural Steel: **ASTM A 36** (ASTM A 36M).
- C. Steel Sheet Piling: **ASTM A 328** (ASTM A 328M) or **ASTM A 572** (ASTM A 572M)
- D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of **3 inches**.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
 - 1. Shore, support, and protect utilities encountered.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
- C. Locate excavation support and protection systems clear of permanent construction and to permit forming and finishing of concrete surfaces.
- D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure excavation support and protection systems remain stable.
- E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils and damaging structures, pavements, facilities, and utilities.
 - 1. Remove excavation support and protection systems to a minimum depth of **48 inches** below overlying construction and abandon remainder.
 - 2. Repair or replace, as approved by Engineer, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION 02260

SECTION 02321 – TRENCHING AND EXCAVATING FOR UTILITIES AND STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-16 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Excavating and backfilling for trenches and/or structures.
- B. Related Sections include the following:
 - 1. Division 1 Section "Measurement and Payment" for a schedule of unit prices.(N/A)
 - 2. Division 1 Section "Construction Facilities and Temporary Controls."
 - 3. Division 2 Section "Site Clearing" for site stripping, grubbing, removing topsoil, and protecting trees to remain.
 - 4. Division 2 Section "Dewatering" for lowering and disposing of ground water during construction.
 - 5. Division 2 Section "Excavation Support and Protection."
 - 6. Division 2 Section "Rock Excavation" for removal of rock and backfilling trench.
 - 7. Division 2 Section "Lawns and Grasses" for seeding and mulching disturbed areas.
 - 8. Division 3 Section "Cast-in-Place Concrete" for concrete placement.

1.3 DEFINITIONS

- A. Backfill: Soil materials used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe, or beside a structure to 3 ft. above bottom of excavation.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench or pit.
- B. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.
- C. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
- D. Classification of Excavated Materials: No classifications of excavated materials will be made except for Rock Excavation as defined in Division 2 of these specifications. Excavation and trenching work shall include the removal and subsequent handling of all materials excavated or otherwise removed in the performance of the contract work, regardless of the type, character, composition, or condition thereof.
- E. Fill: Soil materials used to raise existing grades.

1.4 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Engineer not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer's written permission.
 - 3. Contact utility-locator service for area where Project is located before excavating.
- B. Traffic: Do not interfere with or close public or private roadways or driveways without permission of governing authorities. Work within the rights-of-way of public roadways shall be done in accordance with requirements and provisions of the permits issued by the agencies for the construction within their respective rights-of-way.
- C. If materials are encountered that are suspected of being hazardous or toxic, the Contractor shall notify the Engineer immediately. If hazardous or toxic materials are present, the Engineer will issue a work change directive in accordance with Division 1 "Modification Procedure".

PART 2 - PRODUCTS

2.1 FILL MATERIALS

- A. Earth Backfill: Excavated earth material free of cinders, frozen materials, ashes, refuse, boulders, rocks or organic materials. Rocks three (3") inches or larger shall be excluded from the backfill for at least three (3') feet above the top of pipe. Boulders and stone with a dimension of eight (8") inches shall be excluded from all backfill.
- B. Granular Backfill: Gravel or crushed stone meeting the requirements of Section 1005 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures, latest edition. Standard size shall be #57 unless otherwise noted on the plans or contract documents.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by trenching operations.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. Comply with approved erosion control plan and make necessary repairs, corrections, etc. within 5 days after each rainfall event. Should the site come under any order of the Land Quality Section, the contractor shall take all immediate efforts to put the site into full compliance within the time period specified in such order.
- C. Provide barricades, warning signs, and warning lights around open excavations as necessary to prevent injury to persons.

- D. The Contractor is solely responsible for determining the potential for injury to persons and damage to property and for executing the work to prevent injury and damage.
- E. Do not allow excavation subgrades and soil to be subjected to freezing temperatures, frost or excessive water.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding within easement limits, and from flooding Project site and surrounding areas.
- B. Protect work area from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.
- C. If trench bottom soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with stabilization stone. No separate payment will be made for stabilization stone.
- D. Water shall be disposed of in a manner as not to be a menace to the public health and in accordance with applicable local regulations and State Environmental Protection Division standards and permits.

3.3 EXPLOSIVES

- A. Explosives: The Contractor shall assume sole responsibility for the effects of explosives and comply with the requirements of "Rock Excavation" of these specifications.

3.4 EXCAVATION, GENERAL

- A. General: Excavation includes the removal of any materials necessary to achieve the required elevations and includes:
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
 - 2. Unnecessary Excavation: The expense of materials outside of limits indicated shall be borne by the Contractor.
 - 3. Approval of Subgrade: The adequacy of the subgrade shall be subject to the inspection and approval of the Engineer before installation of the pipeline or structures.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus **1 inch**. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to **12 inches** higher than top of pipe or conduit, unless otherwise indicated.
 - 1. Clearance: **12 inches** on each side of pipe or conduit.
- C. Trench Bottoms: Excavate trenches **6 inches** deeper than bottom of pipe elevation to allow for bedding course. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade. Hand excavate for bell of pipe.
 - 1. Unsuitable Subgrade: Where unsuitable materials are encountered below the excavation limits, they shall be removed and disposed of to the level of suitable material. Areas so excavated shall be backfilled with stabilization stone.
 - 2. Trench Length: The Contractor shall not have open in excess of two hundred (200') feet of trench at any one time.

3.7 STORAGE OF SOIL MATERIALS

- A. Contractor may stockpile excess backfill material in areas acceptable to the engineer and Contractor provided stockpile has adequate erosion control devices to prevent off-site sedimentation. The stockpile is to be located such that surface water will drain away from stockpile. Contractor shall be responsible for removing any excess soil from stockpile not incorporated into the project. If soil is placed on pavement, provide 2" of rock dust over pavement prior to placing soil. No additional payment will be made for this material.

3.8 UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on trench bottoms. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- B. After the pipe is installed, granular backfill shall be placed evenly and carefully around and over the pipe to assure that backfill material is distributed properly and to maintain the proper grade and alignment. The remainder of the trench shall be backfilled with suitable excavated earth

material. Rocks three (3") inches or larger shall be excluded from backfill for at least three (3') feet above the top of pipe. Boulders and stone with dimensions greater than eight (8") inches shall be excluded from the backfill.

- C. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.
- D. Place and compact final backfill of satisfactory soil material to match existing grade on either side of trench.

3.9 COMPACTION OF BACKFILLS AND FILLS

- A. Place backfill and fill materials in uniform layers not more than **8 inches** in loose depth for material compacted by heavy compaction equipment, and not more than **4 inches** in loose depth for material compacted by hand-operated tampers.
- B. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
 1. Outfalls: Twelve (12") inches of pipe subgrade and subsequent lifts: 90 percent.
 2. Sidewalk areas and road shoulders: Twelve (12") inches of pipe subgrade and subsequent lifts: 95 percent.
 3. All other paved areas and around structures: Twelve (12") inches of pipe/structure subgrade and subsequent lifts: 98 percent.
- C. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within ± 3 percent of optimum moisture content in sidewalk and all other paved areas.
- D. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

3.10 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes and to prevent ponding. Comply with compaction requirements and grade to provide a smooth transition between adjacent existing grades.

3.11 FIELD QUALITY CONTROL

- A. The Engineer will observe compaction methods and techniques while backfilling is in progress. If in the opinion of the Engineer the Contractor is not compacting the soil in accordance with these specifications, then the Engineer will engage a qualified geotechnical engineering testing agency to perform field quality-control testing.
- B. The Contractor will allow the testing agency to inspect backfill layers. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved Areas or around structures: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area, but in no case fewer than three tests.
 2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 500 feet or less of trench length, but no fewer than two tests.
- D. When testing agency reports that fills or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.
- E. The Owner will pay for all initial tests and proctors; however, cost of retests will be paid by the Contractor.

3.12 PROTECTION AND MAINTENANCE

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.
- C. Where settling occurs before Project warranty period elapses, backfill with additional soil material, compact, and reconstruct surfacing.
1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.13 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's easement.
- B. Contractor shall dispose of excess waste material to a site having an approved erosion control plan and current permit from either a local agency having jurisdiction or from NCDENR, Land Quality Section. If site does not have an approved plan and current permit, then Contractor shall be responsible for preparing plan and obtaining permit. Payment of any fees will be paid by the Contractor.

END OF SECTION 02321

SECTION 02322 - ROCK EXCAVATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-16 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the drilling, blasting, excavating, removing and disposing of rock from trenches or pits and includes the backfill replacement material.
- B. Related Sections include the following:
 - 1. Division 1 Section "Measurement and Payment" for a schedule of unit prices.
 - 2. Division 2 Section "Trenching For Utilities" for excavating, backfilling and shaping.
 - 3. Division 2 Section "Dewatering" for lowering and disposing of ground water during construction.
 - 4. Division 2 Section "Excavation Support and Protection."

1.3 DEFINITIONS

- A. Rock Excavation: Solid, ledge rock in place which in the opinion of the Engineer, cannot be removed practically without the use of drilling and blasting.
 - 1. Rock excavation includes removal and disposal of solid rock, boulders over 1/2 cu. yd., ledge rock, rock-hard cementitious deposits and other materials or obstructions which cannot be dislodged and excavated with modern, heavy-duty, track-mounting excavating equipment defined as follows:
 - a. For trenches less than 10' in width or pits in excess of 20' in either length or width: Caterpillar Model 215 or equivalent hydraulic excavator.
 - b. Materials which can be removed with the above specified equipment will not be considered as rock and no extra payment will be allowed for such removal.
- B. Replacement Material: Soil material to be used to replace excavated rock material.
 - 1. Material stockpiled from utility trench operations suitable for use as backfill material.
 - 2. Satisfactory soil material imported from off-site for use as backfill material.

1.4 PROJECT CONDITIONS

- A. The Contractor will select an independent, qualified blasting consultant to inspect the blast site and any structures within a 1,000-foot radius of the blasting location. The consultant shall provide sufficient written and photographic documentation to accurately reflect the pre-blast condition of the structure.
- B. Provide vibration-recording instruments to record peak particle velocity (2.0 inches per second maximum allowable), air overpressure (133 decibels maximum allowable) and frequency (15-hertz minimum allowable).
- C. A post-blast inspection shall be performed upon the completion of blasting.

1.5 CONSTRUCTION REQUIREMENTS

- A. The Contractor shall obtain a blasting permit, prior to performing any blasting operations.
- B. The approval of the Engineer shall be obtained before any blasting of rock takes place. The Engineer may fix the hours of blasting if he deems it necessary. The Contractor shall conduct a pre-blast survey and provide the report to the City of Graham and the Engineer.
- C. All applicable Federal, State, and Local regulations pertaining to transporting, storing, and using explosives shall be met.
- D. The Contractor shall take all necessary precautions to protect life and property while engaged in blasting operations. Where there exists the danger of rock or overburden being thrown by a blast, an approved type of blasting mat shall be used. The Engineer will approve the blasting mat for type of construction but not for adequacy. No blasting will be allowed unless a galvanometer is used to check cap circuits.
- E. The blasting consultant shall provide vibration recording instruments for use on the initial shots and any other places within one thousand feet (1,000') of a utility, structure, or property which could be damaged by vibration, concussion, or falling rock, the Contractor shall be required to keep a blasting log containing the items listed in Item "G" below in order to determine/verify proper blasting procedures. The Contractor shall provide the Engineer a copy of the monitoring report for the Engineer's file. These instruments shall be of the type which records on direct reading tape the three components of velocity.
- F. Overpressure (concussion) shall be recorded on direct recording tape on equipment specifically designed for impact-type overpressure from blasting.
- G. The blasting consultant shall maintain an accurate log of each shot, listing as a minimum the following data:
 - 1. Date.
 - 2. Time.
 - 3. Weather conditions including temperature and humidity.
 - 4. Station number or other reference to base line survey data.
 - 5. Manufacturer and type of explosive.
 - 6. Method of detonation.
 - 7. Total weight of explosive per shot.
 - 8. Number of delays.
 - 9. Number of holes.

10. Hole depth.
11. Depth to surface of rock (if unexposed during drilling).
12. Amount of explosive per hole number.
13. Total weight of explosive per delay.
14. Amount of stemming.
15. Type and amount of blast matting.
16. A sketch of the hole pattern, with hole numbers for each shot.

This blasting log shall be made available to the Engineer upon request and shall be kept in an orderly manner. Compliance of the contractor with these specifications does in no way relieve him of legal liabilities relative to blasting operation. All blasting operations will be conducted in strict accordance with existing ordinances and accepted safe practices relative to the storage and use of explosives.

- H. All blasting operations will be conducted in such a manner to control the effect on the surrounding area. The following limits will be used for all blasting:

Maximum Allowable Peak Particle Velocity: 2.0 inches per second

Maximum Allowable Air Overpressure: 133 decibels

Minimum Allowable Frequency: 15 hertz

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 TRENCH OR PIT WIDTH

- A. Pipe or structure clearance in rock shall be a minimum of 6 inches below the grade line of the pipe or structure and 12 inches on each side of the nominal diameter of the pipe or structure. Additional excavation outside these limits for excavation required to comply with OSHA regulations or to install shoring, bracing or trench box shall not be considered in computation of rock quantities.

3.2 REPLACEMENT MATERIAL

- A. The Contractor shall provide replacement material either from previously stockpiled trench excavation materials or borrow material to backfill over and around the pipe or structures as specified in Division 2, Section "Trenching for Utilities" and such cost will be included in the unit price bid for rock excavation.

PART 4 – BASIS OF PAYMENT

- A. Measurement of rock will be on a cubic yards basis as verified by the engineer or the city representative on site.
- B. Underruns or overruns of estimated contract quantities shall not be the basis for any claims made by the contractor against the owner or Engineer and the contract unit price and payment will be full compensation for all work covered by this article regardless of the quantity of actual rock excavation encountered, including replacement material.

END OF SECTION 02322

SECTION 02511 - PAVING REPAIR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-16 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Hot-mix asphalt paving.
- B. Related Sections include the following:
 - 1. Division 2 Section "Trenching for Utilities" for aggregate subbase and base courses and aggregate pavement shoulders.

1.3 SUBMITTALS

- A. The Contractor shall, upon request from the Owner, submit the job mix formula to be used on the project, along with documentation from the asphalt supplier certifying that the materials used in the asphaltic concrete conform to the applicable NCDOT standards.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed hot-mix asphalt paving similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Manufacturer Qualifications: Engage a firm experienced in manufacturing hot-mix asphalt similar to that indicated for this Project and with a record of successful in-service performance.
 - 1. Firm shall be a registered and approved paving mix manufacturer with authorities having jurisdiction or with the DOT.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All materials shall conform to the requirements of NCDOT Standard Specifications for Roads and Structures, latest edition.

PART 3 – EXECUTION

3.1 EXAMINATION

Verify that subgrade is dry and in suitable condition to support paving and imposed loads.

- B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.

3.2 PATCHING AND REPAIRS

Patching: Saw cut perimeter of patch and excavate existing pavement section to sound base. Recompact new subgrade. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically.

1. Tack coat faces of excavation and allow to cur before paving.
2. Fill excavation with dense-graded, hot-mix asphalt base or intermediate mix and, while still hot, compact flush with adjacent surface.
3. Partially fill excavation with dense-graded, hot-mix asphalt base mix and compact while still hot. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

3.3 SURFACE PREPARATION

General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

3.4 PAVEMENT THICKNESS

- A. Hot-mix asphalt mix shall be placed as follows:

1. Base Course: B25.0B base = 8 inches.
2. Intermediate Course: I19.0B = 6 inches
3. Surface Course: S9.5B Surface Course - 2 inches.

3.5 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt mix on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness, when compacted.

1. Place hot-mix asphalt base course in number of lifts and thickness' indicated.

2. Place hot-mix asphalt surface course in single lift.

B. Place hot-mix asphalt in accordance with applicable NCDOT Standard Specifications for Roads and Structures, latest edition.

3.6 COMPACTION

A. Compact hot-mix asphalt in accordance with applicable NCDOT Standard Specifications for Roads and Structures, latest edition.

B. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

3.7 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

3.8 FIELD QUALITY CONTROL

A. The Engineer will observe patching installation while in progress. If in the opinion of the Engineer the patching installation is not in compliance with these specifications, then the Engineer may engage the services of a qualified independent testing agency to perform compaction testing.

1. If testing meets or exceeds specifications, the Owner will pay for testing.
2. If testing fails to meet specifications, then Contractor will pay for testing and any additional tests to confirm project compliance.

B. All testing will be in accordance with applicable NCDOT or ASTM requirements.

C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

D. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

END OF SECTION 02511

SECTION 02530 - SANITARY SEWERS

PART 1- GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-16 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes sanitary sewers and necessary appurtenances for the sanitary sewer installation.
- B. Related Sections include the following:
 - 1. Division 1 Section "Measurement & Payment" for a schedule of unit prices.(N/A)
 - 2. Division 2 Section "Trenching for Utilities" for excavating, backfilling and shaping.
 - 3. Division 3 Section "Precast Concrete Structures" for concrete manholes and structures.

1.3 SUBMITTALS

- A. Product Data: For the following:
 - 1. Sanitary Sewer Pipe

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect pipe, pipe fittings, and seals from dirt and damage.

1.5 PROJECT CONDITIONS

- A. Locate existing structures and piping to be closed, abandoned or connected to.
- B. Connection to Existing Facilities: Do not interrupt the flow of sewer through the existing sewer mains until the following conditions are complied with:
 - 1. Contractor to prepare a written description detailing how by-pass pumping will be achieved and maintained during the connection process. Plans shall also include provisions for back-up pumping measures in the event the initial pumps were to fail.
 - 2. Connections may not begin until written approval of the Engineer has been maintained.

PART 2 - PRODUCTS

2.1 DUCTILE IRON PIPE AND FITTINGS

A. Materials:

Ductile iron pipes shall conform to AWWA/ANSI C-151/A21.51. All pipes shall have a minimum pressure of 350 psi. **All Ductile Iron pipe shall be Class 50 as indicated on the bid form and plans.**

1. Flanges for ductile iron pipe shall be in accordance with AWWA C115 and bolts, gaskets and installation shall be in accordance with AWWA C115, Appendix A, requirements.
2. Joints for ductile iron pipe and fittings shall be push-on, rubber gasketed joints in accordance with the applicable requirements of AWWA C111/ANSI A21.11. Standard push-on joints shall have a deflection capability of not less than three degrees. Special deflection bells shall have a deflection capability of not less than four degrees. The pressure rating for push-on joints shall be a minimum of 350 psi.
3. The exterior of ductile iron pipe, specials, and fittings shall be coated with an asphaltic coating in accordance with AWWA C151, Section 51-9. The finished coating shall be smooth, continuous and strongly adherent to the pipe.
4. Restrained joints for ductile iron pipe and fittings shall be American Flex Ring, Griffin-Snap Lok, or US Pipe – T.R. Flex.
5. The bolts and nuts for flanged fittings and mechanical joints shall meet the requirements of ASTM A307.

B. Fittings: Ductile Iron Fittings shall meet all requirements of AWWA/ANSI C110/A21.10 and will be of the mechanical joint type.

1. The interior and exterior coatings shall be the same as specific for ductile iron pipe.
2. Fittings shall have a minimum pressure rating of 350 psi.
3. Rubber gaskets joints shall conform to AWWA/ANSI C111/A21.11.

C. Interior Lining – Cement lining – standard in accordance with ANSI/AWWA C104/A21.4.

PART 3- EXECUTION

3.1 GENERAL

- A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe or coatings. Pipe or fittings shall not be dropped. All pipe or fittings shall be examined before laying, and no piece shall be installed which is found to be defective. Any damage to the pipe coatings shall be repaired as directed by the Engineer.
- B. Pipe and fittings shall be subjected to a careful inspection just prior to being laid or installed. If any defective pipe is discovered after it has been laid it shall be removed and replaced with a sound pipe in a satisfactory manner at no additional expense to the Owner. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work, and when installed or laid, shall conform to the lines and grade required.
- C. Underground piping shall slope uniformly between manholes.
- D. Contractor shall exercise extreme care when constructing piping to protect from damage all existing underground utilities, and all existing structures.

3.2 INSTALLATION

- A. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.
- B. Pipe shall be installed using bedding, as shown in the Contract Documents, and in accordance with requirements of Industry Standard Specifications except as otherwise provided herein. A firm, even bearing throughout the length of the pipe shall be constructed by tamping bedding material at the sides of the pipe up to the elevation designated by the bedding type. Bell holes shall be hand excavated to insure uniform bearing along the pipe barrel. Pipes will be laid with bell on the uphill end of the pipe.
- C. Prior to being lowered into the trench, each pipe will be inspected by the crew foreman. Faulty pipe shall be rejected and removed from the work site. Pipes having any defects which are insufficient to cause the rejection of the pipe will be laid so as to bring defects in the top half of the sewer, observing such special directions as the Engineer may give with reference thereto. All pipes shall be sound and clean before laying. When laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by watertight plug or other approved means.
- D. No pipe will be stockpiled or temporarily laid out within ten (10) feet of excavation in earth or within thirty (30') feet of rock which must be blasted for removal. All pipes will be protected against injury from falling rock when blasting.

- E. The pipe and fittings will be laid in the trench so that after the sewer is completed the invert of the pipe will conform accurately to the line and grade shown on the plan or as revised by the Engineer.
- F. Whenever the Engineer's drawings show, or for other reasons it may be necessary to change from one pipe type to another, the Contractor will furnish a donut or a flexible coupling with two stainless steel clamps, recommended by pipe manufacturers, to make the joint. A brick and mortar collar will be constructed around all joints where couplings or donuts are used unless otherwise recommended by the manufacturers.
- G. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a bell shall be beveled to conform to the manufactured spigot end. Lining shall be undamaged.
- H. Joints:
 - 1. Push-on joints shall be made in strict accordance with the manufacturer's instructions. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the bell end of the pipe, and the joint surfaces cleaned and lubricated. The plain end of the pipe is to be aligned with the bell of the pipe to which it is to be joined, and pushed home with a jack or by other means. After joining the pipe, a metal feeler shall be used to make certain that the rubber gasket is correctly located.
 - 2. Couplings shall be placed on pipe and lubricated in accordance with manufacturer's recommendation. Pipes shall be aligned and carefully pushed together. Gasket shall be in the desired position after jointing. Invert grade of pipe shall be carefully rechecked after jointing. Any discrepancies in grade shall be corrected.
- I. Trenches shall be kept dry at all times during the laying of the pipe. At the conclusion of each day's work, the open end of the pipe shall be securely closed to prevent the entrance of water, mud, rodents, vermin, etc.
 - 1. Dewater trench as necessary to maintain dry laying conditions.
- J. The Contractor shall arrange, if requested, for the pipe manufacturer to furnish information and supervise the installation of at least the first five (5) joints of pipe installation.
- K. The Contractor shall carefully regulate his equipment and construction operations such that the loading of the pipe does not exceed the loads for which the pipe is designed and manufactured. Any pipe damaged during construction operations shall be replaced at the Contractor's expense.

3.3 BEDDING OR SEWER PIPE

- A. General: All sanitary sewer pipe shall be provided with a firm uniform bed of granular backfill material, No. 57 stone, to fully support the pipe along its entire length. The stone shall have a minimum depth of at least six (6") inches.

B. Ductile Iron Pipe

1. Provide granular backfill material, No. 57 stone, (Class 'C' Bedding), from bottom of pipe to a depth of 1/8 diameter of pipe where the depth of cover is less than 16 feet.
2. Provide granular backfill material, No. 57 stone, (Class 'A' Bedding), from bottom of pipe to top of pipe where cover is greater than 16 feet but less than 24 feet.

3.4 FIELD QUALITY CONTROL

- A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
- B. Place plug in end of incomplete piping at end of day and when work stops. Flush piping between manholes and other structures to remove collected debris. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after backfill is in place, and again at completion of Project.
 1. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Crushed, broken, cracked, or otherwise damaged piping.
 - c. Infiltration: Water leakage into piping.
 - d. Exfiltration: Water leakage from or around piping.
 2. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
 3. Reinspect and repeat procedure until results are satisfactory.

3.5 TESTING GRAVITY SEWERS

- A. The Contractor shall test all gravity sewer mains in accordance with one of the following methods described in this section. The test method to be performed by the Contractor shall be approved and verified by the Engineer.
- B. Contractor shall furnish all labor, materials, equipment and apparatus required to perform gravity sewer testing.
- C. Engineer shall be present for all testing. Contractor to schedule test time with Engineer; however, Contractor shall give Engineer at least 24 hour notice of test time. Engineer will document all testing and distribute copies of test results to Contractor and Owner.
- D. Low Pressure Air Testing
 1. All air testing shall be in accordance with ASTM C-828-86 or latest revision.
 2. Air leakage testing of installed system shall be performed with a continuous monitoring gauge no less than 4 inches \pm (4") in diameter with minimum divisions of 0.10 psi

- and an accuracy of ± 0.04 psi. All air used shall pass through a single, above ground control panel visible to the Project Representative during the testing.
3. Determine the groundwater elevation and determine the average groundwater head above the section of line being tested. Adjust the following test pressures by adding 0.43 psi per foot of groundwater head.
 4. Pressurize the system to 4.0 psi (greater than average groundwater pressure). Throttle the air supply to maintain that constant pressure for at least 2 minutes. The air pressure supply shall then be disconnected from the system or shut off.
 - a. Do not enter the manhole during test.
 - b. Do not exceed 9.0 psi in the system.
 5. Observe the continuous monitoring gauge while decreasing the pressure to no less than 3.5 psi (greater than groundwater pressure). At a reading of 3.5 psi, or any convenient observed pressure reading between 3.5 psi and 4.0 psi, timing shall commence with a stop watch or other timing device that is at least 99.8% accurate.
 6. Measure the time interval for pressure to drop 1.0 psi.
 - a. If the time, shown in the following Table 1 for the designated line size and length, elapses before the air pressure drops 1.0 psi, the section undergoing test may be discontinued once the prescribed time has elapsed even though the 1.0 psi drop has not occurred.
 - b. If pressure drops 1.0 psi before the appropriate time shown in the Table 1 has elapsed, the air loss rate shall be considered excessive and the section of pipe has failed the test.

Table 1 Minimum Test Times For Various Pipe Sizes

<u>Pipe Diameter</u> (Inches)	<u>Time</u> (Minutes/100 ft.)
12	1.8
18	3.0
24	3.6
30	4.8
42	7.3

7. If the section fails the air test, the Contractor shall determine at his own expense the source, or sources of leakage, and shall repair or replace all defective materials and workmanship. Repeat procedure until results are satisfactory.

E. Infiltration/Exfiltration Testing

1. The Engineer will determine the type of test required for each section after the ground water table has been measured by the Contractor. The following general criteria will govern the type of test to be conducted.

- a. Wherever the ground water table is measured to be not less than 3' above the top of the pipe throughout the full length in the section being tested, an infiltration test may be used.
 - b. Wherever the ground water table is measured to be less than 3' above the top of the pipe at the highest point in the section being tested, an exfiltration test may be used.
2. When conditions are suitable for testing the pipe by an infiltration test, test the pipe and manholes in sections not longer than 1,000 feet in length by the following procedures.
- a. Install a watertight plug with a 2" tapped connection in the pipe just upstream of the manhole at the low end of the section being tested. The tap shall be in the plug at or above the centerline of the carrier pipe and the entire installation shall cause all water flowing through the carrier pipe to pass through the tap. Install a short section of pipe in the tap as required to catch and measure the water flowing through the carrier pipe with a calibrated container.
 - b. Install a watertight plug in the carrier pipe just upstream of the manhole at the high end of the section being tested.
 - c. Allow the flow from infiltration to stabilize and become relatively constant in the 2" pipe. Fill the calibrated container with the flow and record the fill time with a stopwatch.
 - d. Recheck the ground water table to assure the level is still more than 3' above the invert of the pipe at the highest point in the section being tested.
 - e. The pipe and manholes will have passed the test if the infiltration does not exceed a flow rate of 10 gallons per day per inch of pipe diameter per mile of length.
 - 1.) This criteria shall be computed for each section of pipe by measuring the amount of time required to add one gallon of water to a container unless otherwise directed by the Engineer.
3. When conditions are suitable for testing the pipe by an exfiltration test, test the pipe and manholes in sections not longer than 1,000 feet in length by the following procedures:
- a. Install a watertight plug in the carrier pipe just upstream of the manhole at the low end of the section being tested. The plug should be securely anchored or blocked since it will be subjected to hydrostatic pressures.
 - b. Install a watertight plug in the carrier pipe just upstream of the manhole at the upper end of the section being tested.

- c. Fill the section of pipe including interim manholes with water until the water level in the manhole at the high end of the section is approximately 3' above the top of the pipe. Care should be taken during filling to assure that no air has been trapped in the pipe. For each foot that the average ground water table is above the bottom invert of the pipe, add 1' to the water level at which the line is tested. Where the measured ground water table is found to be 3' or more above the top of the carrier pipe, the Engineer may require an alternative testing procedure.
 - d. After filling, allow the section to stand for a period of 4 hours or longer as required to assure that the pipe and manhole walls are saturated. Add water as required to maintain the water level in the upstream manhole at least 3' above the top of the pipe.
 - e. After the pipe and manhole walls are saturated, add water as required to bring the water level to 3.5' above the top of the pipe in the upstream manhole. Recheck the ground water table and make any necessary adjustments to the test level.
 - f. Mark the water level in the upstream manhole on the manhole wall and allow the section to sit for one (1) hour.
 - g. Then, quickly add water to the system and measure the amount of water required to bring the water level back to the mark previously placed on the manhole wall.
 - h. The section of pipe will have passed the test if the exfiltration rate does not exceed 10 gallons per day per inch of pipe diameter per mile of length.
4. If, for any reason, a section of pipe fails either of the tests procedures previously outlined or any substitute test procedure approved by the Engineer, the Contractor shall locate the defective materials and/or installation and make any necessary repairs. After the corrective actions have been taken, the section of pipe shall be retested subject to the same provisions or requirements outlined above.
 - a. No sealant shall be used in the newly installed sewers to correct leaks without prior approval of the Engineer. The extent and type of repair which may be allowed shall be subject to the approval of the Engineer.

END OF SECTION 02530

SECTION 02825 - LAWNS AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-16 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Ground Preparation.
 - 2. Furnishing and applying lime and fertilizer.
 - 3. Seeding and mulching.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Measurement and Payment" for schedule of unit prices.
 - 2. Division 2 Section "Site Clearing" for protection of existing trees and planting, topsoil stripping and stockpiling, and site clearing.
 - 3. Division 2 Section "Trenching for Utilities".

1.3 SUBMITTALS

- A. Certification of grass seed from seed vendor for each grass-seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver seed, limestone and fertilizer in original sealed, labeled, and undamaged containers. Store in dry containers and in accordance with manufacturer's recommendations.

1.5 COORDINATION AND SCHEDULING

- A. The Contractor shall seed and mulch all disturbed areas within 2 weeks after the trench has been installed and the trench backfilled. Where ingress and egress routes require utilization of an area where the trench has been backfilled a ten (10') foot wide strip on the high side of the easement may remain unseeded. Once the ingress and egress location is no longer required for access, unseeded strip shall be seeded and mulched within 15 calendar days.

PART 2 – PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.

2.2 LIME

- A. Lime: Commercial grade agricultural limestone in the form of dolomitic limestone.

2.3 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:

1. Composition: 10 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.4 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat.
- B. Fiber Mulch: Biodegradable dyed-wood cellulose-fiber mulch, nontoxic, free of plant growth- or germination-inhibitors, with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
- C. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application, nontoxic and free of plant growth- or germination-inhibitors. Minimum tack rate is 10#/1,000 sq. ft.

2.5 EROSION-CONTROL MATERIALS

- A. Blankets: Biodegradable wood or straw, or fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
 1. North American Green S150 or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive seeding for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 GROUND PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
- B. Limit subgrade preparation to areas that will be planted in the immediate future.
- C. Loosen subgrade to a minimum depth of 4 inches by plowing, disking and harrowing until these areas are friable and well pulverized. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter detrimental to final grading, proper bonding or the proper growth of the planting. If the prepared surface becomes eroded as a result of rain or for

any other reason, or becomes crusted before the seed is sown, the surface shall again be placed in a condition suitable for seeding.

3.3 LIME APPLICATION

- A. After the area to be seeded has been brought to finished grade, lime shall be uniformly distributed at a rate of 4,000 pounds per acre over the seeding area with a mechanical spreader.

3.4 FERTILIZER APPLICATION

Commercial fertilizer grade 10-10-10 shall then be distributed uniformly at the rate of 1,000 pounds per acre and shall be uniformly mixed with the soil to a depth of at least 4 inches by disking, harrowing or by other methods acceptable to the Engineer.

- B. Fertilizer shall not be applied when the wind makes it difficult to get satisfactory distribution.

3.6 SEEDING

- A. The seed shall be a mixture as shown in the table below, and shall be applied at the rates shown in the table:

<u>Season</u>	<u>Kinds of Seed</u>	<u>Pounds Per Acre</u>
November 1 - January 31	Tall Fescue	100
	Rye (Grain)	50
February 1 - April 30	Tall Fescue	80
	Bluegrass	60
May 1 - July 31	Tall Fescue	70
	Weeping Lovegrass	20
August 1 - October 31	Tall Fescue	100
	Sudan Hybrid	50

The seed shall be uniformly sown by approved mechanical power drain drills, or in small areas, by mechanical hand seeders. The seeds shall be covered and compacted to a depth of 1/8 to 1/2 inch by means of a cultipacker and an empty traffic roller or another roller weighing less than 3 tons. Broadcast seeding shall not be done when the wind makes it difficult to get satisfactory distribution.

3.6 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
1. Mix slurry with nonasphaltic tackifier.
 2. Apply slurry uniformly to all areas to be seeded in a 1-step process. Apply mulch at the minimum rate of 1500 lb per acre (16.5 kg per 100 sq. m) dry weight but not less than the rate required to obtain specified seed-sowing rate.
 3. Apply slurry uniformly to all areas to be seeded in a 2-step process. Apply first slurry application at the minimum rate of 500 lb per acre (5.5 kg per 100 sq. m) dry weight but not

less than the rate required to obtain specified seed-sowing rate. Apply slurry cover coat of fiber mulch at a rate of 1000 lb per acre (11 kg per 100 sq. m).

3.7 MOISTURE

Seed shall not be sown unless the soil has the optimum moisture content or more through a depth of at least 4 inches, nor shall it be sown when there is frost in the ground. The Owner has the authority to postpone seeding at any time when weather and moisture conditions are not favorable.

3.8 MULCH

All areas to be seeded shall be uniformly mulched in a continuous blanket immediately after seeding using Wheat straw at a minimum of 2 1/2 tons per acre. The rate of application will correspond to a depth of at least one inch and not more than one and one half inches, according to the texture and moisture content of the mulch material. It is intended that mulch shall allow some sunlight to penetrate and air to circulate, at the same time shading the ground, reducing erosion and conserving soil moisture. The Contractor shall take steps necessary to prevent loss of mulch or bunching of mulch as caused by the wind. All mulch shall be tacked per DOT standards.

3.9 MAINTENANCE

- A. The Contractor shall maintain all seeded and mulched areas in a satisfactory condition until final acceptance of the work. This includes repairing washes that occur, and the application of additional seed, installation of additional lime, and/or fertilizing and watering as needed.

3.10 STAND OF GRASS

- A. If, after a suitable growth period, a satisfactory stand of grass is not evident, the unsatisfactory areas shall be reseeded, including any additional ground preparation, liming and fertilizing necessary, using the type of seed specified. A stand of grass is defined as a full cover, over the areas seeded and mulched, with grass that is alive and growing.

END OF SECTION 02930

SECTION 02832

CHAIN LINK FENCING

1. SCOPE. This section covers chain link fencing and gates. Fencing shall be provided in the alignment indicated on the drawings at the following location(s):
 - a. Dead end of Staley Street.
2. FENCE TYPE. Fencing shall conform to the details indicated on the drawings and shall be of the following general types.
 - 2.01 Fencing shall consist of black vinyl coated steel fabric, with a top rail, bottom tension wire,. The fabric height shall be 4 feet. Posts shall be set in concrete.
3. MATERIALS.
 - 3.01 Steel Fencing. All steel or malleable iron parts and accessories shall be hot-dip galvanized or aluminum coated after fabrication and black vinyl coating.

Fabric	9 gauge, 2 inch mesh; black vinyl coated; knuckled selvage on top, twist selvage on bottom.
Posts	Steel pipe, ASTM F669, Group IC, with ASTM F1234, Type B interior and exterior protective coating.
Line Posts For 6 Foot Fencing	2-3/8 inch OD pipe, 3.12 lb. per ft.
Terminal Posts For 6 Foot Fencing	2-7/8 inch OD pipe, 4.64 lb. per ft.
Top Rails	1-5/8 inch OD steel pipe, 1.40 lb. per ft.
Rail Couplings	Sleeve type, 6 inches long, ASTM F626.
Bracing	Pipe brace same as top rail, with 3/8 inch diameter steel rod truss and tightener.
Post Tops	Pressed steel, malleable iron with pressed steel extension arm, or one-piece aluminum casting, ASTM F626.
Stretcher Bars	Steel, ASTM F626, 3/16 inch by 3/4 inch, or equivalent area.
Fabric Ties	Aluminum bands or wires, ASTM F626.
Tension Wire	ASTM A824, galvanized or aluminum coated oil spring wire, 7 gauge.
Handrail-Setting Cement	Minwax "Super Por-Rok Cement" or Master Builders "Set 45".

3.02 Aluminum Alloy Fencing.

Fabric	6061-T94 wire, 6 gauge, 2 inch mesh, knuckled selvage top and bottom.
Posts	ASTM B429, 6063-T6, Schedule 40 pipe.
Line Posts	2-3/8 inch OD, 1.26 lb. per ft.
Terminal Posts (End, Corner and Pull)	2-7/8 inch OD, 2.00 lb. per ft.
Top Rails	ASTM B429, 6063-T6, Schedule 40 pipe, 1-5/8 inch OD, 0.79 lb. per ft.
Rail Couplings	Outside type, 6 inches long, ASTM F626.

4. FENCE CONSTRUCTION. The installed fence shall conform to the alignment and finish grade indicated. All posts shall be plumb. Unless otherwise indicated on the drawings, posts shall be spaced approximately 10 feet apart. Where necessary, the fence grade shall be adjusted to fit the ground contour by slipping the fence fabric links. Ground surface irregularities shall be graded as required to maintain not more than 2 inches clearance below the bottom of the fence fabric.

Where the fencing is supported by a concrete structure, posts shall be set in sleeves that provide at least ¼ inch clearance all around. Sleeves shall be fabricated from Schedule 40 black steel pipe and hop-dip galvanized after fabrication. Sleeves shall be 5 inches long unless otherwise indicated on the drawings. Sleeves shall be rigidly supported in accurate alignment in the forms and shall be positioned vertically so that the top of the sleeve is approximately ½ inch below the finish concrete surface. Posts shall be wedged in accurate alignment, and the annular space between posts and sleeves shall be filled with handrail-setting cement to the top of the steel sleeve. Filling of the remaining space with sealant, as indicated on the drawings, is covered in the caulking section.

Where posts are set in earth, concrete foundations 36 inches deep shall be provided. If bedrock is encountered, post excavation shall be continued to the 36 inch depth or 18 inches into the bedrock, whichever is less. Concrete foundations shall be circular in horizontal sections, not less than 10 inches in diameter for line posts, and with a diameter not less than the post OD plus 9 inches for a terminal and gate posts, except that foundations in bedrock shall be a minimum of 6 inches larger than the outside dimension of the post. Foundations shall extend above the ground surface and shall be crowned approximately one inch. Concrete for foundations shall conform to the cast-in-place concrete section. Each foundation shall be cured for at least 72 hours before further work is done on the post.

Top rails, bottom rails, and bottom tension wires shall be installed before the fabric. Top and bottom rails shall be furnished in at least 18 foot lengths and shall be securely connected to gate and terminal posts. Tension wires shall be installed approximately 6 inches above grade and shall be attached to each post and securely anchored at terminal and gate posts. Straight runs between braced posts shall not exceed 1,500 feet. A terminal post shall be provided at each change in slope.

Fabric shall be attached to the top rail, bottom rail, and bottom tension wire at 24 inches centers, and to the line posts at 15 inch centers. Barbed wire shall be fastened to each extension arm by internal clips or external fabric ties. Stretcher bars shall be provided at each gate and terminal post. Each stretcher bar shall be threaded through the fabric and anchored to the post at 15 inch centers by positive mechanical means.

Each gate and terminal post shall be braced by a horizontal pipe brace and an adjustable truss extending to an adjacent line post. Corner posts shall be braced in both directions.

Fabrics shall be stretched taut and anchored so that a pull of 150 pounds at the middle of a panel will not lift the bottom of the fabric more than 6 inches.

All surfaces of aluminum which will be in contact with concrete, mortar, or dissimilar metals shall be given a heavy coat of coal tar paint.

5. DRAWINGS AND DATA. Complete detail drawings and specifications for the fence, gates, and accessories shall be submitted in accordance with the submittals sections.
6. See construction plans – site and utility plan for fence dimensions. In the event of any discrepancies, use the most heavy duty or larger size material.
7. All materials and parts shall be used for heavy duty industrial applications.

END OF SECTION

SECTION 03410 - PRECAST CONCRETE STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-16 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes precast concrete structures and necessary appurtenances for the precast concrete structure installation.
- B. Related Sections include the following:
 - 1. Division 1 Section "Measurement and Payment" for schedule of unit prices. (N/A)
 - 2. Division 2 Section "Trenching for Utilities" for excavating, backfilling and shaping.
 - 3. Division 2 Section "Sanitary Sewers" for sewer installation.

1.3 SUBMITTALS

- A. Product Data: For the following:
 - 1. Precast Concrete Structures
 - 2. Manhole Rings and Covers
- B. Design Mix Reports and Calculations: For each class of concrete used to fabricate the precast concrete structures.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Precast sections may be provided with lifting notches on the inside face of walls to facilitate handling. Lifting notches shall not be more than 3 inches deep; holes extending through the wall will not be acceptable.
- B. Precast sections shall be handled carefully and shall not be bumped or dropped. Hooks shall not come in contact with joint surfaces.
- C. Precast sections shall not be delivered to the project site until the sections have attained a minimum strength of at least 80 percent of the specified design strength or a minimum of seven days whichever is greater.
- D. The date of manufacture shall be identified on all precast sections.

PART 2 - PRODUCTS

2.1 PRECAST STRUCTURES

- A. Materials:
 - 1. Concrete shall conform to ASTM C478 and the following:
 - a. Compressive Strength: 5000 psi minimum at 28 days
 - b. Air Content: 4 percent minimum

- c. Alkalinity: Adequate to provide a Life Factor, $A_z = \text{Calcium}$
 - d. Cementitious Materials: Minimum of 564 pounds per C.Y.
 - e. Coarse Aggregates: ASTM C33. Sound, crushed, angular granitic stone only. Smooth or rounded stone shall not be used.
 - f. Fine Aggregates: ASTM C33. Free from organic impurities.
 - g. Chemical Admixtures: ASTM C494. Calcium chloride or admixtures containing calcium chloride shall not be used.
 - h. Air Entraining Admixtures: ASTM C260
2. Reinforcing steel shall be ASTM A615 Grade 60 deformed bar, ASTM A82 wire or ASTM A185 welded wire fabric.
 3. Lift loops shall be ASTM A416 steel strand. Lifting loops made from deformed bars are not allowed.
 4. Flexible joint sealants shall be butyl rubber based conforming to Federal Specification SS-S-210A, AASHTO M-198, Type B - Butyl Rubber and as follows: maximum of 1% volatile matter and suitable for application temperatures between 10 and 100 degrees F.
 5. Nonshrink grout interior patching of all penetrations shall be as follows:
 - a.) Cormix Supreme
 - b.) L & M "Crystex"
 - c.) Masterbuilders "Masterflow 713 Grout"
 - d.) Masterbuilders "Set Grout"
 - e.) Savereisen Cements "F-100 Level Fill Grout"
 - f.) UPCO "Upcon Super Flow"
 - g.) U.S. Grout "Five Star Grout"
 6. Manhole rings and covers shall be equal to those shown on the plans and will conform to ASTM A48, Class 30B for gray cast iron materials. All castings shall be watertight and thoroughly coated with an asphaltic varnish and be as manufactured by:
 - a.) Dewey Brothers, Inc.
 - b.) Vulcan Foundry, Inc.
 - c.) U.S. Foundry and Manufacturing Corporation
 7. Manhole steps shall conform to OSHA standards and shall be resistant to corrosion by hydrogen sulfide and other sewer gases. Steps shall be provided in bases, risers, cones, transition cones, and transition top sections aligned vertically on 16" centers. Steps shall be secured to the wall with a compression fit in tapered holes or cast in place. Steps shall not be vibrated or driven into freshly cast concrete or grouted in place. The steps shall be Copolymer Polypropylene Plastic reinforced with a 1/2" diameter grade 60 bar and have serrated tread and tall end lugs. Step pullout strength shall be 2000 lbs. minimum when tested according to ASTM C497.

B. Fabrication and Manufacturing:

1. Precast component fabrication and manufacturers shall conform to the following:
 - a.) Precast manufacturing shall be in conformance with ASTM C478. Inside slab finishes resulting from casting against forms shall be free of any defects and honey comb. Exterior slab surfaces shall have a float finish. Small surface holes, normal color variations, normal form joint marks, and minor depressions, chips and spalls may be tolerated. Dimensional tolerance shall be those set forth in the appropriate references and specified below.

- b.) Joint surfaces between bases, risers, and cones shall be manufactured to the joint surface design and tolerance requirements of ASTM C361. The maximum slope of the vertical surface shall be 2 degrees. The maximum annular space at the base of the joint shall be 0.10". The minimum height of the joint shall be 4". Joint shall be smooth, uniform, and sharp edged.
 - c.) Lift inserts shall be sized for a precision fit with the lift devices, shall comply with OSHA 1926.704, and shall not penetrate through the manhole wall.
 - d.) Step holes shall be cast or drilled in the bases, risers, and cones to provide a uniform step spacing of 16" with the first step being 16" from the top of the cones. Cast step holes shall be tapered to match the taper of the steps.
- 2. Precast base sections shall be cast monolithically without construction joints.
 - 3. Precuts riser sections shall have a minimum lay length of 16".
 - 4. Precast flat slab top sections shall have a manhole access with an inside diameter of 24" and shall be designed for HS-20 traffic loadings as defined in ASTM C890. Items to be cast into special flat slab tops shall be sized to fit within the manhole ID and the top and bottom surfaces.
 - 5. Precast grade rings may be used to adjust ring and covers to finished grade. No more than 8 vertical inches of grade rings will be allowed per manhole. Grade rings shall conform to ASTM C478 and shall be no less than 4 inches in height.
 - 6. Pipe to manhole connectors shall conform to ASTM C923.
 - 7. Joints between precast components shall be sealed internally between the tongue and the groove and the following:
 - a.) Internal seals shall consist of an o-ring gasket conforming to ASTM C443, installed according to the manufacturer's recommendation.
 - b.) Internal seals may consist of a profile gasket conforming to ASTM C-443 and C-361, installed according to manufacturer's recommendation. Note: The Contractors may, at his option, use butyl rubber in addition to o-ring or profile gasket along the bottom groove of each section to help in sealing.
 - 8. Lifting devices for handling precast components shall be provided by the precast manufacturer and shall comply with OSHA Standard 1926.704.

PART 3 - EXECUTION

3.1 GENERAL

- A. Care shall be taken in loading, transporting and unloading precast concrete structures. Structures shall be subjected to a careful inspection prior to installation. Any damaged area shall be repaired to the satisfaction of the engineer or removed from the project if damaged beyond repair at no additional cost to the owner.
- B. All precast structures shall be thoroughly cleaned before installation and kept clean until placed into service.
- C. Precast structures shall be installed where indicated on the construction drawings and in accordance with field staking cut sheets provided by the engineer.

- D. Contractor shall exercise extreme care when installing precast structures to protect existing underground utilities and existing structures from damage.

3.2 INSTALLATION

- A. All precast structures shall be provided with a uniform bed of granular backfill material, No. 57 stone, a minimum of 6" inches deep to fully support the precast structure. The bedding shall extend a minimum of 6 inches beyond the outside dimensions of the precast structure.
- B. Precast structures shall be set to be vertical and with sections in true alignment with a 1 inch maximum tolerance.
- C. Interior lift holes shall be plugged and grouted with materials specified in Part 2.
- D. Pipes shall be connected to precast structures and boots shall be tightened in accordance with manufacturer's recommendations. Non shrink grout shall be provided around pipe ends such that a uniform flow and constant grade through structures will be provided.
- E. O-ring rubber joints shall be provided at all joints to provide a watertight joint.
- F. All structures shall be set to top elevations shown on plans but in no event shall be less than 2 feet above finish grade.
- G. Vent piping shall be installed where indicated and to the elevations shown on the construction drawings.

3.3 TESTING

- A. The Contractor shall vacuum test all new sewer manholes for leakage in the presence of the Engineer.

The Contractor shall furnish all labor, equipment, and any appurtenant items necessary to satisfactorily perform the vacuum test. All testing equipment shall be approved for vacuum testing manholes.

A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time for the vacuum to drop to 9 inches of mercury shall not be less than that shown in the table below:

Manhole Depth	Diameter of Manhole		
	48" Dia.	60" Dia.	72" Dia.
10 Ft. or Less	60 Sec.	75 Sec.	90 Sec.
>10 Ft. But <15 Ft.	75 Sec.	90 Sec.	105 Sec.
>15 Ft. But <25 Ft.	90 Sec.	105 Sec.	120 Sec.

(Times shown are minimum elapsed times for a drop in vacuum of 1 inch or mercury.)

If the manhole fails the initial test, necessary repairs shall be made with an approved non-shrink grout while the vacuum is still being drawn. Retesting shall proceed and continue until a satisfactory test is accomplished.

END OF SECTION 03410

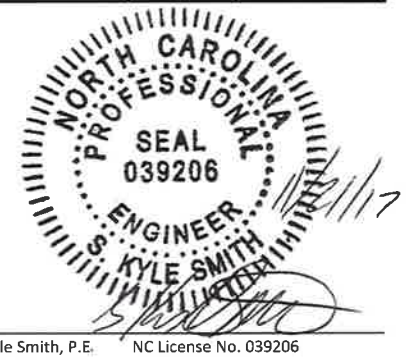


alley, williams, carmen & king, inc.

Tabulation of Bids

City of Graham
 Whitsett & Staley Street Water & Sanitary Sewer Improvements
 Tuesday, November 21, 2017 at 2:00 PM
 Graham City Hall, 201 South Main Street
 AWCK Project 16125

Item No.	Description	Estimated Quantity	Unit	Breece Enterprises, Inc		C&J Utilities, Inc.		Pipeline Utilities, Inc.		Thomas Stanley Grading & Hauling, Inc.		Triangle Grading & Paving, Inc.	
				Unit Price	Bid Amount	Unit Price	Bid Amount	Unit Price	Bid Amount	Unit Price	Bid Amount	Unit Price	Bid Amount
1	Mobilization	1	LS	\$ 18,000.00	\$ 18,000.00	\$ 4,000.00	\$ 4,000.00	\$ 23,000.00	\$ 23,000.00	\$ 10,000.00	\$ 10,000.00	\$ 13,901.00	\$ 13,901.00
2	Traffic Control	1	LS	\$ 18,000.00	\$ 18,000.00	\$ 6,000.00	\$ 6,000.00	\$ 93,805.00	\$ 93,805.00	\$ 1,000.00	\$ 1,000.00	\$ 10,500.00	\$ 10,500.00
3	Wattles - including installation, maintenance and removal	25	LF	\$ 10.00	\$ 250.00	\$ 20.00	\$ 500.00	\$ 86.00	\$ 2,150.00	\$ 10.00	\$ 250.00	\$ 12.50	\$ 312.50
4	Silt Fence, including stone, storage excavation, maintenance and removal	400	LF	\$ 4.00	\$ 1,600.00	\$ 5.00	\$ 2,000.00	\$ 7.00	\$ 2,800.00	\$ 5.00	\$ 2,000.00	\$ 3.00	\$ 1,200.00
5	Clearing, grubbing, debris removal, and limb clearing	1	LS	\$ 3,000.00	\$ 3,000.00	\$ 5,000.00	\$ 5,000.00	\$ 2,000.00	\$ 2,000.00	\$ 2,500.00	\$ 2,500.00	\$ 18,500.00	\$ 18,500.00
6	Clean Stone for Erosion Control Devices, complete in place	10	Tons	\$ 40.00	\$ 400.00	\$ 30.00	\$ 300.00	\$ 59.00	\$ 590.00	\$ 40.00	\$ 400.00	\$ 55.00	\$ 550.00
7	Class B Rip Rap for Erosion Control Devices, complete in place	15	Tons	\$ 50.00	\$ 750.00	\$ 60.00	\$ 900.00	\$ 68.00	\$ 1,020.00	\$ 55.00	\$ 825.00	\$ 44.00	\$ 660.00
8	Orange Construction Fence, complete in place including maintenance and removal	225	LF	\$ 5.00	\$ 1,125.00	\$ 4.00	\$ 900.00	\$ 4.00	\$ 900.00	\$ 4.00	\$ 900.00	\$ 4.25	\$ 956.25
9	Stabilization Fabric for Temporary Access Road, complete in place including removal	330	SY	\$ 6.00	\$ 1,980.00	\$ 5.00	\$ 1,650.00	\$ 2.00	\$ 660.00	\$ 7.00	\$ 2,310.00	\$ 3.00	\$ 990.00
10	ABC Stone for Temporary Access Road, complete in place including removal	90	Tons	\$ 40.00	\$ 3,600.00	\$ 30.00	\$ 2,700.00	\$ 60.00	\$ 5,400.00	\$ 55.00	\$ 4,950.00	\$ 43.50	\$ 3,915.00
11	Permanent Chain Link Fence, complete in place	50	LF	\$ 50.00	\$ 2,500.00	\$ 67.00	\$ 3,350.00	\$ 32.00	\$ 1,600.00	\$ 35.00	\$ 1,750.00	\$ 67.15	\$ 3,357.50
12	Seeding and Mulching, including repair seeding	1	LS	\$ 4,000.00	\$ 4,000.00	\$ 2,500.00	\$ 2,500.00	\$ 4,000.00	\$ 4,000.00	\$ 3,500.00	\$ 3,500.00	\$ 4,500.00	\$ 4,500.00
13	Stabilization Stone, including undercut excavation below pipe bedding as authorized by Engineer	60	Tons	\$ 40.00	\$ 2,400.00	\$ 30.00	\$ 1,800.00	\$ 65.00	\$ 3,900.00	\$ 40.00	\$ 2,400.00	\$ 59.20	\$ 3,552.00
14	Incidental Stone, complete in place	125	Tons	\$ 40.00	\$ 5,000.00	\$ 30.00	\$ 3,750.00	\$ 60.00	\$ 7,500.00	\$ 40.00	\$ 5,000.00	\$ 62.20	\$ 7,775.00
15	6" DIP Water Main, Class 50, including asphalt/concrete removal, excavation, backfill, and testing complete in place	315	LF	\$ 75.00	\$ 23,625.00	\$ 48.00	\$ 15,120.00	\$ 65.00	\$ 20,475.00	\$ 55.00	\$ 17,325.00	\$ 45.00	\$ 14,175.00
16	Fire Hydrant, complete in place, including hydrant tee, hydrant valve, mega lugs, concrete thrust block, stone, 6" DIP hydrant leg, painting of hydrant, testing, and chlorination	1	EA	\$ 7,500.00	\$ 7,500.00	\$ 4,200.00	\$ 4,200.00	\$ 3,700.00	\$ 3,700.00	\$ 5,500.00	\$ 5,500.00	\$ 5,075.00	\$ 5,075.00
17	Compact Ductile Iron Fittings, complete in place	100	LBS	\$ 10.00	\$ 1,000.00	\$ 5.00	\$ 500.00	\$ 25.00	\$ 2,500.00	\$ 5.00	\$ 500.00	\$ 6.00	\$ 600.00
18	6" Gate Valve, complete in place	1	EA	\$ 2,500.00	\$ 2,500.00	\$ 1,200.00	\$ 1,200.00	\$ 950.00	\$ 950.00	\$ 1,500.00	\$ 1,500.00	\$ 1,300.00	\$ 1,300.00
19	6" x 6" Full Body Tapping Sleeve and 6" Tapping Valve, complete in place	1	EA	\$ 5,000.00	\$ 5,000.00	\$ 4,500.00	\$ 4,500.00	\$ 4,100.00	\$ 4,100.00	\$ 4,500.00	\$ 4,500.00	\$ 3,850.00	\$ 3,850.00
20	Class B Concrete Blocking, complete in place	5	CY	\$ 200.00	\$ 1,000.00	\$ 350.00	\$ 1,750.00	\$ 230.00	\$ 1,150.00	\$ 300.00	\$ 1,500.00	\$ 230.43	\$ 1,152.15
21	1/4" Water Service Connection, including piping, fittings, valves, meter setter and meter box, complete in place	7	EA	\$ 2,000.00	\$ 14,000.00	\$ 1,500.00	\$ 10,500.00	\$ 1,800.00	\$ 12,600.00	\$ 1,500.00	\$ 10,500.00	\$ 830.00	\$ 5,810.00
22	Connection of New Water Service to Existing Water Service, including piping, fittings, and any other items necessary to make connection, complete in place	7	EA	\$ 300.00	\$ 2,100.00	\$ 800.00	\$ 5,600.00	\$ 850.00	\$ 5,950.00	\$ 1,500.00	\$ 10,500.00	\$ 1,575.00	\$ 11,025.00
23	Abandon Existing Water Main, complete in place	1	LS	\$ 1,500.00	\$ 1,500.00	\$ 4,500.00	\$ 4,500.00	\$ 3,000.00	\$ 3,000.00	\$ 3,000.00	\$ 3,000.00	\$ 1,150.59	\$ 1,150.59
24	8" DIP Class 50 Sanitary Sewer Main including bedding, backfill, and testing complete in place	550	LF	\$ 85.00	\$ 46,750.00	\$ 55.00	\$ 30,250.00	\$ 86.00	\$ 47,300.00	\$ 75.00	\$ 41,250.00	\$ 140.00	\$ 77,000.00
25	4' Diameter Precast Concrete Doghouse Manhole with ring and cover, complete in place, including testing	1	EA	\$ 3,000.00	\$ 3,000.00	\$ 3,800.00	\$ 3,800.00	\$ 9,000.00	\$ 9,000.00	\$ 4,500.00	\$ 4,500.00	\$ 4,950.00	\$ 4,950.00
26	4' Diameter Precast Standard Concrete Manhole with ring and cover, complete in place, including testing	4	EA	\$ 2,200.00	\$ 8,800.00	\$ 2,800.00	\$ 11,200.00	\$ 4,900.00	\$ 19,600.00	\$ 3,000.00	\$ 12,000.00	\$ 3,400.00	\$ 13,600.00
27	4' Diameter Precast Outside Drop Concrete Manhole with ring and cover and outside drop connections including piping and fittings, complete in place, including testing	1	EA	\$ 3,500.00	\$ 3,500.00	\$ 5,500.00	\$ 5,500.00	\$ 8,200.00	\$ 8,200.00	\$ 6,000.00	\$ 6,000.00	\$ 7,190.00	\$ 7,190.00
28	4" Sanitary Sewer Service Connection, including piping, bedding, fittings, cleanout, and cap complete in place	11	EA	\$ 1,700.00	\$ 18,700.00	\$ 1,500.00	\$ 16,500.00	\$ 3,500.00	\$ 38,500.00	\$ 1,750.00	\$ 19,250.00	\$ 1,265.00	\$ 13,915.00
29	Connection of New Sewer Service to Existing Sewer Service, including piping, bedding, fittings, cleanouts, and any other	7	EA	\$ 200.00	\$ 1,400.00	\$ 1,200.00	\$ 8,400.00	\$ 1,650.00	\$ 11,550.00	\$ 3,000.00	\$ 21,000.00	\$ 678.00	\$ 4,746.00
30	Rock Excavation, including disposal of unsuitable material and replacement with suitable material, blast monitoring, pre and post blast survey, \$30 CY minimum bid	50	CY	\$ 250.00	\$ 12,500.00	\$ 80.00	\$ 4,000.00	\$ 250.00	\$ 12,500.00	\$ 150.00	\$ 7,500.00	\$ 40.00	\$ 2,000.00
31	Borrow Material including Disposal, & compaction, complete in place	640	CY	\$ 35.00	\$ 22,400.00	\$ 50.00	\$ 32,000.00	\$ 65.00	\$ 41,600.00	\$ 25.00	\$ 16,000.00	\$ 32.50	\$ 20,800.00
32	Removal of Existing Sanitary Sewer Manholes, including disposal and replacement material, complete in place	2	EA	\$ 1,000.00	\$ 2,000.00	\$ 800.00	\$ 1,600.00	\$ 2,500.00	\$ 5,000.00	\$ 2,500.00	\$ 5,000.00	\$ 396.00	\$ 792.00
33	Flowable Fill for Sanitary Sewer Line Abandonment, including pumping and plugging of existing sewer main, complete in place	5	CY	\$ 300.00	\$ 1,500.00	\$ 300.00	\$ 1,500.00	\$ 1,200.00	\$ 6,000.00	\$ 500.00	\$ 2,500.00	\$ 440.00	\$ 2,200.00
34	Bituminous Concrete Intermediate Course Type 119.0 B	200	TN	\$ 100.00	\$ 20,000.00	\$ 300.00	\$ 60,000.00	\$ 280.00	\$ 56,000.00	\$ 125.00	\$ 25,000.00	\$ 151.50	\$ 30,300.00
35	Contingency Allowance	1	EA	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00
				Total	\$ 271,380.00	Total	\$ 267,970.00	Total	\$ 469,000.00	Total	\$ 262,610.00	Total	\$ 302,299.99



Kyle Smith, P.E. NC License No. 039206
 Firm's License No. F-0203

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NOV 20 2017

CITY OF GRAHAM



Volunteer Application City of Graham Boards and Commissions

If you are a City of Graham resident or reside in the extra-territorial jurisdiction (ETJ), at least 18 years, and are willing to volunteer your time and expertise to your community, please complete and return to:

***Applications will be kept on file for 3 years**

By mail: City of Graham, Attn: City Clerk, PO Drawer 357, Graham, NC 27253

By email: dsperry@cityofgraham.com

By Fax: (336)570-6703

For questions, call: (336)570-6700

Please check all Boards and Commissions on which you would be willing to serve:

Extra-territorial residents can only serve on the Board of Adjustment or the Planning Board

- | | |
|--|--|
| <input type="checkbox"/> Alamance County Library Committee (2 years) | <input type="checkbox"/> Graham Housing Authority (5 years) |
| <input type="checkbox"/> Alcohol Beverage Control (3 years) | <input checked="" type="checkbox"/> Graham Sports Hall of Fame (6 years) |
| <input type="checkbox"/> Appearance Commission (4 years) | <input type="checkbox"/> Historic Resources Commission (4 years) |
| <input type="checkbox"/> Board of Adjustment (3 years) | <input type="checkbox"/> Planning Board (3 years) |
| <input type="checkbox"/> Canine Review Board (3 years) | <input type="checkbox"/> Recreation Commission (3 years) |
| <input type="checkbox"/> Graham Historical Museum (3 years) | <input type="checkbox"/> Tree Board (3 years) |

If you are currently serving on a Board in the City of Graham, please list:

Personal Information

Name: Anne W. Maynard

Mailing Address: 818 W. Itshire Dr, Burlington, NC 27217

Home Address (if different) _____

Home Phone: 336-584-9807 Work Phone: _____

Employer: Detined ADSS Position: Assit Principal

Email Address AMAYWARD54@AOL.COM

Civic Involvement (please list the names of civic organizations in which you hold current membership):

Please list any work, volunteer, and/or educational experience that you would like us to consider

GRAHAM Hall of Fame (Sports)

Why do you wish to serve the City in this capacity?

I have been on Committee & have been requested to serve again. I enjoyed my term with the committee & was formerly a teacher, coach, counselor and asst principal at Graham High



STAFF REPORT

SUBJECT:	TEMPORARY ENCROACHMENT REQUEST BY JASON COX
PREPARED BY:	FRANKIE MANESS, CITY MANAGER, AARON HOLLAND, ASSISTANT CITY MANAGER

REQUESTED ACTION:

Provide written consent to Jason Cox with Carolina Property Holdings to utilize the area adjacent to Sesquicentennial Park for outdoor dining.

BACKGROUND/SUMMARY:

Jason Cox with Carolina Property Holdings has submitted a request to Council to obtain a temporary encroachment for the use of outdoor dining for the sidewalk area adjacent to Sesquicentennial Park in downtown along the N. Main Street and NW Court Square sides of the property. Chapter 18, Article VII of the City of Graham Code of Ordinances provides the application process required to obtain a temporary encroachment permit; including provisions under Sec. 18-194 (1) to obtain permission from adjacent landowners and businesses to extend the temporary encroachment area beyond the area directly abutting the existing place of business.



Mr. Cox currently has an approved temporary encroachment permit on file for the area directly abutting his property at 106-110 N. Main Street for outdoor dining. Being that the City of Graham is the fee simple owner of the Sesquicentennial Park, written consent must be provided by Council in order for Mr. Cox to utilize the area adjacent to the park.

FISCAL IMPACT:

N/A

STAFF RECOMMENDATION:

Staff recommends approval.

SUGGESTED MOTION(S):

I move to approve the request by Jason Cox with Carolina Property Holdings and to provide written consent to utilize the sidewalk area adjacent to Sesquicentennial Park for the use of outdoor dining.

Darcy Sperry

From: Jason Cox <jason@aedosgrp.com>
Sent: Wednesday, November 29, 2017 1:01 PM
To: Darcy Sperry
Cc: Nathan Page
Subject: Encroachment Permit - Request to be added to City Council Agenda
Attachments: DRAFT NW COURT SQ ENCROACHMENT PERMIT.pdf; Outline of Request.docx; Site Plan.docx

Good afternoon Darcy

I would like to have an agenda item added to the City Council meeting for December 5th, requesting the City's permission be given for application of an encroachment permit on the sidewalk in front of the parcel owned by the City at NW Court Square.

I have attached an incomplete Temporary Encroachment application, along with a rough draft drawing of the proposed site to share to Council.

Thank you,

Jason Cox

Principal

Aedos Holdings | Monroe Companies | DBD/Monroe Holdings

jason@aedosgrp.com | Phone: 336.263.1180

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Project Outline

Carolina Property Holdings is currently working on a historic rehab mixed-use redevelopment of 106-110 N Main St (also known as the Patterson Building)

Current plans call for the following spaces as part of this project:

- 2 Ground Level Restaurants
- 1 Ground Level Retail
- ~5,000 sq ft of shared use offices and studio space on the second floor.

We believe this curated mix provides the highest and best current use for the building, and is supportive to other area businesses. In order to achieve this mix, sidewalk space directly in front of the building is very limited, with 4 entrances planned along the front of the building.

Request Outline

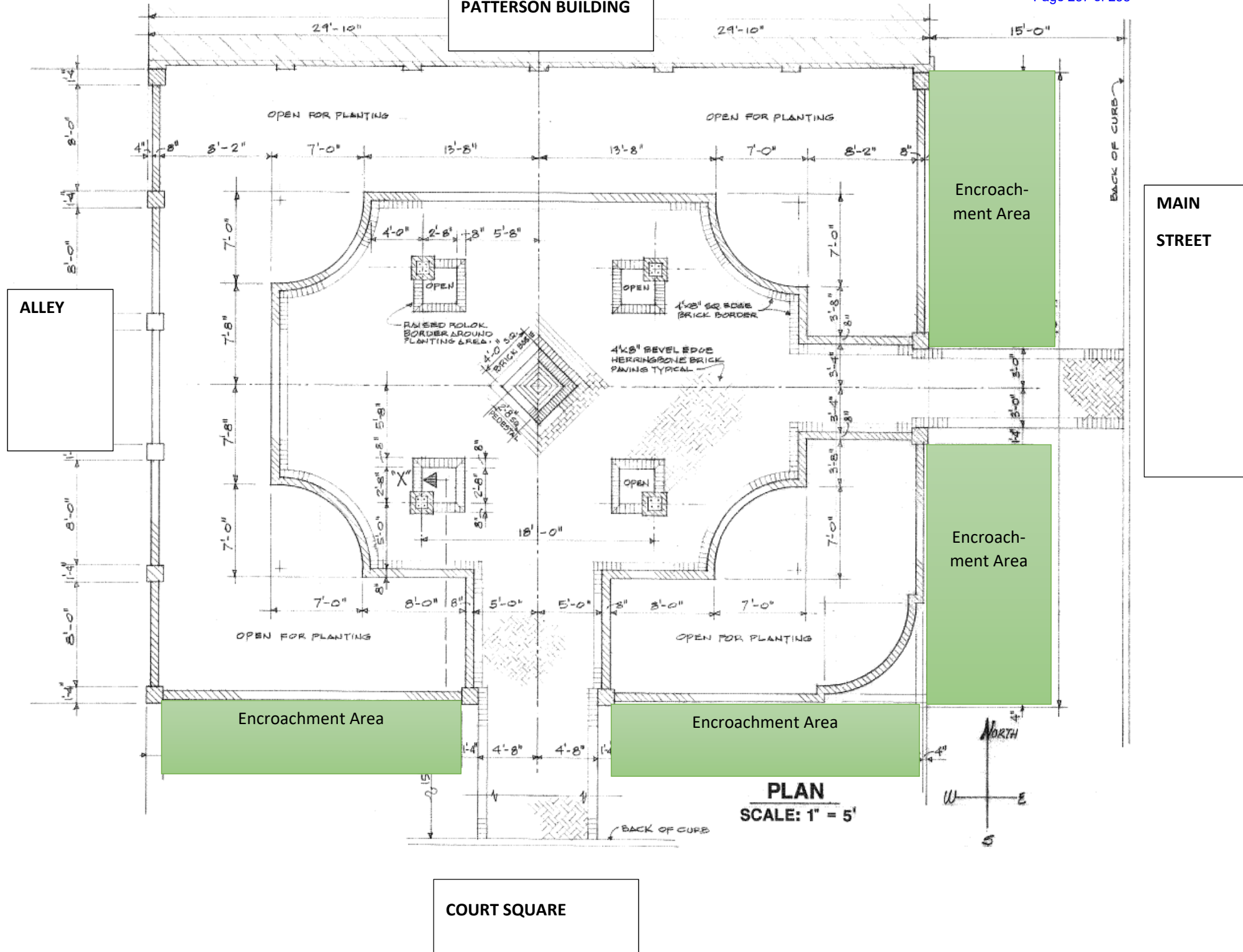
Outdoor seating is needed for both proposed restaurants, and provides strong benefits to other downtown businesses due to the pedestrian traffic and ongoing activity throughout the day and evenings that such outdoor dining provides.

Directly adjacent (to the south) of the Patterson Building is a city-owned parcel known as Sesquicentennial Park. Graham's Code of Ordinances allows for a business to be granted temporary encroachment permits along the sidewalk of an adjacent parcel, with the adjacent property owner's permission (Section 18-194)

We are requesting the City of Graham, as the adjacent property owner, to provide their permission for the application of a temporary encroachment for outdoor dining along the sidewalks only of the city-owned parcel.

Such permission would not grant final approval of the actual temporary encroachment. Any final permit would be subject to all applicable City requirements for such a use, including requirements for pedestrian travel width on the sidewalks, liability insurance coverage, and requirements related to the type, style, and uses of any outdoor furniture.

PATTERSON BUILDING



ALLEY

Encroachment Area

Encroachment Area

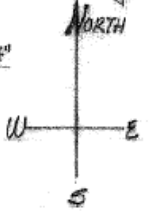
Encroachment Area

Encroachment Area

MAIN STREET

COURT SQUARE

PLAN
SCALE: 1" = 5'





STAFF REPORT

SUBJECT:	INCREASE FOR FIREFIGHTERS FEE
PREPARED BY:	FRANKIE MANESS, CITY MANAGER; JOHN ANDREWS, FIRE CHIEF

REQUESTED ACTION:

Provide \$1 in funding per call for volunteer firefighters to be paid into the Fireman's Relief Fund.

BACKGROUND/SUMMARY:

The City has traditionally contributed \$10 per call for each volunteer firefighter that attends a call. Of the \$10, \$9 is paid to the firefighter and \$1 is paid to the Fireman's Relief Fund. The City's contribution to the Fireman's Relief Fund would effectively raise the contribution to the volunteer firefighter to a rate of \$10 per call. The amount contributed to volunteers has not been considered in more than a decade and they do not receive annual COLAs.

The Fireman's Relief Fund is a locally managed fund that is intended to provide assistance to firefighters in need as well as fund a supplemental retirement plan. The NC State Firefighters Association has general oversight over the fund along with local decision-making by the Relief Fund Board.

FISCAL IMPACT:

Annual costs are around \$3,000. Funds are available in the FY 2017-2018 Budget; therefore, no additional appropriation is required.

STAFF RECOMMENDATION:

Approval. Volunteers provide an invaluable service to the citizens of Graham all the while reducing required expenditures. To employ individuals to cover just the calls that volunteers attend, it would require the addition of personnel equivalent to 3 full-time firefighters.

SUGGESTED MOTION(S):

I move we provide \$1 in funding per call for volunteer firefighters to be paid into the Fireman's Relief Fund.