

Project Manual

FOR

Jackson County Public Schools
Proposed Improvements for Blue Ridge Water
and Wastewater Systems
CDBG-I Project No. 09-D-2945
Jackson County - Owner
Jackson County, N.C.

May 5, 2020
Revised July 28, 2020 (NCPWS updates)
October 2, 2020

Prepared for:

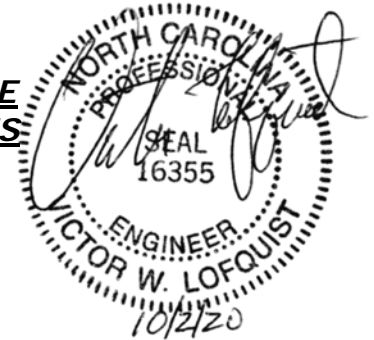
Jackson County
401 Grindstaff Cove Road
Sylva, North Carolina 28779



Firm License No. C-2288

This Page Intentionally Blank

Project Manual
for
Jackson County Public Schools
PROPOSED IMPROVEMENTS FOR BLUE RIDGE
SCHOOL WATER AND WASTEWATER SYSTEMS
CDBG-I Project No. 09-D-2945
Jackson County - Owner
Jackson County, North Carolina



SPECIFICATION TABLE OF CONTENTS

Section	Title	Pages
0100	Advertisement for Bids	0100-1 through 0100-2
0200	Instructions to Bidders	0200-1 through 0200-15
0410	Bid Form	0410-1 through 0410-5
0435	Bid Bond	0435-1 through 0435-1
0510	Notice of Award	0510-1 through 0510-1
0520	Agreement	0520-1 through 0520-4
0550	Notice to Proceed	0550-1 through 0550-1
0610	Performance Bond	0610-1 through 0610-2
0615	Payment Bond	0615-1 through 0615-2
0620	Contractor's Application for Payment	0620-1 through 0620-3
0625	Sales Tax Forms	0625-1 through 0625-2
0630	Consent of Surety Company to Final Payment	0630-1 through 0630-1
0640	Contractor's Affidavit of Payment of Debts and Claims	0640-1 through 0640-1
0650	Contractor's Affidavit of Release of Liens	0650-1 through 0650-1
0660	Change Order Form	0660-1 through 0660-1
0700	General Conditions	0700-1 through 0700-43
0800	Supplementary Conditions	0800-1 through 0800-4
0850	Special Provisions & CDBG Contract Requirements	0850-1 through 0850-33
0860	Allowances	0860-1 through 0860-1
0900	Geotechnical Report	20 pages total (including cover)
Technical		
2090	Rock Excavation & Blasting	2090-1 through 2090-8
2110	Clearing, Grubbing and Demolition	2110-1 through 2110-6
2200	Earthwork	2200-1 through 2200-12
2210	Excavation, Trenching & Backfilling for Utilities	2210-1 through 2210-9
2370	Erosion & Sedimentation Control	2370-1 through 2370-4
2390	Seeding & Mulching	2390-1 through 2390-5
2510	Water Distribution Improvements	2510-1 through 2510-18
2530	Wastewater Collection & Treatment Improvements	2530-1 through 2530-12
2630	Storm Drainage & Incidentals	2630-1 through 2630-7
2720	Aggregate Base & Gravel Surfaces	2720-1 through 2720-3
2770	Concrete Pavements and Sidewalks	2770-1 through 2770-10

This Page Intentionally Blank

ADVERTISEMENT FOR BIDS – CDBG-I PROJECT

Jackson County
Proposed Improvements for Blue Ridge School Water and Wastewater Systems
Grant No. CDBG-I 09-D-2945

Separate sealed bids for Jackson County Board of Commissioners for Proposed Improvements for Proposed Improvements for Blue Ridge School Water and Wastewater Systems at the Jackson County Board of Education Board Room located at the Jackson County Board of Education Central Office, 396 Hospital Road, Sylva, NC 28779 until 2:00 pm EST on Thursday, November 5, 2020 for the construction of the Jackson County Public Schools Proposed Improvements for Blue Ridge Water and Wastewater Systems, then at said office to be publicly opened and read aloud. The bidder shall show such evidence by clearly displaying his or her current license number on the outside of the sealed envelope in which the proposal is delivered.

The project is located at the Blue Ridge Public School in the Glenville community in southern Jackson County, North Carolina. The project will include improvements to the existing water system and existing wastewater system serving the school. The water improvements will include the construction of new storage and booster pumping facilities consisting of 2 each -3000 gallon polyethylene water tanks, 3 each– 7.5 hp booster pumps with hydropneumatic tanks, building enclosing tanks and booster pumps, a stand-by generator and related appurtenances. Water improvements also include the removal of a 10,000 gallon elevated water tank. The wastewater improvements will include the construction of a new 10,000 gpd packaged wastewater treatment system, a stand-by generator, a grease trap and related appurtenances. Wastewater Improvements improvements will also include the demolition of the existing 10,000 gpd wastewater treatment plant.

The Information for Bidders, Bid Form, Contract Plans, Specifications, Bid Bond, Performance and Payment Bond, and other contract documents may be examined at the office of Lofquist & Associates, Inc., 11 Citrus Drive, Sylva, North Carolina 28779, (828) 586-1424 during normal office hours. Copies may be obtained from the office of Lofquist & Associates, Inc., 11 Citrus Drive, Sylva, North Carolina 28779, (828) 586-1424 upon non-refundable payment of \$150.00 for each set.

A non-mandantory Pre-Bid Conference will be held outside the main entrance to Jackson County Blue Ridge Public School located at 95 Bobcat Drive, Glenville, NC 28736 on Wednesday, October 21, 2020 at 1:00 pm EST.

All project related questions are to be submitted in writing to Lofquist & Associates, Inc., 11 Citrus Drive, Sylva, North Carolina 28779, (828)586-1424..

This project is being funded in whole or in part by the Community Development Block Grant Program (CDBG). All federal CDBG requirements will apply to the contract: Bidders on this work will be required to comply with Section 109 and E.O. 11246 which prohibits

Jackson County Public Schools
Proposed Improvements for Blue Ridge School
Water and Wastewater Systems
CDBG-I Project No. 09-D-2945
Jackson County - Owner
Jackson County, North Carolina

discrimination in employment regarding race, creed, color, sex, or national origin. Bidders must comply with Title VI of the Civil Rights Act of 1964, Davis Bacon Act, Anti-Kickback Act, and Contract Work Hours and Safety Standards Act. Jackson County is committed to and supportive of efforts to effectively maintain and/or increase the use of Small and Minority/Women-Owned Business and Historically Underutilized Businesses (HUB) contract participation for Construction Projects, services (including professional and consulting services) and commodities purchases, **AND** increase contract participation to offer employment, training and contracting opportunities in accordance with Section 3 of the Housing and Urban Development Act of 1968 (24 C.F.R Part 135).

No bidder may withdraw his/hers bid within 90 days after the actual date of the opening thereof.

Jackson County reserves the right to waive any informalities or to reject any or all bids.

This information is available in Spanish or any other language upon request. Please contact Mike Poston at 828-631-2255 or at the Justice & Administration Building, 401 Grindstaff Cove Road, Sylva, NC 28779 for accommodations for this request.

Esta información está disponible en español o en cualquier otro idioma bajo petición. Por favor, póngase en contacto con Mike Poston al 828-631-2255 o en Justice & Administration Building, 401 Grindstaff Cove Road, Sylva, NC 28779 de alojamiento para esta solicitud.

This municipality is an **Equal Opportunity Employer**

Date: October 4, 2020

Authorized Representative: Don Adams, Jackson County Manager



SECTION 0200

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office*--The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

B. *Bidding Documents or Bid Documents*—*refers to all drawings, plans, specifications and addenda prepared by the Engineer for the project and issued by the Issuing Office.*

ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents will be made available from the issuing office of Lofquist & Associates, Inc., 11 Citrus Drive, Sylva, North Carolina 28779, (828) 586-1424. Bid documents can be provided in electronic pdf format at no cost or can be provided in printed form for a non-refundable cost of \$150. Bidders are not required to purchase a printed copy of bid documents to submit a bid.

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

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

ARTICLE 3 - QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, within three days of Engineer's or Owner's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, references and such other data as may be deemed necessary or requested by the Engineer. Bidder's submittal shall include written evidence and documentation to the satisfaction of the Engineer and Owner and in accordance with applicable portions of the contract documents.

ARTICLE 4 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

4.01 *Subsurface and Physical Conditions*

A copy of the August 18, 2020 *Revised Report of Test Pit Exploration, KEG Project No. JA20-4049-01* by the *Kessel Engineering Group* is included in the specifications but is not part of the Contract Documents. Bidder is responsible for conducting their own investigations, verifications, interpretations and reaching their own conclusions regarding subsurface and physical conditions prior to submitting a bid. The bidder shall obtain the approval of the owner prior to conducting investigations and bidder shall be solely responsible for all safety, security, costs, property damage or any other effect as a result of or related to the bidder's conductance of said investigations, verifications, interpretations and conclusions.

4.02 *Underground Facilities*

A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon unavailable, incomplete and approximated information available or unavailable to the Engineer at the time of and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others. The contractor is responsible for conducting the necessary investigations, verifications and interpretations to determine the presence, absence and locations of all underground facilities, including but not limited to, utilities and structures.

4.03 *Hazardous Environmental Condition*

A. The Supplementary Conditions identify those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that Engineer has used in preparing the Bidding Documents.

B. Copies of reports and drawings referenced in Paragraph 4.03.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.06 of the General Conditions has been identified and established in Paragraph 4.06 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings. When available, the cost for copies of reports and drawings shall be the actual cost of copying plus labor.

4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated conditions appear in Paragraphs 4.02, 4.03, and 4.04 of the General Conditions and any subsequent amendments in the Supplementary Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work appear in Paragraph 4.06 of the General Conditions and any subsequent amendments in the Supplementary Conditions.

4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, prior to Bidder's submission of a Bid and as Bidder deems necessary for submission of said Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations

relative to excavation and utility locates and shall be fully and solely responsible for any effect such examinations, investigations, explorations, tests and studies may have.

4.06 Reference is made to Article 7 of the Supplementary Conditions for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents.

4.07 It is the responsibility of each Bidder before submitting a Bid to:

A. examine and carefully study the Bidding Documents, the other related data identified in the Bidding Documents, and any Addenda;

B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;

D. when available, carefully study all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions, and (2) reports and drawings of Hazardous Environmental Conditions at the Site which have been identified in the Supplementary Conditions as provided in Paragraph 4.06 of the General Conditions;

E. obtain and carefully study (or accept consequences of not doing so) all examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;

F. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;

G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

H. correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;

I. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and

J. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

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

ARTICLE 5 - PRE-BID CONFERENCE

5.01 The notification of a pre-Bid conference will listed in the advertisement for bids including the time and place listed of the pre-Bid conference. Representatives of Owner and Engineer will be present at the conference to discuss the Project. When a pre-Bid conference is conducted, Bidders are highly encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 6 - SITE AND OTHER AREAS

6.01 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents. The Contractor is responsible for confining all construction activities and work to areas which the Owner has easement, right-of-way, ownership or legal right to access. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to 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 ten days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by the Engineer.

ARTICLE 8 - BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of Five (5) percent of Bidder's maximum Bid price and in the form of a certified check or bank money order or a Bid bond issued by a

surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions and any subsequent amendments listed in Supplementary Conditions.

8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 10 days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until after the Effective Date of the Agreement, whereupon Bid security furnished by such Bidders will be returned.

8.03 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within 30 days after the Bid opening.

ARTICLE 9 - CONTRACT TIME

9.01 The Contract Time to complete the Work (Base Bid plus any Alternate Bids selected by the Owner), so that it is ready for final payment as evidenced by the Engineer's written recommendation of final payment, is **One Hundred Eighty (180) Consecutive Calendar Days** as stipulated in the Bid and will be entered into the Agreement.

ARTICLE 10 - LIQUIDATED DAMAGES

10.01 Provisions for liquidated damages, are as stipulated in the Bid and will be entered into the Agreement.

ARTICLE 11 - SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 The Contract, if awarded, will be on the basis of materials and equipment described in the Bidding Documents, or those substitute or "or-equal" materials and equipment approved by Engineer and identified by Addendum. Specific brands, if listed, are intended only to specify performance and design characteristics required. The materials and equipment described in the Bidding Documents establish a standard of required type, function and quality to be met by any proposed substitute or "or-equal" item. No item of material or equipment will be considered by Engineer as a substitute or "or-equal" unless written request for approval has been submitted by Bidder and has been received by Engineer at least 5 days prior to the date for receipt of Bids. Each such request shall conform to the requirements of Paragraph 6.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within three days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, in which case apparent Successful Bidder shall submit an acceptable substitute, without an increase in the Bid.

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

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

12.04 Subcontractors, suppliers and others shall meet all requirements and stipulations as described under Special Provisions and other portions of the Bid Documents.

ARTICLE 13 - PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents. The contractor may make copies of said Bid Form for their use.

13.02 All blanks on the Bid Form shall be completed by legibly printing in ink or by typewriter and the Bid signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each blank or space provided, including subtotals and totals, where applicable.

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

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

13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and

accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown below the signature.

13.06 A Bid by an individual shall show the Bidder's name and official address.

13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown below the signature.

13.08 All names shall be typed or printed in ink below the signatures.

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

13.10 The address and telephone number for communications regarding the Bid shall be shown.

13.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the State of North Carolina. Bidder's North Carolina contractor's license number shall also be legibly printed in ink or typed on the Bid Form.

13.12 The sealed Bid must be accompanied by all applicable and properly completed forms & certifications required by the NC Division of Water Infrastructure for this specific project for the Bid to be considered complete and valid.

ARTICLE 14 - BASIS OF BID; COMPARISON OF BIDS

14.01 Bidders shall submit a Bid on a lump sum basis and/or on a unit price basis for each item of Work as is listed and provided for in the Bid schedule.

A. The total price listed in the Bid schedule will be the sum of the products of the quantity of each item and the corresponding unit price. The final quantities and Contract Price for unit price items will be determined in the field by the Engineer as specified in the Bidding Documents.

B. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

14.02 The Bid prices shall include all such amounts as the Bidder deems proper for overhead and profit.

ARTICLE 15 - SUBMITTAL OF BID

15.01 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope plainly marked with **"Bid Enclosed For: Proposed Improvements for Blue Ridge School Water and Wastewater Systems"**, the name and address of Bidder, the Bidder's North Carolina contractor's license number and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope

containing the Bid shall be enclosed in a separate envelope addressed to **Jackson County, Jackson County Administration Office, 401 Grindstaff Cove Road, Room A207, Sylva, North Carolina 28779.**

ARTICLE 16 - MODIFICATION AND WITHDRAWAL OF BID

16.01 A Bid 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 prior to the date and time for the opening of Bids.

16.02 If within 72 hours after Bids are opened, any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. The bidder must submit credible evidence that the bid was based on a mistake that constituted a substantial, unintentional arithmetic error or unintentional omission, but not a judgment error on the part of the Bidder, in the preparation of the Bid. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 - OPENING OF BIDS

17.01 Bids will be opened at the time and place indicated in the Advertisement or Invitation to Bid and, unless obviously non-responsive, read aloud publicly. The Owner reserves the unqualified right to reject any and all bids and waive any informalities.

ARTICLE 18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for a period of 90 consecutive calendar days following the receipt of Bids, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

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

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

19.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, options, unit prices and other data, as may be requested in the Bid Form.

19.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as requested by the Owner.

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

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

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

19.07 In determining the lowest responsible, responsive bidder, the owner shall take into consideration the bidder's compliance with the requirements of bidding laws, the past performance of the bidder on construction contracts for the Owner with particular concern given to completion times, quality of work, cooperation with other contractors, and cooperation with the designer and owner. Failure of the low bidder to furnish the required documentation may constitute a basis for disqualification of the bid. Should the owner adjudge that the apparent low bidder is not the lowest responsible, responsive bidder by virtue of the information evaluated by the owner, said apparent low bidder will be so notified and his bid security shall be returned to the bidder.

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

19.09 If the Contract is to be awarded, Owner will award the Contract to the lowest responsive, qualified Bidder whose evaluation by the Owner is deemed to be in the best interest of the project taking into consideration lump sum prices, unit prices, alternate prices and optional prices. The Owner reserves the right to choose and select any combination of alternate or optional bid items if so identified in the Bid form. The Owner's final selection of base bid plus any combination, all, or no options and/or alternates may change the order of the lowest, qualified Bid received.

ARTICLE 20 - CONTRACT SECURITY AND INSURANCE

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

ARTICLE 21 - SIGNING OF AGREEMENT

21.01 When Owner gives a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents which are identified in the Agreement as attached thereto. Within 10 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder.

ARTICLE 22 - SALES AND USE TAXES

22.01 If the Owner is an entity exempt from local and/or state sales and use taxes on materials and equipment to be incorporated in the Work the Contractor shall submit sales tax statements and certifications as identified in the Supplementary Conditions or required by the Owner.

ARTICLE 23 - RETAINAGE

23.01 Provisions concerning Contractor's retainage are set forth in the Agreement.

ARTICLE 24 – CDBG CONTRACT PROVISIONS

24.01 CDBG contract provisions are as follows, as outlined in Special Provisions and other sections of the Bid Documents.

Conflict of Interest (2 CFR Part §200.318 General procurement standards)

Interest of Members, Officers, or Employees of the Recipient, Members of Local Governing Body, or Other Public Officials. No member, officer, or employee of the recipient, or its agents, no member of the governing body of the locality in which the program is situated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the program during his tenure or for one year thereafter, shall have any financial interest, direct or indirect, in any contract or subcontract,

or the proceeds thereof, for work to be performed in connection with the program assisted under this agreement. Immediate family members of said members, officers, employees, and officials are similarly barred from having any financial interest in the program. The recipient shall incorporate, or cause to be incorporated, in all such contracts or subcontracts, a provision prohibiting such interest pursuant to the purpose of this section.

Nondiscrimination Clause —

Section 109, Housing and Community Development Act of 1974

No person in the United States shall on the ground of race, color, national origin, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds available under this title.

Age Discrimination Act of 1975, as amended — **Nondiscrimination on the Basis of Age**

No qualified person shall on the basis of age, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity which receives or benefits from Federal financial assistance.

Section 504 of the Rehabilitation Act of 1973, as amended — **Nondiscrimination on the Basis of Disability**

No qualified disabled person shall on the basis of disability, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity which receives or benefits from Federal financial assistance.

Access to Records and Record Retainage Clause

In general, all official project records and documents must be maintained during the operation of this project and for a period of three years following closeout in compliance with 24 CFR 570.490.

The North Carolina Department of Commerce: Rural Development Division, the North Carolina Department of the Treasurer, U.S. Department of Housing and Urban Development, the Comptroller General of the United States, and the NC Department of Environmental Quality, or any of their duly authorized representatives, shall have access to any books, documents, papers and records of the Administering Agency which are pertinent to the execution of this agreement, for the purpose of making audits, examinations, excerpts and transcriptions in compliance with the above Rule.

Lobbying Clauses

Required by Section 1352, Title 31, U.S. Code

- (1) *No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with*

the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative, agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

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

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

Legal Remedies Provision and Termination Provision

As stated in 24 CFR Part 85.36 (2 CFR Appendix II to Part 200—Contract Provisions for Non-Federal Entity Contracts Under Federal Awards)

- a. Contracts other than small purchases shall contain provisions or conditions which will allow for administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as may be appropriate.

As stated in 24 CFR Part 85.36 (2 CFR Appendix II to Part 200—Contract Provisions for Non-Federal Entity Contracts Under Federal Awards)

- b. All contracts in excess of \$10,000 shall contain suitable provisions for termination by the grantee including the manner by which it will be effected and the basis for settlement. In addition, such contracts shall describe conditions under which the contract may be terminated for default as well as conditions where the contract may be terminated because of circumstances beyond the control of the contractor.

APPENDIX II TO PART 200—CONTRACT PROVISIONS FOR NON-FEDERAL ENTITY CONTRACTS UNDER FEDERAL AWARDS

In addition to other provisions required by the Federal agency or non-Federal entity, all contracts made by the non-Federal entity under the Federal award must contain provisions covering the following, as applicable.

(A) Contracts for more than the simplified acquisition threshold currently set at \$150,000, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

(B) All contracts in excess of \$10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement.

(C) Equal Employment Opportunity. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of “federally assisted construction contract” in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, “Equal Employment Opportunity” (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” and implementing regulations at 41 CFR part 60, “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor.”

(D) Davis-Bacon Act, as amended (40 U.S.C. 3141-3148). When required by Federal program legislation, all prime construction contracts in excess of \$2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, “Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction”). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United

States”). The Act provides that each contractor or sub recipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

(E) Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

(G) Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended—Contracts and sub grants of amounts in excess of \$150,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

(H) Debarment and Suspension (Executive Orders 12549 and 12689)—A contract award (see 2 CFR 180.220) must not be made to parties listed on the government wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

(I) Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)—Contractors that apply or bid for an award exceeding \$100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered

Jackson County Public Schools
Proposed Improvements for Blue Ridge School
Water and Wastewater Systems
CDBG-I Project No. 09-D-2945
Jackson County - Owner
Jackson County, North Carolina

by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

[78 FR 78608, Dec. 26, 2013, as amended at 79 FR 75888, Dec. 19, 2014]

This Page Intentionally Blank

BID FORM
Jackson County Public Schools
Proposed Improvements for Blue Ridge Water and Wastewater Systems

BIDDER

This Bid submitted by _____, ("Bidder"), a duly licensed, organized and authorized Bidder under the laws of the State of North Carolina as _____ (insert "an individual", "a partnership" or "a corporation" as applies).

BID RECIPIENT

This Bid is submitted to: Jackson County, Jackson County Administration Office, 401 Grindstaff Cove Road, Room A207, Sylva, North Carolina 28779, ("Owner") for the completion of the Jackson County Public Schools Proposed Improvements for Blue Ridge Water and Wastewater Systems in accordance with the Contract Documents.

The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner as provided in the Bidding Documents to perform all Work as specified or indicated and for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents. All materials incorporated into the Work shall be new and undamaged. The Owner reserves the exclusive and unqualified right to reject any or all Bids and waive any informality.

BIDDER'S ACKNOWLEDGEMENTS

Bidder accepts all of the terms and conditions of the Instructions to Bidders and other portions of the Bidding Documents including, without limitation, those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

BIDDER'S REPRESENTATIONS

In submitting this Bid, Bidder represents that:

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

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

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

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

Bidder has obtained and carefully studied (or accepts the consequences for not doing so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.

Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.

Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.

The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

FURTHER REPRESENTATIONS

Bidder further represents that:

This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any 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 individual or entity to refrain from bidding; and

Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.

BID SCHEDULES

Bidder agrees to complete the Work in accordance with the Contract Documents for the prices listed in the following Bid schedules. Each and every blank must be filled in with the Bidder's pricing in all bid schedules, unit price schedules and alternate schedules for a Bid to be considered as valid. No conditional or incomplete Bid will be accepted. The Owner reserves the right to reject all bids.

The Owner reserves the exclusive and unqualified right to accept the lowest qualified and responsible bidder or reject all bids. The selection of bids and/or alternates will be based on prices received, available funding and as determined by the Owner to be in the best interest of the project. The Owner reserves the right to select the lowest responsible bidder on the basis of the total bid price and an evaluation of alternate bid prices and/or an evaluation of unit bid prices, including those unit prices applied to the base bid or separate from the base bid. The lowest Bid received will not necessarily be determined by the base bid amount alone. The Owner may reject a bid on the basis of a unit price or bid alternate price being deemed unreasonable in the Owner's opinion.

Jackson County Public Schools
Proposed Improvements for Blue Ridge
Water and Wastewater Systems
CDBG-I Project No. 09-D-2945
Jackson County - Owner
Jackson County, North Carolina

TIME OF COMPLETION

Bidder agrees that all Work will be completed in accordance with the Bidding Documents within One Hundred Eighty (180) consecutive calendar days following the start date selected by the Owner in the Notice to Proceed.

LIQUIDATED DAMAGES

Bidder further accepts the provisions of the agreement and agrees to pay as liquidated damages the sum of \$800.00/day for each consecutive calendar day the Bidder fails to complete the work for any of the specified contract time.

BID SECURITY

Bidder hereby acknowledges that the required Bid Security, in the amount of 5% of the total base bid, is enclosed with this Bid in accordance with the requirements set forth in the Bidding documents and is a condition of this Bid.

Bidder's Name: _____

BASE BID (Entire Project)

The undersigned Bidder, having thoroughly familiarized themselves with all aspects of the project, bid documents and local conditions affecting the Work, hereby agrees to furnish all labor, materials, equipment, supplies, services and incidentals necessary to complete all work in accordance with the Bid Documents and to the satisfaction of the engineer and owner for the lump sum price. See Allowances section for allowance items and associated quantities to be included in the following base bid lump sum price. If a contract is to be awarded, the Work will include both items 1 & 2 as follows:

Item 1: WATER SYSTEM IMPROVEMENTS (complete, including all water system Work)

LUMP SUM BID: _____ Dollars \$ _____
(words)

Item 2: WASTEWATER SYSTEM IMPROVEMENTS (complete, including all wastewater system Work)

LUMP SUM BID: _____ Dollars \$ _____
(words)

TOTAL BASE BID (ITEMS 1 + 2) = \$ _____

UNIT PRICES

Unit prices quoted and accepted shall apply throughout the life of the contract. The undersigned Bidder, having thoroughly familiarized themselves with all aspects of the project and local conditions affecting the Work, hereby agrees to furnish all labor, materials, equipment, supplies, services and incidentals necessary to complete the unit price work in accordance with the Bid Documents and to the satisfaction of the engineer and owner for the following unit price allowances. Unit prices shall be applied, as appropriate, to compute the total value of work performed under unit price items, in accordance with the contract documents, regardless of actual quantities of unit price work performed. The owner reserves the right, at their sole discretion, to select the lowest bid received based on the base bid, the alternate bids or on the basis of individual unit prices and to vary the scope of work based on the individual unit prices regardless of the quantities of work.

U1. Rock Excavation	(CY)	\$ _____ /CY
(_____ Dollars per cubic yard)		
Words		
U2. Undercut with Stone Backfill	(CY)	\$ _____ /CY
(_____ Dollars per cubic yard)		
words		
U3. Undercut with Soil Backfill	(CY)	\$ _____ /CY
(_____ Dollars per cubic yard)		
words		
U4. Underdrain	(LF)	\$ _____ /LF
(_____ Dollars per linear foot)		
words		

Jackson County Public Schools
Proposed Improvements for Blue Ridge
Water and Wastewater Systems
CDBG-I Project No. 09-D-2945
Jackson County - Owner
Jackson County, North Carolina

Pricing for all items listed under the Base Bid and Unit Prices must be completely filled out for a bid to be considered valid. Bidder acknowledges that all quantities listed in the bid schedules are either estimated quantities or assumed allowances and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual final quantities, which will be determined and specified by the Engineer. The above unit prices shall remain valid and in effect regardless how much the actual, final installed quantities vary from the estimated quantities listed in the bid schedule. **Note: *See Allowances, Specification Section 0860 for allowance quantities to be included in the Lump Sum Base Bid Items.**

This Bid respectfully submitted by:

Bidder Name:

Address:

Telephone Number: _____

Facsimile Number: _____

NC Contractor's License Number: _____

Federal I.D. No.: _____

By: _____

(Signature)

(Print Name & Title of Authority)

Date: _____

Witness: _____

(Signature - Proprietorship or Partnership)

(Print Name & Title)

(CORPORATE SEAL)

Attest: _____

(Signature - Corp. Secretary)

(Print Name & Title of Authority)

This Page Intentionally Blank

BID BOND

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

KNOW ALL MEN BY THESE PRESENTS THAT _____

_____, as Bidder, and _____
_____, as Surety, who is duly
licensed to act as surety in North Carolina, are held and firmly bound unto Jackson County, Jackson
County Administration Building, 401 Grindstaff Cove Road, Sylva, North Carolina 28779, as Owner, for
Jackson County Public Schools Proposed Improvements for Blue Ridge Water and Wastewater Systems
in the penal sum of \$ _____ DOLLARS (5% of maximum
total bid), lawful money of the United States of America, for the payment of which, well and truly to be
made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and
severally, firmly by these presents.

Bond Number: _____

Signed, sealed and dated this _____ day of _____ 20 ____
(Not later than Bid due date)

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

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION is such, that if the
Bidder shall be awarded the contract for which the bid is submitted and shall execute the contract and give
bonds for the faithful performance thereof within ten days after the award of same to the Bidder, then this
obligation shall be null and void; but if the Bidder fails to so execute such contract and give bonds as
required, the Surety shall, upon demand, forthwith pay to the Owner the amount set forth in the first
paragraph hereof.

BIDDER

SURETY

(Seal)
Bidder's Name and Corporate Seal

(Seal)
Surety's Name and Corporate Seal

Bidder's Address

Surety's Address & Principal Place of Business

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

Note: Above addresses are to be used for giving required notice

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Surety's liability.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

3.2. All Bids are rejected by Owner, or

3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

Jackson County Public Schools
Proposed Improvements for Blue Ridge School
Water and Wastewater Systems
CDBG-I Project No. 09-D-2945
Jackson County - Owner
Jackson County, North Carolina

Notice of Award

From Owner: Jackson County, Jackson County Administration Office, 401 Grindstaff Cove Road, Sylva, North Carolina 28779

Contract:	CDBG-I Project No.:
<i>Proposed Improvements for Blue Ridge School Water and Wastewater Systems</i>	09-D-2945

To Bidder:

Bidder's Address:

You are notified that your Bid dated _____ for the above Contract has been considered. You are the Successful Bidder and are hereby awarded a Contract for the **Proposed Improvements for Blue Ridge Water School and Wastewater Systems.**

Bidder agrees to complete the project as described in the Contract Documents for a total Contract Price of _____
Dollars (\$ _____)

(Note: Actual payment under Contract will be adjusted to final quantities on contracts including Unit Prices.)

Three (3) copies of the Contract Documents (except Drawings) accompany this Notice of Award, all three of which will be considered an original document.

You must comply with the following conditions precedent within ten [10] days of the date you receive this Notice of Award.

1. Return to the Owner all three (3) fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents Performance and Payment Bonds as specified in the Instructions to Bidders, General Conditions and Supplementary Conditions.

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

OWNER: <u>Jackson County</u> Signed:	ACCEPTED BY: CONTRACTOR: _____
Print Name:	Signed:
Title:	Print Name:
Date:	Title:
	Date:

This Page Intentionally Blank

AGREEMENT

This Agreement, is by and between JACKSON COUNTY (Owner)
and _____ (Contractor).

Contractor shall satisfactorily complete all Work as specified or indicated in the Contract Documents for the project: Jackson County Public Schools Proposed Improvements for Blue Ridge Water and Wastewater Systems. The term Contract Documents refers to the following documents by Lofquist & Associates, Inc. (Engineer):

Project Manual (Specifications) including:

(seal dated 10/2/20)

Front End Sections

Advertisement for Bids
Instructions to Bidders
Bid Form
Bid Bond
Notice of Award
Agreement
Notice to Proceed
Performance Bond
Payment Bond
Contractor's Application for Payment Forms
Sales Tax Forms
Consent of Surety Company to Final Payment
Contractor's Affidavit of Release of Liens
Contractor's Affidavit of Payment of Debts & Claims
General Conditions
Supplementary Conditions
Special Provisions

Technical Sections

Section 02090	Rock Excavation & Blasting
Section 02110	Clearing, Grubbing & Demolition
Section 02200	Earthwork
Section 02210	Excavation, Trenching & Backfilling for Utilities
Section 02370	Erosion & Sedimentation Control
Section 02390	Seeding & Mulching
Section 02510	Water Distribution Improvements
Section 02530	Wastewater Collection & Treatment Improvements
Section 02720	Aggregate Base & Gravel Surfaces
Section 02770	Concrete Pavements, Curbs and Sidewalks

DRAWINGS (Plans) including:

Sheet C1.0: General Information (seal dated 5/21/20)
Sheet C2.0: Existing Site &
Demolition Plan (seal dated 5/21/20)
Sheet C3.0: Erosion Control Plan (seal dated 5/21/20)
Sheet C4.0: Proposed Wastewater Treatment
Plant Site Plan (seal dated 5/21/20)
Sheet C5.0: Proposed Wastewater Treatment
Plant Details (seal dated 5/21/20)
Sheet C6.0: Proposed Wastewater Treatment
Plant Details (seal dated 5/21/20)
Sheet C7.0: Proposed Water Storage & Booster Pumping Site
Plan (seal dated 7/28/20)
Sheet C8.0: Proposed Water Storage & Booster Pumping
Details (seal dated 7/28/20)
Sheet C9.0: Erosion Control &
Site Details (seal dated 4/30/20)
Sheet C10.0: Sanitary Sewer Details (seal dated 4/30/20)
Sheet C11.0: Potable Water Details (seal dated 7/28/20)
Sheet C12.0: Miscellaneous Details (seal dated 4/30/20)
Sheet E1.0 Electrical Legend and
General Notes (seal dated 10/2/20)
Sheet E2.0 WWTP Electrical Site Plan (seal dated 10/2/20)
Sheet E3.0 WWTP One-Line Diagram, Riser Diagrams,
and Schedules (seal dated 10/2/20)
Sheet E4.0 Booster Pump Station Electrical
Plan (seal dated 10/2/20)
Sheet E5.0 WTP Electrical Site Plan, One-Line Diagram,
and Schedules (seal dated 10/2/20)

The Following Addenda:

No.: _____ Date: _____

No.: _____ Date: _____

No.: _____ Date: _____

Time of Completion

Bidder agrees that all Work (Base Bid) will be completed in accordance with the Bidding Documents within **One Hundred Eighty (180) Consecutive Calendar Days** following the start date selected by the Owner in the Notice to Proceed.

Liquidated Damages

Bidder further accepts the provisions of the agreement and agrees to pay as liquidated damages the sum of **\$800.00/day** for each consecutive calendar day the Bidder fails to complete the work within the specified time of completion specified above.

Work & Contract Price

The Contractor shall complete all Work to the satisfaction of the engineer and owner and comply with all conditions of the Contract Documents for a total contract price of \$ _____ as stipulated in the Bid Form. The payments to the Contractor under this agreement will be based on the actual quantities installed for unit price items, as measured by the engineer, and shall be paid for at the unit prices listed in the bid schedule.

Payment Procedures

The Contractor shall submit monthly applications for payment with any supporting documents, (four (4) copies required), to the Engineer for review and processing as provided in the Contract Documents. The Owner shall make progress payments on the basis of the Contractor's approved payment applications as provided in the Contract Documents. The Owner shall hold a 5% retainage from payment for work and materials requested in progress payments until 50% of the work, in the opinion of the engineer and owner, is satisfactorily completed and the work is being completed on schedule, at which time the retainage withheld on subsequent pay applications will be reduced to 0%.

Contractor's Representations

- a) Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
- b) Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- c) Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
- d) Contractor has obtained and carefully studied (or assumes responsibility for doing so) all conditions at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto.
- e) Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- f) Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- g) The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

Assignment of Contract

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

Successors and Assigns

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

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in triplicate. One counterpart each has been delivered to Owner, Contractor and Engineer. All portions of the Contract Documents have been signed or identified by Owner and Contractor or on their behalf.

This Agreement, is made effective this _____ day of _____ in the year of 20_____.

OWNER:

CONTRACTOR:

JACKSON COUNTY

By: _____

By: _____

Title: _____

Title: _____

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest: _____

Attest: _____

Title: _____

Title: _____

Address:

Address:

Jackson County

401 Grindstaff Cove Road

Sylva, North Carolina 28779

(828) 586 - 2195

NC Contractors

License No.: _____

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

Notice to Proceed

Owner: JACKSON COUNTY	Project: Proposed Improvements for Blue Ridge School Water and Wastewater Systems
Engineer: Lofquist & Associates, Inc.	CDBG-I Project No.: 09-D-2945
To Contractor:	
Contractor's Address:	

You are hereby notified that the Contract Times under the above contract will commence to run on _____. On or before that date, you are to commence work on the project and start performing your obligations under the Contract Documents. In accordance with the Agreement, the completion date of all Work shall be _____.

Before commencing any Work at the Site you must provide certificates of insurance in accordance with the Contract Documents to the Owner and copies of these certificates to the Engineer.

OWNER: <u>Jackson County</u> Signed:	ACCEPTED BY: CONTRACTOR: _____.
Print Name:	Signed:
Title:	Print Name:
Date:	Title:
	Date:

This Page Intentionally Blank

PERFORMANCE BOND

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

CONTRACTOR (Name and Address):

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

OWNER (Name and Address):

CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Bond Number:

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____ (Seal)

Name and Title:

(Space is provided below for signatures of additional parties, if required.)

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____ (Seal)

Name and Title:

SURETY

(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

Attest:

Signature and Title

SURETY

(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

Attest:

Signature and Title:

EJCDC No. C-610 (2002 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, and the American Institute of Architects.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.
2. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 3.1.
3. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
 - 3.1. Owner has notified Contractor and Surety, at the addresses described in Paragraph 10 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
 - 3.2. Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 3.1; and
 - 3.3. Owner has agreed to pay the Balance of the Contract Price to:
 1. Surety in accordance with the terms of the Contract;
 2. Another contractor selected pursuant to Paragraph 4.3 to perform the Contract.
4. When Owner has satisfied the conditions of Paragraph 3, Surety shall promptly and at Surety's expense take one of the following actions:
 - 4.1. Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
 - 4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and Contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
 - 4.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:
 1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
 2. Deny liability in whole or in part and notify Owner citing reasons therefor.
5. If Surety does not proceed as provided in Paragraph 4 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 4.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
6. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To a limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:
 - 6.1. The responsibilities of Contractor for correction of defective Work and completion of the Contract;
 - 6.2. Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions or failure to act of Surety under Paragraph 4; and
 - 6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.
7. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.
8. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.
9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
10. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.
11. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
12. Definitions.
 - 12.1. Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
 - 12.2. Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
 - 12.3. Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
 - 12.4. Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY – Name, Address and Telephone
 Surety Agency or Broker
 Owner's Representative (engineer or other party)

PAYMENT BOND

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

CONTRACTOR (Name and Address):

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

OWNER (Name and Address):

CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Bond Number:

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____ (Seal)

Name and Title:

SURETY

(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

Attest:

Signature and Title

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____ (Seal)

Name and Title:

SURETY

(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

Attest:

Signature and Title:

EJCDC No. C-615 (2002 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, the American Institute of Architects, the American Subcontractors Association, and the Associated Specialty Contractors.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
 - 2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2. Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
 - 4.1. Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the addresses described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2. Claimants who do not have a direct contract with Contractor:
 1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
 2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
 3. Not having been paid within the above 30 days, have sent a written notice to Surety and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
 - 6.1. Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 6.2. Pay or arrange for payment of any undisputed amounts.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.
9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.
10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related Subcontracts, purchase orders and other obligations.
11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.
13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.
14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.
15. DEFINITIONS
 - 15.1. Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's Subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
 - 15.2. Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
 - 15.3. Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY – Name, Address and Telephone
Surety Agency or Broker:
Owner's Representative (engineer or other party):

Contractor's Application For Payment No. _____

	Application Period:	Application Date:
To (Owner): JACKSON COUNTY	From (Contractor):	Via (Engineer)
Project: Jackson County Public Schools Proposed Improvements for Blue Ridge Water and Wastewater Systems		
CDBG-I Project No. 09-D-2945	Contractor's Project No.:	Engineer's Project No.:

APPLICATION FOR PAYMENT

Change Order Summary

Approved Change Orders		
Number	Additions	Deductions
TOTALS		
NET CHANGE BY CHANGE ORDERS		

1. ORIGINAL CONTRACT PRICE	_____
2. Net change by Change Orders	_____
3. CURRENT CONTRACT PRICE (Line 1 ± 2)	_____
4. TOTAL COMPLETED AND STORED TO DATE (Column F on Progress Estimate)	_____
5. RETAINAGE:	
a. _____ % x \$ _____ Work Completed	_____
b. _____ % x \$ _____ Stored Material.....	_____
c. Total Retainage (Line 5a + Line 5b)	_____
6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5c).....	_____
7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application)...	_____
8. AMOUNT DUE THIS APPLICATION	_____
9. BALANCE TO FINISH, PLUS RETAINAGE (Column G on Progress Estimate + Line 5 above).....	_____

CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies that: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

By:	Date:
-----	-------

Payment of:	\$ _____	(Line 8 or other - attach explanation of other amount)
is recommended by:	_____	_____
	(Engineer)	(Date)
Payment of:	\$ _____	(Line 8 or other - attach explanation of other amount)
is approved by:	_____	_____
	(Owner)	(Date)
Approved by:	_____	_____
	Funding Agency (if applicable)	(Date)

Progress Estimate

Contractor's Application For Payment No. _____

For: Jackson County Public Schools Proposed Improvements for Blue Ridge Water and Wastewater Systems					Application Number:		
Application Period:					Application Date:		
A		B	Estimated Quantity of Work Completed			F	G
Item		Scheduled Unit Price	C	D	\$ Amount Requested for Materials Presently Stored (not in C or D)	Total \$ Completed and Stored to Date (C + D + E)	\$ Balance to Finish (B - F)
Scheduled Value Item #	Description		From Previous Application (C + D)	This Period			
	NOTES: 1. Contractor to submit Schedule of Values to the Engineer for the Engineer's review and approval within 15 calendar days following the issuance of the Notice to Proceed. Contractor shall modify and revise the Schedule of Values as recommended by the Engineer.						
	Totals						

Contractor's Application For Payment No. _____

0620 - 3

This Page Intentionally Blank

NORTH CAROLINA
STATE & COUNTY SALES AND USE TAX REPORT
SUMMARY TOTALS AND CERTIFICATION

CONTRACTOR: _____

Page _____ of _____

PROJECT: _____

FOR PERIOD: _____

	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL COUNTY TAXES	NC TAX	TOTAL COUNTY & NC TAX
CONTRACTOR							
SUBCONTRACTOR(S)*							
TOTALS:							

* Attach subcontractor(s) report(s)

** Must balance with Detail Sheet(s)

I certify that the above figures do not include any tax paid on supplies, tools and equipment which were used to perform this contract and only includes those building materials, supplies, fixtures and equipment which actually became a part of or annexed to the Work. I certify that, to the best of my knowledge, the information provided here is true, correct, and complete.

Sworn to and subscribed before me,

This the _____ day of _____, 20____

Signed

Notary Public

My Commission Expires: _____

Print or Type Name of Above

Seal

NOTE:

This certified statement may be subject to audit.

NORTH CAROLINA STATE & LOCAL SALES AND USE TAX REPORT DETAIL

CONTRACTOR: _____

Page _____ of _____

SUBCONTRACTOR _____

FOR PERIOD: _____

PROJECT: _____

PURCHASE DATE	VENDOR NAME	INVOICE NUMBER	TYPE OF PROPERTY	NC TAX PAID	COUNTY TAX PAID	COUNTY OF SALE *
				\$	\$	
				TOTAL:	\$	

* If this is an out-of-state vendor, the County of Sale should be the county to which the merchandise was shipped.

** The contractor shall submit sales tax reports for all materials, supplies, fixtures and equipment with each pay request or payment will not be made by the owner.

CONSENT OF SURETY COMPANY TO FINAL PAYMENT

Project & Contract: **Jackson County**
 Jackson County Public Schools Proposed Improvements for
 Blue Ridge Water and Wastewater Systems
 CDBG-I Project No. 09-D-2945
 Jackson County, North Carolina

To: **Jackson County**
 401 Grindstaff Cove Road
 Sylva, North Carolina 28779

Agreement Date: _____

Contractor: _____

In accordance with the provisions of the contract between the owner and the contractor as indicated above,
the (here inset 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:

Jackson County, Owner

as set forth in said surety company's bond.

IN WITNESS WHEREOF,
the surety company has hereunto set its hand this _____ day of _____ 20

Surety Company

Signature of Authorized
Representative

Attest: Title _____
(Seal):

This Page Intentionally Blank

CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS

Project & Contract: **Jackson County**
Jackson County Public Schools Proposed Improvements for
Blue Ridge Water and Wastewater Systems
CDBG-I Project No. 09-D-2945
Jackson County, North Carolina

To: **Jackson County**
401 Grindstaff Cove Road
Sylva, North Carolina 28779

Agreement Date: _____

Contractor: _____

State of: North Carolina

County of: Jackson

The undersigned, pursuant to the General Conditions, Supplementary Conditions and other stipulations in the of the Contract, hereby certifies that, he 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 contract referenced above for which the owner or his property might in any way be held responsible.

CONTRACTOR: _____

Address: _____

By: _____
Authorized Signature

Print Name/Title

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

Notary Public:
My Commission Expires:

This Page Intentionally Blank

CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIENS

Project & Contract: **Jackson County**
Jackson County Public Schools Proposed Improvements for
Blue Ridge Water and Wastewater Systems
CDBG-I Project No. 09-D-2945
Jackson County, North Carolina

To: **Jackson County**
401 Grindstaff Cove Road
Sylva, North Carolina 28779

Agreement Date: _____

Contractor: _____

State of: North Carolina

County of: Jackson

The undersigned, pursuant to the General Conditions, Supplementary Conditions and other stipulations in the of the Contract, hereby certifies that to the best of his knowledge, information and belief, the Releases or Waivers of Lien 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 contract referenced above.

CONTRACTOR: _____

Address: _____

By: _____
Authorized Signature

Print Name/Title

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

Notary Public:
My Commission Expires:

This Page Intentionally Blank

Change Order No.:

Date of Issuance: _____

CDBG-I Project No.: 09-D-2945

Project: Proposed Improvements for Blue Ridge School Water and Wastewater Systems	Owner: Jackson County
Contractor:	Agreement Date:

The Contract Documents are modified as follows by execution of this Change Order:

Description: The following changes, modifications and revisions, as described as follows, are hereby incorporated into the Contract Documents with the Owner's and Contractor's approvals. All work described by this change order shall be in accordance with the Contract Documents except where specifically modified herein.

Detailed Description:

CHANGE IN CONTRACT PRICE:	CHANGE IN CONTRACT TIME:
Original Contract Price: \$ _____.	Original Contract Time: _____ Calendar Days
Change in price by previously approved Change Orders: Add: \$ _____.	Original Contract Completion Date: _____.
Contract Price prior to this Change Order: \$ _____.	Consecutive Calendar Days added to Contract Completion by this Change Order: _____.
Change in price due to this Change Order: Add \$ _____. Deduct - \$ _____. Total Price Adjustment this Change Order: \$ _____.	
Modified Contract Price incorporating this Change Order: \$ _____.	New Contract Completion Date incorporating this Change Order: _____.

<u>PREPARED & RECOMMENDED BY:</u>	<u>APPROVED BY:</u>	<u>ACCEPTED BY:</u>
ENGINEER: <u>Lofquist & Associates, Inc.</u>	OWNER: <u>Jackson County</u>	CONTRACTOR:
Signed: _____	Signed: _____	Signed: _____
Print Name: _____	Print Name: _____	Print Name: _____
Title: _____	Title: _____	Title: _____

This Page Intentionally Blank

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By



PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

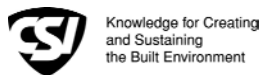
AMERICAN COUNCIL OF ENGINEERING COMPANIES

AMERICAN SOCIETY OF CIVIL ENGINEERS

This document has been approved and endorsed by



The Associated General Contractors of America



Construction Specifications Institute

Copyright ©2002

National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314

American Council of Engineering Companies
1015 15th Street, N.W., Washington, DC 20005

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400

TABLE OF CONTENTS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01	<i>Defined Terms</i>
1.02	<i>Terminology</i>

ARTICLE 2 - PRELIMINARY MATTERS

2.01	<i>Delivery of Bonds and Evidence of Insurance</i>
2.02	<i>Copies of Documents</i>
2.03	<i>Commencement of Contract Times; Notice to Proceed</i>
2.04	<i>Starting the Work</i>
2.05	<i>Before Starting Construction</i>
2.06	<i>Preconstruction Conference</i>
2.07	<i>Initial Acceptance of Schedules</i>

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01	<i>Intent</i>
3.02	<i>Reference Standards</i>
3.03	<i>Reporting and Resolving Discrepancies</i>
3.04	<i>Amending and Supplementing Contract Documents</i>
3.05	<i>Reuse of Documents</i>
3.06	<i>Electronic Data</i>

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

4.01	<i>Availability of Lands</i>
4.02	<i>Subsurface and Physical Conditions</i>
4.03	<i>Differing Subsurface or Physical Conditions</i>
4.04	<i>Underground Facilities</i>
4.05	<i>Reference Points</i>
4.06	<i>Hazardous Environmental Condition at Site</i>

ARTICLE 5 - BONDS AND INSURANCE

5.01	<i>Performance, Payment, and Other Bonds</i>
5.02	<i>Licensed Sureties and Insurers</i>
5.03	<i>Certificates of Insurance</i>
5.04	<i>Contractor's Liability Insurance</i>
5.05	<i>Owner's Liability Insurance</i>
5.06	<i>Property Insurance</i>
5.07	<i>Waiver of Rights</i>
5.08	<i>Receipt and Application of Insurance Proceeds</i>
5.09	<i>Acceptance of Bonds and Insurance; Option to Replace</i>
5.10	<i>Partial Utilization, Acknowledgment of Property Insurer</i>

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01	<i>Supervision and Superintendence</i>
6.02	<i>Labor; Working Hours</i>
6.03	<i>Services, Materials, and Equipment</i>
6.04	<i>Progress Schedule</i>
6.05	<i>Substitutes and "Or-Equals"</i>
6.06	<i>Concerning Subcontractors, Suppliers, and Others</i>
6.07	<i>Patent Fees and Royalties</i>
6.08	<i>Permits</i>
6.09	<i>Laws and Regulations</i>
6.10	<i>Taxes</i>
6.11	<i>Use of Site and Other Areas</i>
6.12	<i>Record Documents</i>

6.13.....	<i>Safety and Protection</i>
6.14.....	<i>Safety Representative</i>
6.15.....	<i>Hazard Communication Programs</i>
6.16.....	<i>Emergencies</i>
6.17.....	<i>Shop Drawings and Samples</i>
6.18.....	<i>Continuing the Work</i>
6.19.....	<i>Contractor's General Warranty and Guarantee</i>
6.20.....	<i>Indemnification</i>
6.21.....	<i>Delegation of Professional Design Services</i>
ARTICLE 7 - OTHER WORK AT THE SITE	
7.01.....	<i>Related Work at Site</i>
7.02.....	<i>Coordination</i>
7.03.....	<i>Legal Relationships</i>
ARTICLE 8 - OWNER'S RESPONSIBILITIES	
8.01.....	<i>Communications to Contractor</i>
8.02.....	<i>Replacement of Engineer</i>
8.03.....	<i>Furnish Data</i>
8.04.....	<i>Pay When Due</i>
8.05.....	<i>Lands and Easements; Reports and Tests</i>
8.06.....	<i>Insurance</i>
8.07.....	<i>Change Orders</i>
8.08.....	<i>Inspections, Tests, and Approvals</i>
8.09.....	<i>Limitations on Owner's Responsibilities</i>
8.10.....	<i>Undisclosed Hazardous Environmental Condition</i>
8.11.....	<i>Evidence of Financial Arrangements</i>
ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION	
9.01.....	<i>Owner's Representative</i>
9.02.....	<i>Visits to Site</i>
9.03.....	<i>Project Representative</i>
9.04.....	<i>Authorized Variations in Work</i>
9.05.....	<i>Rejecting Defective Work</i>
9.06.....	<i>Shop Drawings, Change Orders and Payments</i>
9.07.....	<i>Determinations for Unit Price Work</i>
9.08.....	<i>Decisions on Requirements of Contract Documents and Acceptability of Work</i>
9.09.....	<i>Limitations on Engineer's Authority and Responsibilities</i>
ARTICLE 10 - CHANGES IN THE WORK; CLAIMS	
10.01.....	<i>Authorized Changes in the Work</i>
10.02.....	<i>Unauthorized Changes in the Work</i>
10.03.....	<i>Execution of Change Orders</i>
10.04.....	<i>Notification to Surety</i>
10.05.....	<i>Claims</i>
ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK	
11.01.....	<i>Cost of the Work</i>
11.02.....	<i>Allowances</i>
11.03.....	<i>Unit Price Work</i>
ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES	
12.01.....	<i>Change of Contract Price</i>
12.02.....	<i>Change of Contract Times</i>
12.03.....	<i>Delays</i>
ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK	
13.01.....	<i>Notice of Defects</i>
13.02.....	<i>Access to Work</i>
13.03.....	<i>Tests and Inspections</i>
13.04.....	<i>Uncovering Work</i>
13.05.....	<i>Owner May Stop the Work</i>
13.06.....	<i>Correction or Removal of Defective Work</i>
13.07.....	<i>Correction Period</i>

13.08	<i>Acceptance of Defective Work</i>
13.09	<i>Owner May Correct Defective Work</i>
ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION	
14.01	<i>Schedule of Values</i>
14.02	<i>Progress Payments</i>
14.03	<i>Contractor's Warranty of Title</i>
14.04	<i>Substantial Completion</i>
14.05	<i>Partial Utilization</i>
14.06	<i>Final Inspection</i>
14.07	<i>Final Payment</i>
14.08	<i>Final Completion Delayed</i>
14.09	<i>Waiver of Claims</i>
ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION	
15.01	<i>Owner May Suspend Work</i>
15.02	<i>Owner May Terminate for Cause</i>
15.03	<i>Owner May Terminate For Convenience</i>
15.04	<i>Contractor May Stop Work or Terminate</i>
ARTICLE 16 - DISPUTE RESOLUTION	
16.01	<i>Methods and Procedures</i>
ARTICLE 17 - MISCELLANEOUS	
17.01	<i>Giving Notice</i>
17.02	<i>Computation of Times</i>
17.03	<i>Cumulative Remedies</i>
17.04	<i>Survival of Obligations</i>
17.05	<i>Controlling Law</i>
17.06	<i>Headings</i>

GENERAL CONDITIONS

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's 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.A 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. The General Requirements pertain to all sections 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 in connection with the Work.

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. *Related Entity* -- An officer, director, partner, employee, agent, consultant, or subcontractor.

37. *Resident Project Representative*--The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. *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.

39. *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.

40. *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.

41. *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.

42. *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.

43. *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.

44. *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.

45. *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.

46. *Successful Bidder*--The Bidder submitting a responsive Bid to whom Owner makes an award.

47. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

48. *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 any Subcontractor.

49. *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.

50. *Unit Price Work*--Work to be paid for on the basis of unit prices.

51. *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.

52. *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 following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following 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 requirements of and information in the Contract Documents and conformance with the design concept of the completed 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 which 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*

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.

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 may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended 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, or Engineer, or any of, their Related Entities, 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 may discover 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 any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, 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 knew or reasonably should have known 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, code, or instruction (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 or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, 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 Engineer's consultants, including electronic media editions; or
2. reuse any of 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 adaption by Engineer.

B. The prohibition 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. Copies of data furnished by Owner or Engineer to Contractor or 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 of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general 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 Related Entities 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 at or contiguous to the Site 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, Owner and Engineer, and any of their Related Entities 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.

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; 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:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general 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 Related Entities 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.

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 to Contractor written notice: (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, 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, 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 current 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 must be accompanied by a certified copy of the agent's authority to act.

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 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 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.

5.04 *Contractor's Liability Insurance*

A. Contractor shall purchase and maintain such liability and other 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, include as additional insured (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, 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 completed operations insurance;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

5. 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);

6. 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

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.

a. 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, 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 an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, 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 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 additional insured to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such boiler and machinery 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, 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 an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with 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 additional insured 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 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 to be listed as insureds or additional insureds (and the officers, directors, 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 additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, 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 to be listed as insured or additional insured (and the officers, directors, 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, 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, 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 insureds, 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. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

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,

3) it has a proven record of performance and availability of responsive service; and

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 that 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 in 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 or not 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 or not 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;

4) and 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 either a Change Order for a substitute or 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 item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the 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 anything in the Contract Documents 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 an additional insured 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, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, 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, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, 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 primary 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, 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. 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. 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, 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).

D. 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 acceptable 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*: Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

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 determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and

d. shall also have 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.

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 Drawing's 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 Related Entities 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, 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 respective consultants, agents, officers, directors, partners, or employees 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, 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 via 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, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall 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 their work and will only cut or alter their 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 actions or inactions.

C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's 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 in respect of 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 in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.06 *Insurance*

A. Owner's responsibilities, if any, in 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 in 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. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

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 and will not be changed without written consent of Owner and Engineer.

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 believe 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.

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.B.

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 notice 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) is required by the provisions of any bond to be given to a surety, 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 Time 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 include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

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 at the Site. 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, 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, expresses, 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 and 11.01.B.

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 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 Paragraph 12.01.C.2.a 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 the Related Entities of each of them 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. All 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, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site 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 said 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, it must, if requested by Engineer, be uncovered 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 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 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 on the Site 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, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to 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. that 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 corrects to Owner's satisfaction the reasons for such action.

3. If it is subsequently determined 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.

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 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 will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion 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.7;

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 or Owner's property might in any way be responsible 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 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 their 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.

This Page Intentionally Blank

SECTION 0800

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the “Standard General Conditions of the Construction Contract prepared by the Engineers Joint Contract Documents Committee (EJCDC No. C-700, 2002 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 Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

Article 1 – Definitions And Terminology

SC-1.01.A.17. Add the following language at the end of the Paragraph 1.01.A.17 in the General Conditions:

1.01.A.17.....The term *Plans* has the same definition and meaning as *Drawings*.

SC-1.01.A.19. Delete Paragraph 1.01.A.19. of the General Conditions in its entirety and insert the following in its place:

1.01.A.19 *Engineer* – The engineer for the project is Lofquist & Associates, Inc., 11 Citrus Drive, Sylva, North Carolina 28779; (828) 586-1424.

Article 2 – Preliminary Matters

SC-2..02.A. Delete Paragraph 2.02.A. of the General Conditions in its entirety and insert the following in its place:

2.02..A *Copies of Documents*: The engineer will furnish the contractor with up to 4 printed copies of the drawings and specifications at no cost. Additional copies can be furnished at additional cost to contractor to include the cost of reproduction plus labor.

Article 4 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points

SC-4.02 Delete Paragraphs 4.02.A and 4.02.B in their entirety and insert the following in the General Conditions:

4.02.A. Bidder is responsible for conducting their own investigations, verifications, interpretations and reaching their own conclusions regarding subsurface and physical conditions prior to submitting a bid. The bidder shall obtain the approval of the owner prior to conducting investigations and bidder shall be solely responsible for all safety, security, costs, property damage or any other effect as a result of or related to the bidder's conductance of said investigations, verifications, interpretations and conclusions.

4.02.B The Contractor is required to visit the Site, conduct explorations and investigations with the Owner's permission and to become familiar with and satisfied as to the general, local, and Site conditions that may affect cost, progress, performance, and furnishing of the Work. This is to involve an alert, heads-up, eyes-open, reasonable examination of the area and the conditions under which the Work is to be performed (see GC-4.03.C.2.b). Additional or special requirements for such examinations, investigations and interpretations are set forth in the Instructions to Bidders and elsewhere in the Contract Documents.

SC-4.03 Delete Paragraphs 4.03.A through 4.03.C inclusive, of the General Conditions in their entirety and insert the following paragraph.

4.03 Differing Subsurface or Physical Conditions – The contractor is responsible for completing the Work regardless of subsurface or physical conditions encountered for the prices listed in the Bid form. No additional compensation or time allowances will be provided in the event conditions vary or differ from those anticipated. If so identified and quantified in the Bid documents, additional compensation shall be made for Rock Excavation at the price listed in the Bid form.

SC-4.05 Delete Paragraph 4.05.A of the General Conditions in its entirety and insert the following paragraph.

4.05 *Reference Points*

A. The Contractor shall be fully responsible for laying out the Work using experienced surveyors, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Engineer. Contractor shall report to Engineer immediately whenever: 1) there exist any discrepancy or ambiguity in the lay out of the Work or 2) any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations. The Contractor shall be responsible for the accurate replacement or relocation of such lost, destroyed or disturbed reference points or property monuments by a NC Professional Land Surveyor. The surveyor shall submit a sealed, certified statement to the

Engineer stated that the reference point or property monument has been replaced in accordance with NC surveying standards.

SC-4.06 Delete Paragraphs 4.06.A and 4.06.B of the General Conditions in their entirety and insert the following:

4.06.A. No reports on drawings related to Hazardous Environmental Conditions are known to Owner or Engineer.

4.06.B. Not Used.

Article 5 – Bonds and Insurance

SC-5.02.B. Add the following new paragraph after Paragraph 5.02.A in the General Conditions:

5.02.B The Contractor shall be required to submit valid performance bonds, payment bonds, insurance certificates and related documents concurrently with the return of the executed Agreement to the Owner.

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.B in the General Conditions:

5.03.C. Failure of Owner to demand such certificates or other evidence of full compliance with these insurance requirements or failure of Owner to identify a deficiency from evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

5.03.D. By requiring such insurance and insurance limits herein, Owner does not represent that coverage and limits will necessarily be adequate to protect Contractor, and such coverage and limits shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

SC-5.04 Add the following new paragraph immediately after Paragraph 5.04.B of the General Conditions:

5.04.C. The limits of liability for the insurance required by Paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation and Employers Liability Insurance, and related coverages under Paragraphs 5.04.A.1 and A.2 of the General Conditions: shall have minimum limits required by law.

2. Contractor's General Liability under Paragraphs 5.04.A.3 through A.6 of the General Conditions which shall include completed operations and product

liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Contractor, shall not be less than the following amounts:

A combined single limit of \$5,000,000 per occurrence, with an aggregate limit of \$5,000,000.

Property Damage liability insurance will provide Blasting & Explosion, Collapse, and Under-ground coverages where applicable shall not be less than the following amounts:

\$5,000,000 per occurrence,
Aggregate limit of \$5,000,000.

3. Automobile Liability under Paragraph 5.04.A.6 of the General Conditions shall not be less than the following amounts:

\$5,000,000 per accident,
\$5,000,000 per person,
Aggregate limit of \$5,000,000.

4. The Contractual Liability coverage required by Paragraph 5.04.B.4 of the General Conditions shall provide coverage for bodily injury and property damage shall not be less than the following amounts:

\$5,000,000 per accident,
\$5,000,000 per person,
Aggregate limit of \$5,000,000

5. Fire and Extended Coverage Insurance (Builder's Risk) including fire, extended coverage, vandalism and malicious mischief, including offsite storage and work areas, shall be as described under SC-5.06.A

SC-5.06.A. Delete Paragraph 5.06.A in its entirety and insert the following in its place in the General Conditions:

A. Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof.

1. This insurance shall:

a. include the interests of Owner, Contractor, Subcontractors, Engineer and any other individuals or entities identified herein, and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

b. in addition to the individuals and entities specified, include as additional insureds, the following:

1) Contractor shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the 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, 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 an insured or additional insured.

c. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss and damage to the Work (total Bid price plus additional items as described), 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;

d. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

e. 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;

f. allow for partial utilization of the Work by Owner;

g. include testing and startup; and

h. 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 additional insured to whom a certificate of insurance has been issued.

2. Contractor shall be responsible for any deductible or self-insured retention.

3. The policies of insurance required to be purchased and maintained by Contractor in accordance with this Paragraph SC-5.06.A shall comply with the requirements of paragraph 5.06.C of the General Conditions.

SC-5.06. E Delete Paragraph 5.06.E of the General Conditions in its entirety.

SC-5.08 Delete Paragraphs 5.08.A and 5.08.B of the General Conditions in their entirety

Article 6 – Contractor's Responsibilities

SC-6.10 Add the following new paragraph immediately after Paragraph 6.10.A of the General Conditions:

6.10.B If Owner qualifies for a state or local sales tax exemption in the purchase of certain materials and equipment, to be incorporated into the Work, then: Owner will furnish the required tax listing forms and certification forms for the Contractor's use in recording all tax expenditures on the purchase of supplies and materials to be incorporated into the Work. The required number of tax listing forms and certificates shall be provided to the Engineer and Owner on a monthly basis by the Contractor.

6.10.C. Owner's sales tax exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

Article 7 – Other Work at the Site

SC-7.02 Delete Paragraph 7.02 of the General Conditions in its entirety and substitute the following:

7.02 Coordination

The Contractor shall be the sole party responsible for coordination of the Work with all other parties or entities operating, performing other work or otherwise present within the project area, whether in contract with the Owner or not,

including, but not limited to scheduling and sequencing of construction in a manner which results in the successful and satisfactory completion of the Work in a timely manner.

SC-7.04 Add the following new paragraph immediately after paragraph 7.03 of the General Conditions :

7.04 Claims Between Contractors

A. Should Contractor cause damage to the work or property of any other contractor at the Site, or should any claim arising out of Contractor's performance of the Work at the Site be made by any other contractor against Contractor, Owner, Engineer, or the construction coordinator, Contractor shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by arbitration or at law.

B. Contractor shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner, Engineer, the construction coordinator and the officers, directors, partners, employees, agents and other consultants and subcontractors of each and any of them from and against all claims, costs, losses and damages (including, but not limited to, fees and charges of engineers, architects, attorneys, and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any other contractor against Owner, Engineer, Engineer's Consultants, or the construction coordinator to the extent said claim is based on or arises out of Contractor's performance of the Work. Should another contractor cause damage to the Work or property of Contractor or should the performance of work by any other contractor at the Site give rise to any other Claim, Contractor shall not institute any action, legal or equitable, against Owner, Engineer, or the construction coordinator or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from Owner, Engineer, or the construction coordinator on account of any such damage or Claim

Article 11 – Cost of the Work; Allowances; Unit Price Work

SC-11.01.A.5.c, Delete Paragraph 11.01.A.5.c in its entirety and insert the following in its place:

c. Construction Equipment and Machinery:

1. Rentals of all construction equipment and machinery, and the parts thereof 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.

2. Costs for equipment and machinery owned by Contractor will be paid at a rate shown for such equipment in the most current edition of R.S. Means Construction Cost index adjusted to local market factors. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs. Costs will include the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, shall cease to accrue when the use thereof is no longer necessary for the changed Work. Equipment or machinery with a value of less than \$5,000 will be considered small tools.

Article 12 – Change of Contract Price; Change of Contract Times

SC-12.03, Delete Paragraph 12.03 (12.03.A through 12.03.E) in its entirety and insert the following in its place:

12.03 *Abnormal Weather Delays*

A. The Contractor shall be entitled to additional contract time in the event of abnormally severe or extended rain or cold conditions. No adjustment to contract price shall be made due to abnormal or severe weather or temperature conditions or delays resulting thereof. Additional contract days will be granted to the Contractor on the basis of data from the nearest climatological gauging station officially used by the National Oceanic and Atmospheric Administration (NOAA) for a period of the past 20 years. When the number of rain days (0.1 inch rain event or greater) during the construction contract period, as measured at the nearest NOAA gauging station, exceeds the most recently available 20 year average rain days (0.1 inch rain event or greater) for the same time period and season of the same gauging station, as determined by NOAA data, then the Contract Time will be extended by the number of calendar days that actual rain days exceeded the NOAA 20 year average number of rain days. Additionally, any days when the maximum daily temperature does not reach 40 degrees Fahrenheit or greater, during the construction contract period, as measured at the nearest NOAA gauging station, shall be added to the Contract Time, to extend the Contract time the same number of days that the actual recorded maximum temperature is below 40 degrees Fahrenheit.

END OF SECTION

SECTION 0500

SPECIAL PROVISIONS & CDBG CONTRACT REQUIREMENTS

The following selected special conditions apply to this project.

1.0 Contractor Coordination, School Restrictions, Work Conflicts, Delay Allowances & Stop Orders:

Throughout construction, the Contractor shall be responsible for coordinating all stages and aspects of the work with all others using or working within or in the vicinity of the project area, including but not limited to: the school administration, the water and wastewater system operators, other contractors working in or adjacent to the project area, service companies and all utility owners. Existing utilities within the project area may be in conflict with portions of the work and will require modifications and/or relocations. Any costs associated with relocating utilities and assessed by the utility company as relocation costs will be paid for by the owner, directly to the utility owner. When delays are caused by parties other than the contractor and prevent the contractor from continuing with any portion of the work, the contractor may request additional time equal to the actual time of the delay. The contractor's request for additional time must be made in writing to the engineer within 10 days after occurrence of the delay event. If, in the opinion of the engineer, the time extension is justified, the contract time will be extended for a time equal to the actual time of the delay. No additional monetary compensation or any other form of compensation will be paid to the contractor for delays related to other contractors, utilities or school operations. The contractor is responsible for including in their bid, any and all other allowances necessary for delays due to school operations, delays due to the work of other contractors and delays due to utility relocations/modifications whether direct or incidental.

2.0 Contractor Use of Premises: During construction, the contractor shall have use of the premises to the extent required for construction operations. However, the contractor's use of the premises and construction operations is limited by the Owner's ability to provide uninterrupted operation of the existing school and any ongoing work being performed by other contractors working in and adjacent to the project area. The contractor shall confine operations to the immediate areas of construction. Portions of the site beyond the area of proposed construction work are not to be used for construction traffic and shall not be disturbed. Under no circumstances will the contractor be allowed to enter school buildings or use school restroom or sanitary facilities. The contractor is responsible for providing approved, portable sanitary facilities and office space as required by regulation and as necessary to complete their work. The contractor is further subject to all school policies regarding access to and work on school properties.

3.0 Erosion Control & Stormwater: Protection of adjacent properties and surface waters should be emphasized and given careful consideration by the contractor in planning all construction sequencing, scheduling and construction practices. The contractor shall perform all work in a manner which provides maximum protection of surface waters and adjacent properties. The contractor is responsible for complying with all erosion control and stormwater permits and regulations (including all self monitoring and record keeping) specific to the project site.

There shall be no specific pay items for erosion control. Erosion control shall be treated as incidental work. For the purposes of the Owner making payments to the Contractor, erosion control shall be treated as 10% of all unit pay items. See Section 02370, Erosion Control for additional information.

4.0 Existing Buried Utilities: There are existing buried utilities within the project area which are not shown on the

plans and existing utilities shown on the plans that may not be shown correctly on the plans. The contractor should contact NC One Call and all non-member utilities and make the necessary additional investigations and implement the necessary measures, at the contractor's expense, to successfully complete the project.

5.0 Engineer's and Technician's Site Visits: The Contractor agrees to closely coordinate with the Engineer and other technicians involved in the construction process to allow time for the Engineer to observe underground installations, particularly storm drainage, water and sewer construction, prior to backfilling operations. The Contractor will be responsible for coordinating all site visits by the Engineer and providing the Engineer a minimum of 48 hours notice prior to the need for a site visit.

6.0 Tie ins: The Contractor shall be the party responsible for making proper tie ins of all water lines, drains, electrical, telephone and other utilities as necessary to make all work function as intended.

7.0 Project Meetings: The Contractor and all subcontractors shall be required to have authorized and qualified supervisory level representatives, who are well familiar with the project progress and project activities, attend all project meetings, preconstruction conferences, progress meetings and any other meetings scheduled by the owner or designer. Monthly and/or bi-monthly project meetings may or may not be held at the Owner's discretion. The contractor will be responsible for taking detailed notes during the meeting and developing written minutes for the meeting, in chronological order, accurately detailing the meeting date, time, and place, the attendees and their contact information, project schedule status, topics discussed and how they were initiated, action items and the person(s) responsible for taking action, key events, descriptions of decisions made and party responsible for each decision and any other pertinent issues, discussions or course of action.

8.0 Disturbance of Pavements: The Contractor shall make provisions when cutting existing pavements, including sidewalks, to maintain vehicle and pedestrian routes in a usable condition during school operating hours in a condition acceptable to the owner. All pavements, including those used for vehicle and pedestrian traffic, shall, at a minimum, have a temporary gravel surface, suitable for use by traffic, by the end of each day. All asphalt and concrete pavements, curb and gutter and other pavement surfaces shall be repaired within 10 calendar days of when pavement was disturbed.

9.0 After Hour and Weekend Work: The Owner, at their discretion, may or may not require that some portions of the work be conducted when school and other activities on school grounds is not in session. When required, work will be performed during time periods specified by the Owner. After hour and weekend work will be provided by the Contractor, when requested, at no additional cost to the Owner and with no adjustment to the contract time.

10.0 Storage and Staging Areas: The contractor will be responsible acquiring and maintaining, at their own expense, adequate, secure and safe storage and staging areas in the vicinity of the project as required for the successful completion of all Work.

12.0 NCDWI and CDBG Requirements: This project is being funded through the NC Division of Water Infrastructure (DWI) and the Contractor is responsible for complying with all DWI requirements, including Davis-Bacon prevailing wage provisions, MBE/WBE/DBE requirements and goals, The following pages summarize key DWI requirements and provisions for this project.

Statement encouraging Historically Underutilized Businesses (HUB) to submit bids/proposals

Jackson County and the Prime Contractor are committed to and supportive of efforts to effectively maintain and/or increase HUB contract participation for Construction Projects, services (including professional and consulting services) and commodities purchases. Jackson County encourages all Jackson County HUB firms to participate in procurement and contracting activities. Jackson County is recognizing its responsibilities to the communities it serves and the society in which it conducts business. The use of Historically Underutilized Businesses must be a function of our normal purchasing/contracting procedures, just as equal employment opportunity must be an integral part of normal personnel policy and procedures. No potential supplier/contractors will be precluded from consideration on the basis of race, color, religion, sex, age or national origin.

Statement encouraging Minority/Women Owner Businesses (M/WBE) to submit bids/proposals

Jackson County and the Prime Contractor are committed to provide small, minority, and women business enterprises equal access to opportunity for participation in Jackson County contracts for Construction, Professional Services, Other Services, and Goods and Supplies. Jackson County encourages all Jackson County M/WBE firms to participate in procurement and contracting activities. Jackson County is recognizing its responsibilities to the communities it serves and the society in which it conducts business. The use of minority and women business enterprises must be a function of our normal purchasing/contracting procedures, just as equal employment opportunity must be an integral part of normal personnel policy and procedures. No potential supplier/contractors will be precluded from consideration on the basis of race, color, religion, sex, age or national origin.

§135.38 Section 3 clause.

All section 3 covered contracts shall include the following clause (referred to as the section 3 clause):

A. The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.

B. The parties to this contract agree to comply with HUD's regulations in 24 CFR part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.

C. The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the

qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.

D. The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.

E. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 135.

F. Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.

G. With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

**SECTION 3 PLAN
CDBG-I Project**

PRIME CONTRACTOR

For _____
(Name of Company)

Submitted by:

Name of Owner/Developer: _____

Address: _____

Contact Information: _____

General Statement

_____, as the prime contractor is committed to comply with the Section 3 regulations (24 CFR Part 135). It is our desire to work together to ensure compliance, **to the greatest extent feasible**, through the awarding of contracts for work and services to Section 3 Certified businesses, and to provide employment and training to Section 3 residents. We commit to include the Section 3 clause in the construction contract and all subcontracts. All subcontractors interested in submitting bids for contracts will be informed of the Section 3 requirements and goals.

Goals

Contracting:

We will demonstrate compliance with Section 3 regulations, and Good Faith Efforts to award at least 10 percent of the total dollar amount of all Section 3 covered contracts for building trades work, and, at least 3 percent of the total dollar amount of all other Section 3 covered contracts (i.e., professional services) to Section 3 business concerns.

- ☐ 10% of labor contracts and
- ☐ 3% of all other contracts to Section 3 businesses

If we do not meet the minimum goals set forth above, we will be prepared to demonstrate why it was not possible. We understand failure to follow our Section 3 Plan could result in finding us non-compliant with the Section 3 regulations.

Employment and Training:

We will demonstrate compliance with Section 3 regulations, and Good Faith Efforts to employ Section 3 residents as 30 percent of the aggregate number of new hires, and to provide training to those new hires. We agree to provide information regarding existing employees and hiring needs as a part of this plan.

Any goal established in this plan must be met. If we fail to do so, we agree to provide an explanation and documentation as to why the goal was not met.

Outreach

We are committed to conduct an aggressive outreach campaign to make Section 3 Businesses and Section 3 Residents aware of contracting and possible hiring opportunities in connection with this Section 3 Covered Project. Efforts will include, but not be limited to, publication of opportunities in the local newspapers, use of signage at the project site, flyers posted in the neighborhood and surrounding areas, notification of local housing authorities, notification of Section 3 Residents from the Town/City/County Income Surveys project area, contractor and trade organizations, employment agencies, career centers and local Youthbuild chapters.

Project Neighborhood Area

The project neighborhood area:

This area will be the primary focus of all outreach attempts.

Section 3 Coordinator

Name:

Contact Information:

This person will serve as the main point of contact for all Section 3 related issues on behalf of the prime contractor, and the subcontractor.

Reporting

We agree to submit a Master Subcontractor List on the 20th day of each month after construction of the Section 3 Covered Project has commenced. We agree to submit an annual report to the Town/City/County of _____ on HUD Form 60002 of the Section 3 Covered Project. We agree to immediately report any changes in this plan, including but not limited to, changes in the dollar amount of contracts awarded and staffing needs of the subcontractors.

Attachments

The following attachments are incorporated into and made a part of this Section 3 Plan:

- _____ Section 3 Clause that will be included in all contracts
- _____ Contracting Plan
- _____ Outreach to Solicit Bids from Section 3 Businesses
- _____ Permanent Employee Listing for the Prime Contractor
- _____ Permanent Employee Listing for the Sub Contractors

We agree to provide to the Town/City/County of _____ the following documentation as soon as the information is available to us:

- Outreach to Solicit Bids from Section 3 Businesses (updated)
- New Hires for the Prime Contractor
- New Hires for the Subcontractor
- Section 3 New Hires Trained for the Prime Contractor
- Section 3 New Hires Trained for the Subcontractor
- HUD 60002 Report

Submitted to Town/City/County of

Date: _____

Prime Contractor

(Print/type name)

By: _____

(Print/type name and title)

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been

communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who

is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) **Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by

the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be

awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1 01 0, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration..... makes, utters or publishes any statement knowing the same to be false..... shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. The provisions of this paragraph B are applicable where the amount of the prime contract exceeds \$100,000. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

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

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.

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

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

C. Health and Safety. The provisions of this paragraph C are applicable where the amount of the prime contract exceeds \$100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

(3) The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

"General Decision Number: NC20200054 08/14/2020

Superseded General Decision Number: NC20190054

State: North Carolina

Construction Type: Building

County: Jackson County in North Carolina.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.80 for calendar year 2020 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.80 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2020. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2020
1	08/14/2020

* PLUM0421-004 07/01/2020

	Rates	Fringes
PIPEFITTER (Excluding HVAC System Installation).....	\$ 28.50	12.41

SUNC2011-035 08/26/2011		

	Rates	Fringes
BRICKLAYER.....	\$ 18.45	4.18
CARPENTER (Drywall Hanging Only).....	\$ 17.59	2.31
CARPENTER (Form Work Only).....	\$ 14.28	1.13

CARPENTER, Excludes Drywall Hanging, and Form Work.....	\$ 15.60	2.25
CEMENT MASON/CONCRETE FINISHER...	\$ 14.02	0.00
ELECTRICIAN.....	\$ 15.37	0.40
HVAC MECHANIC (Installation of HVAC Unit Only, Excludes Installation of HVAC Pipe and Duct).....	\$ 16.94	3.04
IRONWORKER, STRUCTURAL.....	\$ 18.75	5.62
LABORER: Common or General.....	\$ 11.98	2.05
LABORER: Landscape & Irrigation.....	\$ 10.29	1.82
LABORER: Mason Tender-Brick/Cement/Concrete.....	\$ 10.00	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 18.60	1.41
OPERATOR: Crane.....	\$ 19.25	2.37
OPERATOR: Grader/Blade.....	\$ 15.25	1.52
PAINTER: Brush, Roller and Spray.....	\$ 14.77	1.87
PLUMBER, Excludes HVAC Unit Installation.....	\$ 17.51	2.33
ROOFER.....	\$ 13.55	0.80
SHEET METAL WORKER (HVAC Duct Installation Only).....	\$ 15.62	2.09
SHEET METAL WORKER, Excludes HVAC Duct and Unit Installation.....	\$ 13.61	1.10
TRUCK DRIVER: Dump Truck.....	\$ 12.50	1.36

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

=====

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
for Federal Contractors applies to all contracts subject to the
Davis-Bacon Act for which the contract is awarded (and any
solicitation was issued) on or after January 1, 2017. If this
contract is covered by the EO, the contractor must provide
employees with 1 hour of paid sick leave for every 30 hours
they work, up to 56 hours of paid sick leave each year.

Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates

the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an

interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION"

Conflict of Interest (2 CFR Part §200.318 General procurement standards)

Interest of Members, Officers, or Employees of the Recipient, Members of Local Governing Body, or Other Public Officials. No member, officer, or employee of the recipient, or its agents, no member of the governing body of the locality in which the program is situated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the program during his tenure or for one year thereafter, shall have any financial interest, direct or indirect, in any contract or subcontract, or the proceeds thereof, for work to be performed in connection with the program assisted under this agreement. Immediate family members of said members, officers, employees, and officials are similarly barred from having any financial interest in the program. The recipient shall incorporate, or cause to be incorporated, in all such contracts or subcontracts, a provision prohibiting such interest pursuant to the purpose of this section.

Nondiscrimination Clause —

Section 109, Housing and Community Development Act of 1974

No person in the United States shall on the ground of race, color, national origin, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds available under this title.

Age Discrimination Act of 1975, as amended —
Nondiscrimination on the Basis of Age

No qualified person shall on the basis of age, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity which receives or benefits from Federal financial assistance.

Section 504 of the Rehabilitation Act of 1973, as amended —
Nondiscrimination on the Basis of Disability

No qualified disabled person shall on the basis of disability, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity which receives or benefits from Federal financial assistance.

Access to Records and Record Retainage Clause

In general, all official project records and documents must be maintained during the operation of this project and for a period of three years following closeout in compliance with 24 CFR 570.490.

The North Carolina Department of Commerce: Rural Development Division, the North Carolina Department of the Treasurer, U.S. Department of Housing and Urban Development, the Comptroller General of the United States, and the NC Department of

Environmental Quality, or any of their duly authorized representatives, shall have access to any books, documents, papers and records of the Administering Agency which are pertinent to the execution of this agreement, for the purpose of making audits, examinations, excerpts and transcriptions in compliance with the above Rule.

Lobbying Clauses

Required by Section 1352, Title 31, U.S. Code

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative, agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds, have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying" in accordance with its instructions.

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

Legal Remedies Provision and Termination Provision

As stated in 24 CFR Part 85.36 (2 CFR Appendix II to Part 200—Contract Provisions for Non-Federal Entity Contracts Under Federal Awards)

- a. Contracts other than small purchases shall contain provisions or conditions which will allow for administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as may be appropriate.

As stated in 24 CFR Part 85.36 (2 CFR Appendix II to Part 200—Contract Provisions for Non-Federal Entity Contracts Under Federal Awards)

- b. All contracts in excess of \$10,000 shall contain suitable provisions for termination by the grantee including the manner by which it will be effected and the basis for settlement. In addition, such contracts shall describe conditions under which the contract may be terminated for default as well as conditions where the contract may be terminated because of circumstances beyond the control of the contractor.

APPENDIX II TO PART 200—CONTRACT PROVISIONS FOR NON-FEDERAL ENTITY CONTRACTS UNDER FEDERAL AWARDS

In addition to other provisions required by the Federal agency or non-Federal entity, all contracts made by the non-Federal entity under the Federal award must contain provisions covering the following, as applicable.

(A) Contracts for more than the simplified acquisition threshold currently set at \$150,000, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

(B) All contracts in excess of \$10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement.

(C) Equal Employment Opportunity. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of “federally assisted construction contract” in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, “Equal Employment Opportunity” (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” and implementing regulations at 41 CFR part 60, “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor.”

(D) Davis-Bacon Act, as amended (40 U.S.C. 3141-3148). When required by Federal program legislation, all prime construction contracts in excess of \$2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, “Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction”). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the

Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). The Act provides that each contractor or sub recipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

(E) Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

(G) Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended—Contracts and sub grants of amounts in excess of \$150,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

(H) Debarment and Suspension (Executive Orders 12549 and 12689)—A contract award (see 2 CFR 180.220) must not be made to parties listed on the government wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

(I) Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)—Contractors that apply or bid for an award exceeding \$100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any

Revised 11/28/18

Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

[78 FR 78608, Dec. 26, 2013, as amended at 79 FR 75888, Dec. 19, 2014]

Disclosure of Lobbying Activities

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure)

1. Type of Federal Action: _____ a. contract _____ b. grant _____ c. cooperative agreement _____ d. loan _____ e. loan guarantee _____ f. loan insurance	2. Status of Federal Action: _____ a. bid/offer/application _____ b. initial award _____ c. post-award	3. Report Type: _____ a. initial filing _____ b. material change For material change only: Year _____ quarter _____ Date of last report _____
4. Name and Address of Reporting Entity: _____ Prime _____ Subawardee Tier _____, if Known: Congressional District, if known:		5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime: Congressional District, if known:
6. Federal Department/Agency: 	7. Federal Program Name/Description: CFDA Number, if applicable: _____	
8. Federal Action Number, if known: 	9. Award Amount, if known: \$ _____	
10. a. Name and Address of Lobbying Registrant <i>(if individual, last name, first name, MI):</i>	b. Individuals Performing Services <i>(including address if different from No. 10a)</i> <i>(last name, first name, MI):</i>	
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.		
Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____		
Federal Use Only		Authorized for Local Reproduction Standard Form - LLL (Rev. 7-97)

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitations for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Included prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10(a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503



Certification of Eligibility Form

Grantee: _____

Grant Number: _____

Project Name: _____

This form must be included in all contracts obligated by grantees and paid with CDBG funds

By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Federal Funded Government contracts by **29 CFR §5.12, 2 CFR § 2424, 2 CFR § 180.220, and 40 U.S. Code § 3144 - Authority to pay wages and list contractors violating contracts, Davis Bacon Act.**

No part of this contract shall be subcontracted to any person or firm ineligible for award of a Federal Funded Government contract by **29 CFR §5.12, 2 CFR § 2424, 2 CFR § 180.220, and 40 U.S. Code § 3144 - Authority to pay wages and list contractors violating contracts, Davis Bacon Act.**

The Federal Debarment and Suspension/ Purchase and Contract List (www.sam.gov) and the State of North Carolina Debarred Vendors/Purchase and Contract List (<http://ncadmin.nc.gov/government-agencies/procurement/contracts/debarred-vendors>) have been reviewed and the contractor or subcontractor has been determined to be eligible to participate in a CDBG assisted project.

We have attached the documentation proving eligibility (websites printout).

<u>Firm Information</u>	
Name:	
Address:	
Federal Identification Number or Social Security Number:	
Representative Name and Title:	
<u>Verification</u>	
Verification date:	
Verifying Officer Name and Title:	

Firm Representative

Date

Verifying Officer

Date

Grantee Representative

Date

Table A: Prime Contractor and list of selected subcontractors

List Prime and ALL of the selected subcontractors (both DBE's and non-DBE's) being used on the project. Each Trade listed on this sheet should have a completed Table B: Subcontract Solicitation List showing the DBE firms contacted and given opportunities to bid.

Company Name (list prime first then subs)	Company Address and Phone	Trade (Above) and Price (Below)	MBE or WBE and certifying agency <u>if applicable</u>	(State use only) Listed in EPLS as Debarred?
		\$		
		\$		
		\$		
		\$		

Calculate M/WBE utilization as a percent (00.00%) of the prime contract. Limited to 100% even if the Prime is a DBE.

MBE and WBE subs total	\$	_____ %
Prime Contract Price	\$	

Note: Table A substitutes the State of NC "Identification of Minority Participation" form

Table B: Subcontract Solicitation List

Table B is required if:

- 1) Utilization % on Table A is less than 10%

Trade: _____ (enter the trade being solicited, paving, hauling etc.)

List the firm being used on the project first. If three MBE or WBE firms are not listed, additional information must be provided showing advertisements and/or sources used to identify MBE/WBE subs.

Use as many of these sheets as are necessary to cover every trade being subbed out.

Company Name	Company Address and Phone	MBE or WBE and certifying agency if applicable.	How was this firm contacted (email, letter, phone) and what was the result of the solicitation? *

*Must submit copies of emails or letters. If phone calls were made this sheet can serve as documentation of calls.

NC Division of Water Infrastructure MBE/WBE (DBE) Compliance Supplement Instructions (CDBG-I)

(This package combines the various aspects of State of NC HUB program requirements and Federal DBE requirements into a single compliance supplement to eliminate redundancy and ambiguity)

Item	What to do with it
Good Faith Efforts Form	Provided by all bidders to be responsive
Table A (Summary of firms on job)	Provided by all bidders to be responsive
Table B (per item being subbed)	Provided by low bidder that obtains less than 10% M/WBE utilization (see page 2)
Provide documentation of anything you did that is mentioned later in this supplement (Keep documents in Local Government files)	<ul style="list-style-type: none">- Proof of trade paper advertisement- Printouts of DBE sources used- Solicitation emails and/or letters

NOTES on this Compliance Supplement

- **State of NC MBE/WBE participation goal:** 10% (combined)

Table B is not required for SRP and SEL projects if you achieve 10% utilization.

The good faith efforts must be adhered to and all forms provided regardless of what percentage utilization is achieved.

DBE (MBE or WBE) Certification

For a firm to count towards the goals, a firm must be properly certified. Table A and Table B both provide spaces to note who certified the firm. The North Carolina Department of Administration and North Carolina Department of Transportation are the most common certifications we see listed. Division of Water Infrastructure staff verify all certifications listed.

GUIDANCE ON MBE/WBE OUTREACH

1. Minimum Acceptable Outreach Standards

The program shall include minority and woman-owned businesses in all contracting activities entered by the participating jurisdiction to facilitate the provision of any federal law applicable to such jurisdiction. Minimum HUD standards require that each participating jurisdiction's outreach effort to minority and women-owned businesses be:

- A good faith, comprehensive and continuing endeavor;
- Supported by a statement of public policy and commitment published in the print media of widest local circulation;

- Supported by an office and/or a key, ranking staff person with oversight responsibilities and access to the chief elected official; and
- Designed to utilize all available and appropriate public and private sector local resources.

2. Guidelines for a Minority/Women Business Outreach Program

Under the minimum HUD standards cited above, the following guidelines are provided for use by participating jurisdictions in implementing outreach programs to ensure the inclusion, to the maximum extent possible, of entities owned by minorities and women. Each participating jurisdiction should:

- Develop a systematic method for identifying and maintaining an inventory of certified minority and women's business enterprises (MBEs and WBEs), their capabilities, services, supplies and/or products;
- Utilize the local media, electronic and print, to market and promote contract and business opportunities for MBEs and WBEs;
- Develop informational and documentary materials (fact sheets, program guides, procurement forecasts, etc.) on contract/subcontract opportunities for MBEs and WBEs;
- Develop procurement procedures that facilitate opportunities for MBEs and WBEs to participate as vendors and supplies of goods and services;
- Sponsor business opportunity-related meetings, conferences, seminars, etc., with minority and women business organizations; and
- Maintain centralized records with statistical data on the utilization and participation of MBEs and WBEs as contractors/subcontractors in all HUD-assisted program contracting activities.

Each participating jurisdiction, utilizing the standards and guidelines listed above, shall prescribe procedures and actions it will undertake in implementing a minority and women's business enterprise outreach program. The above items represent basic outreach-related activities and are not all-inclusive actions a participating jurisdiction may undertake.

Pertinent State of North Carolina Administrative Code Regarding M/WBE Compliance. The provisions in this Compliance Supplement constitute compliance with the Rules below.

Owner Requirements	01 NCAC 30I .0306
Contractor Requirements	01 NCAC 30I .0308

Resources

Some sources for identifying MBE/WBE (DBE) firms

- <https://www.ips.state.nc.us/vendor/SearchVendor.aspx> (NCDOA)
- <https://www.ebs.nc.gov/VendorDirectory/default.html> (NCDOT)
- http://dsbs.sba.gov/dsbs/search/dsp_dsbs.cfm (US SBA)

Some sources for finding minority trade papers for potential solicitation advertisements and Federal advertising options

- <http://web.sba.gov/subnet/> (US SBA Subnet advertising website)
- <https://www.mbda.gov/> (US Dept. of Commerce)
- <https://ncadmin.nc.gov/businesses/hub> (NC HUB Office)

Good Faith Efforts Form

Attempts to provide subcontracting opportunities for MBE/WBE firms.

Per 01 NCAC 30I .0101, 50 points must be claimed below by the bidder.

(This is identical to State of NC Affidavit A)

- ☐ **1 – (10 pts)** Contacted minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.
- ☐ **2 --(10 pts)** Made the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bids are due.
- ☐ **3 – (15 pts)** Broken down or combined elements of work into economically feasible units to facilitate minority participation.
- ☐ **4 – (10 pts)** Worked with minority trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
- ☐ **5 – (10 pts)** Attended pre-bid meetings scheduled by the public owner.
- ☐ **6 – (20 pts)** Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.
- ☐ **7 – (15 pts)** Negotiated in good faith with interested minority businesses and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
- ☐ **8 – (25 pts)** Provided assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers to help minority businesses in establishing credit.
- ☐ **9 – (20 pts)** Negotiated joint venture and partnership arrangements with minority businesses to increase opportunities for minority business participation on a public construction or repair project when possible.
- ☐ **10 - (20 pts)** Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

Results of Good Faith Efforts Undertaken (you must check one box below)

- ☐ No subcontractors are being used for this contracted work. Fill out Table A listing only the Prime Contractor. **(This statement takes the place of State of NC Affidavit B)**
- ☐ Subcontractors are being used. Fill out Table A and B for each trade. **Each Table B lists 3.**
- ☐ Subcontractors are being used. If any Table B has fewer than 3 solicitations, you must also advertise in an M/WBE trade paper and indicate what source of M/WBE firms you used (*must list at least one*). Some possible papers and sources of M/WBE firms are listed in the Instructions of this Supplement.

Name of the Trade Paper: _____

Submit proof of advertisement with package

M/WBE Sources: Source: _____ Source: _____

Submit printouts from M/WBE source(s)

Certification Statement and Affidavit of Contractor.

The below affidavit constitutes compliance with 01NCAC 30I .0308(7)(a) and (b) and takes the place of State of North Carolina Affidavits C and D.

I have read the information in this compliance supplement and all information provided to the State in this package is accurate and true to the extent of my knowledge including the calculated percentages and the good faith efforts presented herein.

Prime Contractor Company Name (Print)

Prime Contractor Representative (Sign & Date)



State of _____, County of _____

Subscribed and sworn to before me this _____ day of _____ 20____

Notary Public _____

My Commission Expires _____

Applicant Name (Print)

Applicant Authorized Representative (Sign & Date)

Division of Water Infrastructure Project Number

Employment and Contracting Opportunities

To the extent that they are otherwise applicable, the Town/City/County of _____ and **Prime Contractor** shall comply with:

(a) **Executive Order 11246**, as amended by Executive Orders 11375, 11478, 12086, and 12107 (3 CFR 1964-1965 Comp. p. 339; 3 CFR, 1966-1970 Comp., p. 684; 3 CFR, 1966-1970., p. 803; 3 CFR, 1978 Comp., p. 230; 3 CFR, 1978 Comp., p. 264 (Equal Employment Opportunity), and Executive Order 13279 (Equal Protection of the Laws for Faith-Based and Community Organizations), 67 FR 77141, 3 CFR, 2002 Comp., p. 258; and the implementing regulations at 41 CFR chapter 60; and

(b) **Section 3 of the Housing and Urban Development Act of 1968** (12 U.S.C. 1701u) and implementing regulations at 24 CFR part 135.

[68 FR 56405, Sept. 30, 2003]

The Equal Opportunity plan and Section 3 plan have been adopted by the Town/City/County of _____

Name and Title
Grantee Authorized Representative

Date

Signature
Grantee Authorized Representative

Name and Title
Prime Contractor Representative

Date

Signature
Prime Contractor Representative

This Page Intentionally Blank

SECTION 0860 **ALLOWANCES**

Certain items in the Contract Documents are identified, defined and described as allowance items. The following identified allowances shall be included in the lump sum base bid amount. The final payment for each of these items will be adjusted to the actual final quantities of work for each item, as measured by the engineer, and will be paid for at the unit price for each item.

1.0 “Rock Excavation” Allowance: Refer to *Rock Excavation & Blasting – Section 02090* of the specifications for a complete description. **A TOTAL OF One Hundred (100) cubic yard allowance for “rock excavation” shall be included in the lump sum total bid. THE ALLOWANCE SHALL BE EQUALLY DIVIDED WITH AN ALLOWANCE OF FIFTY (50) CUBIC YARDS INCLUDED IN THE WASTEWATER LUMP SUM BID PRICE AND AN ALLOWANCE OF FIFTY (50) CUBIC YARDS INCLUDED IN THE WATER LUMP SUM BID PRICE. See also Rock Excavation & Blasting –Section 02090.**

2.0 “Undercut Excavation with Stone Backfill” Allowance: Refer to *Earthwork – Section 02200* of the specifications for a complete description. **A TOTAL OF One Hundred (100) cubic yard allowance for “undercut excavation with stone backfill” shall be included in the lump sum total bid. THE ALLOWANCE SHALL BE EQUALLY DIVIDED WITH AN ALLOWANCE OF FIFTY (50) CUBIC YARDS INCLUDED IN THE WASTEWATER LUMP SUM BID PRICE AND AN ALLOWANCE OF FIFTY (50) CUBIC YARDS INCLUDED IN THE WATER LUMP SUM BID PRICE. See also Earthwork –Section 02200.**

3.0 “Undercut Excavation with Soil Backfill” Allowance: Refer to *Earthwork – Section 02200* of the specifications for a complete description. **A TOTAL OF One Hundred (100) cubic yard allowance for “undercut excavation with soil backfill” shall be included in the lump sum total bid. THE ALLOWANCE SHALL BE EQUALLY DIVIDED WITH AN ALLOWANCE OF FIFTY (50) CUBIC YARDS INCLUDED IN THE WASTEWATER LUMP SUM BID PRICE AND AN ALLOWANCE OF FIFTY (50) CUBIC YARDS INCLUDED IN THE WATER LUMP SUM BID PRICE. See also Earthwork – Section 02200.**

4.0 “Underdrain” Allowance: Refer to *Storm Drainage & Incidentals – Section 02630* of the specifications for a complete description. **A TOTAL OF One Hundred (100) linear feet allowance for “underdrain” shall be included in the lump sum total bid. THE ALLOWANCE SHALL BE EQUALLY DIVIDED WITH AN ALLOWANCE OF FIFTY (50) LINEAR FEET INCLUDED IN THE WASTEWATER LUMP SUM BID PRICE AND AN ALLOWANCE OF FIFTY (50) LINEAR FEET INCLUDED IN THE WATER LUMP SUM BID PRICE. See also Storm Drainage & Incidentals – Section 02630.**

This Page Intentionally Blank

Jackson County Public Schools
Proposed Improvements for Blue Ridge School
Water and Wastewater Systems
CDBG-I Project No. 09-D-2945
Jackson County - Owner
Jackson County, North Carolina

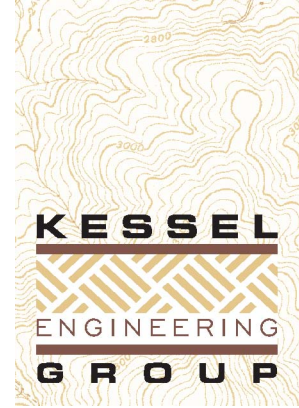
SECTION 0900

Report of Geotechnical Exploration

The following “Revised Report of Test Pit Exploration” geotechnical report Dated August 18, 2020 by Kessel Engineering Group is intended only for general reference and is not a part of the Contract Documents. Bidders are responsible for making their own interpretations of data, conducting their own investigations, verifications and reaching their own conclusions regarding physical conditions prior to submitting a bid. The bidder shall obtain the approval of the owner prior to conducting on site investigations.

August 18, 2020

Mr. Don Adams
Jackson County Manager
401 Grindstaff Cove Road, A207
Sylva, NC 28779
donadams@jacksonnc.org



**Revised Report of Test Pit Exploration
Blue Ridge School Water & Wastewater Improvements
Jackson County, North Carolina
KEG Project No. JA20-4049-01**

Mr. Adams:

Kessel Engineering Group, PLLC (KEG) is pleased to present this revised report of test pit exploration for the proposed Blue Ridge School Water and Wastewater Improvements project in Jackson County, North Carolina. The purpose of this exploration was to determine general subsurface conditions at the site and to provide geotechnical recommendations for foundation design and site preparation.

PROJECT INFORMATION

Initial project information was provided through email correspondence between our Mr. Ian Johnson, P.E. and Mr. Victor Lofquist, P.E. of Lofquist & Associates, Inc. Additional information was gathered during a May 29, 2020 site visit by our Mr. Matthew Gibson, P.E. We have been provided with a set of drawings entitled *Proposed Improvements for Blue Ridge School Water and Wastewater Systems*, sheets C1.0 through C8.0, prepared by Lofquist and dated 4/30/2020. We have also recently been provided with revised sheets C4.0 and C6.0 (revised May 21, 2020). The provided drawings include existing and proposed facilities, as well as existing and proposed topographic contours.

The 27.5-acre site is located along the west side of NC-107 and to the south of North Norton Road (see Figure 1). The site is relatively flat with an existing school facility, an early college building, and three administration/classroom buildings, associated parking, and sports fields. An existing wastewater treatment facility is located to the west of the school building and to the south of the soccer field. A slope with inclinations of 2H:1V to 3.5H:1V is located on the east side of the property going downhill from NC-107 to the west. The east and west edges of the property are wooded. A creek runs north to south along the western edge of the property, and an additional creek borders the property to the north.

Project plans consist of constructing a new 10,000 gallon per day wastewater treatment plant directly to the south of the existing water treatment plant, as well as a water storage facility on the southeast corner of the site, directly to the east of the southeastern corner of the early college building, and to the east of the existing well. Current project plans include excavating the area for the wastewater treatment plant and burying the system. Based on our review of the provided topographic information, earthwork fills on the order of 10 feet are anticipated for the proposed wastewater treatment plant with a tank bearing elevation of between approximately 3626.26 feet and 3627.65 feet, and a finished grade elevation of 3636 feet. Anti-floatation deadman systems are also planned to be used in conjunction with the wastewater treatment plant tanks. It should be noted that the wastewater treatment plant footprint has been shifted slightly to the northeast since performing our fieldwork (approximately 40 ft). Earthwork fills on the order of 1 to 2 feet are anticipated for the proposed water storage facility with a finished floor elevation of approximately 3662.6 feet. Based on the provided drawings, foundation loading for the proposed tanks and water storage utility building is 2,500 psf.

KESSEL ENGINEERING GROUP

582 HENDERSONVILLE ROAD SUITE ONE | ASHEVILLE NC 28803 | P:(828) 277-6351 F:(828) 277-6355
WWW.THEKESSELGROUP.COM

SITE GEOLOGY

The project site is located in the Blue Ridge Physiographic Province. The bedrock in this region is a complex crystalline formation that has been faulted and contorted by past tectonic movements. The rock has weathered to residual soils which form the mantle for the hillsides and hilltops. The typical residual soil profile in areas not disturbed by erosion or grading consists of clayey soils near the surface where weathering is more advanced, underlain by sandy silts and silty sands.

The boundary between soil and rock is not sharply defined. This transitional zone, termed “partially weathered rock,” is normally found overlying the parent bedrock. Partially weathered rock is defined, for engineering purposes, as residual material with standard penetration resistances in excess of 100 blows per foot. Weathering is facilitated by fractures, joints and the presence of less resistant rock types. Consequently, the profile of the partially weathered rock and hard rock is quite irregular and erratic, even over short horizontal distances. Also, it is not unusual to find lenses and boulders of hard rock and zones of partially weathered rock within the soil mantle, well above the general bedrock level.

Quite often, the upper soils along drainage features and in flood plain areas are water-deposited (alluvial) materials that have been eroded and washed down from adjacent higher ground. These alluvial soils are usually soft and compressible, having never been consolidated by pressures in excess of their present overburden.

FIELD EXPLORATION

The site was explored by performing a series of four (4) test pits (TP-1, TP-2, TP-3, and TP-4) in the footprint of the proposed wastewater treatment plant, and three (3) test pits (TP-5, TP-6, and TP-7) in the footprint of the proposed water storage utility building at the approximate locations as indicated on the attached *Field Exploration Plan* (see Figure 2 and Figure 3). The test pits locations were determined in the field by our Mr. Matthew Gibson, P.E. by referencing the provided set of drawings and identifiable site landmarks.

Test pits were excavated by Scott Farmer Grading, Inc., utilizing a Bobcat E32 mini-excavator. The soils encountered by the test pits were identified in the field from cuttings brought to the surface by the excavation equipment. At regular intervals the soil consistency of the encountered materials was measured with a dynamic cone penetrometer. The conical point was first seated to penetrate any loose cuttings and then was driven increments of 1¼ inches with blows from a 15 pound hammer falling 20 inches. The number of blows required to achieve this penetration was recorded. The penetration resistance, once properly evaluated, is an index to the soil strength and foundation supporting capability. Groundwater levels were measured at the time of excavation. The test pits were backfilled at the completion of the field work. Soil descriptions are tabulated on the attached test pit logs.

SUBSURFACE CONDITIONS

Beneath a surficial layer of topsoil and rootmat approximately 6 to 12 inches thick, test pits performed in the location of the proposed wastewater treatment plant encountered existing fill and alluvial soils. Test pit TP-1 encountered fill to a depth of 3 feet beneath the existing ground surface that were underlain by alluvial soils to a refusal depth of 5.5 feet beneath the existing ground surface. The encountered fill soils consisted of very loose silty sands (SM) with gravel. Test pit TP-3 encountered alluvial soils, below the surficial topsoil and rootmat, to a refusal depth of 7 feet beneath the existing ground surface. Test pit TP-4 encountered alluvial soils, below the surficial topsoil and rootmat, to a depth of 7 feet, underlain by residual soils to a refusal depth of 7.5 feet beneath the existing soil. The alluvial soils encountered in test pits TP-1, TP-3, and TP-4 consisted of very loose and loose silty sands (SM) with some topsoil and trace organics. Residuum encountered in test pit TP-4 consisted of very firm silty sands (SM).

Test pit TP-2 encountered unmarked existing utilities at 12 inches below the existing ground surface. It was unclear if these utilities were currently in service and therefore test pit TP-2 was terminated prior to damaging these utility lines.

Test pits TP-5, TP-6, and TP-7 were performed in the location of the proposed water storage utility building. TP-5 encountered 12 inches of topsoil and rootmat underlain by existing fill soils extending to 3 feet beneath the existing ground surface. The fill encountered in test pit TP-5 consisted of loose silty sands (SM) with trace topsoil and gravel. Test pit TP-7 encountered fill to a depth of 3.5 feet, consisting of firm silty sands (SM) with gravel. The existing fill was underlain by residuum, extending to a refusal depth of 5.5 feet in test pit TP-5, and a termination depth of 9 feet in TP-7. Test pit TP-6 encountered residuum from the ground surface to a termination depth of 9 feet. Encountered residuum consisted of loose to very firm silty sands (SM).

Refusal materials are those materials which are sufficiently hard to prevent the vertical advancement of the excavation equipment. Refusal may result from very dense soils, partially weathered rock, boulders, lenses, ledges, or layers of relatively hard rock underlain by partially weathered rock or residual soil; refusal may also represent the surface of relatively continuous bedrock. Core drilling or power drilling procedures are required to penetrate refusal materials and to determine their character and continuity. Core drilling or power drilling was beyond the scope of this exploration.

TABLE 1 SUMMARY OF SUBSURFACE CONDITIONS ENCOUNTERED BY TEST PITS (MEASURED IN FEET BELOW THE EXISTING GROUND SURFACE)						
Test Pit No.	General Location	Topsoil/ Rootmat (feet)	Existing Fill (feet)	Alluvium (feet)	Residuum (feet)	Termination or Refusal Depth (feet)
TP-1	Wastewater Treatment Plant - NW End of Pad	0 to 0.5	1 to 3	3 to 5.5*	-	5.5 (r)
TP-2**	Wastewater Treatment Plant - SW Corner of Pad	0 to 1	-	-	-	1.0 (t)**
TP-3	Wastewater Treatment Plant - SE Center of Pad	0 to 1	-	1 to 7.5*	-	7.5 (r)
TP-4	Wastewater Treatment Plant -NE End of Pad	0 to 0.5	-	1 to 7*	7 to 7.5	7.5 (r)
TP-5	Water Storage Utility Building - SW Corner of Pad	0 to 1	1 to 3*	-	3 to 5.5	5.5 (r)
TP-6	Water Storage Utility Building - NW Corner of Pad	-	-		0 to 9	9 (t)
TP-7	Water Storage Utility Building - East Center of Pad	-	0 to 3.5	-	3.5 to 9	9 (t)

Note: See Figure 2 for approximate locations.

- Material not encountered in test pit

* Topsoil/organic materials encountered in fill/alluvial soils. Reference test pit logs for details.

** TP-2 terminated at 12 inches due to encountered existing utilities

At the time of excavation, test pits TP-4, TP-5, and TP-6 encountered groundwater at depths of 5 feet, 5.5 feet, and 3 feet beneath the existing ground surface, respectively. Groundwater levels may fluctuate several feet with seasonal and rainfall variations and with changes in the water level in the adjacent creek. Normally, the highest groundwater levels occur in late winter and spring and the lowest levels occur in late summer and fall.

The above descriptions and table provide a summary of the subsurface conditions encountered by the test pits. The attached logs contain information recorded at each test pit location. The lines designating the interfaces between various strata represent approximate boundaries and the transition between strata may be gradual. Elevations noted in the logs were determined from the provided topographic information and should be considered approximate. Soil conditions may vary between test pit locations.

ANALYSIS AND DESIGN RECOMMENDATIONS

Wastewater Treatment Plant

Difficult Excavation

Test pits TP-1, TP-3 and TP-4 encountered shallow refusal materials at an elevation of approximately 3626.5 feet. This is within approximately 1 foot or less of the proposed tank bearing elevations. Depending on the proposed final grades, difficult excavation may be encountered in these areas, as the surface of refusal materials can be erratic even over short horizontal distances.

Heavy excavation equipment and heavy excavation equipment with ripping tools will likely be able to remove some of the refusal materials encountered at the site. The ease of excavation of these materials cannot be specifically quantified and depends on the quality of grading equipment, skill of the equipment operators and geologic structure of the material itself, such as the direction of bedding, planes of weakness and spacing between discontinuities. Resistant areas could likely be approached from multiple directions with the ripper and thus align with a plane of weakness, facilitating excavation efforts. Pneumatic hammers may be necessary to efficiently remove more resistant areas of PWR and bedrock. Alternatively, if possible, raising proposed tank elevations and associated site grades could help reduce the need for difficult excavations. Depending on the ability to effectively remove/excavate refusal materials, it may be necessary to provide alternative designs for anti-buoyancy deadman systems (i.e., locations adjacent tanks in lieu of below).

Existing Fill and Alluvium

Test pits TP-1, TP-3, and TP-4 encountered fill and alluvium containing topsoil and organics. Based on our experience with similar soils and site conditions, the existing fill and alluvial soils containing topsoil and organics are not suitable to use as fill for the wastewater treatment plant backfill around tanks or to raise site grades. We recommend using soil in accordance with the *Engineered Fill* section of this report.

Water Storage Utility Building

Based on subsurface information gathered in test pits TP-5, TP-6, and TP-7, the existing residuum and fill soils are suitable for support of shallow foundations, grade slabs, and newly placed engineered fill, provided surficial topsoil and rootmat materials are removed. Once surficial topsoil and rootmat materials are removed, we recommend proofrolling the construction area as described below prior to earthwork fill placement. Areas that fail proofrolling should be undercut to firmer materials and backfilled with engineered fill.

Foundations

Based on the test pit data and our experience with similar site conditions, the site is suitable for foundation support for the design bearing pressure of 2,500 psf of the proposed wastewater treatment plant as well as the proposed shallow foundations of the water storage utility building. Satisfactory performance of foundations is subject to the design and construction recommendations contained in this report.

To verify that residuum, existing fill passing proofrolling, or newly placed engineered fill encountered in the foundation excavations are suitable for bearing, we recommend that foundation excavations be examined and checked with a dynamic cone penetrometer by an engineering technician working under the direction of the geotechnical engineer. If alluvium is encountered at the wastewater treatment plant bearing elevation, these materials should be undercut to firm or better residuum and brought back to grade with engineered fill as described below. We understand the wastewater treatment plant components will typically be seated on a minimum 8 inch thick bedding layer of No. 57 stone. If groundwater is encountered at the bedding layer elevation, we recommend the No. 57 stone be wrapped in a non-woven, needle-punched filter fabric (e.g. Mirafi 140N) to help prevent the mitigation of soil fines into the bedding layer and possible settling of the components.

We recommend that the shallow foundations for the water storage utility building bear at least 36 inches below final exterior grade to provide frost protection and protective embedment and develop the recommended bearing capacity. We also recommend that the minimum widths for individual column and continuous wall footings be 24 and 18 inches, respectively. The minimum width is considered advisable to provide a margin of safety against a local or punching shear failure of the foundation soils.

Foundations should be constructed as soon as possible in order to minimize the potential for damage to bearing materials. The foundation bearing area should be level and free of loose soil, ponded water and debris. Foundation concrete should not be placed on soils that have been disturbed by seepage. If surface water intrusion or exposure softens the bearing materials, the softened materials must be removed from the foundation excavation bottom prior to placement of concrete. If the excavations must remain open for an extended period of time, or if rainfall becomes imminent while the bearing materials are exposed, we recommend that a 2-inch to 4-inch mudmat of lean (2,000 psi) concrete be placed on the bearing soils before the placement of reinforcing steel for protection.

Grade Slabs

Based on test pit data and our experience with similar site conditions, the site is suitable to provide subgrade support of the proposed grade slabs at the water storage utility building. Areas to provide support for grade slabs should be proofrolled prior to construction as described below. Grade slabs should be jointed around columns and along footing supported walls so that the slab and foundations can settle differentially without damage. If slab thickness permits, joints containing dowels or keys may be used in the slab to permit movement between parts of the slab without cracking or sharp vertical displacements. Completed slabs should be protected from excessive surface moisture prior to and during periods of prolonged below-freezing temperatures to prevent subgrade freezing and resulting heave.

Secondary Design Considerations

The following secondary design considerations are known to generally enhance performance of structural systems. Stormwater should be collected by an adequate stormdrain system and piped away from structures and fill slopes. Site grading should result in positive drainage away from structures. Water should not be allowed to pond around structures or in such locations that would lead to saturation of their subgrade. A minimum slope of approximately $\frac{1}{4}$ to $\frac{1}{2}$ -inch per foot should provide adequate drainage. Backfill for utility lines should be placed in accordance with the requirements for engineered fill to minimize the potential for differential settlement.

CONSTRUCTION RECOMMENDATIONS

Clearing and Grubbing

Existing topsoil, vegetation, disturbed soils, limbs, stumps, and surface soils containing organic matter or other deleterious materials should be removed from the area of the proposed construction. Topsoil and organic soils may be stockpiled for later use in areas to be landscaped. Stumps and other deleterious materials should be disposed of offsite or in areas of the site that will not be developed. Further construction of structures or pavement in areas containing limbs or stumps, organic soils, burn pit residue or other deleterious materials will first require that these materials be removed.

Engineered Fill

Fill used to raise the site should be uniformly compacted in thin (8-inch to 10-inch loose measure) horizontal lifts to at least 95 percent of the standard Proctor maximum dry density (ASTM D-698). The upper 18 inches of soils located below grade slabs should be compacted to 98 percent of the standard Proctor maximum dry density. Based on our visual observations during our subsurface exploration, the on-site fill soils are generally suitable to use as engineered fill, provided they are moisture conditioned and free of topsoil and organic material. The on-site alluvium is not suitable for reuse as engineered fill. Aggregate base course (ABC stone) may be substituted as a select backfill material in areas such as the base of excavation in the proposed wastewater treatment plant. If utilized, ABC stone should be compacted to the same standard as noted above. In general, soils having a Plasticity Index (PI) greater than 30 (less than 15 is preferable) should not be used for fill.

Engineered fill should be constructed in horizontal stages starting at the bottom of the fill area. Prior to each stage of fill placement into an existing slope, the slope should be benched with a level pad. The resulting series of level benches will serve to break the potential slip plane between the existing soils and newly placed engineered fill.

Before filling operations begin, representative samples of each proposed fill material should be collected and tested to determine the compaction and classification characteristics. The maximum dry density and optimum moisture content should be determined. Once compaction begins, a sufficient number of density tests should be performed by an engineering technician working under the direction of the geotechnical engineer to measure the degree of compaction being obtained.

The surface of compacted subgrade soils can deteriorate and lose its support capabilities when exposed to environmental changes or construction activity. Deterioration can occur from, but is not limited to, the effects of freezing temperatures, the formation of erosion gullies, exposure to extreme wetting/drying conditions, long term exposure to natural elements, and rutting caused by construction traffic. We recommend that surfaces of the subgrade that have deteriorated or softened be recompacted immediately prior to construction of additional engineered fill or pavements. Additionally, excavations through the subgrade soils, such as utility trenches, should be properly backfilled with compacted lifts of engineered fill. Recompanction of subgrade surfaces and compaction of backfill should be checked with a sufficient number of density tests to determine if adequate compaction is being achieved.

Shallow Groundwater

As mentioned previously, test pits TP-4, TP-5, and TP-6 encountered groundwater at depths of 5 feet, 5.5 feet, and 3 feet beneath the existing ground surface, respectively. Groundwater control will likely be required during construction at the wastewater treatment plant footprint, and may be required at the water storage utility building if the water table rises at the time of construction. We recommend the groundwater table be maintained at a depth of at least 2 feet below bottom of fill during fill placement. Adequate control of this groundwater could likely be accomplished by means of gravity ditches and pumping from gravel-lined, cased sumps. The contractor should be prepared to promptly remove surface water from the general construction area by similar methods.

Abandoning Existing Structures and Utilities

The proposed wastewater treatment plant is currently planned to be constructed in the same general location as the existing plant. Abandoned utilities should be removed and the resulting trenches filled with engineered fill, or abandoned utilities should be plugged after the facility is abandoned. If pipes are not removed or plugged, they may serve as conduits for subsurface erosion resulting in settlement. Trench backfill over left-in-place utility lines may require densification or replacement.

Proofrolling

We recommend that areas to provide support for engineered fill, pavements, foundations, and grade slabs be observed for soft soils and proofrolled with a 25 to 35 ton, four wheeled, rubber tired roller or similar approved equipment. The proofroller should make at least four passes over each location, with the last two passes perpendicular to the first two. Areas which wave, rut, or deflect excessively and continue to do so after several passes of the proofroller should be excavated to firmer soils. Excavated areas should be backfilled in thin (8-inch to 10-inch) lifts with engineered fill, as recommended in this report. The proofrolling and excavating operations should be monitored by an engineering technician working under the direction of the geotechnical engineer. Proofrolling should not be performed immediately following periods of precipitation or on wet or saturated subgrade.

The surface of the residual soils, existing fills, and newly placed engineered fill soils can deteriorate and lose its support capabilities when exposed to environmental changes and construction traffic. The removal or recompaction of these surficial soils may be required prior to construction of pavements and grade slabs. The extent of removal, if necessary, should be determined during construction by proofrolling.

Slopes and Excavations

Confined excavations such as for utility installation should conform to OSHA regulations. Due to the close proximity of the tanks in the proposed wastewater treatment plant, we recommend a mass excavation be performed to install equipment. Temporary side slopes through existing alluvium should be laid back at 2H:1V, or shallower. If groundwater is observed to be exiting the temporary excavations, the geotechnical engineer should be contacted immediately for revised recommendations for allowable cut slope inclinations. Permanent fill slopes constructed with newly placed engineered fill should be placed on a suitable foundation and should be constructed at 2H:1V, or flatter. Horizontal benches should be installed at regular vertical intervals as required by municipal codes. Cut and fill slope surfaces should be protected from erosion by grassing or by other means. Permanent slopes of 3H:1V or flatter may be desirable for mowing.

SPECIFICATIONS REVIEW

We recommend that we be retained to make a review of the foundation and earthwork plans and specifications prepared from the recommendations presented in this report. We would then suggest any modifications so that our recommendations are properly interpreted and implemented. An additional fee would apply for review of plans and specifications.


BASIS OF RECOMMENDATIONS

Our evaluation of foundation support conditions has been based on our understanding of the project information and data obtained in our exploration as well as our experience on similar projects. The general subsurface conditions utilized in our foundation evaluation have been based on interpolation of the subsurface data between the widely spaced test pits. Subsurface conditions between the test pits may differ. If the project information is incorrect or the structure locations (horizontal or vertical) and/or dimensions are changed, please contact us so that our recommendations can be reviewed. The discovery of site or subsurface conditions during construction which deviate from the data obtained in this exploration should be reported to us for our evaluation. The assessment of site environmental conditions for the presence or absence of pollutants in the soil, rock and groundwater of the site was beyond the scope of this exploration.

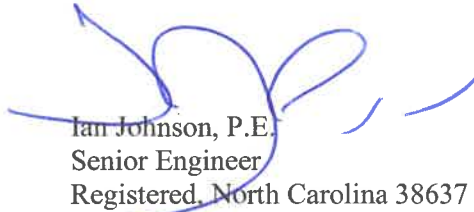
We appreciate the opportunity to offer our professional services on this project. We hope that you will give KEG consideration to providing construction materials testing services during the construction phase of this project. If you have any questions concerning this report, please contact us.

Sincerely,

KESSEL ENGINEERING GROUP, P.C. (N.C. Firm License No. P-0420)

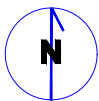
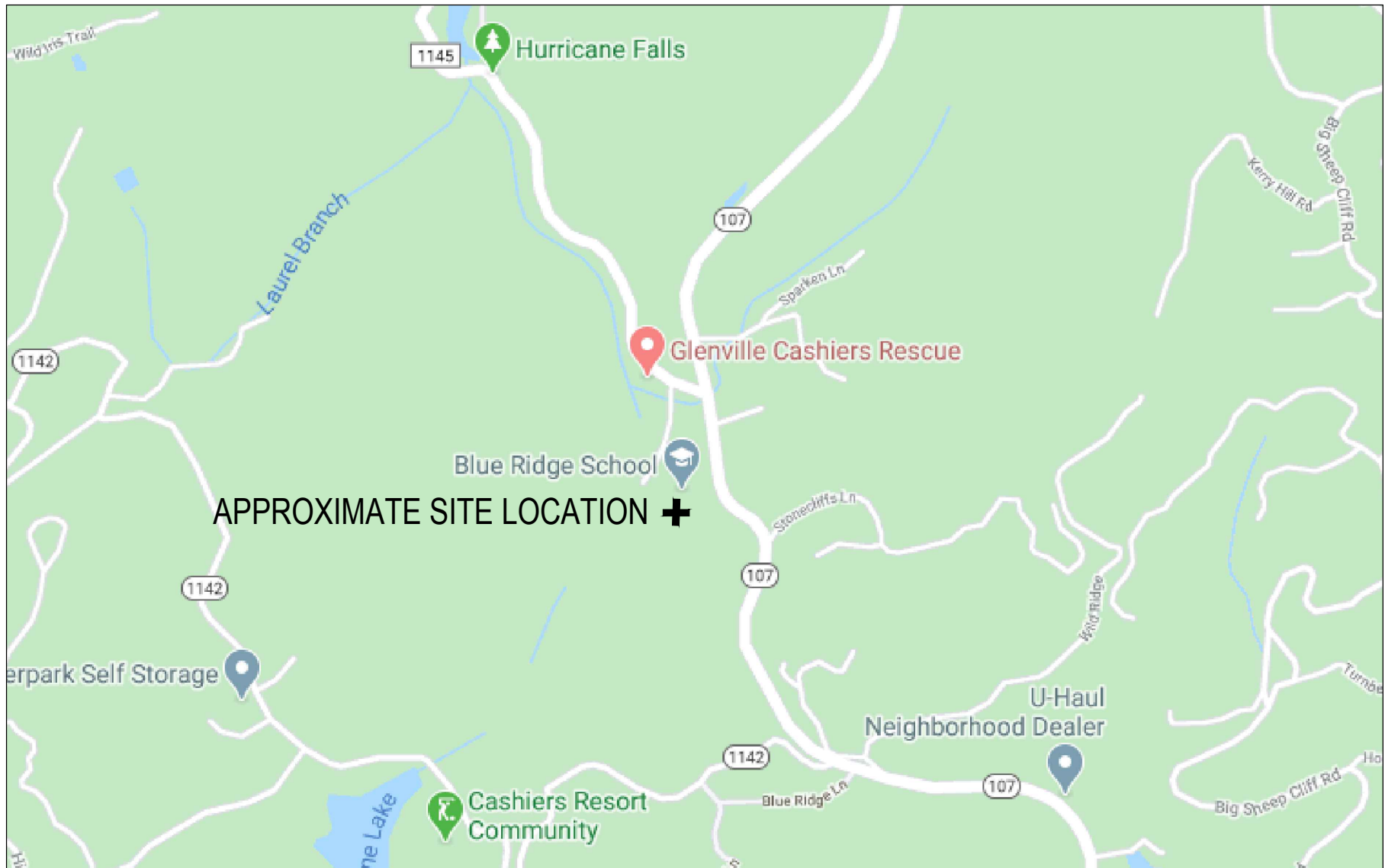

Matthew Gibson, P.E.
Project Engineer
Registered, North Carolina 50361




Ian Johnson, P.E.
Senior Engineer
Registered, North Carolina 38637

Attachments: Figure 1: Site Location Plan
Figure 2: Field Exploration Plan – Wastewater Treatment Plant
Figure 2: Field Exploration Plan – Water Storage Utility Building
Test Pit Logs (TP-1 through TP-7)
Key to Soil Classification and Consistency Descriptions.

Distribution: Mr. Don Adams, Jackson County; via email donadams@jacksonnc.org
Mr. Victor Lofquist, P.E. Lofquist & Associates; via email victor.lofquist@frontier.com



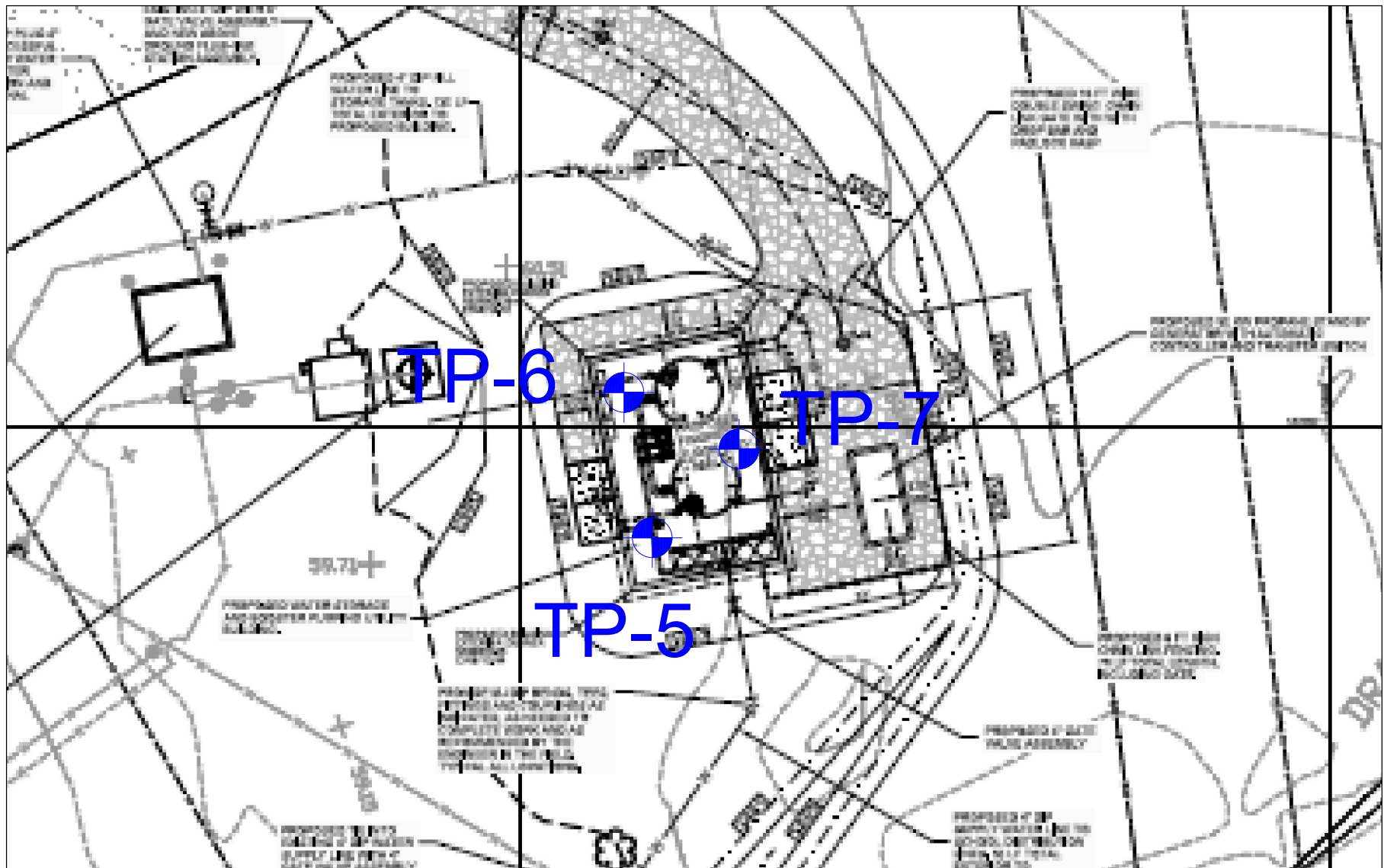
SITE LOCATION PLAN
 BLUE RIDGE SCHOOL - WATER & WASTEWATER IMPROVEMENTS
 JACKSON COUNTY, NORTH CAROLINA

PROJECT NO. JA20-4049-01 DATE: 08/18/2020
 REFERENCE: *Google Maps*

FIGURE
1

KESSEL ENGINEERING GROUP

582 HENDERSONVILLE ROAD SUITE ONE | ASHEVILLE NC 28803 | P: (828) 277-6351 | F: (828) 277-6355
 WWW.THEKESSELGROUP.COM



FIELD EXPLORATION PLAN -WATER STORAGE UTILITY BLDG
BLUE RIDGE SCHOOL - WATER AND WASTEWATER IMPROVEMENTS
JACKSON COUNTY, NORTH CAROLINA

PROJECT NO. JA20-4049-01

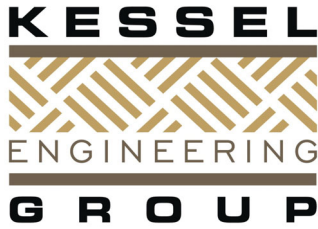
TP LOCATIONS APPROXIMATE. DRAWING NOT TO SCALE.

REFERENCE: PROPOSED IMPROVEMENTS FOR BLUE RIDGE SCHOOL WATER AND
WASTEWATER SYSTEMS - SHEET C7.0, by Lofquist & Associates, inc., dated 4/30/2020

FIGURE
3

KESSEL ENGINEERING GROUP

582 HENDERSONVILLE ROAD SUITE ONE | ASHEVILLE NC 28803 | P:[828] 277-6351 | F:[828] 277-6355
WWW.THEKESSELGROUP.COM



TEST PIT NO. TP-1

PROJECT: Blue Ridge School - Wastewater Improvements PROJECT NO.: JA20-4049-01
 CLIENT: Jackson County DATE START: 6-25-20 END: 6-25-20
 LOCATION: See Figure 2 ELEVATION: 3632 (feet)
 EXCAVATED BY: Scott Farmer LOGGED BY: M.Gibson
 EXCAVATION EQUIPMENT: Bobcat E32
 DEPTH TO - WATER> INITIAL ✓ AFTER 24 HOURS: ✓ CAVING> ✗


SOIL TEST BORING REVISED 4049-01 BLUE RIDGE SCHOOL - WATER & WASTEWATER IMPROVEMENTS.GPJ KESSEL GROUP.GDT 7/14/20

ELEVATION/ DEPTH (FT)	DESCRIPTION	SOIL TYPE	SAMPLES	DYNAMIC CONE PENETRATION RESULTS BLOWS/1-3/4 inches
				2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5
	6-Inches TOPSOIL / ROOTMAT			
3630 2	Very Loose, Light Brown, Micaceous, Silty, Fine to Medium SAND with Gravel (Fill)		2 1 2 n = 1	
3628 4	Loose, Black, Wet, Silty, Fine to Medium SAND with Trace Topsoil and Trace Organics (Alluvium)		2 2 11 n = 6	
3626 6	Equipment refusal encountered at 5.5 feet. No groundwater encountered at time of excavation.		25/1.5 n = 25/1.5	
3624 8				
3622 10				
3620 12				



TEST PIT NO. TP-2

PROJECT: Blue Ridge School - Wastewater Improvements PROJECT NO.: JA20-4049-01
 CLIENT: Jackson County DATE START: 6-25-20 END: 6-25-20
 LOCATION: See Figure 2 ELEVATION: 3633 (feet)
 EXCAVATED BY: Scott Farmer LOGGED BY: M.Gibson
 EXCAVATION EQUIPMENT: Bobcat E32
 DEPTH TO - WATER> INITIAL ✓ AFTER 24 HOURS: ✓ CAVING> ✗

ELEVATION/ DEPTH (FT)	DESCRIPTION	SOIL TYPE
3632	12- Inches TOPSOIL / ROOTMAT	
2	Test pit terminated at 1.0 feet. No groundwater encountered at time of excavation.	
3630		
4		
3628		
6		
3626		
8		
3624		
10		
3622		
12		
3620		

Encountered Existing Utilities at 1 foot. Test Pit Terminated.

TEST PIT NO. TP-2
Sheet 1 of 1



TEST PIT NO. TP-3

PROJECT: Blue Ridge School - Wastewater Improvements PROJECT NO.: JA20-4049-01
 CLIENT: Jackson County DATE START: 6-25-20 END: 6-25-20
 LOCATION: See Figure 2 ELEVATION: 3634 (feet)
 EXCAVATED BY: Scott Farmer LOGGED BY: M.Gibson
 EXCAVATION EQUIPMENT: Bobcat E32
 DEPTH TO - WATER> INITIAL ✓ AFTER 24 HOURS: ✓ CAVING> ✗

SOIL TEST BORING REVISED 4049-01 BLUE RIDGE SCHOOL - WATER & WASTEWATER IMPROVEMENTS.GPJ KESSEL GROUP.GDT 7/14/20

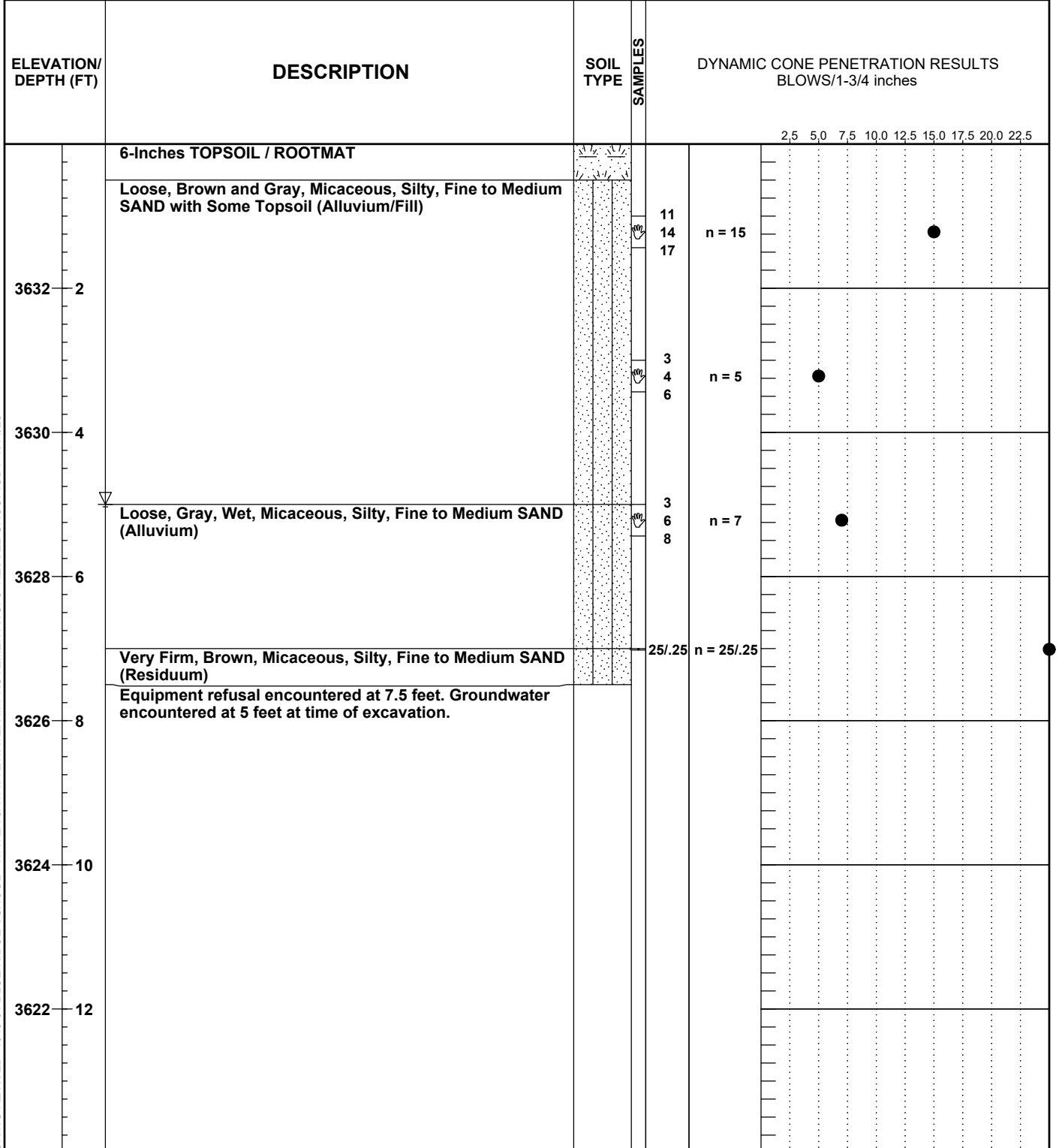
ELEVATION/ DEPTH (FT)	DESCRIPTION	SOIL TYPE	SAMPLES	DYNAMIC CONE PENETRATION RESULTS BLOWS/1-3/4 inches
				2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5
	12-Inches TOPSOIL / ROOTMAT			
3632 2	Very Loose, Gray and Brown, Moist, Micaceous, Silty, Fine to Medium SAND with Trace Topsoil (Alluvium/Fill)		4 3 3 n = 3	
3630 4			4 3 2 n = 2	
3628 6	Loose, Black, Wet, Micaceous, Silty, Fine to Coarse SAND with Trace Topsoil and Trace Organics (Alluvium)		2 6 4 n = 5	
3626 8	Equipment refusal encountered at 7.5 feet. No groundwater encountered at time of excavation.		8 3 12 n = 7	
3624 10				
3622 12				

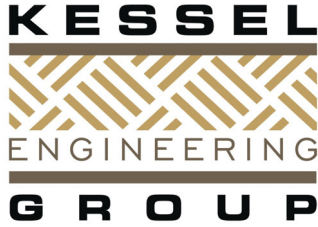


TEST PIT NO. TP-4

PROJECT: Blue Ridge School - Wastewater Improvements PROJECT NO.: JA20-4049-01
 CLIENT: Jackson County DATE START: 6-25-20 END: 6-25-20
 LOCATION: See Figure 2 ELEVATION: 3634 (feet)
 EXCAVATED BY: Scott Farmer LOGGED BY: M.Gibson
 EXCAVATION EQUIPMENT: Bobcat E32
 DEPTH TO - WATER> INITIAL 5 ft AFTER 24 HOURS: 5 ft CAVING> NO

SOIL TEST BORING REVISED 4049-01 BLUE RIDGE SCHOOL - WATER & WASTEWATER IMPROVEMENTS.GPJ KESSEL GROUP.GDT 7/14/20





TEST PIT NO. TP-5

PROJECT: Blue Ridge School - Wastewater Improvements PROJECT NO.: JA20-4049-01
 CLIENT: Jackson County DATE START: 6-25-20 END: 6-25-20
 LOCATION: See Figure 2 ELEVATION: 3661 (feet)
 EXCAVATED BY: Scott Farmer LOGGED BY: M.Gibson
 EXCAVATION EQUIPMENT: Bobcat E32
 DEPTH TO - WATER> INITIAL 5.5 ft AFTER 24 HOURS: 5.5 ft CAVING> NO

ELEVATION/ DEPTH (FT)	DESCRIPTION	SOIL TYPE	SAMPLES	DYNAMIC CONE PENETRATION RESULTS BLOWS/1-3/4 inches										
				2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5		
3660	12-Inches TOPSOIL / ROOTMAT													
2	Loose, Brown, Micaceous, Silty, Fine to Coarse SAND with Trace Topsoil and Gravel (Fill)		5 7 6	n = 6										
3658	Very Firm, Brown, Gray and White, Micaceous, Silty, Fine to Medium SAND (Residuum)		18 25/1.75	n = 25/1.75										
4														
3656			18 25/1.25	n = 25/1.25										
6	Equipment refusal encountered at 5.5 feet. Groundwater encountered at 5.5 feet at time of excavation.													
3654														
8														
3652														
10														
3650														
12														
3648														

TEST PIT NO. TP-5
Sheet 1 of 1

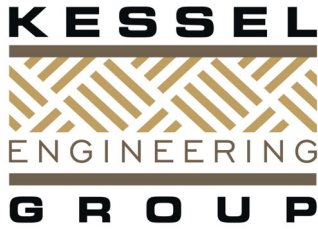


TEST PIT NO. TP-6

PROJECT: Blue Ridge School - Wastewater Improvements PROJECT NO.: JA20-4049-01
 CLIENT: Jackson County DATE START: 6-25-20 END: 6-25-20
 LOCATION: See Figure 2 ELEVATION: 3661 (feet)
 EXCAVATED BY: Scott Farmer LOGGED BY: M.Gibson
 EXCAVATION EQUIPMENT: Bobcat E32
 DEPTH TO - WATER> INITIAL 3 ft AFTER 24 HOURS: 3 ft CAVING> NO

SOIL TEST BORING REVISED 4049-01 BLUE RIDGE SCHOOL - WATER & WASTEWATER IMPROVEMENTS.GPJ KESSEL GROUP.GDT 7/14/20

ELEVATION/ DEPTH (FT)	DESCRIPTION	SOIL TYPE	SAMPLES	DYNAMIC CONE PENETRATION RESULTS BLOWS/1-3/4 inches											
				2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5											
3660	Firm, Gray and Brown, Micaceous, Silty, Fine to Medium SAND (Residuum)		12 20 25	n = 22											
2															
3658	Firm to Very Firm, Gray and White, Wet, Micaceous, Silty, Fine to Medium SAND		8 16 16	n = 16											
4															
3656			16 25/1.5	n = 25/1.5											
6															
3654			14 25/1.5	n = 25/1.5											
8															
3652	Test pit terminated at 9.0 feet. Groundwater encountered at 3 feet at time of excavation.														
10															
3650															
12															
3648															



TEST PIT NO. TP-7

PROJECT: Blue Ridge School - Wastewater Improvements PROJECT NO.: JA20-4049-01
 CLIENT: Jackson County DATE START: 6-25-20 END: 6-25-20
 LOCATION: See Figure 2 ELEVATION: 3662 (feet)
 EXCAVATED BY: Scott Farmer LOGGED BY: M.Gibson
 EXCAVATION EQUIPMENT: Bobcat E32
 DEPTH TO - WATER> INITIAL ✓ AFTER 24 HOURS: ✓ CAVING> ✗

SOIL TEST BORING REVISED 4049-01 BLUE RIDGE SCHOOL - WATER & WASTEWATER IMPROVEMENTS GPJ KESSEL GROUP.GDT 7/14/20

ELEVATION/ DEPTH (FT)	DESCRIPTION	SOIL TYPE	SAMPLES	DYNAMIC CONE PENETRATION RESULTS BLOWS/1-3/4 inches
				2,5 5,0 7,5 10,0 12,5 15,0 17,5 20,0 22,5
3660 2	Firm, Brown, Wet, Micaceous, Silty, Fine to Medium SAND with Gravel (Fill)		8 16 16 n = 16	
3658 4	Firm, Tan, Micaceous, Silty, Fine to Medium SAND (Residuum)		5 15 24 n = 19	
3656 6			8 13 15 n = 14	
3654 8	Loose, Tan, Micaceous, Silty, Fine to Medium SAND		5 7 10 n = 8	
3652 10	Firm, White and Brown, Micaceous, Silty, Fine to Medium SAND		12 18 25 n = 21	
3650 12	Test pit terminated at 9.0 feet. No groundwater encountered at time of excavation.			

KEY TO SOIL CLASSIFICATIONS AND CONSISTENCY DESCRIPTIONS

Cone Penetrometer Resistance Average blows over 3-1/2 in. increment

1 to 4
5 to 15
16 to 29
over 30

SANDS

Relative Density

Very Loose
Loose
Firm
Very Firm

Particle Size Identification

Boulder: Greater than 300 mm
Cobble: 75 to 300 mm
Gravel:
Coarse - 19 to 75 mm
Fine - 4.75 to 19 mm
Sand:
Coarse - 2 to 75 mm
Medium - 0.425 to 2 mm
Fine - 0.075 to 0.425 mm
Sils & Clay: Less than 0.075 mm

Cone Penetrometer Resistance Average blows over 3-1/2 in. increment

1 to 4
5 to 9
10 to 29
over 30

SILTS and CLAYS

Consistency

Soft
Firm
Stiff
Very Stiff

KEY TO DRILLING SYMBOLS



Grab Sample



Split Spoon Sample



Undisturbed Sample



Groundwater Table at Time of Drilling

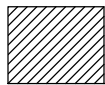


Groundwater Table 24 Hours after Completion of Drilling

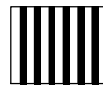
KEY TO SOIL CLASSIFICATIONS



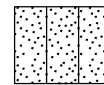
Well-graded Gravel
GW



Low Plasticity Clay
CL



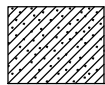
Clayey Silt
MH



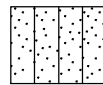
Silty Sand
SM



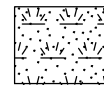
Poorly-graded Gravel
GP



Sandy Clay
CLS



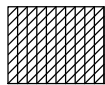
Sandy Silt
MLS



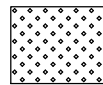
Topsoil
TOPSOIL



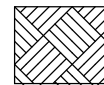
Partially Weathered
Rock
BLDRCBBL



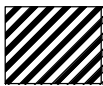
Silty Clay
CL-ML



Sand
SW



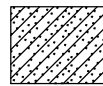
Bedrock
BEDROCK



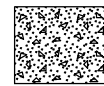
High Plasticity Clay
CH



Silt
ML



Clayey Sand
SC



Concrete
AS

SECTION 02090

ROCK EXCAVATION & BLASTING

1.0 GENERAL

1.1 Description: The Contractor shall furnish all materials, labor, equipment, supplies and incidentals necessary to complete all rock excavation and blasting in a safe manner and as required for the successful completion of the project to the satisfaction of the engineer and as shown on the plans, and as specified herein and related sections of the specifications.

1.2 “Rock Excavation”, in all situations including trenches, pits and open excavations, shall be defined as the excavation of any hard, naturally occurring, solid ledge rock (igneous, metamorphic and sedimentary) which requires the use of explosives and/or special impact tools such as jackhammers, sledge hammers, chisels, or similar devices specifically designed for use in cutting or breaking rock. Rock excavation shall be as further defined in paragraphs 1.2.1 and 1.2.2.

1.2.1 Rock excavation for trenches and pits shall be defined as the removal of a formation that cannot be excavated without systematic drilling and blasting that is performed only for the purposes of utility installation. In contrast, normal or earth excavation is a formation that when plowed or ripped, breaks down into small enough pieces to be easily moved, can be loaded in hauling units, and can be readily incorporated into an embankment or foundation in relatively thin layers. Boulders larger than 1 cubic yard shall be classified as rock. The Contractor, if requested, shall prove that material should be classified as trench rock excavation, by demonstration that the material cannot be removed with a backhoe equipped with a 36" bucket with rock teeth placed on a 345 hp 100,000 lb class excavator with a drawbar pull of 75,920 lb. The Contractor shall, if requested, provide equipment specification data verifying the above minimum-rated equipment will be used for demonstration purposes. Such equipment shall be in good repair and proper working condition.

1.2.2 Rock excavation in open excavations shall be defined as the removal of a formation that cannot be excavated without systematic drilling and blasting that is not for the purposes of utility installation. In contrast, normal or earth excavation is a formation that, when plowed and ripped, breaks down into small enough pieces to be easily moved, can be loaded in hauling units, and can be readily incorporated into an embankment or foundation in relatively thin layers. Boulders larger than 1 cubic yard shall be classified as rock. The Contractor, if requested shall prove that material should be classified as rock excavation, by providing a demonstration that the material cannot be ripped with a D-8 crawler tractor with 310 flywheel horsepower or equal, pulling a single-tooth ripper with ripping performed in a criss-cross pattern or against the natural bedding plane. The Contractor shall, if requested, provide equipment specification data verifying the above minimum-rated equipment will be used for demonstration purposes. Such equipment shall be in good repair and in proper working condition. This classification does not include materials such as loose rock, concrete or other materials that can be moved by means other than drilling

and blasting or drilling and wedging, but which, for reasons of economy in excavating the Contractor prefers to remove by drilling and blasting.

Method of payment for rock excavation shall be at the quoted unit prices per cubic yard in the Bid Form. Final payment for rock excavation will be adjusted to the actual cubic yards of rock excavation performed and will be paid for at the unit price quoted for "rock excavation" in the bid form. There will be no distinction made in payment for trench rock excavation or rock excavation in open areas. Rock that the engineer has not measured and quantified by the engineer will not be paid for. It is the contractor's responsibility to coordinate and contact the engineer to measure and quantify rock a minimum of 24 hours in advance after the contractor has exposed the entire surface of the rock to be removed.

1.3 Contractor shall exercise extreme care in all blasting related operations as required to prevent any damage to all public or private properties, structures, utilities, facilities and residences. No blasting shall occur outside the hours of 8:30 a.m. to 3:30 p.m., Monday through Saturday unless approved otherwise by the engineer and any other agencies having jurisdiction.

1.4 It is required that the contractor engage the services of an independent, qualified blasting consultant, experienced in controlled blasting techniques for similar civil and hydraulic works, to prepare blasting plans, to supervise the installation of instruments, monitor blasting operations and to supervise the interpretation of recorded results. The contractor's employment and use of an independent blasting consultant will be mandantory, including all blast monitoring and record keeping. Independent blasting consultants shall have a minimum five years documented experience in the handling and use of explosives, related testing, monitoring and seismic surveys. **If the contractor elects to excavate rock using non-explosive techniques, the requirement to engage the services of an independent, qualified blasting consultant, will be optional at the contractor's discretion.**

1.4.1 The blasting consultant shall develop project specific blasting plans for the contractor's use. The blasting plan shall, at a minimum, contain a schedule of neighborhood preblast advisories and notifications, preblast and postblast structural surveys, a tabulation of the nearest distances to structures within the specified blast generated seismic influence zone, detailed safety and security measures to be implemented, the types and use of blast monitoring equipment, blast hole diameters and depths, the types and amounts of explosive to be used, the length of the stemming columns and the types of stemming material, the type of initiation system to be used, the methods used to control fly rock and sufficient related information to safely and successfully execute blasing operations.

1.4.2 The blasting plan conditions or recommendations and any conditions shown on the plans or imposed herein shall not, in any way, relieve the contractor of his sole responsibility for safety, loss of life, property damage and obtaining adequate rock breakage and limiting rock breakage to within the final lines and grades necessary for the proper completion of the project.

1.5 The contractor shall use experienced, blasters, blast technicians, competent supervisors and skilled labor for all blasting operations. Such persons shall possess all required federal, state, and local licenses and/or permits.

1.5.1 Blasting, the use of explosives and blaster qualifications shall be in strict compliance with the North Carolina Occupational Safety and Health Standards for the Construction Industry, Subpart U – “Blasting and the Use of Explosives,” Sections 1926.900 through 1926.914, latest edition.

1.5.2 The contractor shall obtain all the required permits, and pay all fees related thereto, from local, state and federal agencies for transportation, storage and use of explosives and notify the local fire marshall and the engineer prior to the commencing any blasting operations. The contractor is required to have insurance specifically covering all practices and obligations related to blasting and the use of explosives.

2.0 MATERIALS

2.1 The contractor shall furnish all materials, equipment, labor and incidentals required to successfully accomplish all work to the satisfaction of the engineer and owner.

2.2 Explosives shall be handled, transported, used, controlled, and monitored as prescribed by the most stringent of rules specified in OSHA Standards, NFPA – Code for Explosive Materials and local, state or federal codes and ordinances.

2.3 No overnight storage of explosives will be allowed on the project site. Only the amount of explosives to be used each day shall be on the jobsite. Unused explosives shall be removed from the project at the end of the working day. All loaded blast holes are to be shot the day they are loaded.

2.4 Blasting mats shall weigh at least 25 pounds per square foot or greater if necessary to prevent any degree of fly material as a result of blasting. Mats shall be a minimum of 6 feet by 10 feet and shall be equipped with suitable placement attachments.

2.5 The contractor shall institute a system of audible signals to warn of impending blasts and in accordance with all agencies having jurisdiction.

2.5.1 The contractor shall erect signboards of adequate size stating that blasting operations are taking place in the area. Such signs shall be clearly visible at all points of access to the area, shall clearly describe the audible signal system for warning of impending blasts and shall be in accordance with all agencies having jurisdiction.

2.5.2 The contractor shall mark all day storage places and explosives transport vehicles with signs stating clearly and boldly, DANGEROUS EXPLOSIVES and any other signing required by regulatory bodies.

2.6 The blasting consultant, engaged by the contractor, shall provide and operate properly calibrated blast monitoring seismographs and air blast overpressure/sound monitoring devices, at the nearest structures in the vicinity of blasting operations to accurately measure and record particle velocity and air overpressure.

2.7 All fill materials, borrow materials, select fill, bedding materials, stone and any other materials that are, in the engineer's opinion, necessary due to rock excavation will be provided by the contractor at the contractor's sole expense. All types, grades and quality of materials used for fill, backfill, bedding or other uses associated with rock excavation shall be in accordance with other related sections of these specifications.

3.0 EXECUTION

3.1 The primary objective for blasting rock is to construct excavations where the rock outside of the excavation will be undisturbed and the shape of the excavation will conform to the lines and grades indicated on the plans or specified herein. It is the responsibility of the contractor to conduct their operations in such a manner that this objective is safely achieved.

3.1.1 Unless shown otherwise on the plans, rock shall be excavated and paid for to the following limits. Additional rock excavation beyond the limits indicated on the plans or specified herein, or associated waste material disposal, borrow material or incidentals will not be paid for and will be performed at the contractor's sole expense.

Trenches

Sidewalls:	Pipe outside diameter plus 8 inches each side calculated with trench sidewalls assumed to be vertical
Floor:	Pipe outside diameter plus 6 inches below the pipe to the lines, grades or depth indicated on the plans

Structures

Foundation:	12 inches outside and below the bearing depth of the foundation unless shown otherwise on the plans or allowed by the engineer or architect
Walls:	24 inches beyond the outermost vertical structure wall or foundation limits other than footings
Slabs:	6 inches below the concrete slab bearing elevation

Roadways

Subgrade:	Stone base course bearing elevation plus 12 inches additional depth or a minimum of 2 feet below the finished road surface elevation whichever is greater
-----------	---

Ditches: Only depth as necessary to provide ditch profile specified

3.2 The contractor shall notify the engineer a minimum of 48 hours in advance of loading explosives or commencing any other blasting related operations.

3.3 Unless approved otherwise by the engineer, all blasting shall occur when a representative of the engineer and owner is present to witness each blast.

3.4 Explosives shall not be used as a means of transporting materials outside the excavation prism.

3.4.1 Inadequately confined or unconfined surface charges are prohibited.

3.4.2 Except for presplitting as specified below, rock cuts requiring systematic drilling and blasting shall have the excavated material removed in lifts with a maximum lift height of 25 feet.

3.4.3 Unless controlled by other requirements in these specifications, sub-drilling for final lines and grades shall not be greater than 3 feet below excavation grade.

3.4.4 Shots shall be designed so that where possible, the explosive energy is directed toward the developed free face.

3.4.5 Explosives shall be of such quantity and quality, and shall be used in such a manner as to minimally open seams or otherwise damage rock outside the prescribed limits of excavation. The firing systems of general blast holes shall be controlled by the use of delay detonators, and explosives used for any single period of delay, shall be the minimum required.

3.4.6 Blasting within 300 feet of any concrete which has been in place less than 28 days will not be allowed.

3.5 Particle velocity shall not exceed 0.5 inches per second and air overpressure (blast) shall not exceed 0.029 psi (140 dBL) as measured by the blasting consultant engaged by the contractor. Where local conditions dictate or recommended by the blasting consultant for site specific conditions, particle velocity and air overpressure levels shall be reduced below these levels.

3.5.1 The blasting consultant shall prepare a report for each blasting operation or shot performed. The contractor shall provide the engineer with copies of all blast reports prepared by the blast consultant. In reporting a shot, the distance from the shot to each recorder, amount of explosives used in each delay, the total amount of explosives used and the time shall be noted. Blast reports shall be submitted to the engineer within 24 hours following each shot or blasting operation performed. No separate or direct payment will be made to the contractor for the use of

blasting consultants, monitoring equipment, monitoring of blasts, record keeping and reports and any other incidental costs.

3.6 Cover the area to be shot with blasting mats or other approved type of protective material that will prevent the scattering of rock, fragments or any other fly material. Give ample warning to all persons within the vicinity prior to blasting and provide signals warning of danger in suitable places to alert people in vehicles before firing any blast.

3.7 After a blast has been fired, the blaster shall make a careful inspection to determine that all charges have exploded before employees are allowed to return to the operation. Misfires shall be corrected in accordance with the requirements of the applicable portions of Federal, State, and/or local safety codes for blasting. The contractor shall be responsible for any and all damages to property or injury to persons resulting from blasting, or accidental or premature explosions that may occur in connection with the use of explosives.

3.8 All loose and shattered rock or other loose material, which may endanger any structure or the workers, shall be removed and the excavation site made safe before proceeding with the work. After muck removal and before drilling of blast holes for a new round, the face shall be cleaned and thoroughly examined for missed holes and unexploded powder. Blasting techniques shall be developed prior to blasting and improved as work progresses. The fact that the removal of loose or shattered rock or other loose material may enlarge the excavation beyond the required limits shall not relieve the contractor of the responsibility for removal of such material and replacement of suitable materials at his sole expense.

3.9 All rock excavation with design slopes of 1 horizontal to 1 vertical, or steeper, shall be excavated by using controlled blasting techniques. All line holes for controlled blasting shall be 2 to 3 inches in diameter. The contractor shall test the selected methods by making test shots within the interior of the excavation as needed to confirm the suitability of selected methods. The test shots shall be so placed that they will pose no threat to the final rock face. If the test results are unacceptable, the contractor shall modify his proposed blasting method and perform other tests until the method produces acceptable results. Unless the proposed method provides acceptable results as judged by the engineer, the contractor shall not use the proposed method of controlled blasting against any final rock faces or in any place where the final face will be damaged by the test blast or blasts.

3.9.1 Spacing for presplit line holes shall be 2 feet on centers. Maximum depth of vertical presplit holes for a single drilling setup shall not be greater than 25 linear feet. Successive sets of presplit holes may have their collars slightly offset from the design slopes, but shall be so inclined that all sets closely approximate the design slopes.

3.10 In case damage from blasting occurs to existing structures, public or private properties, to any portion of the work, or to any material surrounding the project, the contractor shall remove such damaged work, repair the work, and replace the material and otherwise perform such work

for repair or replacement to the satisfaction of the engineer and owner at the contractor's sole expense.

3.11 All excavated rock material and any other waste materials related to or generated by rock excavation, unless specifically stipulated on the plans to be incorporated into the project, shall be removed from the project site and disposed of offsite by the contractor at a disposal site secured and properly permitted by the contractor. All costs associated with the disposal of rock and other waste materials shall be at the contractor's sole expense with no additional cost to the owner.

3.12 The contractor shall be responsible for providing all borrow material, select fill materials, stone bedding material and any other materials needed for the proper completion of the work, to the satisfaction of the engineer, as a result of rock excavation. All costs associated with the provision of these materials, including but not limited to, the securing of suitable borrow source(s), all testing of borrow materials for suitability, all loading, hauling, unloading, placing, compacting and incidental costs and work shall be at the sole expense of the contractor. Borrow materials, stone, bedding materials and other materials needed due to or related to rock excavation shall meet the approval of the engineer and shall be in accordance with other applicable sections of these specifications.

4.0 METHOD OF MEASUREMENT & BASIS OF PAYMENT

4.1 When rock is encountered during excavation or construction, the contractor is responsible for exposing the surface of the rock, giving the engineer a minimum of 24 hours advance notice and allowing the engineer adequate time to profile the surface of the rock for use in estimating the volume removed for payment purposes. The contractor shall assist and allow the engineer adequate time to profile the rock surface prior to and following the completion of a given section or area of rock excavation. The contractor shall be responsible for implementing all necessary safety and security measures as needed to allow rock surfaces to remain exposed for measurement by the engineer. Payment for rock excavation will be made on the basis of the engineer's field measurements and associated calculated volumes based on the actual rock quantity. **See Allowances, Specification Section 0860 for allowance quantities to be included in the Lump Sum Base Bid Amount.**

4.2 Payment for rock excavation will be made to lines, grades and limits shown on the plans and specified herein. The excavation of rock beyond the specified limits, including all associated work, materials, labor and incidentals, will not be paid for and shall be corrected to the engineer's satisfaction at the contractor's expense.

4.3 The contractor shall be paid for the actual amount of rock excavation, based on the engineer's quantity measured and estimated during construction, at the price per cubic yard stipulated in the bid form. Payment for rock excavation shall include all labor, materials, equipment, supplies, drilling, overburden and matings, explosives, safety equipment and provisions, signing, permits, fees, blasting consultants, monitoring equipment, specialists, excavation, loading, unloading, testing of borrow sources, obtainment of borrow sources, borrow

Jackson County Public Schools
Proposed Improvements for Blue Ridge
Water and Wastewater Systems
CDBG-I Project No. 09-D-2945
Jackson County - Owner
Jackson County, North Carolina

materials and placement, disposal of waste materials offsite, bedding and fill materials, stone, compaction, construction delays, damage repair and any other incidentals necessary to properly complete all rock excavation to the satisfaction of the engineer and owner.

END OF SECTION

SECTION 2110

CLEARING, GRUBBING AND DEMOLITION

1.0 GENERAL

1.1 Description: The Contractor shall furnish all materials, labor, equipment, supplies, maintenance and incidentals necessary to perform all clearing, grubbing and demolition operations as necessary to properly complete the project to the satisfaction of the engineer and owner. All clearing, grubbing and demolition shall be performed in accordance with all local, state and national codes, standards and regulations at the contractor's expense. The work of clearing, demolition and grubbing shall be performed within the project limits as indicated by the plans and as necessary for the successful completion of the project. The contractor will be solely responsible for making investigations and determining the extent of clearing, grubbing and demolition operations required prior to submitting a bid including all clearing, grubbing and demolition necessary for the proper completion of all work to the satisfaction of the engineer.

1.2 The elevated tank demolition and removal shall be performed by an experienced and qualified contractor of specialty subcontractor. The tank demolition subcontractor shall employ qualified personnel, properly equipped to perform all elevated pedestal tank disassembly, demolition, removal and proper off site disposal. The tank demolition subcontractor shall have a minimum of 5 years similar experience in demolition and removal. The contractor shall employ the necessary skilled craftsmen, consultants, erect all necessary safeguards and temporary structures, provide all necessary equipment (cranes, etc.), supplies and tools, provide all traffic control plans and measures, obtain approval and any necessary permits from landowners, utilities and others having jurisdiction, any testing of materials, lead related abatment, removal and disposal (if required), pay any related demolition and disposal fees and as needed to properly perform the work and safely and completely remove the existing elevated tank at Blue Ridge School following the successful transfer and start up of the new storage and booster pumping system for the school. The tank specialty subcontractor shall be fully insured in the minimum amounts required by the contract documents.

1.3 Immediately prior to the demolition and removal of the existing wastewater treatment plant demolition and removal, the contractor shall be responsible for engaging a licensed septage hauler to completely pump all wastes and liquids out of tankage and properly disposing of all pumped wastes at a properly permitted receiving facility. The contractor will include all costs associated with disposal. With the engineer's approval and following the successful start up of the new wastewater treatment facility, the contractor will proceed with the disassembly and demolition of the existing wastewater treatment plant.

1.4 The contractor shall install all erosion control measures shown on the plans and as specified in other sections prior to commencing clearing, grubbing and demolition operations.

Where necessary due to conflicts, erosion control measures shall be installed immediately following clearing and grubbing operations for a particular area of construction.

1.5 The contractor shall take all the necessary measures to prevent any damage to any public or private properties, structures, utilities, facilities, etc. Should any damage occur, the contractor shall be fully responsible for making the necessary repairs or replacements, at the contractor's expense, to the satisfaction of the engineer and owner.

1.6 The contractor will be solely responsible for making investigations and determining the existence, exact locations, sizes, depths, extent and material types of all existing utilities that may be affected by project activities prior to commencing construction. All existing utilities and related facilities are not shown on the plans and the locations shown on the plans may have been approximated. Any damage incurred to existing utilities, whether shown on the plans, not shown on the plans or incorrectly shown on the plans are the responsibility of the contractor and shall be repaired to the original or better condition, to the satisfaction of the utility owner and engineer, at the sole expense of the contractor.

1.6.1 The contractor shall be responsible for coordinating all construction with all utility companies affected by the project. Except in an emergency, the contractor shall not operate any controls on any existing utility system or otherwise change or affect the operation of the utility without prior approval of the utility owner.

1.7 The contractor shall be responsible for all job site safety and security including, but not limited to, work zone traffic control and signing. The contractor shall provide and maintain adequate work zone traffic control in accordance the latest editions of the NCDOT "Standard Specifications for Roads and Structures," the NCDOT "Roadway Standard Drawings" the "Manual of Uniform Traffic Control Devices" and all site specific conditions imposed by the NCDOT local Division Office.

1.8 There shall be no burning allowed of any materials associated with the project either within the project area or at any remote location. All waste materials, that will not be incorporated into the work, resulting from clearing, grubbing, and demolition operations, whether natural or manmade materials, shall be disposed of, at the contractor's expense, off the owner's property in accordance with applicable regulations.

2.0 MATERIALS

2.1 The contractor shall furnish all materials, equipment, labor and incidentals required to successfully accomplish all clearing, demolition and grubbing to the satisfaction of the engineer and owner.

2.2 The contractor shall be responsible for furnishing all materials, equipment, labor, temporary structures and devices and incidentals required to successfully and safely completely dismantle, remove and dispose of all of the existing facilities identified to be

taken out of service as a part of the work to the satisfaction of the owner, engineer and all agencies and parties having jurisdiction.

3.0 EXECUTION

3.1 The contractor shall perform all clearing of the project area and related areas, approved by the owner and engineer, as needed to facilitate successful construction consisting of the cutting, removal, and satisfactory disposal of all trees, vegetation, structures and foundations to be demolished, pavements and bases to be removed, utilities to be removed or abandoned and debris at the contractor's expense. The contractor shall perform all grubbing consisting of the loading, removing, hauling and properly permitted disposal of all cuttings, stumps, vegetation, organic matter, structures to be demolished and other natural or manmade debris at a location off the owner's property at the contractor's expense. All applicable permits and offsite disposal locations shall be obtained by the contractor at the contractor's expense. No additional payment will be made for clearing and grubbing work at offsite locations related to construction such as borrow sites.

3.1.1 The work of clearing, grubbing and demolition shall include, at the contractor's expense, the complete removal and offsite disposal of all below ground foundations, footings, utilities, vaults, tanks and other manmade improvements, whether abandoned or identified to be abandoned, unless specifically approved otherwise by the engineer.

3.2 The tank demolition subcontractor shall employ and furnish the necessary consultants, craftsmen, laborers, testing, equipment, supplies and all related work and incidentals necessary to safely and completely dismantle the existing 10,000 gallon elevated pedestal water tank following the successful transfer of the school water supply to the new water storage and booster pumping system and make proper disposal of all waste materials in accordance with all applicable regulations. The Owner has the right to retain ownership of any valves, controls, or other components being removed at their discretion. Any materials to be retained by the Owner will be carefully removed and set aside by the contractor, without damage, at locations designated by the Owner on the school property. Any scrap or recycle value associated with materials not retained by the Owner and associated with the elevated water tank removal shall be to the benefit of the tank demolition subcontractor.

3.2.2 The limits of tank demolition and removal, to be the responsibility of the tank demolition subcontractor, shall include the entire tank and all foundations, pipes, accessories, adjacent valves and manholes, and other tank related incidentals to minimum depth of 3 ft below the existing ground surface elevation as it exists at the tank foundation perimeter prior to construction. Tank demolition and removal shall include plugging all pipes and conduits, after being cut off a minimum of 3 ft below the ground surface, with 2,500 psi non-shrink grout completely filling and sealing the inside of the cut end of the pipe or conduit for a minimum length of 2 ft within the interior or the cut

pipe or conduit. The limits of tank demolition and removal shall include any related above grade components and any below grade components down to a minimum depth of 3 ft and within 10 ft of the tank or tank foundation that are to be taken out of service with the tank removal. All demolished concrete and materials to a depth of 3 ft below grade shall be hauled away and properly disposed of off the Owner's property. The excavation remaining follow demolition and disposal to a depth of 3 ft shall be filled by the contractor with select, well compacted borrow material filled to the existing grade elevations surrounding the excavation, fine graded, and seeded and mulched as needed to establish permanent grassing.

3.2.3 The tank demolition subcontractor shall be responsible for engaging the services of qualified professionals as needed to perform structural and hazardous waste assessments (lead based paint only) of the tank and related components, including any testing and evaluation services, as necessary to successfully disassemble the tank and related components, remove all wastes from the owner's property and properly dispose of all wastes in accordance with applicable codes and regulations and in accordance with agencies having jurisdiction. The professionals, engaged by the tank demolition subcontractor, shall develop a tank demolition plan, specific to the site conditions, tank and current conditions of the tank and appurtenances, that will ensure the safe removal of the tank in an expedient manner without contamination of the owner's property. Tank disassembly and demolition shall take place on a weekend or other time school is not taking place unless specifically approved otherwise by the school principal. Unsafe, partially dismantled tank conditions shall not be allowed to remain when school is in session. The tank demolition subcontractor shall fence or otherwise provide a suitable security barrier to effectively barricade the public and unauthorized personnel from the tank site during disassembly, demolition and debris removal.

3.3 Following pump and haul of all wastes and liquids from the abandoned wastewater treatment plant by a licensed septage hauler and with the engineer's approval, demolition of the existing wastewater treatment plant may be commenced. No sludges and wastes from the existing wastewater treatment plant shall be disposed of in the new wastewater treatment plant. The demolition and removal limits for the existing wastewater treatment plant shall include all tanks, structures, equipment, piping, electrical, valves, manholes, fencing and other wastewater treatment related incidentals to minimum depth of 3 ft below the existing ground surface elevation as measured from existing grade prior to construction. The Owner will retain ownership of the existing shed and any other components the Owner desires to retain. Any materials to be retained by the Owner will be carefully removed and set aside by the contractor, without damage, at locations designated by the Owner on the school property. Wastewater plant demolition and removal shall include plugging all pipes and conduits, after being cut off a minimum of 3 ft below the ground surface, with 2,500 psi non-shrink grout completely filling and sealing the inside of the cut end of the pipe or conduit for a minimum length of 2 ft within the interior of the cut pipe or conduit. The limits of wastewater treatment plant demolition and removal shall include any related above grade components and any below

grade components, down to a minimum depth of 3 ft below existing grade, that are to be taken out of service. All demolished concrete and materials to a depth of 3 ft below grade shall be hauled away and properly disposed of off the Owner's property. The excavation remaining follow demolition and disposal to a depth of 3 ft shall be filled by the contractor with select, well compacted borrow material filled and fine graded to the proposed elevations shown on the site plan, and seeded and mulched as needed to establish permanent grassing.

3.4 All material containing organic matter, such as root mat and other vegetative matter, shall be considered vegetation and removed as part of the work of grubbing. Earth or soil, which in the opinion of the engineer is clean, will not be considered as clearing debris. Topsoil will be treated as clearing debris. However, if allowed by other sections of these specifications, clean topsoil may be used as a final cover on areas to be grassed. Topsoil is defined as friable clay loam surface soil. Satisfactory topsoil shall be, in the opinion of the engineer, reasonably free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, and without weeds, roots, heavy organic matter, debris and other objectionable material.

3.5 The contractor shall take the necessary measures and precautions to protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within the drip line. The contractor shall provide all temporary guards and measures necessary to protect trees and vegetation to be left standing at the contractor's expense. The contractor shall water trees and shrubs to be preserved within the project limits on an as needed basis. 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. Should such injuries occur, all rough edges of scarred areas shall be made reasonably smooth in accordance with generally accepted horticultural practice. Any such plants that are damaged by any construction operations to such an extent as to destroy their value, shall be cut and disposed of by the contractor, when so directed by the engineer.

3.6 The work of clearing, demolition and grubbing shall also include the removal and satisfactory disposal of crops, weeds, and other annual growth; the removal and satisfactory disposal of fences, steps, walls, chimneys, column footings, other footings, structures, buildings, foundation slabs, basements, other foundation components, pavements and base materials, signs, junked vehicles, and other rubble and debris if identified to be demolished or removed; and the filling of holes and depressions all at the contractor's expense. Any items which the wishes to retain ownership of shall be salvaged by the contractor, free of damage, and stored on the project site at a location(s) to be designated by the owner.

3.7 As part of clearing and grubbing operations, the contractor will be required to cut off and plug, as directed by the engineer, any storm sewer, water line, sewer line or other utility to be abandoned or intercepted during the construction of the project and remove any septic tank or

portion thereof to be abandoned or intercepted during the construction of the project at the contractor's expense.

3.8 Clearing, demolition & grubbing operations shall be completed sufficiently in advance of grading operations as may be necessary to prevent any of the debris from the clearing and grubbing operations from interfering with earthwork or other construction operations.

3.9 All work under this section shall be performed in a manner which will prevent soil erosion and loss of sedimentation. The contractor shall provide all erosion control work, temporary or permanent, as may be necessary to prevent erosion resulting from clearing and grubbing operations. At all locations possible, the installation of temporary or permanent erosion control measures shall be performed prior to commencing clearing, grubbing or demolitions activities.

3.10 The contractor is required to completely remove all demolition, clearing and grubbing materials including, but not limited to, all stumps and other vegetative matter and dispose of all waste generated off the owner's property at an approved site at the contractor's sole expense. The contractor shall be responsible for paying all landfill related fees and acquiring any additional permits, at the contractor's expense, that may be necessary for the successful completion of the project to the satisfaction of the engineer. The contractor is responsible for locating properly permitted landfills or disposal facilities that will accept the particular types of wastes generated by the project and transporting all waste materials to the appropriate locations.

3.11 All holes and other depressions shall be filled, and the area brought to sufficiently uniform contour to the satisfaction of the engineer. This work shall be done regardless of whether the irregularities were the result of the contractor's operations or were originally existing.

4.0 METHOD OF MEASUREMENT & BASIS OF PAYMENT

4.1 All work, materials, equipment, labor, testing, incidentals and appurtenances described in this section, shall not be measured and paid for as such, but shall all be treated as incidental work. The contractor shall appropriately divide and include the price of all work covered herein in the associated lump sum bids for water improvements or wastewater improvements in the proper proportions.

END OF SECTION

SECTION 2200

EARTHWORK

1.0 GENERAL

1.1 Description: The Contractor shall furnish all materials, labor, equipment, supplies and incidentals necessary to complete all proposed earthwork, including but not limited to, excavation, backfill, undercut excavation, fill, backfill, compaction, provision and installation of borrow materials, embankment formation, subgrade preparation, removal and offsite disposal of all waste, demolished or excess materials, grading and land contouring to the satisfaction of the engineer, and as shown on the plans, specified herein and as specified in related sections.

1.2 The owner may, at their discretion, obtain the services of a licensed geotechnical consultant, at the owner's expense, to sample and test soil parameters to verify that soils meet project requirements and perform compaction density testing of soils, fill, backfill, subgrade and base materials. A licensed geotechnical engineer shall be any qualified agency having a NC professional soils engineer on staff, experienced in soil mechanics, testing and soils science and having the necessary staff and properly calibrated equipment to accurately test soil compaction density and the necessary related parameters. The owner may, at their discretion, select not to have or to have a representative of the geotechnical consultant on the project site periodically or full time, depending upon job conditions and progress. The owner's geotechnical consultant shall have the authority to approve or disapprove earthwork on the basis of compliance with project specific requirements and parameters. Any work that does not comply with project requirements, shall be repaired, replaced or otherwise corrected by the contractor at the contractor's expense, to the satisfaction of the engineer and owner's geotechnical engineer. All costs associated with retesting due to non-compliant work shall be paid for by the contractor until such time the geotechnical consultant is satisfied that the work has been corrected. The contractor is responsible, at their expense, for engaging the services of qualified professional geotechnical consultant(s) as necessary to monitor earthwork operations and provide quality control of operations to insure that construction is completed in accordance with the contract documents.

1.3 Classified Excavation: All excavation, with the exception of Rock Excavation, and Undercut Excavation, as defined herein, shall be "unclassified" or defined as Earth Excavation regardless of materials, obstructions, positions or conditions encountered whether naturally occurring or manmade. Earth excavation shall include the removal of and offsite disposal of rock excavation, structures, pavements and other obstructions, utilities, underground structures, together with any other type of earth and manmade material encountered necessary to complete all work. No additional or separate payment shall be made for earth excavation including any incidentals, related fees or any other costs or losses incurred by the contractor. All excavation that is not classified rock excavation or undercut excavation will be classified as earth excavation regardless of conditions, situations or materials encountered. All payment for

earth excavation shall not be measured but shall be included in the lump sum bids for completing all work.

1.3.1 Rock Excavation: shall be defined, performed, measured and paid for in accordance with *Section 02090, Rock Excavation*.

1.3.2 Undercut Excavation with Stone Backfill: shall include removing unsuitable existing materials beyond the required limits of subgrade elevations. When excavation has reached the required subgrade elevations, the contractor shall contact the engineer, and the owner's geotechnical engineer to conduct a site visit. If the engineer, based on advice from the owner's geotechnical engineer, determines that the bearing materials at the required subgrade elevations are unsuitable, the contractor shall continue the excavation to a depth approved by the engineer, remove unsuitable material for the project site, and replace excavated material with select stone or aggregate borrow materials. The select stone borrow material for replacing the excavated undercut material shall be an approved aggregate replacement material. Approved aggregate replacement materials for "Undercut Excavation with Stone Backfill" shall include NCDOT #57 washed stone, NCDOT ABC stone, NCDOT Class A, B, 1 or 2 Rip Raps or a combination of these materials depending upon the site specific recommendations of the owner's geotechnical engineer. All approved aggregate replacement materials shall be well consolidated with suitable vibratory compaction equipment and compacted to a minimum of 100 percent density per AASHTO T 180. Undercut excavation with stone backfill shall also include the complete encapsulation of aggregate replacement materials with a heavy duty, non-woven engineering fabric such as Mirafi 140N or an approved equal. All engineering fabric seams shall be overlapped by a minimum of 2 feet. Undercut excavation shall not include excavation, disposal and replacement of materials necessary to reach the standard subgrade elevations indicated on the plans. Undercut excavation with stone backfill shall only include additional excavation beyond subgrade limits which has been approved by the engineer. Undercut excavation extending beyond the limits specified by the engineer shall not be paid for but shall be properly repaired at the contractor's expense. Undercut excavation with stone backfill shall include the removal and disposal of unsuitable materials off the owner's property, the provision, placement and compaction of approved aggregate replacement materials to replace the volume of removed materials, the provision and installation of engineering fabric to completely encapsulate the aggregate replacement materials and all other related work and incidentals to the satisfaction of the owner's geotechnical engineer and the engineer. Topsoil removal shall not be paid for regardless of locations or depths encountered. Materials that are damaged in part due to construction activities, practices or schedules, such as foundation excavations subjected to rain or water intrusion, freezing and subsequently must be removed, shall not be considered undercut excavation and shall be repaired or corrected by the contractor at the contractor's expense. The contractor shall be paid for approved undercut excavation

with stone backfill at the unit price stipulated in the contract. Undercut excavation that has not been coordinated by the contractor with the engineer and the owner's geotechnical engineer will not be paid for.

1.3.3 Undercut Excavation with Soil Backfill: shall include removing unsuitable existing materials beyond the required limits of subgrade elevations. When excavation has reached the required subgrade elevations, the contractor shall contact the engineer, and the owner's geotechnical engineer to conduct a site visit. If the engineer, based on advice from the owner's geotechnical engineer, determines that the bearing materials at the required subgrade elevations are unsuitable, the contractor shall continue the excavation to a depth approved by the engineer, remove unsuitable material for the project site, and replace excavated material with select borrow soil material. The select borrow soil material for replacing the excavated undercut material shall be provided by the contractor from an approved off-site source and shall be in accordance with paragraphs 2.2, 2.2.1, 2.2.2 and 3.13 of this specification section and acceptable to the owner's geotechnical engineer. All approved soil replacement materials shall be well compacted with suitable vibratory compaction equipment to a minimum of 98 percent standard Proctor maximum dry density as determined by ASTM D698. Undercut excavation with soil backfill may be placed on top of undercut excavation with stone backfill at the discretion of the Owner's geotechnical engineer. Undercut excavation shall not include excavation, disposal and replacement of materials necessary to reach the standard subgrade elevations indicated on the plans. Undercut excavation with soil backfill shall only include additional excavation beyond subgrade limits which has been approved by the engineer. Undercut excavation extending beyond the limits specified by the engineer shall not be paid for but shall be properly repaired at the contractor's expense. Undercut excavation with soil backfill shall include the removal and disposal of unsuitable materials off the owner's property, the provision, placement and compaction of approved borrow soil materials to replace the volume of removed materials and all other related work and incidentals to the satisfaction of the owner's geotechnical engineer and the engineer. Topsoil removal shall not be paid for regardless of locations or depths encountered. Materials that are damaged in part due to construction activities, practices or schedules, such as foundation excavations subjected to rain or water intrusion, freezing and subsequently must be removed, shall not be considered undercut excavation and shall be repaired or corrected by the contractor at the contractor's expense. The contractor shall be paid for approved undercut excavation with soil backfill at the unit price stipulated in the contract. Undercut excavation that has not been coordinated by the contractor with the engineer and the owner's geotechnical engineer will not be paid for.

1.3.4 Unauthorized excavation consists of removing materials beyond the indicated or specified limits, subgrade elevations or the dimensions required to complete the work. Unauthorized excavation, as well as remedial work directed by the owner's geotechnical engineer, shall be performed to the satisfaction of the engineer at the contractor's expense.

1.3.5 Earthwork is not "balanced." It is the bidder's responsibility to determine the actual quantities required to successfully complete the project and include all required earth excavation and all work in the base bid amount. The owner's geotechnical engineer will be responsible for determining the suitability or unsuitability of earthwork and related materials.

1.4 All work shall be in accordance with the provisions, rules and regulations of the North Carolina Department of Environment and Natural Resources and all other local, state and national agencies having jurisdiction.

1.5 The contractor shall be solely responsible for all job site safety and security.

1.5.1 The contractor shall be solely responsible for complying with all local, state and national codes, standards, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations and otherwise maintain safe jobsite conditions.

1.5.2 The contractor shall be solely responsible for work zone traffic control and signing. The contractor shall provide and maintain adequate work zone traffic control in accordance with the latest editions of the NCDOT "Standard Specifications for Roads and Structures," the NCDOT "Roadway Standard Drawings" the AASHTO "Manual of Uniform Traffic Control Devices" and all site specific conditions imposed by the NCDOT local Division Office.

1.6 The contractor shall be the party responsible for coordinating all construction with the owner, engineer, owner's geotechnical engineer, other contractors, subcontractors, utility companies and any other parties affected by the project. Except in an emergency, the contractor shall not operate any controls on any existing utility system without prior approval of the utility owner.

1.7 The contractor will be solely responsible for making investigations and determining the existence, exact locations, sizes, and material types of all existing utilities that may be affected by project activities prior to commencing construction. All existing utilities and related facilities are not shown on the plans and the locations shown on the plans may have been estimated based on available information. Any damage incurred to existing utilities, whether shown on the plans, not shown on the plans or incorrectly shown on the plans is the responsibility of the contractor and shall be repaired to the original or better condition, to the satisfaction of the utility owner and engineer, at the sole expense of the contractor. Should the position of any pole, guy wire, pipe, conduit, conductor or other utility or structure be such

that its removal and/or adjustment is necessary to complete construction, such change will be done by the owner of the obstructions at the contractor's expense.

1.8 During the progress of the work, sidewalks and crossings shall be kept open for the passage of pedestrians. Unless otherwise authorized, drives, roads and streets shall not be obstructed; and unless the engineer authorizes the complete closing of a drive, road or street, the contractor shall take such measures as may be necessary to keep it open for traffic.

1.8.1 The contractor shall construct and maintain adequate and approved temporary walkways, roads and bridges over excavations and disturbed areas as may be necessary for the purpose of accommodating pedestrians to the satisfaction of the engineer. This shall include the contractor providing, installing and maintaining temporary pavements or gravel surfaces at his expense in a condition acceptable to the engineer. When no longer needed, temporary measures shall be removed, disposed of off the owner's property and the area restored to a condition acceptable to the engineer at the contractor's expense.

1.8.2 When earthwork or excavation impacts a drive, road, street or other vehicle route, the contractor shall perform construction in a manner that maintains the passage of vehicle traffic in a manner acceptable to the engineer and owner. This includes the provision, placement and periodic grading of temporary gravel surfaces and/or pavements at the contractor's expense. The contractor shall provide all periodic maintenance stone needed and associated grading and later removal and offsite disposal of all temporary measures at the contractor's expense. The contractor shall provide all traffic control measures necessary to provide for safe traffic passage at all times.

2.0 MATERIALS

2.1 The contractor shall be responsible for insuring that all construction materials are loaded, unloaded, stockpiled, hauled, distributed, covered, protected, installed and otherwise handled in a manner that will prevent weather damage or other damage thereto their quality or usefulness and which will insure delivery and installation in a sound and acceptable condition.

2.2 Backfill, Fill and Borrow Materials: shall be excavated, loaded, hauled, unloaded, placed and compacted by the contractor as necessary for the proper completion of the project. All material shall be clean material, free of vegetation, organic matter, rocks larger than 2 inches in any dimension or other deleterious materials. The contractor shall be responsible for drying and/or wetting fill, borrow, or backfill materials if necessary to achieve proper moisture content and the specified compaction criteria. If available and suitable, materials may be used from onsite excavation or shall be imported borrow material if not available onsite. Imported borrow material shall be provided as needed by the contractor, at their sole expense, as necessary for the proper completion of the project to the satisfaction of the engineer and owner.

2.2.1 When offsite borrow material is needed, the contractor shall be responsible for obtaining a suitable borrow source and having all borrow sources being considered tested for suitability by a qualified NC professional geotechnical engineer at the contractor's expense. If the borrow material is found to be acceptable, and is acceptable to the engineer, the contractor shall be responsible for all permitting, excavating, hauling, placing and compacting the material all at the contractor's sole expense and as approved by the engineer. Borrow material, fill and backfill materials shall be in accordance with the following:

2.2.2 Suitable Soil Materials for fill, backfill and borrow shall be in accordance with ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation, organic matter and other deleterious matter. Suitable soils shall have a Plasticity Index (PI) of less than 15 and a minimum density of 95 pounds per cubic foot at the specified degree of compaction.

2.2.3 Unsuitable Materials which shall not be allowed for use as borrow, fill or backfill material shall be any material classified by ASTM D 2487 as soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, PT or any soils containing organic material greater than 2% by weight, or any soils containing rocks or stones larger than 2 inches in any dimension, or any soils containing other materials objectionable to the engineer or any soils which cannot be compacted to specified percentage of maximum density given site specific moisture conditions.

2.3 Topsoil, unsuitable materials or any material containing organic or other objectionable materials shall not be incorporated into fill or backfill. Clean topsoil, free of roots, rocks, stones and debris, may be stockpiled at approved locations and used as a 4" topdressing on areas having slopes of 25% and less to the finished grades specified in all areas to be grassed. Where insufficient topsoil is available on the project site, the contractor shall provide from an acceptable source and place topsoil to a minimum depth of 4" for all areas to be grassed and having a finished slope of 25% and less. Any topsoil, unsuitable material or excess material which is not incorporated into the work shall be considered waste material and shall be removed and properly disposed of off the owner's property by the contractor at the contractor's expense. Any borrow, fill or other material necessary as a result of topsoil or other material removal from the project site shall be obtained, permitted, hauled, placed, compacted, graded and otherwise completed to the engineer's satisfaction by the contractor at the contractor's expense. No additional payment or compensation will be made to the contractor as a result of, or related to topsoil or other unsuitable materials regardless of site conditions or depths and limits encountered.

2.4 Any and all excess, waste or unsuitable materials shall be removed, hauled and disposed of off the project site, in accordance with applicable regulations, all at the contractor's sole expense.

2.5 Crusher Screenings: where specified as a select material shall be a fine aggregate material consisting of crushed stone screenings (washed or unwashed) meeting the following gradations:

Sieve	% Passing
3/8 in.	100
#4	80 - 100
#10	65 - 95
#40	25 - 55
#200	0 - 20

2.6 Washed Stone: Unless specified otherwise, washed stone shall be a coarse aggregate material meeting the gradation requirements of NCDOT standard size No. 57 as specified in Section 1005 of the NCDOT “Standard Specifications for Roads and Structures.”

2.7 Concrete: Unless specified otherwise on the plans or other sections of these specifications, all concrete and grouts shall be Portland cement concrete having a minimum compressive strength of 4,000 psi at 28 days. All concrete exposed to weather shall be air entrained. Concrete shall be NCDOT Class A in accordance with Section 1000 of the NCDOT “Standard Specifications for Roads and Structures.”

3.0 EXECUTION

3.1 The contractor shall be responsible for protecting structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

3.1.1 The contractor shall protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

3.1.2 Obstructions: It shall be the contractor’s sole responsibility to conduct exploratory investigations and become thoroughly acquainted with existing conditions and to locate structures and utilities within the project limits in order to avoid conflicts or damage. Where conflicts are unavoidable, the engineer shall be contacted prior to proceeding with construction and all work shall be coordinated with the owner and performed so as to cause no interference with the service rendered by the facility disturbed. All affected utilities shall be notified by the contractor prior to excavation in their vicinity.

3.1.3 The contractor shall 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.

3.2 Any areas to be filled, graded, or to support pavements or structures shall be cleared and grubbed to remove all topsoil, vegetation, organic matter or other deleterious materials to the satisfaction of the owner's geotechnical engineer at the contractor's expense. All waste materials resulting from clearing and grubbing operations shall be disposed of off the owner's property at the contractor's expense.

3.3 When, in the opinion of the Owner's geotechnical engineer and the engineer, undercut excavation is required, the contractor is responsible for notifying the engineer and allowing the engineer adequate time to profile the excavation surfaces prior to and following undercutting operations for use in estimating the volumes of undercut for payment purposes. The contractor shall assist and allow the engineer adequate time to profile the temporary surfaces prior to and following the completion of a given section or area of undercut excavation. The contractor shall be responsible for implementing all necessary safety and security measures as needed to allow temporary undercut surfaces to remain exposed for measurement by the engineer. Payment for undercut excavation will be made on the basis of the engineer's estimated volumes.

3.4 The contractor shall be responsible for achieving the proper moisture content in all materials to be used for fill, borrow material or backfill. The contractor shall uniformly moisten material that is too dry and scarify or otherwise dry material that is too wet before placement and compaction to within 3 percent of optimum moisture content or as required to meet compaction requirements.

3.4.1 Fill or backfill materials shall not be placed on surfaces that are muddy, frozen, or contain frost or ice.

3.5. Proofrolling Existing Subgrades: Any areas to receive fill and any areas that will support buildings, pavements or other structures shall be proofrolled by the contractor using a four wheeled, rubber tired roller as described in Section 260-2 of the NCDOT "Standard Specifications for Roads and Structures," July 2006. The rubber tired roller shall have a minimum loaded weight of 45 tons. The proofroller should make at least four passes over each location, with the last two passes perpendicular to the first two in the presence of the owner's geotechnical engineer. All proofrolling, including but not limited to equipment, shall be provided by the contractor at the contractor's expense. Any areas which, in the opinion of the geotechnical engineer, wave, rut or deflect excessively shall be scarified, excavated, dried or wetted to the proper moisture range and re-compacted and re-proofrolled until satisfactory results are obtained at the contractor's expense. The contractor shall be responsible for coordinating all proofrolling activities with the owner's geotechnical engineer as necessary to insure that the engineer and Owner's geotechnical engineer is on-site to observe all proofrolling activities.

3.6 Existing slopes to receive fill that are steeper than 25% shall be benched prior to beginning placement of fill. Benches shall be cut having a minimum width of approximately 8

feet to 12 feet and a rise between benches no less than 1 vertical foot nor more than 5 vertical feet. Begin each bench cut at the intersection of the original ground and the vertical side of the previous cut. Place suitable fill on excavated benches in layers not exceeding 8 inches loose thickness and compact as specified herein. All benching of existing slopes shall be performed by the contractor in accordance with the recommendations of the owner's geotechnical engineer at the contractor's expense.

3.7 Fill and Embankment Construction: shall be performed using approved materials spread in successive, approximately horizontal layers of not more than 8 inches in depth, loose measurement, for the full extent of a particular area being filled. Each layer shall be compacted as specified using suitable equipment. The fill surface shall be shaped and sloped to properly drain at all times.

3.7.1 The contractor shall make the necessary provisions and allow time for the owner's geotechnical engineer to periodically test the compaction of the placed fill as construction progresses, should they select to do so. Any fill which fails to meet the specified compaction standard shall be removed, replaced with suitable material, re-compacted and re-tested until acceptable results are obtained to the satisfaction of the owner's geotechnical engineer. Any costs associated with replacing fill failing to meet the required compaction requirements shall be paid by the contractor. The contractor shall reimburse the owner for any re-testing costs due to failed compaction testing.

3.7.2 As fill and embankment construction proceeds, the contractor shall periodically proofroll the filled area using a four wheeled, rubber tired roller as described in Section 260-2 of the NCDOT "Standard Specifications for Roads and Structures," July 2006 at intervals requested by the owner's geotechnical engineer. The rubber tired roller shall have a minimum loaded weight of 45 tons. The proofroller should make at least four passes over each location, with the last two passes perpendicular to the first two in the presence of the owner's geotechnical engineer. All proofrolling, including but not limited to equipment, shall be provided by the contractor at the contractor's expense. Any areas which, in the opinion of the owner's geotechnical engineer, wave, rut or deflect excessively shall be scarified, excavated, dried or wetted to the proper moisture range and re-compacted and re-proofrolled until satisfactory results are obtained at the contractor's expense. The contractor shall be responsible for coordinating all proofrolling activities with the owner's geotechnical engineer as necessary to insure that the geotechnical engineer is on-site to observe all proofrolling activities.

3.8 Compaction: All compaction shall be performed by the contractor at the contractor's expense. Unless specifically noted otherwise elsewhere, all fill, backfill, borrow material, subgrade, and other earth materials shall be placed and compacted in individual lifts not exceeding 8 inches in thickness to at least 98% of the standard Proctor maximum dry density as determined by ASTM D 698. Any areas which do not meet the required compaction criteria shall be removed, replaced and re-compacted with suitable material until

the required degree of compaction is achieved, to the satisfaction of the owner's geotechnical engineer, at the contractor's sole expense. The contractor shall reimburse the owner for any re-testing costs due to failed compaction testing. The owner is not required to provide testing for the contractor and the absence of testing in no way relieves the contractor's responsibility to meet compaction requirements at all locations throughout the project as specified.

3.9 Excavations shall be performed by the contractor to the indicated elevations and dimensions within a tolerance of plus or minus 0.10 feet. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, installing services, other construction, and as required by site specific requirements, standards and regulations.

3.9.1 Excavations for Footings and Foundations: Do not disturb the bottom of the 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. Do not allow the bottom of the excavation to be damaged by rain, frost or any other means.

3.10 Sheeting and Bracing: When required to prevent damage to property, injury to persons, erosion, cave-ins, or excessive excavation limits, the contractor shall install adequate sheeting, bracing, retaining walls, trench boxes, etc. as may be necessary and as required by OSHA and other agencies having jurisdiction and in accordance with accepted standard practice. When the situation arises, sheeting and bracing shall be used as necessary to protect the integrity of the project site. The lower portions of sheeting may be left in place and backfilled provided it is at least 5 feet below finished grade and does not interfere with any construction or future improvements planned for the site. All sheeting, bracing, shoring, retaining walls, trench boxes and other support devices shall be in accordance with OSHA, and all other local, state and national regulations, requirements, guidelines and recommendations and shall be at the contractor's expense. The contractor is solely responsible for all safety and site security in any way related to construction.

3.11 The contractor shall uniformly fine grade all areas to a smooth, even surface, in accordance with the lines, grades and elevations shown on the plans. The graded surface shall be free from unwanted irregular surface changes, ridges, ruts and shall provide a smooth transition between existing adjacent grades and newly graded areas. All grades shall be within 0.1 feet of plan grades for grassed areas and within 0.04 feet of plan grades for paved areas. Regardless, all grassed areas shall be sloped for proper drainage at a minimum slope of 2 percent and all paved areas shall be sloped for proper drainage at a minimum slope of 1 percent. All grading shall be performed by the contractor at the contractor's expense.

3.11.1 All disturbed areas to be grassed shall be prepared by the contractor by fine grading to the proper grades and contours, raked smooth and cleaned of all surface rocks, organics or any other debris, and seeded and mulched as needed to establish a healthy stand of grass to the satisfaction of the engineer and the owner. When required by the plans or necessary to establish grasses and prevent erosion, the contractor shall provide and install temporary

excelsior matting anchored in accordance with the manufacturer's instruction and in accordance NCDOT Specification Section 1060-8.

3.12 Excess and Unsuitable Materials : Excess fill, waste, topsoil, unsuitable materials or other materials, whether considered suitable or unsuitable shall become the property of the contractor and shall be loaded, hauled, unloaded, placed and disposed of at locations, off the owner's property, secured and properly permitted by the contractor, in accordance with all agencies having jurisdiction, at the sole expense of the contractor. No additional compensation will be made to the contractor for any activity associated with the disposal of waste or excess materials. The resale of excess or waste materials on the project site will not be permitted.

3.13 Borrow: Should there be insufficient suitable materials from the excavations to meet the requirements for fill or backfill material, the contractor shall be responsible for: locating and obtaining a suitable borrow source off the owner's property, providing all testing necessary to locate suitable borrow and insure the selected materials suitability, all permitting, excavating, loading, hauling, unloading, placing, compacting, disposing of waste material and all other work associated with borrow material all at the contractor's sole expense. All borrow material shall meet the provisions of these specifications.

3.14 Rock Excavation: Rock excavation shall performed in accordance with *Section 2090 "Rock Excavation and Blasting."*

3.15 The contractor shall take all measures necessary to keep surface water out of the foundations, excavations and trenches by diking, ditching, or otherwise avoiding it. All the necessary provisions for proper surface drainage, to the satisfaction of the engineer, shall be made by the contractor as needed to prevent any related damage to the project site or other properties. Any damage as a result of surface water shall be satisfactorily repaired at the contractor's expense.

3.16 Dewatering: All construction shall be performed in dry excavations. All dewatering activities necessary to achieve dry conditions are to be performed by the contractor at the contractor's expense. Groundwater tables shall be maintained by the contractor at levels lower than 2 feet below foundation or structure bearing elevations, pavement subgrade elevations, or pipe invert elevations.

3.16.1 Excavations may be dewatered by using one or more of the following methods: well point system; sumps with pumps or other method(s) as approved by the engineer. Dewatering systems shall be utilized in accordance with good standard practice and must be efficient enough to lower the water level in advance of the excavation and maintain it continuously to keep the excavation bottom and sides firm and dry. Discharge from dewatering shall be disposed of in such a manner that it will not interfere with normal

drainage of the area in which the work is being performed, create a public nuisance, cause ponding or cause erosion or sedimentation concerns or problems.

3.16.2 All dewatering discharges shall be in accordance with applicable NC Stormwater General Permits and any other applicable regulations. The operations shall not cause injury to any portion of the work completed, or in progress, or to the surface of roads, or to any public or private properties. Dewatering method(s) and schedules shall be acceptable to all regulatory agencies having jurisdiction. Where private or public properties outside the construction limits will be involved, advance permission and coordination shall be obtained by the contractor.

4.0 METHOD OF MEASUREMENT & BASIS OF PAYMENT

4.1 All work, materials, equipment, labor, testing, incidentals and appurtenances described in this section, with the exception of Undercut, as defined herein, shall not be measured and paid for as such but shall all be treated as incidental work. The contractor is responsible for including the price of all work covered herein in the lump sum prices for water improvements or wastewater improvements, as appropriate, stipulated for related work in the bid form. **See Allowances section for undercut quantities to be included in lump sum base bid.**

4.2 Undercut Excavation with Stone Backfill: shall include the work as described herein and related portions of the Contract Documents. The contractor shall be paid for undercut excavation with stone backfill in quantities approved by the engineer at the unit bid price stipulated in the contract for the actual quantities of undercut.

4.3 Undercut Excavation with Soil Backfill: shall include the work as described herein and related portions of the Contract Documents. The contractor shall be paid for undercut excavation with soil backfill in quantities approved by the engineer at the unit bid price stipulated in the contract for the actual quantities of undercut.

END OF SECTION

SECTION 2210
EXCAVATION, TRENCHING & BACKFILLING
FOR UTILITIES

1.0 GENERAL

1.1 Description: The Contractor shall furnish all materials, labor, equipment, supplies and incidentals necessary to complete the proposed utility work, including but not limited to water lines, fire sprinkler lines, sewer lines, water and sewer service lines, storm drains, storm drainage structures, culverts, casing pipes, sleeves and other utilities to the satisfaction of the engineer and as shown on the plans, specified herein and as specified in related sections.

1.2 The owner may, at their discretion, obtain the services of a licensed geotechnical consultant, at the owner's expense, to sample and test soil parameters and perform compaction density testing of soils, fill, backfill, subgrade and base materials as required by the engineer and stipulated herein. A licensed geotechnical engineer shall be any qualified agency having a NC professional soils engineer on staff, experienced in soil mechanics, testing and soils science and having the necessary staff and properly calibrated equipment to accurately test soil compaction density and the necessary related parameters. The owner's geotechnical consultant shall have the authority to approve or disapprove earthwork on the basis of compliance with project specific requirements and parameters. Any work that does not comply with project requirements, shall be repaired, replaced or otherwise corrected by the contractor at the contractor's expense, to the satisfaction of the engineer and owner's geotechnical engineer. All costs associated with retesting due to non-compliant work shall be paid for by the contractor until such time the geotechnical consultant is satisfied that the work has been corrected.

1.3 Rock Excavation shall be in accordance with Section 02090, Rock Excavation & Blasting, as specified herein and as specified in related sections of the specifications. Rock Excavation shall be defined and performed in accordance with *Section 02090, Rock Excavation*.

1.4 General grading and sitework shall also be in accordance with Section 02200, Earthwork, and as specified herein and as specified in related sections of the specifications.

1.5 All work shall be in strict accordance with the provisions, rules and regulations of the North Carolina Department of Environment and Natural Resources and all other local, state and national agencies having jurisdiction.

1.6 The contractor shall be responsible for all job site safety and security including, but not limited to, work zone traffic control and signing. The contractor shall provide and maintain adequate work zone traffic control in accordance the latest editions of the NCDOT "Standard Specifications for Roads and Structures," the NCDOT "Roadway Standard Drawings" the

“Manual of Uniform Traffic Control Devices” by the Federal Highway Administration and all site specific conditions imposed by the NCDOT local Division Office.

1.7 The contractor shall be responsible for coordinating all construction with the owner and other all utility companies affected by the project. Except in an emergency, the contractor shall not operate any controls on any existing utility system without prior approval of the utility owner.

1.8 The contractor will be solely responsible for making investigations and determining the existence, exact locations, sizes, and material types of all existing utilities that may be affected by project activities prior to commencing construction. All existing utilities and related facilities are not shown on the plans and the locations shown on the plans may have been approximated. Any damage incurred to existing utilities, whether shown on the plans, not shown on the plans or incorrectly shown on the plans is the responsibility of the contractor and shall be repaired to the original or better condition, to the satisfaction of the utility owner and engineer, at the sole expense of the contractor.

1.9 Connections to existing utilities shall be made when shown on the plans, required to successfully complete the project and as directed by the engineer. The connections shall be made at times most convenient to the public and when the service will be the least endangered by the work. The connections shall be made on weekends, at night, and on holidays if required by the utility owner or engineer. Should the position of any pole, pipe, conduit, conductor or other structure be such that its removal and/or adjustment is necessary to complete construction, such change will be done by the owner of the obstructions at the contractor’s expense.

1.10 Water lines shall be located at least 10 feet laterally from sanitary sewers, unless local conditions or barriers prevent a 10 foot separation, in which case the water main is laid in a separate trench, with the elevation of the bottom of the water pipe at least 18 inches above the top of the sanitary sewer pipe. When a water line crosses a sanitary sewer line, the water line shall be laid at such an elevation that the bottom of the water pipe is at least 18 inches above the top of the sanitary sewer, unless local conditions or barriers prevent an 18 inch vertical separation, in which case both the water line and the sanitary sewer line shall be constructed of Cl. 51 ductile iron pipe (DIP) with joints that are equivalent to AWWA water main standards for a distance of 10 feet on each side of the point crossing.

1.11 During the progress of the work, sidewalks and crossings shall be kept open for the passage of pedestrians. Unless otherwise authorized, drives, roads and streets shall not be obstructed; and unless the engineer authorizes the complete closing of a drive, road or street, the contractor shall take such measures as may be necessary to keep the street open for traffic.

1.11.1 The contractor shall construct and maintain adequate and approved temporary walkways, roads and bridges over excavations and disturbed areas as may be necessary for the purpose of accommodating pedestrians or vehicles to the satisfaction of the engineer. This shall include the

Excavation, Trenching & Backfilling

For Utilities

Lofquist & Associates, Inc.
April 30, 2020

02210 – 2

contractor providing, installing and maintaining temporary gravel surfaces at his expense in a condition acceptable to the engineer.

1.11.2 When open cut installation is allowed across a drive, road or street and traffic is to be maintained, the installation shall be done in sections so that half the width of the roadway will be available to traffic. The Contractor shall provide all traffic control measures necessary to provide for safe traffic passage.

2.0 MATERIALS

2.1 The contractor shall be responsible for insuring that all construction materials are loaded, unloaded, stockpiled, hauled, distributed, covered, protected, installed and otherwise handled in a manner that will prevent breakage, weather damage or other damage thereto their quality or usefulness and which will insure delivery and installation in a sound and acceptable condition.

2.2 Pipe, fittings and other materials for use in constructing utilities shall be in accordance with the plans and other related sections of these specifications.

2.3 Backfill, Fill and Borrow Materials: used in utility construction shall be excavated, loaded, hauled, unloaded, placed and compacted by the contractor as necessary for the proper completion of the project. All material shall be clean material, free of vegetation, organic matter, rocks larger than 2 inches in any dimension or other deleterious materials. The contractor shall be responsible for drying and/or wetting backfill and fill materials if necessary to achieve specified compaction criteria. If available and suitable, materials may be used from onsite excavation or shall be imported borrow material if not available onsite. Imported borrow material shall be provided as needed by the contractor, at his expense, as necessary for the proper completion of the project to the satisfaction of the engineer. When borrow material is needed, the contractor shall be responsible for obtaining a suitable borrow source, having all borrow sources considered tested for suitability by a qualified soils laboratory, excavating, hauling, placing and compacting the material all at the contractor's sole expense. Backfill, fill and borrow materials shall be in accordance with the following:

2.3.1 Suitable Materials For Backfill And Fill: shall be classified as A-1, A-3 or A-2-4 in accordance with AASHTO Designation M-145 and shall be free from vegetation, organic material and rocks larger than 2 inches. Not more than 12 percent by weight of fill material shall pass the No. 200 sieve. All Backfill and Fill materials shall have a minimum, in place, compacted unit weight of 95 pounds per cubic foot.

2.3.2 Suitable Materials to be Placed in Areas having Groundwater or Wet Conditions: shall be NCDOT #57 washed stone or materials classified as A-1 or A-3 in accordance with AASHTO Designation M-145.

2.3.3 Unsuitable Material: which shall not be allowed for use as backfill or fill material are materials classified as A-2-5, A-2-6, A-2-7, A-4, A-5, A-5, A-7 and A-8 in accordance with AASHTO Designation M 145 or any soils containing organic material, or any soils containing rocks or stones larger than 3 inches in any dimension, or any soils containing other materials objectionable to the engineer or any soils which cannot be compacted to specified percentage of maximum density given site specific moisture conditions.

2.3.4 Topsoil, unsuitable materials or any material containing organic or other objectionable materials shall not be incorporated into fill or backfill. Clean topsoil, free of roots, rocks, stones and debris, may be stockpiled at an approved location and used as a 4" topdressing to the finished grades specified in areas to be grassed. Any topsoil, unsuitable material or excess material which is not incorporated into the work shall be considered waste material and shall be removed and properly disposed of offsite by the contractor at the contractor's sole expense. Any borrow, fill or other material necessary as a result of topsoil or other material removal from the project site shall be obtained, permitted, hauled, placed, compacted, graded and otherwise completed to the engineer's satisfaction by the contractor at the contractor's sole expense. No additional payment or compensation will be made to the contractor as a result of, or related to topsoil or other unsuitable materials regardless of site conditions or depths and limits encountered.

2.3.5 Any and all excess or unsuitable materials shall be removed, hauled and disposed of off the project site, in accordance with applicable regulations, all at the contractor's sole expense.

2.4 Crusher Screenings: where specified as a select material shall be a fine aggregate material consisting of crushed stone screenings (washed or unwashed) meeting the following gradations:

Sieve	% Passing
3/8 in.	100
#4	80 - 100
#10	65 - 95
#40	25 - 55
#200	0 - 20

2.5 Washed Stone: shall be a coarse aggregate material meeting the gradation requirements of NCDOT standard size No. 57 as specified in Section 1005 of the NCDOT "Standard Specifications for Roads and Structures."

2.6 Concrete: Unless specified otherwise on the plans or other sections of these specifications, all concrete and grouts shall be Portland cement concrete having a minimum compressive strength of 4,000 psi at 28 days. All concrete exposed to weather shall be air entrained. Concrete shall be NCDOT Class A in accordance with Section 1000 of the NCDOT "Standard Specifications for Roads and Structures."

3.0 EXECUTION

3.1 Compaction: All compaction shall be performed by the contractor at the contractor's expense. Unless specified otherwise on the plans or in other sections of these specifications, all backfill, fill, bedding and select materials shall be placed and compacted in individual lifts not exceeding 6 inches in thickness to a minimum 100% standard proctor density under all roads, drives, parking areas and structures and to a minimum 98% standard proctor density at all other locations as determined by ASTM methods. Any areas which do not meet the required compaction criteria shall be removed, replaced and re-compacted with suitable material until the required degree of compaction is achieved, to the satisfaction of the engineer, at the contractor's sole expense.

3.2 Trenching: The maximum amount of open trench permitted in any one location shall be the length necessary to accommodate the amount of pipe installed in a single day or 500 feet whichever is less. All trenches shall be fully backfilled at the end of each day. Barricades, warning lights, signs, flagmen and other incidentals meeting NCDOT, OSHA and all other applicable requirements shall be provided and maintained.

3.2.1 The maximum width of trench, measured at the top of the pipe, shall not exceed the outside pipe diameter plus two feet, unless otherwise shown on the drawing details or approved by the engineer.

3.2.2 Trench grade for utilities in rock or other non-cushioning material shall be defined as six inches below the outside of the bottom of the utility, which six inches shall be backfilled with extra utility bedding material. Excavation below trench grade that is done in error shall be backfilled to trench grade with stone or other suitable granular material and compacted.

3.2.3 Utility Bedding: The bottom of the trench shall be shaped to provide a firm bedding for the utility pipe. The utility shall be firmly bedded in undisturbed firm soil which is hand-shaped to the pipe, bells and fittings to fully contact all surfaces and properly support the pipe. The bedding shall be shaped so that the pipe will be in continuous contact therewith for its full length and shall provide a minimum bottom segment support for the pipe equal to springline of the pipe or one-half of the outside diameter of the barrel. Special bedding may be required, due to rock excavation, groundwater, depth of cover, impact loadings, or any other conditions as shown on the plans or specified in related sections of specifications. Any type of special bedding required, such as washed stone, crusher screenings or other borrow materials, shall be obtained, hauled, placed and compacted by the contractor at his sole expense as necessary for the proper completion of the project to the satisfaction of the engineer.

3.2.4 Unsuitable Material Below Trench Grade: Soil unsuitable for a proper foundation which is encountered at or below trench grade, such as muck or other deleterious material, shall be removed for the full width of the trench and to the depth required to reach suitable foundation

Excavation, Trenching & Backfilling

For Utilities

Lofquist & Associates, Inc.
April 30, 2020

02210 – 5

material, or otherwise stabilized to the satisfaction of the engineer using stone or other approved special bedding materials and methods. When rock or wet conditions are encountered at trench bottom grade, the contractor shall, at a minimum, extend excavation to 6 inches below the outside bottom of the utility and install NCDOT #57 washed stone bedding to a depth of 6 inches below the pipe and up to the springline of the pipe for the full trench width or to additional depths if necessary to achieve stable conditions. The contractor shall undercut, remove and replace unsuitable materials below trench grade with washed stone or otherwise satisfactorily stabilize foundation materials regardless of depth or materials needed at the contractor's sole expense. No additional compensation will be made for additional undercut excavation, disposal of waste materials, stone bedding, other materials, labor or incidentals necessary to achieve stabilized foundation conditions for utility or storm drainage installation.

3.3 Sheeting and Bracing: In order to prevent damage to property, injury to persons, erosion, cave-ins, or excessive trench widths, adequate sheeting and bracing and trench boxes shall be provided, as required by OSHA and other agencies having jurisdiction and in accordance with accepted standard practice. When the situation arises, sheeting and bracing shall be used as necessary to protect the integrity of the road shoulder. Sheeting shall be removed when the trench has been backfilled to at least one-half its depth, or when removal would not endanger the construction of adjacent structures. When required, to eliminate excessive trench width or other damage, sheeting, bracing, or shoring shall be left in place and the top cut off at an elevation of 5.0 feet below finished grade or 1.0 foot above the top of the pipe, whichever is less, unless otherwise directed. All sheeting and bracing and trench boxes will be in accordance with OSHA, and all other local, state and national regulations, requirements, guidelines and recommendations. The contractor is solely responsible for all safety and site security in any way related to construction. All costs associated with sheeting and bracing will be at the contractor's sole expense.

3.4 Excavated Material: Suitable material to be used for backfill shall be neatly and safely deposited at the sides of the trenches where space is available. Whenever possible, excavated material near a roadway should be deposited on the right-of-way side of the trench away from the travel lanes. Where stockpiling of excavated material is required, the contractor shall be responsible for obtaining the sites to be used and shall maintain the operation as needed to prevent erosion and not present an objectionable appearance. The contractor shall be responsible for transporting the material to and from the stockpile area at his expense. All sites shall be restored to the engineer's satisfaction after the stockpiled material is removed. No excavated activities shall be conducted in a manner which impedes the drainage of road ditches, pipes, culverts or other storm drainage routes.

3.5 Excess and Unsuitable Materials : Excess fill, waste or other materials, whether considered suitable or unsuitable shall be the property of the Contractor and shall be loaded, hauled, unloaded, placed and disposed of at locations secured and properly permitted by the contractor, in accordance with all agencies having jurisdiction, at the sole expense of the

Excavation, Trenching & Backfilling

For Utilities

Lofquist & Associates, Inc.
April 30, 2020

02210 – 6

contractor. No additional compensation will be made to the contractor for any activity associated with the disposal of waste or excess materials. The resale of excess or waste materials on the project site will not be permitted.

3.6 Borrow: Should there be insufficient suitable materials from the excavations to meet the requirements for fill or backfill material, the contractor shall be responsible for: locating and obtaining a suitable borrow, providing all testing necessary to locate suitable borrow and insure the selected materials suitability, excavating, loading, hauling, unloading, placing, compacting, disposing of waste material and all other work associated with borrow material all at the contractor's sole expense. All borrow material shall meet the provisions of these specifications.

3.7 Rock Excavation: Rock excavation shall be performed in accordance with Section 02090 "Rock Excavation and Blasting."

3.8 The Contractor shall take all measures necessary to keep surface water out of the foundations and trenches by diking, ditching, or otherwise avoiding it. All the necessary provisions for proper surface drainage, to the satisfaction of the engineer, shall be made by the contractor.

3.9 Dewatering: All utility installation shall be performed in dry trenches and excavations. All dewatering activities necessary to achieve dry trench conditions are to be performed by the contractor at the contractor's expense.

3.9.1 Trench excavations may be dewatered by using one or more of the following methods: well point system; sumps with pumps or other method(s) as approved by the Engineer. Dewatering systems shall be utilized in accordance with good standard practice and must be efficient enough to lower the water level in advance of the excavation and maintain it continuously to keep the trench bottom and sides firm and dry. If the material encountered at trench grade is suitable for the passage of water without destroying the sides or utility foundation of the trench, sumps may be provided at intervals at the side of the main trench excavation, with pumps used to lower the water level by taking their suction from said sumps. Discharge from dewatering shall be disposed of in such a manner that it will not interfere with normal drainage of the area in which the work is being performed, create a public nuisance, cause ponding or cause erosion or sedimentation concerns or problems.

3.9.2 All dewatering discharges shall be in accordance with applicable NC Stormwater General Permits and any other applicable regulations. The operations shall not cause injury to any portion of the work completed, or in progress, or to the surface of roads, or to any public or private properties. Dewatering method(s) and schedules shall be acceptable to all regulatory agencies having jurisdiction. Where downstream private or public properties outside the construction limits will be involved, advance permission and coordination shall be obtained by the contractor.

3.10 Obstructions: It shall be the contractor's sole responsibility to conduct exploratory investigations and thoroughly acquaint himself with existing conditions and to locate structures and utilities along the proposed utility alignment in order to avoid conflicts or damage. Where conflicts are unavoidable, the engineer shall be contacted prior to proceeding with construction and all work shall be coordinated with the facility owner and performed so as to cause no interference with the service rendered by the facility disturbed. All affected utilities shall be notified by the contractor prior to excavation in their vicinity.

3.11 Backfill material shall be clean, granular earth fill composed of sand, clay and sand, sand and fine gravel, NCDOT #57 washed stone, crusher screenings, or a combination thereof approved by the engineer.

3.11.1 The initial fill from the trench bottom grade or below the trench bottom if unstable conditions are encountered, shall be as shown on the plans and specified herein. All material below the pipe and backfill material to 12 inches above the pipe shall be granular material unless washed stone, crusher screenings or other specified bedding material is shown on the plans. The initial fill shall be carefully placed and tamped around the lower half (springline) of the utility. Backfilling shall be carefully continued until the fill is 12 inches above the top of the utility in layers not exceeding 6 inches (uncompacted thickness), using the best available material from the excavation, if approved by the engineer, or special bedding material if required. The initial fill to an elevation of 12 inches above the pipe shall be free of any rocks or stones having any dimension greater than 1 inch. The initial fill material shall be lowered to within two feet above the top of pipes before it is allowed to fall, unless the material is placed with approved devices that protect the pipes from impact.

3.11.2 The remainder of the trench, above initial backfill and below the subgrade, shall be backfilled and compacted in layers not exceeding 8 inches (uncompacted thickness) per lift using approved material as specified herein.

3.12 All road shoulders and grassed areas shall be: fine graded; raked smooth and cleaned of any rocks, organics or other debris; seeded and mulched and have a healthy stand of grass established; restored to provide proper drainage; restored to the satisfaction of the engineer and all agencies having jurisdiction.

3.13 The specified compaction shall be accomplished using accepted standard methods (powered tampers, vibrators, etc.), with the exception that the first 12 inches of backfilling over the pipe shall be compacted by hand-operated tamping devices. Flooding or puddling with water to consolidate backfill will not be acceptable under any circumstances.

3.13.1 The contractor shall be responsible for coordinating all compaction density testing with the owner's geotechnical consultant. The owner's geotechnical consultant and engineer will select the locations and depths of density tests to be performed as the technician as testing operation

Excavation, Trenching & Backfilling

For Utilities

Lofquist & Associates, Inc.
April 30, 2020

02210 – 8

progress. The contractor is responsible for having excavation equipment onsite and excavating to the depths and locations specified by the engineer for density tests. The contractor is responsible for re-filling and compacting test holes to the specified level of compaction. As a general rule, one density test will be made for approximately every 250 feet utility trench and at least one test location will be selected under each pavement surface that has been cut. The owner is not required to provide testing for the contractor and the absence of testing in no way relieves the contractor's responsibility to meet compaction requirements at all locations throughout the project as specified.

3.13.2 If any compaction density test results are unsatisfactory, the contractor shall re-excavate, replace (if necessary) and recompact the backfill, and retest, all at the contractor's expense until the desired compaction is obtained. Additional "side" compaction tests shall be made to each side of an unsatisfactory test, as directed by the engineer, to determine the extent of re-excavation, fill replacement and re-compaction necessary. The owner shall be reimbursed for all failed compaction tests, "side" compaction tests and all costs associated with re-testing.

4.0 METHOD OF MEASUREMENT & BASIS OF PAYMENT

4.1 All work, materials, equipment, labor, testing, incidentals and appurtenances described in this section, shall not be measured and paid for as such, but shall all be treated as incidental work. The contractor shall appropriately divide and include the price of all work covered herein in the associated lump sum bids for water improvements or wastewater improvements in the proper proportions.

END OF SECTION

This Page Intentionally Blank

SECTION 2370

EROSION & SEDIMENTATION CONTROL

1.0 GENERAL

1.1 Description: The Contractor shall furnish all materials, labor, equipment, supplies, maintenance and incidentals necessary to prevent erosion and sedimentation in accordance with all local, state and federal standards.

1.2 It shall be the contractor's sole responsibility to install and maintain erosion control measures that perform adequately to prevent erosion or loss of sediment to streams, areas outside the construction limits or adjacent properties to the satisfaction of agencies having jurisdiction and the engineer. This may require that the contractor install and maintain additional erosion control measures that are not shown on the plans. Any erosion and sediment control and related work necessary, including repair work, shall be performed by the contractor at the contractor's expense.

1.2.1 The contractor is responsible, at their expense, for obtaining erosion control permits and all other applicable permits for offsite borrow site, offsite waste areas and any other offsite locations used in conjunction with the completion of the work for this project. The contractor will be responsible for complying with all regulatory requirements for offsite locations and will be responsible for all costs associated with the use and compliance on any offsite location used in conjunction with project construction.

1.2.2 The contractor shall be solely responsible for fully complying with Jackson County requirements and with the NC Department of Environmental Quality (NCDEQ) Erosion Control Self Inspection including keeping detailed Self Inspection Reports in strict compliance with NCDEQ requirements. Fully and properly completed and signed, printed copies of all self inspection reports shall be provided to the owner and architect when requested by either party.

1.3 It is the contractor's responsibility to insure that construction activities comply with Jackson County regulations and requirements, NC Stormwater regulations, NPDES permits, The North Carolina Sedimentation Pollution Control Act of 1973, including any subsequent amendments, updates or related requirements under the NC General Statutes or NC Administrative Code. The contractor shall be the party financially responsible for any erosion control, stormwater or NPDES violations and fines related to the construction of the project.

1.3.1 Upon receipt of notice that a land-disturbing activity is in violation of said act, the contractor shall be responsible for ensuring that all steps or actions necessary to bring the project in compliance with said act are promptly taken.

1.3.2 The contractor is responsible for defending any legal actions instituted pursuant to erosion control.

1.3.3 To the fullest extent permitted by law, the contractor shall indemnify and hold harmless the owner, the engineer and the owner's agents from and against all claims, damages, civil penalties, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance of work or failure of performance of work, provided that any such claim, damage, civil penalty, loss of expense is attributable to a violation of the local, state or federal sedimentation pollution control regulations, laws or acts. Such obligation shall not be construed to negate, abridge or otherwise reduce an other right or obligation of indemnity which would otherwise exist as to any party or persons described in the contract documents.

1.4 Contractor shall take all the necessary measures to prevent any damage to any public or private properties, structures, utilities, facilities, etc. Should any damage occur, the contractor shall be fully responsible for making the necessary repairs or replacements, at the contractor's expense, to the satisfaction of the engineer and owner.

1.5 All work shall be in accordance the "Erosion and Sediment Control Planning & Design Manual," latest edition, by the NC Sediment Control Commission etal and the "Erosion and Sediment Control Field Manual," latest edition, by the NC Department of Environmental Quality except where modified on the plans or by the specifications.

1.6 All disturbed or graded areas shall be grassed (temporary or permanent seeding and mulching) or stabilized with a gravel surface within 7 calendar days.

2.0 MATERIALS

2.1 The contractor shall furnish all materials, equipment, labor and incidentals required to successfully accomplish all work to the satisfaction of the engineer and owner. All materials shall be new and in accordance with the following paragraphs.

2.2 STANDARD SILT FENCING: shall be as shown on the plans and in accordance with the following:

2.2.1 Steel posts shall be used for silt fencing. Steel posts shall be at least 5 feet in length, approximately 1 3/8 inches wide measured parallel to the fence, and have a minimum weight of 1.33 lb/ft of length. The post shall be equipped with an anchor plate having a minimum area of 14.0 square inches, and shall have a means of retaining wire and fabric in the desired position without displacement. Fence post spacing shall not exceed 6 feet. Fence posts are inclined toward the runoff source at an angle of 15° to 20° from vertical and shall be driven into the ground for a minimum of 24" and properly secured.

2.2.2 Woven wire fence used for silt fencing shall be at least 32 inches high, and shall have a maximum mesh opening of 6 inches. The top and bottom horizontal wires shall be at least 12 gauge or heavier. All other wires shall be at the least 14 gauge or heavier.

2.2.3 Filter fabric used for silt fencing shall consist of a NCDOT Class B synthetic filter fabric, properly secured to the upslope of the wire mesh with wire ties or plastic zip ties.

2.2.4 The height of the installed silt fencing filter fabric shall be 24 inches above the ground surface. A minimum of 12" of the filter fabric shall be properly anchored and buried below grade using either the trench method or the slicing method as shown on the plans.

2.3 SUPER SILT FENCING: shall be as detailed on the plans.

2.4 STONE FOR EROSION CONTROL: shall be the types and locations shown on the plans and shall be in accordance with Division 10 of the NCDOT Standard Specifications.

2.5 EROSION MATTINGS FOR DITCHES: shall be in accordance with Division 10 of the NCDOT Standard Specifications unless shown otherwise on the plans or described in these specifications.

2.6 EROSION MATTINGS FOR SLOPES: shall be long life, machine produced temporary erosion control blanket of 70% agricultural straw and 30% coconut fiber matrix sandwiched between a polypropylene nettings. Erosion mattings for slopes shall be North American Green SC150 or an approved alternate having equal or better performance characteristic.

3.0 EXECUTION

3.1 The Contractor shall construct and maintain all the necessary erosion control measures as shown on the plans and additional measures as needed to prevent erosion and sedimentation until the project is completed and all disturbed areas have been adequately stabilized by the contractor to the satisfaction of the engineer. Any additional erosion measures or maintenance necessary will be provided by the contractor at no additional cost to the owner.

3.2 All erosion mattings shall be properly installed and anchored using anchoring systems obtained from the manufacturer in accordance with the manufacturer's instructions.

3.3 The contractor shall inspect all erosion measures after every rainfall event and shall remove and dispose of silt accumulations in an approved manner and in accordance with applicable regulations. Erosion control measures shall be rebuilt or removed and replaced whenever they have deteriorated or clogged to such extent that, in the opinion of the engineer, their effectiveness has been reduced.

3.4 All temporary erosion and sediment control measures shall remain in place until the site is completely stabilized to the satisfaction of the engineer. The contractor will be responsible for the removal of all temporary erosion and sediment control measures. All temporary measures removed will remain the property of the contractor and shall be disposed of, off the project property, in an approved manner, at the contractor's expense. Upon removal of temporary erosion control devices, the contractor shall dress the area to give a pleasing appearance, and shall seed and mulch the area or otherwise provide a stabilized surface to the engineer's satisfaction.

3.5 All work shall be performed, managed and monitored by the contractor in accordance with all applicable Erosion Control Regulations, NC Stormwater General Permits, site specific Stormwater permits and all other applicable regulations. The contractor's operations shall not cause injury to any portion of the work completed, or in progress, or to the surface of roads, or to any public or private properties. Method(s) and schedules shall be acceptable to all regulatory agencies having jurisdiction. Where private or public properties outside the construction limits will be involved, coordination shall be performed by the contractor, advance permission shall be obtained by the contractor and all applicable permits shall be obtained by the contractor, at the contractor's expense.

4.0 METHOD OF MEASUREMENT & BASIS OF PAYMENT

4.1 All work, materials, equipment, labor, testing, incidentals and appurtenances described in this section, shall not be measured and paid for as such, but shall all be treated as incidental work. The contractor shall appropriately divide and include the price of all work covered herein in the associated lump sum bids for water improvements or wastewater improvements in the proper proportions. **However, see Special Provisions section for percentage of scheduled values to be treated as erosion control.**

END OF SECTION

SECTION 2390

SEEDING & MULCHING

1.0 GENERAL

1.1 Description: The Contractor shall furnish all materials, labor, equipment, supplies, maintenance and incidentals necessary to complete all temporary and permanent seeding, mulching and establishment of grasses in all disturbed areas. The work shall include, but is not limited to, preparation of seedbeds; furnishing, placing, and covering limestone, fertilizer, and seed; compacting seedbeds; furnishing, placing, and securing mulch; mowing; and other operations necessary for the permanent establishment of grasses and legumes from seed on shoulders, slopes, ditches, or any other disturbed areas. When landscape planting plans are provided, the contractor shall install permanent plants and ground cover in accordance with the specific requirements of the landscaping plan.

1.2 All disturbed or graded areas shall be grassed (temporary or permanent seeding and mulching) or otherwise stabilized by an accepted method within 7 calendar days.

1.3 Seeding and mulching shall be performed on all earth areas disturbed by construction and in any other areas within the project limits which previously had unsatisfactory vegetative cover. The contractor shall adapt his operations to variations in weather or soil conditions as necessary for the successful establishment and growth of the grasses.

1.4 The contractor shall install and maintain erosion control measures that perform adequately in accordance with Section 02370 Erosion Control and all applicable laws and regulations.

1.5 Contractor shall take all the necessary measures to prevent any damage to any public or private properties, structures, utilities, facilities, etc. Should any damage occur, the contractor shall be fully responsible for making the necessary repairs or replacements, at the contractor's expense, to the satisfaction of the engineer and owner.

2.0 MATERIALS

2.1 The contractor shall furnish all materials, equipment, labor and incidentals required to successfully accomplish all work to the satisfaction of the engineer and owner. All materials shall be new, in excellent condition and shall be stored and handled in a manner which prevents damage or degradation.

2.2 All materials, including but not limited to, lime, fertilizer, seed, mulch and tack shall be in accordance with material specifications listed in the latest edition of the NC Department of Transportation Standard Specifications for Roads and Structures. Seeding schedules shall be as shown on the plans.

3.0 EXECUTION

3.1 The contractor shall seed, mulch and establish grasses on all disturbed earth areas. The contractor is required to coordinate seeding and mulching operations with all other parties working within the project limits. The contractor will be responsible for repeating seeding and mulching operations and re-establishing grasses if necessary due to failure or neglect in coordinating with others.

3.2 Seeding and mulching shall be performed on a section by section basis immediately upon completion of utility installation, rough grading or other work for a given section. No exception will be made to this requirement unless otherwise permitted in writing by the engineer.

3.3 When construction is ceased for any period of time, the contractor shall temporarily seed, mulch and establish grasses on earth surfaces, overlapping of operations on previously established grassed areas.

3.4 The contractor shall cut and satisfactorily dispose of weeds or other unacceptable growth on the areas to be seeded. Uneven and rough areas outside of the graded section, such as crop rows, farm contours, ditches and ditch spoil banks, fence line and hedgerow soil accumulations, and other minor irregularities which cannot be obliterated by normal seedbed preparation operations, shall be shaped and smoothed as directed by the engineer to provide for more effective seeding and for ease of subsequent mowing operations.

3.4.1 The soil shall then be scarified or otherwise loosened to a depth of not less than 5 inches except as otherwise provided below or otherwise directed by the engineer. Clods shall be broken and the top 2 to 3 inches of soil shall be worked into an acceptable seedbed by the use of soil pulverizers, drags, or harrows; or by other methods approved by the engineer. All rock and debris 2 inches or larger shall be removed from all ground surfaces prior to the application of seed and fertilizer.

3.4.2 On cut slopes that are 2:1 and steeper, both the depth of preparation and the degree of smoothness of the seedbed may be reduced as permitted by the engineer, but in all cases the slope surface shall be scarified, grooved, trenched, or punctured so as to provide pockets, ridges, or trenches in which the seeding materials can lodge.

3.4.3 Seedbed preparation within 2 feet of the edge of any pavement shall be limited to a depth of 2 to 3 inches.

3.4.4 The preparation of seedbeds shall not be done when the soil is frozen, extremely wet, or when the engineer determines that it is an otherwise unfavorable working condition.

3.5 Seasonal limitation for seeding operations; the kinds of grades of fertilizers; the kinds of seed; and the rates of application of limestone, fertilizer, and seed shall be as recommended by the seed supplier and as shown on the plans.

3.5.1 Equipment to be used for the application, covering, or compaction of limestone, fertilizer, and seed shall have been approved by the engineer before being used on the project. Approval may be revoked at any time if equipment is not maintained in satisfactory working condition, or if the equipment operation damages the seed.

3.5.2 Limestone, fertilizer, and seed shall be applied within 24 hours after completion of seedbed preparation unless otherwise permitted by the Engineer, but no limestone or fertilizer shall be distributed and no seed shall be sown when the Engineer determines that weather and soil conditions are unfavorable for such operations.

3.5.3 During the application of fertilizer, adequate precautions shall be taken to prevent damage to traffic, structures, guardrails, traffic control devices, or any other public or private properties. The Contractor shall either provide adequate covering or change methods of application as required to avoid such damage. When such damage occurs the Contractor shall repair it, including any cleaning that may be necessary.

3.6 Limestone may be applied as a part of the seedbed preparation, provided it is immediately worked into the soil. If not so applied, limestone and fertilizer shall be distributed uniformly over the prepared seedbed at the specified rate of application and then harrowed, raked, or otherwise thoroughly worked or mixed into the seedbed.

3.6.1 If liquid fertilizer is used, storage containers for the liquid fertilizer shall be located on the project and shall be equipped for agitation of the liquid prior to its use. The storage containers shall be equipped with approved measuring or metering devices which will enable the engineer to record at any time the amount of liquid that has been removed from the container. Application equipment for liquid fertilizer, other than a hydraulic seeder, shall be calibrated to ensure that the required rate of fertilizer is applied uniformly.

3.7 Seed shall be distributed uniformly over the seedbed at the required rate of application, and immediately harrowed, dragged, raked, or otherwise worked so as to cover the seed with a layer of soil. If 2 kinds of seed are to be used which require different depths of covering, they shall be sown separately.

3.7.1 When a combination seed and fertilizer drill is used, fertilizer may be drilled in with the seed after limestone has been applied and worked into the soil. If 2 kinds of seed are being used which require different depth of covering, the seeding requiring the lighter covering may be sown broadcast or with a special attachment to the drill, or drilled lightly following the initial drilling operation.

3.7.2 When a hydraulic seeder is used for application of seed and fertilizer, the seed shall not remain in water containing fertilizer for more than 30 minutes prior to application unless otherwise permitted by the engineer.

3.7.3 Immediately after seed has been properly covered the seedbed shall be compacted in the manner and degree approved.

3.7.4 When adverse seeding conditions are encountered due to steepness of slope, height of slope, or soil conditions, the engineer may allow modifications to be made in the above described requirements which pertain to incorporating limestone into the seedbed; covering limestone, seed, and fertilizer; and compaction of the seedbed. Such modifications may include but not be limited to the following:

- 1) The incorporation of limestone into the seedbed may be omitted on (a) cut slopes steeper than 2:1 (b) on 2:1 cut slopes when a seedbed has been prepared during the excavation of the cut and is still in an acceptable condition; or (c) on areas of slopes where the surface of the area is too rocky to permit the incorporation of the limestone.
- 2) The rates of application of limestone, fertilizer, and seed on slopes 2:1 or steeper or on rocky surfaces may be reduced or eliminated.
- 3) Compaction after seeding may be reduced or eliminated on slopes 2:1 or steeper, on rocky surfaces, or on other areas where soil conditions would make compaction undesirable.

Regardless of the modifications allowed, the contractor shall remain fully responsible for the establishment of a healthy, long term growth of grass in all disturbed areas.

3.8. All seeded areas shall be mulched unless otherwise allowed by the engineer.

3.8.1 Grain straw may be used as mulch at any time of the year. If permission to use material other than grain straw is requested by the contractor and the use of such material is approved by the engineer, the seasonal limitations, the methods and rates of application, the type of binding material, or other conditions governing the use of such material will be established by the engineer at the time of approval.

3.8.2 Mulch shall be immediately applied after completion of seeding unless otherwise permitted by the engineer. Care shall be exercised to prevent displacement of soil or seed or other damage to the seeded area during the mulching operations.

3.8.3 Mulch shall be uniformly spread by hand or by approved mechanical spreaders or blowers which will provide an acceptable application. An acceptable application will be that which will allow some sunlight to penetrate and air to circulate but also partially shade the ground, reduce erosion, and conserve soil moisture.

3.8.4 Mulch shall be held in place by applying a sufficient amount of asphalt or other approved binding material to assure that the mulch is properly held in place. The rate and method of application of binding material shall meet the approval of the engineer. Where the binding material is not applied directly with the mulch it shall be applied immediately following the mulch application.

3.8.5 During the application of asphalt binding material, or other approved binding materials which may cause damage, adequate precautions shall be taken to prevent damage to traffic, structures, guardrails, traffic control devices, or any other public or private properties. The Contractor shall either provide adequate covering or change methods of application as required to avoid such damage. When such damage occurs the contractor shall repair it, including any cleaning that may be necessary.

3.8.6 The Contractor shall take sufficient precautions to prevent mulch from entering drainage structures through displacement by wind, water, or other causes and shall promptly remove any blockage to drainage facilities which may occur.

3.9 Areas where seeding and mulching have been performed shall be maintained in a satisfactory condition until final acceptance of the project. Maintenance shall include mowing on a regular basis to the satisfaction of the engineer and owner until such time substantial completion of the project is achieved as determined by the engineer.

3.9.1 Areas of damage or failure to establish healthy, permanent growth of grass, regardless of cause, shall be corrected by being repaired or by being completely redone, at the contractor's expense to the satisfaction of the engineer and owner. Where correction will require extensive seedbed preparation, or where earthwork repairs or complete reshaping are necessary, the contractor shall perform the necessary work at their expense.

4.0 METHOD OF MEASUREMENT & BASIS OF PAYMENT

4.1 All work, materials, equipment, labor, testing, incidentals and appurtenances described in this section, shall not be measured and paid for as such, but shall all be treated as incidental work. The contractor shall appropriately divide and include the price of all work covered herein in the associated lump sum bids for water improvements or wastewater improvements in the proper proportions.

END OF SECTION

This Page Intentionally Blank

SECTION 2510

WATER DISTRIBUTION IMPROVEMENTS

1.0 GENERAL

1.1 Description: The contractor shall furnish all materials, labor, equipment, supplies and incidentals necessary to complete all water distribution construction, including but not limited to, water lines, valves, hydrants, water services, tanks, booster pumping systems, hydropneumatic water storage systems and appurtenances as required for the successful completion of the project to the satisfaction of the engineer, and at the locations, lines, grades, dimensions and locations shown on the plans, and as specified herein and related sections of the specifications.

1.2 All water distribution construction shall be in strict accordance with the provisions, rules and regulations of the North Carolina Department of Environmental Quality (NCDEQ), NC Public Water Supply, applicable National Sanitation Foundation (NSF) standards (NSF 61), NC Building and Plumbing Code requirements and all other local, state and national agencies having jurisdiction. Water distribution construction, as a minimum requirement, shall meet the installation and material standards of the American Water Works Association (AWWA), unless shown otherwise on the plans or specified herein.

1.3 There shall be no physical connection between a safe water supply and a questionable water supply, or a sanitary or storm sewage system that would allow unsafe water to enter the safe water system by direct pressure, vacuum gravity or any other means. All potable water mains and services shall have proper backflow prevention and cross connection control in accordance with all applicable local, state, national and international codes and standards.

1.4 The contractor will be solely responsible for making investigations and determining the existence, exact locations, sizes, and material types of all existing utilities that may be affected by project activities prior to commencing construction. All existing utilities and related facilities are not shown on the plans and the locations shown on the plans may have been approximated. Any damage incurred to existing utilities, whether shown on the plans, not shown on the plans or incorrectly shown on the plans are the responsibility of the contractor and shall be repaired to the original or better condition, to the satisfaction of the utility owner and engineer, at the sole expense of the contractor.

1.4.1 The contractor shall obtain the approval of the school and the Engineer prior to interrupting water service to any existing customers or prior to tapping or connecting to any existing water distribution main or service line. Due to operational and/or maintenance considerations, the tapping of existing mains, the transfer of existing services or interruptions in existing water service will be possible only at times and for periods dictated by school personnel. The contractor should anticipate delays due to the school's operational considerations. There shall be no additional compensation made to the contractor due to delays caused by the school or any utility owner.

1.4.2 Connections to existing utilities shall be made when shown on the plans, required to successfully complete the project and as directed by the engineer. The connections shall be made at times most convenient to the public and when the service will be the least endangered by the work. The connections shall be made on weekends, at night, and on holidays if required by the utility owner or engineer. Should the position of any pole, pipe, conduit, conductor or other structure be such that its removal and/or adjustment is necessary to complete construction, such change will be done by the owner of the obstructions at the contractor's expense.

1.4.3 The contractor shall be responsible for coordinating all construction with all utility companies affected by the project. Except in an emergency, the contractor shall not operate any controls on any existing utility system or otherwise change or affect the operation of the utility without prior approval of the utility owner.

1.5 The contractor shall be responsible for all job site safety and security including, but not limited to, work zone traffic control and signing. The contractor shall provide and maintain adequate work zone traffic control in accordance the latest editions of the NCDOT "Standard Specifications for Roads and Structures," the NCDOT "Roadway Standard Drawings" the "Manual of Uniform Traffic Control Devices" and all site specific conditions imposed by the NCDOT local Division Office.

1.6 Water lines shall be located at least 10 feet laterally from sanitary sewers, unless local conditions or barriers prevent a 10 foot separation, in which case the water main is laid in a separate trench, with the elevation of the bottom of the water pipe at least 18 inches above the top of the sanitary sewer pipe. When a water line crosses a sanitary sewer line, the water line shall be laid at such an elevation that the bottom of the water pipe is at least 18 inches above the top of the sanitary sewer, unless local conditions or barriers prevent an 18 inch vertical separation, in which case both the water line and the sanitary sewer line shall be constructed of Cl. 51 ductile iron pipe (DIP) with joints that are equivalent to AWWA water main standards for a distance of 10 feet on each side of the point crossing.

1.7 At no additional cost to the owner, the contractor will be responsible for engaging the services of a water system material supplier, having on staff, a qualified, control system integrator capable of completing and coordinating a final system design and installation of all electrical, supervisory, control, data acquisition and monitoring systems associated with water storage tanks, pumping systems or other water system devices requiring electrical power, communications or control. The control system integrator shall be a NC Professional Engineer with a minimum of 5 years experience in the design and interface of electrical and control systems for water systems. The control system integrator will be responsible for insuring the compatibility of all components and providing a properly functioning water system to the satisfaction of the engineer and owner and in accordance with all applicable local, state, national and international codes, regulations and standards.

2.0 MATERIALS

2.1 STANDARDS: All materials shall be new, of domestic manufacture, in good condition, as shown on the plans, specified herein and in compliance with applicable regulatory standards.

2.2 PRESSURE RATING: Unless specifically noted otherwise on the plans, all materials, including but not limited to pipe, fittings, joints, valves, service line components, thrust restraints and all incidentals shall be new and shall have a minimum working pressure rating of 200 pounds per square inch (psi).

2.3 SHOP SUBMITTALS: The contractor shall submit to the engineer catalog cuts and shop submittals for all materials, including but not limited to, pumps, tanks, control systems, pipe, fittings, valves, valve boxes, hydrants, vaults, manholes and incidentals proposed for use on the project. Shop submittals shall be delivered to the engineer as clear, detailed pdf documents in manageable file sizes and formats. All shop submittals shall be reviewed and approved by the contractor prior to being submitted to the engineer for review. The shop submittals shall be sent to the engineer with the contractor's digital transmittal indicating the contractor's review and approval of the submittal. Materials which have not been approved shall not be delivered for use on the project. The engineer's review of shop drawings in no way relieves the contractor of his sole responsibility to insure the suitability of all materials used on the project, including but not limited to dimensions, size, capacity, brand, model, compatibility and any other product or material properties. Any unacceptable or unsuitable materials or products incorporated into the project shall be removed and replaced to the satisfaction of the engineer.

2.4 PIPE AND FITTINGS: All water main and water service pipes and fittings shall be the types and sizes shown on the plans and in accordance with the following. All pipe used on the project shall be clearly marked with the weight, class designation, size, and applicable standards. In addition, any PVC pipe or fittings used shall be clearly marked with the NSF seal designating approval for potable water service.

2.4.1 Ductile Iron Pipe (3" through 12"): shall be in conformance with AWWA C150/AWWA C151 and shall be pressure class 350 or thickness class 51. Joints shall be mechanical or push-on type with elastomeric gaskets in conformance with AWWA C111. All ductile iron pipe shall have a standard cement mortar lining in conformance with AWWA C104, and a bituminous seal coating approximately one (1) mil thick. All fittings and bends shall be ductile iron in conformance with AWWA C110 or C153 for compact fittings. Fitting and bend class designation will be compatible with the pipe class designated for the project. All fittings and bends shall be mechanical joint with elastomeric gaskets in accordance with AWWA C111. All fittings and bends shall have a standard thickness cement mortar lining and bituminous seal coat in conformance with AWWA C104.

2.4.2 PVC Pipe: Unless specifically noted otherwise, all PVC pipe shall be SCHEDULE 80 PVC, pressure rated pipe. All pvc pipe used on the project shall be clearly marked with the weight, class designation, size, and applicable standards. Joints shall be solvent welded made using NSF compliant heavy duty primer and solvent in accordance with ASTM standards and the pipe manufacturer's recommendations. All PVC pipe must bear the NSF seal of approval for potable water pipe.

2.4.3 Restrained Joints: All above ground and below ground piping incorporated into the water system improvements shall be internally restrained joints on all pipe and fittings regardless of pipe materials being used for installation. Joint restraint systems shall be heavy duty and constructed of epoxy coated ductile iron, steel or other approved materials. Joint restraints shall allow joint deflection, allow future disassembly of pipe and fittings and shall be capable of withstanding pressures to a minimum of 300 psi. Joint restraint shall be US Pipe TR Flex, American Pipe Lok-Ring, EBAA Iron, Leemco, Ford Uni-Flange, Romac or an approved equal is as appropriate for the type of pipe and fittings being restrained. Restrained joints should be included in the cost of pipe and appurtenance installation. All restrained joints will be installed at the contractor's expense. In addition to being internally restrained, all buried piping shall have concrete thrust blocking as detailed on the plans.

2.5 VALVES – GENERAL: All valves shall be new and shall provide drip tight, zero leakage at working pressures up through two hundred (250) psi in either direction. All valves shall open left (counter-clockwise) and close right (clockwise) unless specifically noted otherwise on the plans. Unless specifically noted otherwise, all buried valves shall be mechanical joint and shall have a two (2) inch square operating nut meeting AWWA standards. All buried valves shall be equipped with a 3-piece cast iron valve box and a precast concrete valve box protector. In locations where the valve operating nut is greater than 4 vertical feet from the ground surface, the contractor shall furnish and install a valve extension stem including centering mechanism and dust protector. All extension stem assemblies shall be manufactured units produced by the valve manufacturer. Exposed valves or valves within utility vaults, manholes or similar structures shall be mechanical joint or flanged as shown on the plans and shall have a cast iron AWWA standard handwheel. All valves shall be equipped with non-rising stem operation. All valves shall be furnished with the necessary materials for installation, operation and maintenance and shall have a full opening flow way of area to the nominal size of the largest connecting pipe. The contractor shall furnish the owner with a minimum of one (1) new manufactured valve wrench, having a length of 7 feet, prior to job completion and prior to final payment.

2.5.1 GATE VALVES (12" and smaller): will be of the iron body, non-rising bronze stem, resilient-seated type manufactured to equal AWWA standard C509 and the specific requirements outlined.

2.5.1.1 Gate Valve disc will have an integrally cast ASTM B-62 bronze stem nut to prevent twisting or angling of the stem. The disc casting will be open on one side so as to form no cavities for the accumulation of solids and permit the application of the protective coating.

The sealing mechanism will consist of a replaceable, contoured natural rubber disc seat ring internally reinforced by a steel ring and molded separately from the disc. The seat ring will be secured to the disc with self-locking stainless steel screws and shaped so that it cannot be installed improperly. The seat ring will seal against an accurately formed machined surface in the valve body.

2.5.1.2 Gate Valves will be provided with two O-ring stem seals with one each placed above and below the thrust collar. The area between the O-rings will be filled with a lubricant to reduce friction and to lubricate the O-ring each time the valve is operated. An anti-friction wash will be placed above the thrust collar to further minimize operating torque. Structural design of the valve will be such that if excessive torque is applied to the stem, failure of the pressure retaining parts will not occur. Stem failure under such conditions will occur externally at such a point as to enable the stem to be safely turned by use of a pipe wrench or other such readily available tool after exposure of the valve. The stem will then be replaceable through removal of the two bolt stuffing box.

2.5.1.3 Gate Valve coatings will be equal to or exceed AWWA C550 and the specific requirements outlined. All internal and external ferrous metal surfaces will be fully coated, holiday free, to a minimum thickness of four (4) mils. The coating will be a two-part thermosetting epoxy suitable for field overcoating and for touchup with the same coating material without special surface preparation or extreme heat. The supplier will furnish detailed performance tests of adhesion, hardness and abrasion resistance of the furnished coatings. Coating will have a successful record of performance in valves, pipe or other allied equipment, for a minimum of ten (10) years.

2.5.2 BUTTERFLY VALVES (14" and larger): All valves having a nominal diameter of fourteen inches (14") or greater will be geared butterfly valves designed for direct burial and will conform to AWWA C504. Valves will be of the tight closing rubber seat type with rubber seats that are bonded to the valve body. No metal to metal sealing surfaces will be permitted. Valves will be bubble tight at a minimum working pressure rating of 250 psi with flow in either direction. Valve discs will rotate 90 degrees from the full open position to the tight shut position. Butterfly valves shall include a standard pipe spacer when required to allow for unobstructed movement of the valve. Coatings will conform to standards specified for gate valves, paragraph 2.3.1.3. Valve bearings will be sleeve-type corrosion-resistant, and self-lubricating with the load not to exceed twenty-five hundred (2500) psi.

2.5.2.1 Butterfly Valve operators will be the traveling nut type designed to withstand three hundred (300) foot pounds of input torque at full open or closed positions without damage to the valve or operator; will be fully gasketed, grease packed, and designed to withstand submersion in water to ten (10) psi; and will close with a clockwise rotation of a two inch (2") square AWWA nut, seventeen (17) to thirty (30) turns depending upon size. Hydrostatic and leakage tests will be conducted in accordance with AWWA C504.

2.5.3 PRESSURE REDUCING VALVES: shall be installed at the location(s) indicated on the plans. This valve shall be capable of maintaining a constant downstream pressure regardless of varying inlet pressure. This valve shall be a hydraulically operated, diaphragm-actuated, globe or angle pattern valve. It shall contain a resilient, synthetic rubber disc, having a rectangular cross-section, contained on three and one-half (3-1/2) sides by a disc retainer and forming a tight seal against a single removable seat insert.

2.5.3.1 The pressure reducing valve diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. The non-wicking diaphragm shall consist of nylon fabric with synthetic rubber and shall not be used as a seating surface. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the valve or pilot controls. All necessary repairs shall be possible without removing the valve from the line.

2.5.3.2 The pressure reducing valve pilot control shall be a direct-acting, adjustable, spring-loaded, normally open, diaphragm valve, designed to permit flow when controlled pressure is less than the spring setting. The control system shall include a fixed orifice.

2.5.3.3 All pressure reducing valves shall be pressure rated for 200 psi working pressure. Pressure reducing valves shall be installed in a precast concrete manhole or vault with all required appurtenances as shown on the plans. Where shown on the plans installations shall include parallel valves for high and low flow ranges. All piping within the vault and extending 5 feet beyond the exterior of the vault walls shall be ductile iron pipe and fittings. All piping must be properly restrained to allow complete removal of the pressure reducing valve with 200 psi pressure against closed valves on both sides of the valve location. All pressure reducing valve installations shall include isolation valves upstream and downstream of the valve and shall be equipped with suitable coupling(s) or unions to allow removal of the pressure reducing valve without cutting any pipe or fittings.

2.5.4 AIR RELEASE VALVES: shall be designed to allow large quantities of air to escape out the orifice when the pipeline is being filled and shall close water tight when water enters the valve. The valve shall also be capable of releasing small amounts or pockets of air which may become trapped in the pipeline during normal operation. The valve shall also allow large quantities of air to enter the pipeline when the pipeline is being drained, or a break has occurred, to break the vacuum.

2.5.4.1 Air Release valves shall consist of a body, cover, baffle, float and seat. The float shall be stainless steel designed to withstand a maximum pressure of 1,000 psi. All material shall conform to ASTM A126 GR. B and ASTM A240.

2.5.4.2 Air release valves shall be installed in a precast concrete manhole with all the required appurtenances as shown on the plans.

2.6 TAPPING SLEEVES & VALVES: Tapping sleeves shall be heavy duty cast iron or ductile iron having a minimum working pressure rating of 250 psi. Tapping sleeves shall be the split sleeve type with mechanical joint ends and a 125 lb branch outlet flange.

2.6.1 Tapping valves shall be resilient seat, ductile iron body gate valves in accordance with AWWA C-509 and the requirements specified herein for gate valves except the valve opening shall provide adequate space and clearance for a full size cutter to pass and shall be equipped with a flanged joint on the inlet side and a mechanical joint on the outlet side of the valve. Tapping valves shall have a standard 2 inch square AWWA operating nut and shall be equipped with a valve box, extension stem (where required) and valve box protector. Whenever possible, taps shall be the next standard size below the main size being tapped.

2.7 VALVE BOXES: All buried valves shall be provided with a valve box. Valve boxes will be manufactured of quality gray cast iron, ASTM A48, Class 30, three piece adjustable slip type boxes with a round, properly sized base to fit over the valve stuffing box and bonnet and a five and one-fourth inch (5-1/4") slip-type shaft suitable for depth of cover as required. Box lids will be marked with the cast in lettering "Water."

2.7.1 All valves that are set at greater than normal depth such that the distance from the operating nut to the finished ground surface is greater than 4 feet will have an extension stem provided and will be installed with the valve box so that the operating nut on the stem extension is 4 feet or less below the ground finished ground surface. Stem extensions shall be provided by the valve manufacturer and shall have an alignment disk designed to keep the extension centered prevent dirt and debris from entering the valve box. Cast iron valve boxes shall be fully coated with bituminous.

2.8 VALVE BOX PROTECTOR: shall be precast concrete (minimum 4,000 psi at 28 days) as shown on the plans. All buried valves shall be provided with a valve box and valve box protector.

2.9 TAPPING SADDLES: Tapping saddles used for 2" and smaller water service connections shall be pressure rated at a minimum of 200 psi and shall be bronze or ductile iron body with epoxy paint. Tapping saddles shall be of approved manufacturer. Tapping saddles shall have a double stainless steel strap, bolts and hardware and shall be in accordance with AWWA standards.

2.9.1 CORPORATION STOPS AND CURB STOPS: for 2" and less water service connections shall be pressure rated for 200 psi or greater working pressure and shall be all bronze material of approved manufacturer conforming to ANSI/AWWA C800.

2.10 FLUSHING STATION (BLOW-OFFS) ASSEMBLIES: shall be the manufactured type or the field assembled type as shown and required on the plans. All flushing stations shall be constructed using 2" nominal size components unless specifically noted otherwise on the

plans. Gate valves used in flushing station construction shall meet the requirements as specified herein.

2.11 **WARNING TAPE:** All water piping, mains, fittings and services shall be marked with buried warning tape regardless of pipe material or size. All warning tape shall be a minimum of 4 mils thick by 3 inch wide and shall include a metallic core which easily allows detection with a metal detector. The warning tape shall be blue with black letters and continuously imprinted "Caution Buried Water Line Below."

2.12 **TRACER WIRE:** All water line piping shall be installed with a continuous 12 gauge, insulated copper wire along the bottom and immediately adjacent to the water piping. The terminal ends of the tracing wire shall be extended up to the ground surface within all valve boxes, all meter boxes, vaults, appurtenance manholes and at all flushing stations. The maximum tracing wire length shall be 500 feet without terminating tracer wire ends at the ground surface in a valve box or other approved location providing access to the tracer wire at the finished ground surface. Underground splices in the tracing wire shall be avoided unless approved otherwise by the engineer. If underground splices are absolutely necessary, they shall be made with a copper split bolt wire connector and inserted into a direct bury gel-filled insulator tube. Tracer wire installation shall be required on all water main and water service piping and shall be in accordance with any standards of installation that the engineer may impose.

2.13 **CASING PIPE:** for use as encasing pipe under roads, pavement or railroads, whether installed by bore or open cut, shall be welded steel pipe conforming to the requirements of ASTM Designation A-139. The minimum casing pipe size and wall thickness shall be as shown on the plans. For sizes not included therein, or for special design considerations, approval shall be obtained from the engineer. All steel casing pipe shall have a minimum 12 mil coating of epoxy or bituminous.

2.13.1 Carrier piping shall be properly and adequately supported throughout the length of the casing pipe using specially designed and fabricated "spiders" as indicated on the plans. Spacing of the spider supports shall not exceed the spacing shown on the plans or less if recommended by the pipe manufacturer under site specific load and installation conditions. Spider supports shall be designed to adequately handle the anticipated load conditions and be of non-corrosive construction. Stainless steel nuts and bolts shall be used. Installation and spacing of casing spiders shall be as required by the manufacturer, and as shown on the standard construction details.

2.13.2 The annular space between the casing and the carrier pipe shall be sealed, at both ends of the casing, with a special sealing system including flexible boot and stainless steel band clamps, specifically designed and manufactured for sealing casing and carrier pipes.

2.14 **CONCRETE:** Unless specified otherwise on the plans or other sections of these specifications, all poured-in-place concrete shall be Portland cement concrete having a

minimum compressive strength of 3,000 psi at 28 days. All concrete exposed to weather shall be air entrained. Concrete shall be NCDOT Class A in accordance with Section 1000 of the NCDOT "Standard Specifications for Roads and Structures."

2.15 PRECAST CONCRETE MANHOLES: shall be minimum 4 ft inside diameter unless shown otherwise on the plans. All manholes, including bases, risers, and tops shall conform to requirements of ASTM C478. Top sections shall be eccentric cone unless shown otherwise. Steps on inside wall shall be in the same plane from bottom of structure to manhole cover. Manhole manufacturer shall design all manhole components to withstand traffic loading, site installation specific live and dead loads and to withstand buoyant forces assuming the water level is at the top of the manhole.

2.15.1 PRECAST VAULTS: shall be as indicated on the plans and constructed of reinforced precast concrete having a minimum compressive strength of 5,000 psi at 28 days, ASTM A615, Grade 60 reinforcing steel, and shall be designed and rated for AASHTO HS20-44 loading with 30 percent impact, and conform to ASTM C-857. The vault manufacturer shall design the structure to withstand traffic loading, site installation specific live and dead loads and to withstand buoyant forces assuming the water level is at the top of the vault.

2.15.2 Unless otherwise approved by the engineer, the contractor shall install a suitable, above ground vent pipe to allow any gases to escape. Installations that contain electrical equipment shall have a blower attached to the vent system. The vent pipe shall be six inch (6") nominal diameter galvanized steel pipe, Grade 40, conforming to ASTM. Standard Designation A 53. The vent shall be extended to an elevation as needed to prevent flooding and shall be equipped with a non-ferrous, corrosion proof insect screen.

2.15.3 Precast Joint Sealing Compound: shall be the flexible type, packaged in extruded preformed shape, sized to completely fill the joint between precast sections, and form a permanently flexible watertight seal. The sealing compound shall be non-shrink and meet AASHTO M-198B.

2.15.4 Manhole Frames and Covers: shall be as shown on the plans and shall be gray cast iron conforming to ASTM A48. The frame and cover shall be rated for HS20-44 loading, have a studded pattern on the cover, and the letters "WATER" cast in place. The studs and the lettering shall be raised approximately 5/16 inch. The cover shall be a minimum 24 inches in diameter and shall have four 3/4 inch vent holes and two lifting slots unless shown otherwise. The bearing surface of the frame and cover shall be machine finished. The cover shall fit firmly on the frame without movement when subject to traffic.

2.15.5 Manhole Steps: shall be polypropylene plastic coated on a No. 4 deformed rebar conforming to ASTM C478, Polypropylene shall conform to ASTM D4101. Steps shall be a minimum of 10 inches wide and project a minimum of 5 inches at the connection points to the wall. The top surface of the step shall have a studded non-slip surface. Steps shall be placed at 12 inch centers. Manhole steps shall not be used in vaults. All vaults shall be

equipped with permanently attached OSHA compliant stainless steel ladders securely anchored with minimum 1/2 inch diameter, stainless steel wedge type concrete anchors.

2.16 Ground Storage and Hydropneumatic Tanks: shall be the types and sizes shown on the plans, shall be lead free, BPA free and shall be NSF 61 certified for potable water service. Tanks not bearing the NSF 61 potable water compliance seal will not be allowed to be incorporated into the work.

2.17 Control Systems: The design and installation of control systems, including, but not limited to, electrical power distribution systems, telephone dialers and related components, shall be provided in accordance with the requirements of the control system integrator, as specified herein and related sections, as shown on the plans and in accordance with all applicable local, state, national and international codes, standards and regulations.

2.17.1 The contractor shall be responsible for the installation of all electrical and control systems required for the proper operation of booster pumping and tank level control systems including all conduit, conductors and other electrical devices. All electrical work shall be completed by a qualified, licensed electrician engaged by the contractor at the contractor's expense. The contractor shall also coordinate the application for power service with the local electrical provider. Any fees associated with the application for new power service will be paid by the owner.

2.17.2 Unless specifically noted otherwise, all electrical controls or control panels shall be contained within NEMA 4X enclosures. All electrical panels shall be UL listed as an industrial enclosure. All electrical equipment and controls shall be equipped with lightning and power surge protection and all control enclosures shall be provided with a cabinet heater and associated thermostat to eliminate moisture and prevent condensation. All electrical and control panels shall be equipped with a padlock hasp.

2.17.3 Booster pump control panels shall be UL listed as an industrial enclosure, shall be as described on the plans. Booster pump control panels shall include automatic pump rotators, all required circuit breakers, NEMA rated starters, individual electro-mechanical elapsed run time meters for each pump and H-O-A switches for each pump. All enclosure hardware and fasteners shall be stainless steel. Control panels shall have an interior, hinged, deadfront panel of non-conducting plastic. The interior deadfront will include H-O-A switches for each pump, a green pump run light for each pump and a low system pressure alarm light. The control panel shall have an aluminum backplate inside the enclosure behind the deadfront and raised off the back wall of the enclosure to hold the bulk of electrical devices, components and wiring. The system integrator shall provide the engineer with a pdf digital submittal including all installation, configuration, wiring schematics, function description and operating instructions for the project specific control panel provided. Pump control panels shall include a programmable telephone dialer, capable of sequentially dialing up to 4 numbers, to notify operators of alarm conditions, including the nature of the alarm condition. Additionally, a red,

alarm light protected by a stainless steel cage and a audible alarm horn with alarm silence shall be external to the control panel to warn of a general alarm condition.

2.18.5 New level transmitters for the new ground storage tanks shall be provided and installed and shall be fully compatible with and properly connected to the existing level control system operating the existing 2 each well pumps and chemical feed systems.

2.19 Utility Building: shall be constructed as detailed on the plans in accordance with NC Building Code requirements and in accordance with all applicable codes by qualified, skilled craftsmen.

3.0 EXECUTION

3.1 Pipe and appurtenances shall be handled in such a manner as to ensure delivery to the site and installed in a sound, undamaged condition.

3.1.1 Plastic pipe shall be stored out of direct sunlight until placement and all plastic pipe showing discoloration, or deterioration shall be rejected for use and replaced with suitable pipe, at no additional cost to the Owner.

3.1.2 All pipe, fittings, and appurtenances shall be carefully examined for defects before placing, and any found defective shall not be used.

3.1.3 If, at any time before completion of the contract, any broken pipe or any defects are found in the lines or in any of their fittings or appurtenances, they shall be replaced to the satisfaction of the engineer.

3.1 All water distribution construction and work will conform to applicable portions of current AWWA Standards and to the pipe manufacturer's installation instructions except as modified by these specifications or shown on the plans.

3.1.1 Alignment and grade of the pipe and the location of fittings, valves, and hydrants will be as shown on the plans, specified herein and as required for a proper installation given site specific jobsite conditions. The required minimum depth of cover between the top of the pipe barrel and the finished grade ground surface shall be no less than 3 feet. The water main will be laid to the required lines and grades with fittings, valves, and hydrants at the required locations and as needed for a proper installation. The contractor shall develop detailed record drawings of pipe alignment and grade, to the satisfaction of the engineer, which will be provided to the engineer at project completion but prior to release of final payment.

3.1.2 The Contractor is solely responsible for making the necessary investigations, installing the necessary bends and fittings and varying the depth of pipeline installation to achieve the minimum required clearances in all locations having existing utilities, structures or other obstructions while maintaining the minimum cover specified (whether existing pipelines,

conduits, cables, mains, structures, etc. are shown on the plans, not shown on the plans or incorrectly shown on the plans).

3.2 The contractor will be held solely responsible for the protection of all existing utilities, private properties and public properties. Any damages as a result of construction will be the repaired by the contractor, at the contractor's sole expense, to the satisfaction of the engineer.

3.3 Proper equipment, tools, and facilities will be provided and used by the contractor for safe and proper completion of the work. All pipe, fittings, valves, hydrants and incidentals will be carefully lowered into the trench piece-by-piece in such a manner as to prevent damage to pipe materials and to protect coatings and linings. Under no circumstances will pipe or any other materials be dropped or dumped into the trench; any pipe or fittings that are dumped will be removed from the work site and will not be used.

3.3.1 The full length of each section of pipe shall rest solidly upon the pipe bed formed at the trench floor with recesses excavated to properly accommodate the bells, joints and fittings. Any pipe that has the pipe bed grade, trench floor or recesses disturbed after laying shall be taken up and re-laid to the satisfaction of the engineer.

3.3.2 Except where necessary in making connections with other lines and as authorized by the engineer, pipe shall be laid with the bells facing in the direction of laying.

3.3.3 All pipe and fittings will be carefully examined for cracks and other defects, while suspended above the trench, immediately before installation in final position. Where applicable, the groove in the bells of pipe will be full and continuous or the pipe will be rejected. Defective pipe or fittings will be removed from the job site within twenty-four (24) hours. All foreign matter or dirt will be removed from the interior and ends of pipe and accessories before they are lowered into position in the trench.

3.3.4 Pipe installation work shall conform to the latest revision of AWWA C651, Preventive and Corrective Measures During Construction. Every precaution will be taken to prevent foreign material, including trench water from entering the pipe. If the pipe laying crew cannot lower the pipe into the trench and into place without getting earth into it, the contractor will be required to place polyethylene wrap of suitable size over each end of the pipe and left there until the connection is made to the adjacent pipe. During construction, no debris, tools, clothing, gravel or other foreign materials will be placed in the pipe. The Contractor will provide and maintain adequate equipment to properly dewater, remove and dispose of all water entering the trench or any other part of the work.

3.3.5 As each length of pipe is placed in the trench, the rubber gasket will be lubricated and installed, according to the manufacturer's recommendation. Only lubricants approved by the joint manufacturer will be allowed. The plain end will be centered in the socket with care used to keep the joint from contacting the ground. The pipe will then be properly seated and

brought to correct line and grade. Glued or solvent weld fittings shall be installed using NSF approved cleaner and glue in strict accordance with manufacturer's instructions.

3.3.6 Mechanical joints shall be made in accordance with the recommendations of the manufacturer. Joint bolts shall be drawn up equally around the entire periphery maintaining equal spacing from the gland to the face of the flange at all points around the joint. All bolts shall be tightened to within the manufacturer specified torque range.

3.4 When pipe laying is ceased or not in progress for any period of time and at the end of each work day, the open ends of all pipe, fittings and service lines will be closed by means of temporary watertight plugs. Cutting of pipe for inserting valves, fittings, or closures pieces will be done in a neat and workman-like manner without damage to the pipe or lining, and so as to leave a smooth end at right angles to the axis of the pipe. Pipe ends will be smooth and beveled with a special beveling device or other tools according to the pipe manufacturer's recommendations. The engineer shall be notified at least 24 hours in advance of when pipe is to be laid in any trench. No pipes will be covered until the engineer has conducted his site visit.

3.5 All water mains, lines, pipe and services, regardless of material, shall have there locations continuously marked by using a detectable marking tape and a 12 gauge tracer wire as shown on the plans and as described in the specifications.

3.6 Adequately restraining or anchoring pipe joints, bends, plugs, caps, tees, reducing sections, fire hydrants, valves, and related appurtenances will be the responsibility of the contractor. Restraints methods and materials shall meet with the engineer's approval. Tying into existing water lines may alter such lines to the extent that these pipelines with existing pipe bends, plugs, caps, tees, reducing sections, fire hydrants, valves, and appurtenances may also require restraining or anchoring; this work shall also be the responsibility of the contractor.

3.6.1 Thrust blocks and mechanical restraints shall be used at all valves, bends, fittings and dead ends in accordance with the plans, as required for 250 psi working pressures plus an additional 100 psi allowance for water hammer and as recommended by the engineer in the field.

3.6.2 When installing thrust blocks, care shall be taken not to block outlets or to cover bolts, nuts, clamps or other fittings or to make them inaccessible. A bond breaker shall be placed between the pipe and the thrust block to aid in ease of future removal. Large thrust blocks shall be separated into sections by a suitable material. A thrust blocks shall bear against undisturbed earth of adequate bearing capacity. Mechanical restraints shall be required if conditions prevent the installation or adversely impact the effectiveness of a thrust block.

3.6.3 All forming for thrust blocks and anchors will be done by bulkheading around the shape of the thrust block or anchor with wood, burlap, or reinforced paper sacks filled with sand or

earth. Wood forms shall be removed before backfilling. Newly placed thrust blocks shall be allowed to set, undisturbed, for a minimum of twenty-four (24) hours prior to any backfilling, tamping or compacting being undertaken. Concrete strength shall be a minimum of 3,000 psi.

3.7 Immediately prior to the installation of a valve or hydrant, the following operations will be performed. The valve or hydrant will be carefully inspected. The interior will be thoroughly cleaned; the valve or hydrant will be operated as many times as necessary to determine that all parts are in proper working order with the valve seating properly and the hydrant drain valve operating properly. Valves and hydrants will be set plumb, in a vertical position and securely braced in place.

3.8 Valves will be provided with valve boxes centered and plumb over the operating nut of the valve. Extension stem shall be used to bring the operating nut up to a depth of 4 feet as necessary. The boxes will be supported and installed so as to prevent any shock or stress being transmitted to the valve or water line. Valve boxes will be maintained in this position during backfilling and covers will be set to finished position during backfilling. Valve box covers will be set to finished grade but may be first left just below the subgrade level to prevent damage during road construction or restoration and later adjusted to grade at the time of paving. Valve boxes shall not be installed in curb and gutter, or pedestrian paths.

3.9 Each flushing hydrant will have a gate valve on the inlet line. Above ground flushing hydrants will be set with the bury line at the established finished grade with hose connections properly oriented.

3.10 Termination Assemblies shall be at dead ends as shown on the plans.

3.11 Air Release Valve Assemblies shall be as shown on the plans.

3.12 Casing pipes crossing under roadways, railroads or pavements shall be located at proper alignments, grades and elevations in order to eliminate possible conflict with existing or future utilities and structures, with a minimum 36-inch depth of cover between the top of the casing pipe and the ground or roadway surface. For casing pipe crossings under roadways and railroads, the contractor shall comply with the regulations of said authority in regard to design, specifications, and construction. Casing installations shall be as required by the NC Department of Transportation for road crossings and the American Railway Engineering Association for railroad crossings. Casings shall be installed by boring and jacking unless open cut installation is specifically noted on the plans. Open cut installations shall be in accordance with Section 2210, Excavating, Trenching & Backfilling for Utilities and related sections.

3.12.1 The boring and jacking operations shall be done simultaneously, with continuous installation, until the casing pipe is in final position. Correct line and grade shall be carefully maintained. Add on sections of casing pipe shall be full-ring welded to the preceding length, developing watertight joints equaling or exceeding pipe strength. The casing installation shall produce no upheaval, settlement, cracking, movement, or distortion of the existing roadbed or

other facilities. Following placement of the carrier pipe within the steel casing, end seals are to be installed at each open end. End seals shall be suitable for restraining the external earth load. When required, casing vents shall be as indicated on the plans or required by the agency having jurisdiction.

3.12.2 Casing pipe holes shall be mechanically bored through the soil by a cutting head on a continuous auger mounted inside the pipe. The distance between the leading end of the first auger section and the leading end of the casing shall be as necessary to maintain a solid plug of spoil material inside the forward portion of the casing.

3.12.3 The casing pipe shall be adequately protected to prevent crushing or other damage under jacking pressures. Backstops shall be provided for adequately distributing the jack thrust without causing deformation of the soil or other damage. The casing pipe shall be abandoned in place, grouted full, and suitably plugged, and an alternate installation made by the contractor should the casing pipe be damaged or if the casing alignment or elevation substantially deviates from the plan locations, and results in the installation being unusable, as determined by the engineer.

3.12.4 Required boring and jacking pits or shafts shall be excavated and maintained to the minimum dimensions necessary to perform the operation. Said excavations shall be adequately barricaded, sheeted, braced and dewatered, as needed, in accordance with the applicable regulations and guidelines of agencies having jurisdiction. Boring and jacking pits will normally be no closer than ten (10) feet from the edge of pavement, with the permitting agency having final determination of the required setback distance.

3.12.5 The contractor's bid price for each casing pipe bore location shall include at least three attempts to bore the site, each time varying depth, grade or location as directed by the engineer. Failed bore attempts will not be paid for.

3.13 TESTING, DISINFECTING & FLUSHING: All newly installed, modified or re-activated water mains, lines and services shall be subjected to specified pressure tests, leakage tests, and sterilization prior to placing such pipelines into service.

3.13.1 Pressure tests, leakage tests, and sterilization of water pipelines shall be made as outlined herein and as outlined in the most current AWWA Standard applicable to the type of pipe material being tested.

3.13.2 Filling and Venting the Line: All valves will be operated only with the approval of the Engineer. The pipeline will be slowly filled with water and all air expelled from the pipe. Care will be taken that all available flushing points, air and vacuum relief valves, and other vents are open during the filling of the line. Where hydrants or other vents are not available in the line, the Contractor will make whatever taps are necessary for venting purposes using bronze corporation stops as specified for water service connections. The rate of filling the line will

not exceed the venting capacity. All water lines, mains, pipes and services shall be flushed to remove all sediment and other impurities.

3.13.3 PRESSURE TESTING: All water lines and appurtenances shall be pressure leak tested in the presence of the engineer, by the contractor, at the contractor's expense. Before pressure testing installed water mains, other than lock joint type pipe, such mains including any valves and fire hydrants shall be secured and anchored by backfilling and tamping around the pipe, and by placing approved reaction backing at all pipe bends, dead ends, tees, and plugs for restraint. All pipe joints should remain uncovered, where possible for leakage inspection.

3.13.4 All testing and flushing shall be performed with clean, chlorinated water. Under no circumstances will compressed air, any other gas or liquid other than clean water be used for pressure testing or flushing purposes.

3.13.5 The contractor shall perform hydrostatic pressure and leakage tests using proper equipment and qualified personnel according to the applicable sections of AWWA C600 to a pressure of 150 pounds per square inch (150 psi) at the low point of the section being tested. The maximum length of line to be tested shall be one thousand (1000) feet unless approved otherwise by the engineer. All joints in connections are to be watertight within tolerances allowed by the specifications in AWWA C600. Any degree of visible leakage or seepage, regardless of volume, that is discovered by observation will be located and made watertight by the contractor. Pressure and leakage tests shall be observed by the engineer and it is the responsibility of the contractor to schedule all testing at least 48 hours in advance with the engineer.

3.13.6 The minimum duration of pressure testing will be a period of 2 hours, unless additional time is required by the engineer. The test section will be pressurized by pumping the section full of clean water using an approved pressure pump.

3.13.7 When leak or pressure testing a particular section of water pipe, the Contractor shall provide a suitable centrifugal water pump, capable of delivering adequate water pressure, an isolation valve, a small water control valve, and two (2) calibrated pressure gauges all interconnected to a calibrated water storage tank. The storage test tank shall be used to supply and measure quantities of clean, chlorinated water to be pumped into the water main through a small pipeline from pump to valve, to pressure gauges, to water pipe test section.

3.13.8 When the water pressure of the pipeline section being tested has reached specified pressure limits, the isolation valve closed, and water pump stopped, the pressure gauge will hold steady if there is no leakage. Any leakage can be measured by running the water pump with the control valve properly throttled to maintain constant pressure and measure the amount of water used from the calibrated storage tank, provided the leakage does not exceed pump capacity.

3.13.9 After the pressure test is complete, the Contractor shall perform a leakage test. The leakage test shall have a minimum duration of at least 2 hours at a pressure of 200 psi and any leakage shall not exceed the amount determined by the following formula:

$$W = \frac{L D (P)^{1/2}}{148,000}$$

In which W equals the allowable leakage in gallons per hour; L is the length of pipeline tested, in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch. Regardless of pass or failure of the pressure test, the contractor shall be responsible for repairing any visible leakage regardless of how small the leakage is.

3.13.10 Leakage or evidence of cracked, damaged, or defective water distribution components or other attachments indicated by the pressure test, shall be located, repaired, removed and replaced with sound materials at the contractor's expense to the satisfaction of the engineer. The leakage tests shall be repeated by the contractor, at the contractor's expense, until test results are satisfactory to the engineer.

3.13.11 **DISINFECTION AND FLUSHING:** All tanks, pumps, water system components, water lines, water services and appurtenances shall be disinfected and flushed in the presence of the engineer at the contractor's expense. Disinfection and flushing of water lines, pumps and water systems components will be completed in accordance with the requirements procedures set forth in applicable AWWA standards, including AWWA Standard C601-14. Ground storage tanks shall be thoroughly cleaned and disinfected in accordance with AWWA Standard C652, Method 2.

3.13.12 After the pressure and leakage tests have been completed and accepted, the pipe section shall be filled with clean water containing 50 ppm chlorine. The chlorinating material shall be liquid chlorine, hypochlorite or HTH material introduced into the pipeline from a suitable calibrated storage tank similar to the pressure testing system described or by other approved methods. The chlorine solution will be retained in the line for at least twenty-four (24) hours.

3.13.13 All valves on the lines being sterilized shall be opened and closed several times during the chlorinated period. Following sterilization, the pipeline shall then be thoroughly flushed with clean water through all its extremities until the residual chlorine is reduced to less than 1.0 ppm or at the same level as in the existing water mains. As a minimum 1-1/2 times the total capacity of the sterilized pipeline must be flushed.

3.13.14 The line shall be tested for turbidity. If the test is not satisfactory, the line will be re-flushed until satisfactory results are obtained.

3.13.15 Tanks shall be disinfected in accordance with the most recent AWWA Standards for disinfection of tanks with clean water containing 100 ppm chlorine. After disinfection and flushing a minimum of 1 sample per tank must be obtained and successfully pass bacteriological testing by a NC certified laboratory. Samples of water lines shall be taken at representative points along the pipeline by the contractor, in approved containers, using standardized approved procedures and submitted to a NC certified testing laboratory for bacteriological testing and chlorine content. A minimum of one sample shall be obtained for each 500 feet or less of pipeline being sterilized or disinfected and at every point of connection to the existing water system. A bacteriological analysis for total coliform bacteria and chlorine content shall be performed by the NC approved laboratory. If this test fails, the pipeline shall be re-chlorinated, re-flushed and retested until satisfactory results are obtained, by the contractor, at the contractor's expense. Copies of all test reports shall be provided to both the engineer and the owner.

3.13.16 The contractor will properly de-chlorinate all flush water and take all necessary precautions to prevent the flow of strong chlorine solution into existing water facilities, streams or other locations and will assume all responsibility for damages done by heavily chlorinated water. No water mains, tanks, pumps or other water system components will be placed in service or tapped until approved by the engineer.

3.13.17 When cutting into or repairing an existing water main, disinfection and flushing shall be performed in accordance with the most recent requirements of AWWA C651, "Disinfection Procedures When Cutting Into or Repairing Existing Mains."

3.14 The system integrator or their representative will be responsible for successfully starting up all booster pumping systems and providing on-site training to the system operators as required for their thorough understanding of system operation, controls and routine maintenance.

3.15 The contractor shall be responsible for maintaining a set of record plans which will reference all fittings, bends (horizontal and vertical), alignment changes, valves, etc. to three (3) major permanent land physical features such as structures, utility poles or property corners. In addition, the contractor shall give a depth of main at each reference point along the alignment. Also the type of material used and manufacturer's name and model or casting number shall be listed. This information shall be provided to the engineer at the end of the project, and prior to release of final payment, for completion of record drawings.

4.0 METHOD OF MEASUREMENT & BASIS OF PAYMENT

4.1 All work, materials, equipment, labor, testing, incidentals and appurtenances described in this section shall be included in the lump sum price stipulated in the bid form for water system improvements.

END OF SECTION

SECTION 02530

WASTEWATER COLLECTION & TREATMENT IMPROVEMENTS

1.0 GENERAL

1.1 Description: The contractor shall furnish all materials, labor, equipment, supplies and incidentals necessary to complete all wastewater treatment plants and facilities, gravity sewer lines and all related appurtenances as shown on the plans and as required for the successful completion of the project, to the satisfaction of the engineer, and in conformance with applicable regulations.

1.2 The contractor shall furnish all materials, labor, equipment, supplies and incidentals necessary to complete a reliable and properly functioning, 10,000 gpd, packaged, integrated, recirculating media filter type wastewater treatment plant capable of consistently operating in compliance with the effluent quality standards stipulated in the current NC NPDES Permit No. NC0066958 for the existing facility with average daily flows of up to 10,000 gallons per day. The packaged, wastewater treatment plant shall include all ancillary items and appurtenances and shall be manufactured and installed in accordance with all applicable local, state, national and international codes and standards, all other applicable regulations and as indicated on the plans. The package pumping system shall be by the same manufacturer as supplying the pump and motor control panel so as to insure suitability and assurance of experience in matching the equipment together and to insure single source responsibility for the equipment.

1.3 The entire packaged wastewater treatment plant shall be provided by a domestic manufacturer having a minimum of 10 years experience in the design, manufacture and fabrication of integrated, package recirculating media filter wastewater treatment system, complete and with all components, integrated controls and appurtenances necessary to place the wastewater treatment plant into reliable service in compliance with permit and agency requirements. The supplier of the packaged wastewater treatment plant shall submit information, data, specifications, a description of the system, references and previous experience to the engineer, a minimum of 2 weeks prior to bid opening, and demonstrating compliance with project plans and specifications, in order to be considered as a potentially pre-approved manufacturer prior to receipt of bids.

1.4 All wastewater treatment systems, sewer mains, sewer services, and wastewater appurtenances shall be in strict accordance with the provisions, rules and regulations of the North Carolina Department of Environmental Quality (NCDEQ), NC Public Water Supply, NSF standards, the North Carolina Building Code and other local, state and national agencies having jurisdiction. There shall be no non-permitted discharge of sewage allowed as a result of construction activities.

1.5 The contractor will be solely responsible for making investigations and determining the existence, exact locations, sizes, and material types of all existing sewer lines and other utilities that may be affected by project activities prior to commencing construction. All existing utilities and related facilities are not shown on the plans and the locations shown on the plans may have been approximated. Any damage incurred to existing utilities, whether shown on the plans, not shown on the plans or incorrectly shown on the plans are the responsibility of the contractor and shall be repaired to the original or better condition, to the satisfaction of the utility owner and engineer, at the sole expense of the contractor.

1.6 The contractor shall obtain the approval of the school prior to connecting to any existing wastewater collection and treatment components. When required to complete construction, the contractor will be responsible for implementing an acceptable means of pumping around or otherwise by-passing the section of line to be replaced such that no discharge of sewage will occur nor will the service of sewer be interrupted. The contractor will be responsible for coordinating and scheduling the sewer line replacement with the utility owner(s).

1.7 The contractor shall be responsible for all job site safety and security including, but not limited to, work zone traffic control and signing. The contractor shall provide and maintain adequate work zone traffic control in accordance the latest editions of the NCDOT "Standard Specifications for Roads and Structures," the NCDOT "Roadway Standard Drawings" the AASHTO "Manual of Uniform Traffic Control Devices" and all site specific conditions imposed by the NCDOT local Division Office.

2.0 MATERIALS

2.1 STANDARDS: All materials shall be new, in good condition, as shown on the plans, specified herein and related sections of the specifications.

2.2 SHOP SUBMITTALS: The contractor shall submit to the engineer, design data, catalog cuts and shop submittals for all materials, including but not limited to, wastewater treatment plant components, tanks, pumps, pump filters, controls and SCADA equipment, pipe, fittings, valves, valve boxes, manholes, iron castings and all other wastewater equipment, sanitary sewers and appurtenances proposed for use on the project. Shop submittals shall be delivered to the engineer as clear, detailed pdf documents in manageable file sizes and formats. All shop submittals shall be reviewed and approved by the contractor prior to being submitted to the engineer for review. The shop submittals shall be sent to the engineer with the contractor's digital transmittal indicating the contractor's review and approval of the submittal. Materials which have not been approved shall not be delivered for use on the project. The engineer's review of shop drawings in no way relieves the contractor of his sole responsibility to insure the suitability of all materials used on the project, including but not limited to dimensions, size, capacity, brand, model, compatibility and any other product or material properties. Any unacceptable or unsuitable materials or products incorporated into the project shall be removed and replaced to the satisfaction of the engineer.

2.3 The recirculating media filter, packaged, wastewater treatment plant shall be a fully integrated system provided by a single supplier to insure proper function and compatibility of all individual components and materials. The integrated wastewater treatment plant shall consist of tanks, filters, pumping equipment, controls, telephone dialer and remote monitoring, generator and all related appurtenances as shown on the plans and as required for a complete, properly installed system in accordance with the wastewater treatment manufacturer's recommendations and as required by applicable regulations to the engineer's satisfaction. The wastewater treatment plant system and stand-by generator supplier will assume unit responsibility for the proper operation of the entire packaged system as specified herein and shown on the plans. All electrical shall be in accordance with all applicable local, state, national and international codes and regulations and shall be in accordance with electrical requirements for the project. The contractor shall furnish the Owner with all standard spare parts and maintenance accessories for the wastewater treatment system and appurtenances.

2.4 All components incorporated into the wastewater improvements portion of the project shall be highly resistant to corrosion and degradation when subjected to buried or corrosive sewage environments. All fasteners, hardware and other metal components shall be AISI type 316 or 304 series stainless steel or alternate corrosion proof materials approved by the engineer.

2.5 Fiberglass Reinforced Plastic (FRP) Tanks, Filter Basins and Flumes: Unless otherwise indicated, the plastic terminology used in this specification shall be in accordance with the definitions given in American Society for Testing and Materials (ASTM) designations D3299-81. This specification is for the hand lay-up; chopped spray technique and filament wound methods for manufacturing of vertical underground fiberglass basins.

2.5.1 The resin used shall be of a commercial grade and shall be evaluated as a laminate by test or determined by previous service to be acceptable for the environment of installation.

2.5.2 The reinforcing material shall be a commercial grade of glass fiber having a coupling agent, which will provide a suitable bond between the glass reinforcement and the resin. The laminate shall consist of an inner surface, an interior layer, and a filament-wound structural exterior layer of laminate body.

2.5.3 FRP inner, wetted surfaces shall be free of cracks, crazing and pitting with a smooth finish and with an average of not over two pits per square foot. Between 0.100 and 0.020 inches of resin-rich surface shall be provided. The inner surface finish of flumes shall be as needed to provide accurate, precise and repeatable flow measurements.

2.5.4 FRP tanks, filter basins and flumes must be designed to withstand wall collapse based on site specific conditions and hydrostatic loading with the water table calculated above the top of the FRP structure and under all liquid level conditions inside the FRP structure. FRP

structures shall be designed and constructed to withstand or exceed two times the actual range of site specific dead and live loading conditions.

2.5.5 The FRP structure manufacturer shall provide an engineered anti-floatation system designed to withstand hydrostatic uplift pressure with the structure empty, the water table above the entire structure and under site specific installation conditions with a minimum safety factor of 1.5.

2.5.6 All hardware, fasteners and fittings, regardless of whether cast in or attached to FRP structures, shall be 316 stainless steel or other approved corrosion proof material.

2.5.7 Pipe connections to FRP structures shall be made with integrally formed, properly gusseted and reinforced, watertight pipe stubs with machined flange or hub ends as needed to make proper, structurally sound, watertight connections to system piping.

2.5.8 All FRP structures shall be watertight and shall be subjected to, and successfully pass, 24 hour leakage testing as specified herein.

2.6 Precast Concrete Rectangular Tanks: shall be tanks pre-approved by the NC On Site Wastewater Branch with valid serial numbers issued by this agency. Where required on the plans, the tanks shall be designed to withstand H20 traffic loading. Precast Joint Sealing Compound shall be the flexible type, packaged in extruded preformed shape, sized to completely fill the joint between precast sections, and form a permanently flexible watertight seal. The sealing compound shall be non-shrink and meet AASHTO M-198B. Precast Concrete Rectangular Tanks shall be watertight and shall be subjected to, and successfully pass, 24 hour leakage testing as specified herein.

2.7 Aluminum access hatches shall be of domestic manufacture and shall be fabricated by a reputable company having a minimum of 15 years experience in the custom fabrication of access and utility hatches. Access hatches shall have the number of doors, minimum clear open dimensions, hinge locations and other features and requirements as indicated on the plans. The access hatch frame shall have a minimum 1/4 inch thick one-piece, extruded aluminum frame, incorporating a continuous flange, which shall be cast into the top section of precast concrete by the precast concrete manufacturer. The exterior portions of the frame in contact with concrete, shall be coated with bitumastic prior to casting the hatch into the precast top. The access door panel skin shall be designed and fabricated from minimum 1/4 inch thick aluminum diamond plate, reinforced to withstand a live load of 625 lbs per square ft of door surface area. The maximum uniform live load rating of 625 lbs per square ft of door surface area shall not result in a maximum allowable deflection of 1/150 of the span of the door in any direction. The access door(s) shall open to 90 degrees and automatically lock with an AISI Type 316 stainless steel hold open arm with aluminum release handle. Access door hinges and all fastening hardware shall be AISI Type 316 stainless steel. The access door shall be equipped with a padlock hasp and a door lift handle. The access door manufacturer shall

provide a lifetime guarantee on the access door against defects in material and/or workmanship.

2.8 PIPE: All sewer pipe materials shall be the types and sizes specified on the plans and in accordance with the following:

2.8.1 Ductile Iron Pipe (for Use on Sewer Mains and Sewer Services): All pipe used on the project shall be clearly marked with the weight, class designation, size, and applicable standards. All pipe, clean-outs and fittings shall be pressure rated ductile iron pipe (DIP) in conformance with AWWA C150, thickness class 51. Joints shall be mechanical or push-on type with elastomeric gaskets in conformance with AWWA C111. All ductile iron pipe shall have a standard cement mortar lining in conformance with AWWA C104, and a bituminous seal coating approximately one (1) mil thick. All fittings and bends shall be ductile iron in conformance with AWWA C110 or C153 for compact fittings. Fitting and bend class designation will be compatible with the pipe class designated for the project. All fittings and bends shall be mechanical joint with elastomeric gaskets in accordance with AWWA C111. All fittings and bends shall have a standard thickness cement mortar lining and bituminous seal coat in conformance with AWWA C104. Clean-outs, where required, shall have a ductile iron adaptor and 4" brass threaded clean-out plug. Ductile iron pipe is required on all sewer mains having a bury depth of greater than 16 vertical feet. PVC will not be allowed for sewer mains with greater than 16 vertical feet of bury.

2.8.2 SCH 40, Polyvinyl Chloride (PVC) Pipe: SCHEDULE 40 PVC, pressure rated pipe. All SCH. 40 pipe used on the project shall be clearly marked with the weight, class designation, size, and applicable standards. All pipe, clean-outs and fittings shall be in accordance with ASTM D2665 and ASTM 1784 standards for PVC resins, sewer pipe and fittings. Joints shall be solvent welded made using heavy duty primer and solvent in accordance with ASTM standards and the pipe manufacturer's recommendations. All fittings shall be molded in one piece in accordance with ASTM D3034 standards.

2.9 SEWER LINE COUPLINGS: Where it is necessary to join dissimilar pipe materials such as ductile iron and PVC, coupling shall be the type specifically designed for use with joining gravity sewer pipes and shall be provided with the appropriate couplings or bushings sizes for specific installation conditions. Couplings shall be absolutely watertight when installed. Couplings shall be the flexible type manufactured of specially formulated elastomeric PVC of high strength and having high resistance to chemical attack. All couplings shall be provided with a full length stainless steel shear band or sleeve and heavy duty stainless steel band clamps. Couplings shall be the eccentric type which allows the sewer flowline or invert elevations to match at the point of connection within the coupling. Shear Bands shall be heavy duty stainless steel or ductile iron. Band clamps shall be series 300 stainless steel or better.

2.10 CASING PIPE: for use as encasing pipe under roads, pavement or railroads, whether installed by bore or open cut, shall be welded steel pipe conforming to the requirements of ASTM Designation A-139. The minimum casing pipe size and wall thickness shall be as

shown on the plans. For sizes not included therein, or for special design considerations, approval shall be obtained from the engineer. All steel casing pipe shall be fully coated on the interior and exterior with a factory applied, uniform coating of an approved epoxy having a minimum dry film thickness of 12 mils.

2.10.1 Carrier piping shall be properly and adequately supported throughout the length of the casing pipe using specially designed and fabricated “spiders” as indicated on the plans. Spacing of the spider supports shall not exceed the spacing shown on the plans or less if recommended by the pipe manufacturer under site specific load and installation conditions. Spider supports shall be designed to adequately handle the anticipated load conditions and be of non-corrosive construction. Stainless steel nuts and bolts shall be used. Installation and spacing of casing spiders shall be as required by the manufacturer, and as shown on the standard construction details.

2.10.2 The annular space between the casing and the carrier pipe shall be sealed, at both ends of the casing, with a special sealing system including flexible boot and stainless steel band clamps, specifically designed and manufactured for sealing casing and carrier pipes.

2.11 PRECAST CONCRETE MANHOLES: shall be minimum 4 ft inside diameter unless shown otherwise on the plans. All manholes, including bases, risers, and tops shall conform to requirements of ASTM C478. Top sections shall be eccentric cone unless shown otherwise. Steps on inside wall shall be in the same plane from bottom of structure to manhole cover. Manhole manufacturer shall design all manhole components to withstand traffic loading, site installation specific live and dead loads and to withstand buoyant forces assuming the water level is at the top of the manhole.

2.11.1 Manhole Pipe Connections: Shall be the factory installed, watertight neoprene boot type installed within core drilled holes at the proper elevation and angle and fastened with a heavy duty internal stainless steel compression ring. The neoprene boot shall fasten to the sewer pipe with a stainless steel worm band clamp. All manhole pipe connections shall provide a drip tight connection with no evidence of seepage. The annular space on the manhole interior between the pipe outside diameter and the precast manhole wall shall be completely filled with non-shrink hydraulic cement.

2.11.2 Precast Joint Sealing Compound: shall be the flexible type, packaged in extruded preformed shape, sized to completely fill the joint between precast sections, and form a permanently flexible watertight seal. The sealing compound shall be non-shrink and meet AASHTO M-198B.

2.11.3 Manhole Frames and Covers: shall be as shown on the plans and shall be gray cast iron conforming to ASTM A48. The frame and cover shall be rated for HS20-44 loading, have a studded pattern on the cover, and the letters “SEWER” cast in place. The studs and the lettering shall be raised approximately 5/16 inch. The cover shall be a minimum 24 inches in diameter and shall be either watertight with neoprene gasket and 4 each stainless steel hex

head cap screw or shall have four 3/4 inch vent holes and two lifting slots depending upon the type required for a particular installation. The bearing surface of the frame and cover shall be machine finished. The cover shall fit firmly on the frame without movement when subject to traffic.

2.11.4 Manhole Steps: shall be polypropylene plastic coated on a No. 4 deformed rebar conforming to ASTM C478, Polypropylene shall conform to ASTM D4101. Steps shall be a minimum of 10 inches wide and project a minimum of 5 inches at the connection points to the wall. The top surface of the step shall have a studded non-slip surface. Steps shall be placed at 16 inch centers.

2.12 Stone: for use in bedding all pipe and couplings and for use as foundation conditioning material shall be NCDOT #57 washed stone.

2.13 Warning Tape: All buried process piping, sewer lines, drain lines, wash water lines, conduits, electrical and communications cables shall be marked with buried warning tape regardless of pipe material or size. All warning tape shall be a minimum of 4 mils thick by 3 inch wide and shall include a metallic core which easily allows detection with a metal detector. The warning tape shall be continuously imprinted with caution warning and a specific description of the utility buried directly below the tape. The warning tape shall be installed directly over the buried line and shall be installed at a depth of 6" to 12" below the finished grade ground surface.

2.14 Concrete: Unless specified otherwise on the plans or by the tank engineer, all poured-in-place concrete shall be Portland cement concrete having a minimum compressive strength of 4,000 psi at 28 days. All concrete exposed to weather shall be air entrained. Concrete shall be in accordance with Section 1000 of the NCDOT "Standard Specifications for Roads and Structures."

3.0 EXECUTION

3.1 All materials and appurtenances shall be handled in such a manner as to ensure delivery to the site and installed in a sound, undamaged condition. All materials shall be carefully examined for defects before placing, and any found defective shall not be used. If any defects are found in the lines or in any of their fittings or appurtenances, they shall be replaced to the satisfaction of the engineer.

3.2 Protect all materials and appurtenances against damage and deterioration by storing in a dry place and above ground at all times until assembly. Cover parts adequately with a protective covering. Materials may be rejected by the engineer if found by the engineer to be defective, deteriorated or damaged. Any materials to be incorporated into the project which are deemed by the engineer to be defective, deteriorated or damaged shall be replaced with new materials by the contractor at the contractor's expense.

3.3 All construction shall be performed by a contractor approved and/or trained by the equipment supplier.

3.4 Alignment and fit of the components, parts and sub-assemblies shall be as shown on the plans and as required for a proper installation given site specific jobsite conditions. The contractor shall develop detailed record drawings of underground conduits and all system components which will be provided to the engineer at project completion but prior to release of final payment.

3.5 All construction shall be in accordance with the design and the instructions of the wastewater treatment plant manufacturer and stand-by generator manufacturers. The system shall be assembled and installed in accordance with the manufacturer's requirements. All bolts and fasteners shall be properly tightened to the torque range specified by the manufacturer. The system shall be handled and assembled in accordance with the manufacturer's specifications taking all necessary precautions to avoid damage.

3.6 Proper equipment, tools, and facilities will be provided and used by the contractor for safe and proper completion of the work. All components, assemblies and incidentals will be carefully positioned piece-by-piece in such a manner as to prevent any damage. All pipe, conduit and other connections and appurtenances shall be made watertight by the contractor.

3.7 Following the successful start up of the new wastewater treatment plant and with the Engineer's approval, the contractor shall demolish, remove and properly dispose of the existing wastewater treatment plant as described in Section 2110 "Clearing, Grubbing and Demolition". Materials or components which the owner does not desire to retain shall become the property of the contractor and shall be properly disposed of by the contractor of site, at the contractor's expense.

3.8 Pipe and appurtenances shall be handled in such a manner as to ensure delivery to the site and installed in a sound, undamaged condition. All pipe, fittings, and appurtenances shall be carefully examined for defects before placing, and any found defective shall not be used. If any defects are found in the lines or in any of their fittings or appurtenances, they shall be replaced to the satisfaction of the engineer.

3.9 Alignment and grade of the pipe and the location of manholes, fittings and clean-outs will be as required for a proper installation given site specific jobsite conditions as required by the engineer. The sewer line will be laid to the required lines and grades with fittings at the required locations and as needed for a proper installation. The size, grade and locations of the sewer lines and appurtenances shall be as shown on the plans, unless approved otherwise by the engineer.

3.10 The contractor will be responsible for engaging the services of a qualified NC Professional Land Surveyor, at the contractor's expense, to stake out all wastewater treatment

plant components and sewer components and obtain the engineer's approval of the stake-out prior to proceeding with construction. The contractor's NC Professional Land Surveyor shall develop detailed record surveys, at the contractor's expense, of all wastewater treatment plant structures, piping, electrical conduits, manhole locations, pipe inverts, alignments and grades, and the locations of all sewer services including the locations and elevations of all fittings and cleanouts to the satisfaction of the engineer, which will be provided to the engineer at project completion but prior to release of final payment.

3.11 The Contractor is solely responsible for making the necessary investigations, installing the necessary fittings and varying the depth of sewer line installation if necessary to achieve a proper installation to the satisfaction of the engineer.

3.12 Proper equipment, tools, and facilities will be provided and used by the contractor for safe and proper completion of the work. All pipe, fittings, manholes and incidentals will be carefully lowered into the trench piece-by-piece in such a manner as to prevent damage to pipe materials and to protect coatings and linings.

3.13 All gravity sewer pipe and couplings shall be fully bedded in washed stone or approved granular material extending at least 4 inches below the pipe to the top of the pipe. The full length of each section of pipe shall rest solidly upon the pipe bed formed in the granular bed at the trench floor with recesses provided to properly accommodate the bells, joints and fittings. All sewer lines shall be laid with the bells facing upstream and the pipe shall be laid in an upstream direction. As each length of pipe is placed in the trench, the rubber gasket will be lubricated and installed, according to the manufacturer's recommendation. Only lubricants approved by the joint manufacturer will be allowed. The plain end will be centered in the socket with care used to keep the joint from contacting the ground. The pipe will then be properly seated and brought to correct line and grade. Glued or solvent weld fittings shall be installed using NSF approved cleaner and glue in strict accordance with manufacturer's instructions.

3.14 Mechanical joints shall be made in accordance with the recommendations of the manufacturer. Joint bolts shall be drawn up equally around the entire periphery maintaining equal spacing from the gland to the face of the flange at all points around the joint. All bolts shall be tightened to within the manufacturer specified torque range.

3.15 When pipe laying is ceased or not in progress for any period of time and at the end of each work day, the open ends of all pipe, fittings and service lines will be closed by means of temporary watertight plugs.

3.16 Casing pipes crossing under roadways, railroads or pavements shall be located at proper alignments, grades and elevations in order to eliminate possible conflict with existing or future utilities and structures, with a minimum 36-inch depth of cover between the top of the casing pipe and the ground or roadway surface. For casing pipe crossings under roadways and railroads, the contractor shall comply with the regulations of said authority in regard to

design, specifications, and construction. Casing installations shall be as required by the NC Department of Transportation for road crossings and the American Railway Engineering Association for railroad crossings. Casings shall be installed by boring and jacking unless open cut installation is specifically noted on the plans. Open cut installations shall be in accordance with Section 2210, Excavating, Trenching & Backfilling for Utilities and related sections.

3.16.1 The boring and jacking operations shall be done simultaneously, with continuous installation, until the casing pipe is in final position. Correct line and grade shall be carefully maintained. Add on sections of casing pipe shall be full-ring welded to the preceding length, developing watertight joints equaling or exceeding pipe strength. The casing installation shall produce no upheaval, settlement, cracking, movement, or distortion of the existing roadbed or other facilities. Following placement of the carrier pipe within the steel casing, end seals are to be installed at each open end. End seals shall be suitable for restraining the external earth load. When required, casing vents shall be as indicated on the plans or required by the agency having jurisdiction.

3.16.2 Casing pipe holes shall be mechanically bored through the soil by a cutting head on a continuous auger mounted inside the pipe. The distance between the leading end of the first auger section and the leading end of the casing shall be as necessary to maintain a solid plug of spoil material inside the forward portion of the casing.

3.16.3 The casing pipe shall be adequately protected to prevent crushing or other damage under jacking pressures. Backstops shall be provided for adequately distributing the jack thrust without causing deformation of the soil or other damage. The casing pipe shall be abandoned in place, grouted full, and suitably plugged, and an alternate installation made by the contractor should the casing pipe be damaged or if the casing alignment or elevation substantially deviates from the plan locations, and results in the installation being unusable, as determined by the engineer. Unless approved otherwise by the engineer, the casing alignment and elevation shall be within 0.10 ft of plan specified locations.

3.16.4 Required boring and jacking pits or shafts shall be excavated and maintained to the minimum dimensions necessary to perform the operation. Said excavations shall be adequately barricaded, sheeted, braced and dewatered, as needed, in accordance with the applicable regulations and guidelines of agencies having jurisdiction. Boring and jacking pits will normally be no closer than ten (10) feet from the edge of pavement, with the permitting agency having final determination of the required setback distance.

3.17 Deflection Test (8" and larger PVC gravity sewers only): The contractor shall perform deflection tests on all non-ductile iron pipe sewer main piping installations. The test shall be conducted after the final backfill has been in place at least 30 days to permit stabilization of the soil-pipe system. The rigid ball or mandrel used for the deflection test shall have a diameter not less than 95 percent of the base inside diameter or average inside diameter of the pipe depending on which is specified in the ASTM Specification, to which the pipe is manufactured. The pipe shall be measured in compliance with ASTM D 2122 Standard Test

Method of Determining Dimensions of Thermoplastic Pipe and Fittings. The test shall be performed without mechanical pulling devices. No pipe shall exceed a deflection of 5 percent. If deflection exceeds 5 percent, replacement or correction shall be performed by the contractor to the satisfaction of the engineer at the contractor's expense. All deflection testing shall be performed at the contractor's expense in the engineer's presence.

3.18 Pipe Leakage Tests: All wastewater treatment plant process piping, sewer lines and sewer piping shall be leak tested in the presence of the engineer at the contractor's expense. All piping shall not have leakage, whether exfiltration or infiltration. Wastewater non-potable water service line shall be subjected to a leak test pressure of 150 psi for a minimum period of 2 hours without evidence of leakage. Any piping exhibiting leakage shall be repaired and retested by the contractor, at the contractor's expense, to the engineer's satisfaction.

3.19 Manholes: All manholes shall be installed on a compacted minimum 8" thick #57 NCDOT ABC stone foundation unless shown otherwise on the plans. All manhole covers shall be installed flush with finished grade unless specifically requested otherwise on the plans. Where manholes are installed in vehicle travel areas having significant cross slope, the contractor shall provide specially fabricated wedge type precast grade rings which match the manhole cover slope to the finished grade ground slope. Regardless of the manhole cover location and elevation, the contractor shall make the necessary provisions to prevent manhole covers from being subject to inflow or infiltration due to typical weather conditions or flood conditions. All manholes shall be subjected to vacuum testing in accordance with ASTM procedures. Any manhole exhibiting any evidence of leakage, inflow, infiltration or exfiltration shall be repaired and retested by the contractor, at the contractor's expense, to the engineer's satisfaction.

3.20 All collection sewers and sewer service piping and clean-out assemblies shall be subjected to air testing. The contractor shall provide all the necessary equipment, including but not limited to temporary plugs and personnel, labor and supplies necessary to complete all testing to the satisfaction of the engineer. All air testing shall be performed at the contractor's expense. Air testing procedures shall conform to the test procedure described in ASTM C-828-86. Any sewer main or sewer service piping or clean-outs exceeding the limits specified for this test shall be repaired and retested by the contractor, at the contractor's expense, to the engineer's satisfaction.

3.21 All FRP tanks and precast concrete tanks and associated connections and appurtenances shall be made watertight by the contractor. Following installation and cleaning of the tank, the contractor shall leak test the completed tank in accordance with ANSI/AWWA D103, Section 9 for liquid tightness by filling the tank with clean, potable water to the overflow level. Do not add additional water for a minimum of 24 hours. Perform the 24 hour leak test in the presence of the engineer. Any leaks, visible seeps or weeps shall be repaired to the satisfaction of the engineer and retested to the satisfaction of the engineer until the wetwell is watertight at no additional cost to the owner. The contractor is responsible for

furnishing a source of clean water other than the school potable water supply. The contractor shall repair any leaks in strict accordance with manufacturer's instructions.

4.0 MANUALS & START UP

4.1 At least 7 days prior to wastewater treatment plant start-up, a pdf digital copy and a minimum of four (4) hard copies of the manufacturer's operation and maintenance (O&M) manuals shall be delivered to the engineer by the contractor for the engineer's review and approval. The manuals shall have clear and concise step-by-step procedures for system start-up, manual and automatic operation, alarm functions and set-up, shutdown, troubleshooting and routine maintenance. The manuals shall include the manufacturer's name, model number, parts list, list of parts and tools of all devices parts, assemblies and sub-assemblies, including contact names, phone numbers and addresses for all authorized organizations capable of supplying replacement parts and all authorized organizations capable of providing on-site service. In addition, the manuals shall include wiring and control diagrams and schematics.

4.2 The contractor and the contractor's suppliers shall be responsible for provided all start-up and testing including furnishing all clean water, materials, devices, labor, supplies, tools and instruments necessary for the successful completion of start-up and testing of the wastewater treatment plant to the satisfaction of the engineer and owner.

4.0 METHOD OF MEASUREMENT & BASIS OF PAYMENT

4.1 All work, materials, equipment, labor, testing, incidentals and appurtenances described in this section shall be included in the lump sum price stipulated in the bid form for wastewater system improvements.

END OF SECTION 02530

SECTION 02630

STORM DRAINAGE & INCIDENTALS

1.0 GENERAL

1.1 Description: The contractor shall furnish all materials, labor, equipment, supplies and incidentals necessary to complete all storm drainage piping, underdrains, culverts, structures, inlets and appurtenances as shown on the plans and as required for the successful completion of the project, to the satisfaction of the engineer, and in conformance with applicable regulations.

1.2 All storm drainage materials and workmanship shall be in accordance the NC Department of Transportation (NCDOT) "Standard Specifications for Roads and Structures," latest edition and the "Roadway Standard Drawings," latest edition except as modified by the plans and specifications for this project.

1.3 The contractor will be solely responsible for making investigations and determining the existence, exact locations, sizes, and material types of all existing utilities that may be affected by project activities prior to commencing construction. All existing utilities and related facilities are not shown on the plans and the locations shown on the plans may have been estimated. Any damage incurred to existing utilities, whether shown on the plans, not shown on the plans or incorrectly shown on the plans is the responsibility of the contractor and shall be repaired to the original or better condition, to the satisfaction of the utility owner and engineer, at the sole expense of the contractor.

1.4 The contractor shall be responsible for all job site safety and security including, but not limited to, work zone traffic control and signing. The contractor shall provide and maintain adequate work zone traffic control in accordance the latest editions of the NCDOT "Standard Specifications for Roads and Structures," the NCDOT "Roadway Standard Drawings" the Federal Highway Administration "Manual of Uniform Traffic Control Devices" and all site specific conditions imposed by the NCDOT local Division Office.

1.5 UNDERDRAIN: shall include the installation of a network of subsurface drains as detailed on the plans. The collection piping installed in the underdrain shall be HDPE slotted, smooth interior drainage pipe in accordance with these specifications. All upstream terminal ends of underdrain shall be provided with a solid watertight HDPE cap or plug which meets the specifications for HDPE underdrain pipe and fittings. Underdrain will be paid for at the stipulated unit price per linear foot and shall include all coordination, stake-out, pipe, tees, wyes, fittings, bends, plugs, joints, adaptors, excavation, stone, filter or engineering fabric, grading, off-site disposal of excess or waste materials, borrow materials, backfill, compaction, connections to structures, incidentals and appurtenances to the satisfaction of the engineer and the Owner's geotechnical engineer (when applicable). Underdrain will

be measured by the engineer along the centerline of the underdrain collection piping through all tie ins, connections, fittings and bends. The contractor shall schedule the engineer 24 hours in advance to measure installed underdrain prior to covering the collector piping and shall allow the engineer adequate time to obtain measurements for payment. The contractor shall be paid for installed underdrain at approved locations at the unit price be linear foot stipulated in the contract. The stone drain without pipe shown on the site plan for the wastewater plant area and extending from the recirculating filter area to daylight discharge will be treated as incidental work to the wastewater improvements bid price and will not be considered as underdrains and will not be paid for as such.

2.0 MATERIALS

2.1 STANDARDS: All materials shall be as specified in the NCDOT "Standard Specifications for Roads and Structures," dated July 2006 and the "Roadway Standard Drawings," dated January 2006 except as modified on the plans and herein.

2.2 SHOP SUBMITTALS: The contractor shall submit to the architect or engineer, catalog cuts and shop submittals for all materials, including but not limited to, pipe, filter fabric, culverts, fittings, structures, frames and grates and incidentals proposed for use on the project. Unless stipulated otherwise in the contract, (6) copies of all shop drawings shall be submitted for review. The engineer's review of shop drawings in no way relieves the contractor of his sole responsibility to insure the suitability of all materials used on the project, including but not limited to dimensions, size, capacity, brand, model, compatibility and any other product or material properties. Any unacceptable or unsuitable materials or products incorporated into the project shall be removed and replaced to the satisfaction of the engineer.

2.3 Storm Drain Pipe, Fittings & Couplings: shall be the types and sizes specified on the plans. All storm drainage pipe, fittings & couplings shall be in accordance with the NCDOT Standard Specifications for Roads and Structures except as modified herein and on the plans.

2.3.1 CMP - Corrugated, Galvanized Steel Pipe: shall be in accordance with AASHTO - M36, 2-2/3" x 1/2" corrugations and shall be hot dipped galvanized and fully bituminous coated in accordance with AASHTO M190. CMP - corrugated, galvanized steel pipe shall have the following minimum steel wall thicknesses exclusive of coatings:

18" and less:	14 gauge
24" through 48":	12 gauge

Coupling bands for C.M.P. shall be a minimum of 10-1/2" in width, hot dipped galvanized, and fully asphalt coated with at least two corrugations matching reformed corrugations on all pipe ends. Coupling bands shall be fastened with minimum two 1/2" high strength galvanized diameter bolts and all couplings shall be made watertight using a neoprene gasket or o-rings.

Flared end sections for CMP shall be galvanized steel, AASHTO - M36, matching the minimum gauge thickness specified for the corresponding pipe size.

Aluminized pipe may be used in lieu of fully bituminous coated galvanized pipe. Aluminized pipe must meet or exceed all the requirements for galvanized pipe except that the pipe, fittings, coupling bands and appurtenances must be fabricated from aluminum alloy steel sheet meeting the requirements of AASHTO M274 and NCDOT requirements.

2.3.2 RCP - Reinforced Concrete Pipe: shall be in accordance with ASTM C655 and ASTM C76 Class IV, Wall B with spigot groove type joints. Joints shall be watertight with o-ring rubber gasket in accordance with ASTM C443 and ASTM C361. Precast flared end sections and endwall, where required, shall be as specified on the plans.

2.3.3 HDPE - Heavy Duty Polyethylene Pipe: shall be double walled with exterior corrugations and an integrally formed, smooth interior waterway. HDPE shall be in accordance with AASHTO Type S with annular exterior corrugations and an essentially smooth interior waterway braced circumferentially with circular ribs which are formed simultaneously with an outer wall. Pipe and fittings shall comply with the requirements for test methods for AASHTO Designations M 252 and M294 and shall be made from virgin polyethylene compounds which conform with the applicable latest edition of the AASHTO Material Specifications for cell classification as defined and described in ASTM D3350. The minimum parallel plate stiffness values, when tested in accordance with ASTM D2412 shall be as follows:

4" through 10":	340 kN/m ²
12":	345 kN/m ²
15":	290 kN/m ²
18":	275 kN/m ²

HDPE fittings shall be one piece molded and have equal strength and water tightness characteristics as specified for pipe. Unless specified otherwise, all pipe joints shall be the bell and spigot type. All HDPE joints shall be watertight with an elastomeric gasket meeting the requirements of ASTM F477. Handling and installation of HDPE shall be in accordance with AASHTO Section 30, ASTM Recommended Practice D2321 and as recommended by the manufacturer.

2.4 Structural Steel Plate Culverts & Structures: shall be a complete, integrated system supplied by a single manufacturer with a minimum of 10 years experience in the manufacture and installation of structural plate structures. Structural plate shall be of domestic manufacture in accordance with AASHTO - M167 and ASTM A761. All fasteners shall be galvanized and meet the provisions of ASTM A 449, Type 1 and ASTM A-563.

2.5 Storm Drainage Structures: shall be in accordance with the NC Department of Transportation (NCDOT) "Standard Specifications for Roads and Structures," dated July 2006 and the "Roadway Standard Drawings," dated July 2006 except as modified by the plans

and specifications for this project. No waffle wall or knock out wall structures will be allowed.

2.5.1 Cast in Place Concrete Storm Drainage Structures: shall be in accordance NCDOT requirements for concrete and shall be minimum 4,000 psi compressive strength at 28 days.

2.5.2 PVC Storm Drainage Structures: shall be used only when stipulated on the plans. PVC structures shall be watertight manufactured units specifically designed for the type of drainage inlets and storm drainage pipe specified. PVC structures shall be manufactured in accordance with ASTM D3034 and ASTM F1336 standards. All PVC Storm drainage structures shall be either 12 inches or 18 inches in diameter as specified on the plans and shall have a ductile iron, high flow, inlet grate unless specified otherwise on the plans. PVC structures shall be manufactured from PVC and shall include an integral PVC floor and integral PVC pipe stub spigots suitable for watertight connection to the types of storm drain pipe specified. All PVC structure construction and pipe connections spigots shall be watertight in accordance with ASTM D3212 standards. All PVC structures shall be designed to withstand H-25 wheel loading. All pedestrian grates shall be ductile iron, H-10 load rated in accordance with ASTM A-48-83 class 30B standards.

2.6 Downspout Adaptor Assemblies: When exposed, above ground roof downspouts are provided, roof downspout connections shall be made using the following assembly unless noted otherwise on the plans:

- 1 each - Cast iron downspout adaptor matching downspout size, as manufactured by Neenah, Wade, Josam or an equal approved by the engineer.
- 1 each - Properly sized cast iron extension matching the downspout adaptor size
- 1 each - Cast iron to heavy duty watertight neoprene adaptor with stainless steel shear band.

2.7 Stone: for use in bedding all pipe and couplings, and for use as underdrain aggregate and for drainage structure foundation conditioning material shall be NCDOT #57 washed stone.

2.8 Concrete: Unless specified otherwise on the plans or Section 3301 of these specifications, all poured-in-place concrete shall be Portland cement concrete having a minimum compressive strength of 4,000 psi at 28 days. All concrete exposed to weather shall be air entrained. Concrete shall be in accordance with Section 1000 of the NCDOT "Standard Specifications for Roads and Structures."

2.9 Geotextile filter fabric for Underdrains: shall be non-woven, needle punched fabrics specifically designed and manufactured for long term subsurface drainage applications. Physical properties of geotextile filter fabric shall meet the requirements listed in the following table.

Property	Test Method	Units	Elongation $\geq 50\%$ ¹
Grab Tensile Strength	ASTM D 4632	N (lbs)	500 (112)
Sewn Seam Strength ²	ASTM D 4632	N (lbs)	450 (101)

Tear Strength	ASTM D 4533	N (lbs)	180 (40)
Puncture Strength	ASTM D 4833	N (lbs)	180 (40)
Burst Strength	ASTM D 3786	kPa (psi)	950 (138)
Ultraviolet Stability ³	ASTM D 4355	%	50

¹ A measured in accordance with ASTM D 4632

² When sewn seams are required.

³ After 500 hrs

In addition, filter fabric permittivity and apparent opening size shall be as specified by the Owner's Geotechnical Engineer.

2.10 Warning Tape: All storm drainage piping shall be marked with buried warning tape regardless of pipe material or size. All warning tape shall be a minimum of 4 mils thick by 3 inch wide and shall include a metallic core which easily allows detection with a metal detector. The warning tape shall be blue with black letters and continuously imprinted "Caution Buried Utility Below" and shall be installed 18" above the installed piping.

3.0 EXECUTION

3.1 Pipe, structures and appurtenances shall be handled in such a manner as to ensure delivery to the site and installed in a sound, undamaged condition. All materials shall be carefully examined for defects before placing, and any found defective shall not be used. If any defects are found in the lines or in any of their fittings or appurtenances, they shall be replaced to the satisfaction of the engineer. All storm drainage pipe foundation preparation, bedding materials and backfill material, and backfilling methods and procedures shall be in accordance with the recommendations of the pipe manufacturer for site specific conditions of installation.

3.2 For underdrain installation, provide full rolls of geotextile filter fabric as furnished from the manufacturer. Protect against damage and deterioration by storing rolls in a dry place and above ground at all times until placement. Cover rolls and partial rolls until used with a dark protective covering. Geotextiles will be rejected by the engineer if found to be defective, deteriorated or damaged.

3.2.1 Underdrain trench excavation shall be to the limits described by the plans and at locations approved by the Owner's geotechnical engineer and the engineer. Excavation shall be performed in a manner so as to prevent large voids from occurring in the sides and bottom of the trench providing a smooth graded surface on both the trench floor and walls that is free of debris.

3.2.2 Underdrain geotextile filter fabric shall be placed loosely with no wrinkles or folds, and with no void spaces between the fabric and the ground surface. Successive sheets of geotextiles shall be overlapped a minimum of 12 inches with the upstream sheet overlapping the downstream sheet unless shown or specified with greater overlap on the plans.

3.2.3 After placing the drainage aggregate in the trench over the geotextile filter fabric, the fabric shall be folded over the top of the backfilled aggregate in a manner to produce a minimum overlap of fabric ends the full trench width. All seams shall be subject to the approval of the engineer.

3.2.4 Should the underdrain filter fabric be damaged during installation or drainage aggregate placement, a geotextile patch shall be placed over the damaged area extending beyond the damaged area a distance of at least 2 feet in all directions unless a larger patch is recommended by the engineer in the field.

3.2.5 Placement of underdrain aggregate should proceed immediately following placement of the geotextile. The geotextile should be covered with a minimum of 30 inches above the trench floor of loosely placed aggregate prior to compaction. A bedding layer of drainage aggregate should be placed below the perforated collector pipe with the remainder of the aggregate placed to the minimum required construction depth. All underdrain collector pipes should have slotted perforations specifically designed for collecting groundwater. All underdrain pipe and fittings shall be min. 6" diameter HDPE smooth interior pipe and fittings in accordance with these specifications. All underdrain collector pipes shall be properly interconnected, installed at a minimum positive drainage slope of 1% and all shall be connected to a concrete site drainage structure through a core drilled hole or a factory fabricated, watertight saddle connection to an existing pipe at a location approved by the engineer. The annular space between the underdrain pipe and drainage structure shall be 1 to 2 inches larger than the pipe outside diameter and shall be fully grouted with an approved high strength, non-shrink grout.

3.2.6 The underdrain aggregate should be compacted with vibratory equipment to a minimum of 100 percent Standard AASHTO density unless recommended otherwise by the owner's geotechnical engineer.

3.3 Alignment and grade of the pipe and the location of structures shall be as shown on the plans and as required for a proper installation given site specific jobsite conditions as approved by the engineer. All storm drain piping will be laid to the required lines and grades at the required locations and as needed for a proper installation. The size and grade of storm drains shall be as shown on the plans, unless approved otherwise by the engineer. The contractor shall develop detailed record drawings of structure locations, pipe locations, alignments and grades, and the locations of all roof drains, underdrains and miscellaneous drains including the locations of all fittings, which will be provided to the engineer at project completion but prior to release of final payment.

3.4 Structural Plate shall be installed in strict accordance with the instructions of the structural plate manufacturer. The structure shall be assembled in accordance with the manufacturer's shop drawings and in accordance with the instructions and supervision of the

plate arch engineer. All bolts and fasteners shall be properly tightened to the torque range specified by the manufacturer. The structural plate system shall be installed in accordance with AASHTO specifications and all necessary precautions shall be taken during backfilling operations to avoid damage to or deformation of the structure. All backfill material and placement shall meet the approval of the manufacturer.

3.5 Proper equipment, tools, and facilities will be provided and used by the contractor for safe and proper completion of the work. All pipe, structures and incidentals will be carefully lowered into the trench piece-by-piece in such a manner as to prevent damage to the structure, pipe or other material or incidental being installed. All storm drain piping shall be carefully bedded as detailed on the plans. The full length of each section of pipe shall rest solidly upon the pipe bed formed with recesses provided to properly accommodate the pipe and fittings.

3.6 All drainage boxes, inlets and all other structures, whether precast, poured in place or otherwise, shall be installed on a level pad of foundation conditioning material (NCDOT #57 stone) compacted to a minimum of 100% standard density. The pad of foundation conditioning material shall have a minimum compacted thickness of 8 inches and extend at least 12" beyond all sides of the structure unless shown otherwise on the plans.

3.7 All storm drain pipe joints, fittings and connections to structures shall be made watertight by the contractor using NCDOT approved materials unless specifically noted otherwise on the plans. Storm drainage construction shall proceed in a sequence and in a manner which does not pose threats to the owner's property nor any other affected public or private properties.

4.0 METHOD OF MEASUREMENT & BASIS OF PAYMENT

4.1 All work, materials, equipment, labor, testing, incidentals and appurtenances described in this section, with the exception of Underdrain, as defined herein, shall not be measured and paid for as such but shall all be treated as incidental work. The contractor is responsible for including the price of all work covered herein in the lump sum prices stipulated for related water and wastewater work in the bid form. **See Allowances, Specification Section 0860 for allowance quantities to be included in the Lump Sum Bid Amounts.**

END OF SECTION

This Page Intentionally Blank

SECTION 2720

AGGREGATE BASE & GRAVEL SURFACES

1.0 GENERAL

1.1 Description: The Contractor shall furnish all materials, labor, equipment, supplies, testing, maintenance and incidentals necessary to construct either aggregate base course suitable for placement of pavement or gravel surfaces at locations shown on the plans and as required for the successful completion of the project. Aggregate materials shall be hauled, placed, compacted, and shaped to conform to the lines, grades, depths, and typical sections required.

1.2 All materials, methods and workmanship shall be in accordance with the latest editions of the NC Department of Transportation (NCDOT), "Standard Specifications for Roads and Structures" and the "Roadway Standard Drawings" except as modified in these specifications or on the plans.

1.3 Contractor shall take all the necessary measures to prevent any damage to any public or private properties, structures, utilities, facilities, etc. Should any damage occur, the contractor shall be fully responsible for making the necessary repairs or replacements, at the contractor's expense, to the satisfaction of the engineer and owner.

2.0 MATERIALS

2.1 The contractor shall furnish all materials, equipment, labor and incidentals required to successfully accomplish all work to the satisfaction of the engineer and owner. All materials shall be clean and in accordance with the NCDOT standards referenced in paragraph 1.2.

2.2 Aggregate Base Course for as a paving base or as a final surface shall be in accordance Articles 1010-1, 1010-2 and 1010-3 of the NCDOT Standard Specifications for Roads and Structures. Unless specified elsewhere, aggregate shall be Type B in accordance with NCDOT requirements.

3.0 EXECUTION

3.1 The Contractor shall construct aggregate base and gravel surfaces at the required locations and thicknesses indicated on the plans to the satisfaction of the engineer and owner. Improper construction or placement of aggregate base or gravel materials shall be corrected, at the contractor's expense, until satisfactory conditions are achieved. Public and private properties shall be protected from any damage or detriment as a result of aggregate base or gravel surface construction.

3.2 Subgrade for aggregate base course or gravel surfaces shall be prepared, stabilized and made suitable for placement of material in accordance with the requirements of Section 500 of the NCDOT Standard Specifications of Roads and Structures except as modified herein or indicated on the plans.

3.3 The aggregate material shall be placed on the subgrade with a mechanical spreader capable of placing the material to a uniform loose depth and without segregation except that for areas inaccessible to a mechanical spreader, the aggregate material may be placed by other methods approved by the engineer.

3.4 Where the required compacted thickness of base is 8 inches or less, the base material may be spread and compacted in one layer. Where the required compacted thickness is more than 8 inches, the base material shall be spread and compacted in 2 or more approximately equal layers.

3.5 The minimum compacted thickness of any aggregate base course for pavement placement or aggregate base for use as a final gravel surface shall be 6 inches at all locations unless specifically noted otherwise on the plans.

3.6 Each layer of aggregate material shall have been compacted, tested and approved prior to placing succeeding layers of base material or pavement.

3.7 No aggregate material shall be placed on frozen subgrade or base.

3.8 Aggregate base course which is in place on November 15 shall have been covered with a subsequent layer of pavement structure or with a sand seal. Base course which has been placed between November 16 and March 15 inclusive shall be covered within 7 calendar days with a subsequent layer of pavement structure or with a sand seal. Sand seal shall be applied in accordance with NCDOT standard requirements. The application of the sand seal will in no way relieve the contractor of the responsibility to maintain or repair the damaged base or subgrade, no matter what the cause of damage, at no cost to the owner.

3.9 No traffic shall be allowed on aggregate base course which has been prepared for installation of pavement other than necessary local traffic and that developing from the operation of essential construction equipment. Any defects that develop in the completed base, regardless of cause, shall be repaired at the contractor's expense to a suitable condition.

3.10 The contractor shall utilize methods of handling, hauling, and placing aggregate materials which will minimize segregation and contamination. If segregation occurs, the contractor shall correct or replace the material to the engineer's satisfaction, at the contractor's expense. Aggregate materials which are contaminated with foreign materials shall be removed and replaced by the contractor at no additional cost to the owner. The above requirements

will be applicable regardless of the type of aggregate material placed and whether being utilized as a pavement base course or final gravel surface.

3.11 All aggregate materials shall be compacted using steel wheel tandem vibratory rollers which have been specifically designed for the compaction of aggregate materials. The number, weight and type of rollers shall be sufficient to compact the mixture to the required density. Unless specifically shown otherwise on the plans, all aggregate materials used for pavement base course or gravel surfaces shall be compacted to a minimum 100% density based on AASHTO T180 as modified by NCDOT.

3.12 Any waste or excess materials shall be properly disposed of offsite at the contractor's expense.

3.13 The owner may employ a qualified testing agency, at their discretion, to conduct density testing of the compacted aggregate materials to verify that the specified density has been achieved. The density tests will be performed at locations randomly selected by the engineer. Areas of aggregate material which fail to meet the specified compaction requirements shall be scarified, repaired and/or replaced as needed to achieve the required compaction at the contractor's expense. Upon completion of corrective measures, density testing will be re-performed to confirm that the specified density has been achieved. All costs associated with re-testing as a result of inadequate densities will be paid for by the contractor.

4.0 METHOD OF MEASUREMENT & BASIS OF PAYMENT

4.1 All work, materials, equipment, labor, testing, incidentals and appurtenances described in this section, shall not be measured and paid for as such, but shall all be treated as incidental work. The contractor shall appropriately divide and include the price of all work covered herein in the associated lump sum bids for water improvements or wastewater improvements in the proper proportions.

END OF SECTION

This Page Intentionally Blank

SECTION 2770

CONCRETE PAVEMENTS AND SIDEWALKS

1.0 GENERAL

1.1 Description: The Contractor shall furnish all materials, labor, equipment, supplies, testing, maintenance and incidentals necessary to construct and/or repair Portland cement slabs, sidewalks, curb, curb & gutter, valley gutters, sidewalks with turndowns, drives, drive turnouts, pavements, and other concrete items and related appurtenances. Placement of concrete pavements shall be constructed on properly prepared subgrade and aggregate base as required for proper construction to the satisfaction of the engineer.

1.2 All materials, methods and workmanship shall be in accordance with the latest editions of the NC Department of Transportation (NCDOT), "Standard Specifications for Roads and Structures" and the "Roadway Standard Drawings" except as modified by the contract documents.

1.3 Contractor shall take all the necessary measures to prevent any damage to any public or private properties, structures, utilities, facilities, etc. Should any damage occur, the contractor shall be fully responsible for making the necessary repairs or replacements, at the contractor's expense, to the satisfaction of the engineer and owner.

2.0 MATERIALS

2.1 The contractor shall furnish all materials, equipment, labor and incidentals required to successfully accomplish all work to the satisfaction of the engineer and owner. All materials shall be new and in accordance with the NCDOT standards referenced in paragraph 1.2.

2.2 Concrete: shall be air entrained and have a minimum compressive strength of 4,000 psi at 28 days unless noted otherwise on the plans. All concrete properties shall be in accordance with NCDOT requirements as specified in the NC Department of Transportation Standard Specifications for Roads and Structures.

2.3 Reinforcing: Deformed grade 60 rebar, ASTM A615 of the sizes & types shown on the plans.

2.4 Welded Wire Fabric: ASTM A185 of the sizes & weights shown on the plans.

2.5 Curing Agents: shall be in accordance with NCDOT Standard Specifications Section 1026.

2.6 Joint Expansion Board Filler: shall be in accordance with NCDOT Standard Specifications Article 1028-1.

2.7 Joint Sealant: shall be 2 component gray sealer in accordance ASTM D1850 or Federal Specification SS-S-00195A.

2.8 Pavement Marking Materials: shall be approved by the NC Department of Transportation and shall be on the most current NC Department of Transportation's "Approved Products List."

3.0 EXECUTION

3.1 The Contractor shall construct concrete pavements at the required locations of the types and thicknesses indicated on the plans to the satisfaction of the engineer and owner. Improper pavements will be removed, properly disposed of off-site and replaced, at the contractor's expense, until satisfactory results are obtained. Bridge floors, curbs, structures, handrails and all other public and private properties shall be covered as needed to prevent splattering or other damage from occurring due to concrete operations.

3.2 The subgrade and aggregate base beneath Portland cement concrete pavement shall be prepared in accordance with NCDOT Standard Specifications. The contractor shall use an approved fine grading machine to produce final subgrade and aggregate base surfaces meeting the lines, grades, and cross sections required by the plans or necessary for the acceptable completion of the work.

3.21 The surface of the aggregate base shall be damp at the time the concrete is placed. The contractor shall sprinkle the base when necessary to provide a damp surface. The contractor shall satisfactorily correct all soft or damaged areas in the subgrade or base prior to placing concrete.

3.2.2 Hauling over the base course will not be allowed except where specifically permitted by the engineer. The engineer may allow equipment dumping concrete to operate on the base to the extent and under the conditions the engineer deems necessary to facilitate placing and spreading the concrete.

3.3 Concrete shall be handled in such a manner as to prevent segregation and kept free from mud, soil, or any other foreign matter.

3.3.1 The contractor is fully responsible for protecting concrete at all times, including but not limited to, the prevention of edge breakage, breakage of unhardened concrete, vandalism and rain or weather damage. Should any damage or detriment occur, the contractor shall replace the damaged concrete at the contractor's expense, to the engineer's satisfaction.

3.3.2 Where finishing operations must be completed after dark, artificial light acceptable to the engineer shall be provided by the contractor.

3.3.3 Paving operations shall not be undertaken or shall be discontinued when any of the following conditions exist:

- a) When a descending air temperature in the shade and away from artificial heat reaches 40°F, paving shall be stopped. Paving shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35°F.
- b) When the subgrade or base course is frozen.
- c) When aggregates to be used in the mix contain frozen particles.
- d) When air temperature in shade is 95°F and rising or the concrete temperature is greater than 95°F.

3.3.4 Where additional pavement must be placed adjacent to new pavement by machine methods, it shall not be placed until the concrete has attained a flexural strength of at least 450 psi. Construction equipment or hauling equipment will not be allowed over the pavement until the concrete has attained a flexural strength of 550 psi.

3.4 Concrete shall be placed using a slip form paver or fixed forms at the contractor's discretion and as required to properly complete the work.

3.4.1 Where a slip form paver is to be used, the concrete shall have sufficient cohesion to prevent appreciable slumping of the pavement edges. When the original mix design produces a concrete which will not meet these requirements, production shall be stopped or slowed and corrections to the mix shall be immediately made.

3.4.2 The slip form paver shall be an approved self-propelled machine(s) designed to spread, consolidate, screed, and float finish the concrete in one complete pass of the machine in such a manner that a minimum of hand finishing will be necessary to provide a dense and homogeneous pavement. The machine shall vibrate the concrete for the full width and depth being placed. The vibration shall be accomplished internally by vibrating tubes or arms working in the concrete or with a vibrating screed or pan operating on the surface of the concrete. The slip form paver shall be equipped with forms of sufficient length and rigidity to adequately support the edges of the slab so as to permit any necessary hand finishing. The slip form paver shall be equipped with and utilize automatic controls for both horizontal and vertical control. These automatic controls shall be checked daily by the contractor and be working properly prior to beginning the days operations.

3.4.3 The slip form paver shall be operated with a continuous forward movement and all operations of mixing, delivering, and spreading the concrete shall be coordinated to provide uniform progress with stopping and starting of the paver held to a minimum. If for any

reason it is necessary to stop the forward movement of the paver, the vibratory and tamping elements shall also be stopped immediately.

3.4.4 Surface smoothness and texture created by the slip form paver shall meet the requirements of NCDOT Standard Specifications Article 710-6 and Article 710-7 except that a longitudinal straight edge tolerance of 1/4 inch in 10 feet will apply to the area within 6 inches of the edge of pavement. The maximum acceptable edge slump shall be 1/4 inch.

3.4.5 Fixed forms shall be metal and of such section and design that they will adequately support the concrete and the construction equipment.

3.4.6 Fixed forms shall have a depth not less than the edge thickness of the pavement to be constructed and not more than 1 inch greater than the edge thickness of the pavement to be constructed. The base width shall be at least equal to the height of the form.

3.4.7 The top face of the fixed form shall not vary from a true plane more than 1/8 inch in 10 feet, and the upstanding leg shall not vary more than 1/4 inch.

3.4.8 Straight fixed forms 10 feet in length shall have at least 3 pin pockets. Straight forms 5 feet in length shall have at least 2 pin pockets.

3.4.9 Form pins shall be metal and shall be capable of holding the forms rigidly in place during construction operations. The engineer may require pin holes in the base to be sealed prior to placing subsequent pavement.

3.4.10 Fixed form sections shall be connected by a locking joint which shall keep the forms free from vertical and horizontal movement.

3.4.11 Straight fixed forms 10 feet in length shall be used on tangents and on curves having a radius of 200 feet or more. Forms for curves having a radius of between 200 feet and 50 feet may be either straight forms 5 feet in length or flexible forms. Forms for curves having a radius of less than 50 feet shall be flexible forms.

3.4.12 All fixed forms shall be thoroughly cleaned before being set and shall be thoroughly oiled before any concrete is placed. The bearing of the forms shall be checked and all areas of inadequate bearing shall be corrected.

3.4.13 All rejected forms which are not satisfactorily corrected immediately shall be removed from the project by the contractor.

3.4.14 Forms shall be set a sufficient distance in advance of the point where the concrete is being placed to provide for a continuous operation in placing the concrete and for proper inspection of line and grade.

3.5 The concrete shall be spread uniformly over the entire area between the forms without segregation. Spreading shall be done with a mechanical spreader except where hand methods are necessary due to pavement design, equipment breakdown, or other emergency.

3.5.1 After the concrete has been spread it shall be uniformly vibrated. Vibrators for full width vibration of concrete paving slabs may be either the surface pan type or the internal type with either immersed tube or multiple spuds. They may be attached to the spreader or the finishing machine, or may be mounted on the separate carriage. They shall not come in contact with the joint, load transfer devices, subgrade, or side forms. Machine mounted vibrators shall be either stopped or removed from contact with the concrete whenever the forward motion of the machinery is stopped. The frequency of the surface vibrators shall not be less than 3,500 impulses per minute and the frequency of the internal type shall not be less than 5,000 impulses per minute for tube vibrators and not less than 7,000 impulses per minute for spud vibrators.

3.5.2 When spud type internal vibrators, either hand operated or attached to spreaders or finishing machines, are used adjacent to forms, they shall have a frequency of not less than 3,500 impulses per minute.

3.6 Finishing and joints for concrete pavement, curb & gutter, sidewalks or miscellaneous concrete shall be in accordance with Article 710-6, Article 720-7, Article 846-3 or Article 848-3 of the NCDOT Standard Specifications for Roads and Structures as applicable. The final finish shall produce a pavement surface that is true to grade and uniform in appearance and free of irregular, rough, or porous areas. Following the finishing of the pavement by the screed and float and the checking with the straightedges, the surface of the pavement shall be further finished by brooming, burlap dragging, or other acceptable method which will produce a uniform surface texture acceptable to the engineer and owner. Broom and burlap drag finished shall be perpendicular to the direction of traffic unless specifically noted otherwise. Care should be taken in finishing concrete in order to avoid ridges or high places which will prevent water from draining properly. The use of excessive water during the finishing operations will not be permitted.

3.7 Concrete less than 72 hours old which may be subject to damage by freezing shall be adequately protected with insulating materials such as burlap, plastic sheets or other materials as approved by the engineer, until the concrete reaches an age of 72 hours. Concrete damaged as a result of freezing shall be removed and replaced by the contractor at no cost to the owner.

3.7.1 Protective covering which will protect the surface of the freshly placed pavement from rain shall be readily available each day at the location of each proposed day's operation prior to beginning work. Concrete damaged as a result of failure on the part of the contractor to adequately protect the concrete from rain and concrete damaged by improper use of

protective covering shall be removed and replaced by the contractor at the contractor's expense.

3.8 Immediately after finishing operations have been completed and surface water has disappeared, all exposed surfaces of the pavement shall be cured by one of the methods covered by this article, unless otherwise approved by the engineer.

3.8.1 The selected curing method shall be applied to the edges of the pavement immediately after the forms are removed. The total curing period required shall not be less than 3 curing days for all methods. A curing day will be considered as any consecutive 24 hour period, beginning when the manipulation of each separate mass has been completed, during which the air temperature adjacent to the mass does not fall below 40°F.

3.8.2 The minimum rate of application of membrane curing compound shall be 1 gallon per 150 square feet when the application equipment is mechanically operated or 1 gallon per 100 square feet when the application equipment is hand operated. Mechanically operated application equipment shall be designed to apply a uniformly agitated continuous flow of the curing compound at the prescribed rate to all concrete surfaces. The membrane curing compound film shall be protected at all times and any damage shall be immediately repaired. The Contractor shall keep available a sufficient amount of polyethylene film, burlap, or other approved material to provide for protection of the concrete during rain or when the application equipment fails to apply the curing compound uniformly to all surfaces.

3.8.3 Sections of polyethylene film shall be spread in a manner which will prevent damage to the finished pavement surface. Lap joints of the sections shall be at least 12 inches wide and suitable precautions shall be taken to prevent the circulation of air beneath the film. The film shall be checked for damage when it is spread and while in use and any damaged sections shall be immediately repaired or replaced.

3.8.4 Sections of burlap shall be spread in a manner which will prevent damage to the finished pavement surface. Lap joints shall be at least 6 inches wide. The amount of burlap to be used shall be not less than 12 ounces per running yard based on a 40 inch width and may be either 1 layer of Class 4 burlap or 2 layers of Class 1, 2, or 3 burlap. The burlap shall be thoroughly saturated prior to placing on the concrete and shall be kept thoroughly wet throughout the curing period.

3.9. Forms shall not be removed from freshly placed concrete until it has hardened sufficiently to resist spalling, cracking, or any other damage, but in no case until at least 24 hours after the concrete has been placed. Any honey-combed areas along the sides or edges of the slab shall be repaired by filling with mortar immediately after the forms have been removed. The mortar shall be a mix of 1 part of cement to 2 parts of fine aggregate.

3.10 All joints shall be constructed in accordance with the requirements of these specifications and the details shown on the plans. All joints shall be sawed or formed and sealed with joint sealer in accordance with the dimensions and details shown on the plans. Joints shall be sealed in accordance with the provisions of Article 700-12 of the NCDOT Standard Specifications for Roads and Structures.

3.10.1 Sawing to the full depth required by the plans to control random cracking shall be done as soon as the concrete has hardened sufficiently to be sawed without spalling and raveling but not more than 24 hours after the concrete is placed. The additional sawing necessary to provide the full joint width required by the plans shall be done no earlier than 10 days prior to the sealing of the joint.

3.10.2 The engineer may order any concrete pavement or shoulder where uncontrolled cracking has occurred prior to final acceptance to be removed and replaced by the contractor at no additional cost to the owner.

3.10.3 Transverse contraction joints shall be formed or sawn as applicable and constructed in accordance with the details, dimensions and intervals as shown on the plans.

3.10.4 Transverse construction joints shall be constructed by use of an approved form in an approved location whenever the placing of concrete is suspended for more than 30 minutes. When applicable, dowel bars of the size and spacing shown on the plans shall be used.

3.10.5 Transverse expansion joints shall be constructed in accordance with the details shown on the plans utilizing an approved joint assembly or joint filler. All joints shall be sealed with low modulus silicone sealant. Backer material and sealant shall be installed in accordance with the manufacturer's recommendations. Any failure of the joint material will be cause for rejection, and the joint shall be repaired as approved by the engineer at no additional cost to the owner. The concrete shall be at least 14 calendar days old before the joints are sealed. Joint sealer shall not be placed when the air temperature near the joint is less than 45°F. or is 45°F. and falling. The sealer shall be placed to reasonably close conformity with dimensions shown on the plans. Any unreasonable deviation will be cause for rejection. Any surplus joint sealer on the pavement shall be removed to the engineer's satisfaction.

3.10.6 Immediately after sawing the joint to the dimensions as shown on the plans, the resulting slurry shall be completely removed from the joint by flushing with a jet of water under pressure. Sand blasting shall be used to clean joint faces before joints are sealed. As many passes with a sand blaster as are necessary shall be made to provide a clean joint wall. After cleaning, the joint shall be thoroughly dry at the time of sealing. All joints shall be blown clear of deleterious materials with air using a nozzle pressure of at least 90 psi before installing the backer rod. Rotary screw compressors shall be used for this purpose and shall be equipped with properly operating traps capable of removing water and oil from the air.

3.11 Sections of concretes, which are to be removed, shall be neatly saw cut with suitable equipment. Sawing to the full depth of the existing concrete will be required without spalling or otherwise damaging the edges to remain. Where removed concretes are to be replaced or repaired, all contact surfaces between the existing concrete and repair concrete shall be completely coated with a suitable bonding agent applied in accordance with the manufacturer's instructions.

3.12 The owner shall engage the services of a qualified testing consultant to test the concrete for adherence to the referenced standards and make test cylinders for compressive strength tests. Testing and samples will be taken randomly as directed by the engineer. In addition, the engineer may require that cores be taken at random locations to determine whether the thickness meets the requirements designated for the project. Concrete which fails to meet the specified strength and other project requirements shall be removed and replaced to the satisfaction of the engineer and owner at the contractor's expense. Upon completion of corrective measures, testing will be re-performed to confirm that the specified density has been achieved. All costs associated with re-testing as a result of inadequate concrete will be paid for by the contractor.

3.13 The contractor shall furnish, install, remove, repair and replace pavement markings as shown on the plans, as necessary to restore preconstruction conditions or better and as required by the engineer. All pavement markings shall be as shown on the plans, in accordance with NCDOT Standard Specifications for Roads and Structures, in accordance with the NCDOT Roadway Standard Drawings and in accordance with the AASHTO Manual of Uniform Traffic Control Devices.

3.13.1 All pavement markings shall be applied using specially designed pavement marking application equipment in accordance with NCDOT requirements. The application equipment shall be maneuverable and manageable to the extent necessary to form straight lines and true arcs. All pavement marking application equipment shall be kept in proper working condition.

3.13.2 Glass beads shall be applied when required to the surface of pavement markings and shall be applied by an automatic dispenser attached to the marking equipment as required to provide the proper amount of retro-reflectivity and uniformly spread and properly embed the beads over the entire surface of the pavement marking.

3.13.3 Pavement markings shall not be placed when the pavement shows any visible signs of containing moisture, or it is anticipated that damage-causing moisture may occur during the installation and drying periods. Paint shall be applied only when the ambient air temperature and pavement surface temperature is a minimum of 40°F and rising and a maximum of 160°F. Thermoplastic pavement markings shall not be applied on existing pavement surfaces or new concrete pavements unless the ambient air temperature and the temperature of the pavement is 60°F and rising. Thermoplastic pavement markings shall not be applied on asphalt surfaces less than 12 hours old unless the ambient air temperature and the temperature of the

pavement is 50°F and rising. Epoxy pavement marking shall not be applied unless the ambient air temperature and the pavement surface temperature is a minimum of 35°F and rising. Cold applied plastic pavement marking shall be installed per manufacturer's specifications.

3.13.4 The Contractor shall premark each installation of pavement marking materials prior to application, except when existing markings are visible. The premarking shall be a guide in placing the pavement markings.

3.13.5 To insure maximum possible adhesion, all pavements upon which new pavement markings are to be placed shall be properly prepared to accept the new pavement markings. The surface preparation shall include but not be limited to, cleaning, sealing and curing compound removal necessary for the markings to adhere to the pavement. All pavements shall be cleaned free of grease, oil, mud, dust, dirt, grass, loose gravel and other deleterious material, prior to the application of the pavement markings. The pavement surface area to be prepared including removal of curing compound shall be a minimum of 2 inches wider than the pavement markings to be placed. All new Portland Cement Concrete pavements which contain curing compound shall have all curing compound and surface laitance removed where long-life pavement markings will be placed. Curing compound removal shall be accomplished by high pressure water, sand or shot blasting methods.

3.13.6 When recommended by the manufacturer, a primer-sealer shall be applied to the area where pavement markings are to be placed. The primer-sealer shall be of the type recommended by the manufacturer of the pavement marking material.

3.13.7 The installed pavement marking material shall have a uniform thickness and smooth surfaced cross-section throughout its entire length. All pavement marking widths and lengths shall be not less than the dimensions specified in the plans and shall not exceed the dimension by more than 1/2 inch. Pavement marking lines shall be straight or of uniform curvature and shall conform with the tangents, curves, and transitions as indicated on the plans and required for site specific requirements. The finished lines shall have well defined edges and be free of horizontal fluctuations. The lateral deviation of the finished lines shall not exceed 1/2 inch from the proposed location alignment at any point. Any greater deviations shall be sufficient cause for requiring the material to be removed and replaced at no additional cost to the owner.

3.13.8 The contractor shall protect the pavement markings until they are track free. Any markings tracked by a vehicle or otherwise damaged shall be removed by methods acceptable to the engineer and replaced at the contractor's expense. The contractor shall be responsible for removing all pavement marking materials spilled on the road surface by a method acceptable to the engineer.

3.13.9 All pavement marking materials shall be applied to the minimum thicknesses for each particular type required by Division 12 of the NCDOT Standard Specifications.

3.13.10 Pavement markings installed by the contractor which prematurely deteriorate, fail to adhere to the pavement, do not meet dimensional tolerances, lack reflectorization, or are otherwise unsatisfactory, during the life of the project shall be replaced by the contractor at the contractor's expense.

4.0 METHOD OF MEASUREMENT & BASIS OF PAYMENT

4.1 All work, materials, equipment, labor, testing, incidentals and appurtenances described in this section, shall not be measured and paid for as such, but shall all be treated as incidental work. The contractor shall appropriately divide and include the price of all work covered herein in the associated lump sum bids for water improvements or wastewater improvements in the proper proportions.

END OF SECTION