BID DOCUMENTS FOR

ZION CHURCH RD. 12” WATERLINE

2020-077

BID NO. 2602

SET # ___

ENGINEERING DEPARTMENT
635 ALFRED BROWN JR. COURT SW,
POST OFFICE BOX 308
CONCORD, NORTH CAROLINA 28026-0308

TABLE OF CONTENTS

SECTION I – BIDS, AGREEMENTS, AND NOTICES

SECTION I

BIDS, AGREEMENTS, AND NOTICES

BID ADVERTISEMENT/INVITATION TO BID

October 5, 2023

Project Title: **2020-077 Zion Church Rd. 12" Waterline**
Project No. 2020-077

Project Description: The **2020-077 Zion Church Rd. 12" Waterline** project consists of the installation of approximately 3184 ± linear feet of 12" water main, providing a loop system on Zion Church Rd. and replacing the existing 8" water line for the purpose of improving the water supply system.

Sealed Bids will be received by the City of Concord (Owner) at the address below. Please submit notarized bids in a sealed envelope by the bid opening time and date. All Bids must be in accordance with the Bidding Documents on file with the City of Concord Engineering Department. Bidders must be licensed contractors in the State of North Carolina. Bids will be received on a unit price basis. A Bid Bond must accompany each bid. The Successful Bidder will be required to furnish a Construction Performance Bond and a Construction Payment Bond as security for the faithful performance and the payment of all bills and obligations arising from the performance of the Contract. Contractor and all Subcontractors will be required to conform to the labor standards set forth in the Contract Documents. Owner reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced, or conditional Bids, and will award to lowest responsible Bidder taking into consideration quality, performance, and time specified in Bid Form for performance of Work. Owner also reserves the right to waive informalities.

Enrique A. Blat, PE
Deputy City Engineer

Engineer: City of Concord Engineering Department
Alfred M. Brown Operations Center
635 Alfred Brown Jr Court SW
P O Box 308, Concord, NC 28026-0308

Contractors wishing to bid on this project must register to bid by sending an email to Carolina Garcia-Zaragoza, P.E. at gzaragozac@concordnc.gov. Registration for bidding requires the name of the company, physical address, email address, and telephone number. All communication regarding this bid will be done through email.

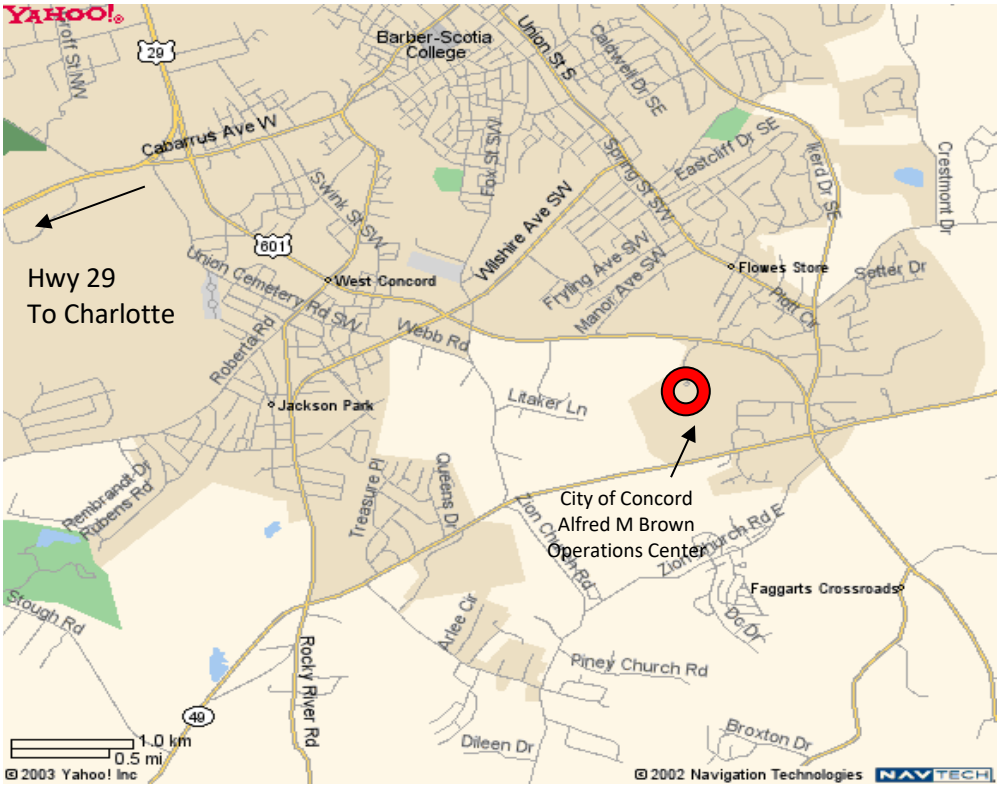
Bid documents are available free of charge from the City of Concord website at: https://www.concordnc.gov/Departments/Finance/Purchasing/RFPs-and-Bids

Technical questions : Contact Carolina Garcia-Zaragoza, P.E., (gzaragozac@concordnc.gov) 704.920.5425.

Bid Due Date: **October 31, 2023 at 10:00 AM**
Location: City of Concord, Alfred M. Brown Operations Center
635 Alfred Brown Jr Court SW, Concord, NC 28026
Conference Room C

(See attached map/directions)

MAP AND DIRECTIONS TO CITY OF CONCORD ALFRED M BROWN OPERATIONS CENTER



Directions from Charlotte

- Take I-77 north to I-85 north from Charlotte to Concord.
- From I-85 north, take exit 49 to the right towards Lowe's Motor Speedway.
- At the Lowe's Motor Speedway, turn left onto Highway 29 (Concord Pkwy) north.
- Keep going north while you pass the Wal-Mart shopping center on your right.
- Turn right at the light at the Chevrolet dealership onto Cabarrus Avenue.
- Turn right at the next traffic light at the Walgreens onto Hwy 601 South (bypass). (Hwy 601 S is also Warren C. Coleman Boulevard).
- Go straight through two traffic lights at Old Charlotte Road and Wilshire Avenue.
- Pass the Bi-Lo shopping center on your left.
- Turn right at the next traffic light at Alfred Brown Jr Court SW (green & white sign on right for the City of Concord Alfred M. Brown Operations Center).
- You will be on the entrance road into our complex.
- Follow signs to the left to Visitor Parking.
- Proceed to the front desk at the Administration Building and sign in with the receptionist.

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS. Terms used in these Instructions to Bidders are meanings assigned to them in the General Conditions and the Supplementary Conditions. An additional term is defined as follows:

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

2. COPIES OF BID DOCUMENTS. Bid Documents may be obtained from the Owner via the link below for the City of Concord's website.

	Charge
Complete set of Bid Documents	**Free download**

http://www.concordnc.gov/Departments/Finance/Purchasing/RFPs-and-Bids

Partial sets of Bid Documents will not be issued in response to requests by subject matter.

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

Owner and Engineer, in making copies of Quoting 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.

3. QUALIFICATIONS OF BIDDERS. To demonstrate qualifications to perform the Work, Bidder may be required to submit written evidence on financial data, previous experience, present commitments, and other such data as may be requested by Owner or Engineer. Each Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located, or Bidder must agree to obtain such qualification prior to award of the Contract.

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

4.02. Underground Facilities. Information and data reflected in the Contract Documents with respect to underground facilities at or contiguous to the site are based upon information and data furnished to Owner and Engineer by owners of such underground facilities or others, and Owner and Engineer disclaim responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary Conditions.

4.03. Additional Information. Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests, and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface, and underground facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance, or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.

On request 24 hours in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the site to its former condition upon completion of such explorations. Arrangements for site visits shall be made by calling the office of the Director of Engineering for the City of Concord at 704.920.5425.

4.04. Easements. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by Owner unless otherwise specified in the Contract Documents.

4.05. Unit Price Contracts. Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid schedule by examination of the site and a review of the drawings and the specifications, including the addenda. After Bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of work or the nature of the work to be done.

4.06. Bidder's Representation. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement concerning examination of the Contract Documents and the site, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

5. INTERPRETATIONS AND ADDENDA. All questions about the meaning or intent of the Quoting Documents and the Contract Documents shall be submitted to Owner in writing. Interpretations or clarifications considered necessary by Owner in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Quoting Documents. Questions received less than 10 days prior to the date for opening of Bids may not be answered. Only answers issued by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

6. **BID SECURITY**. **Each Proposal must be accompanied by a deposit equal to 5% of the net price bid.** This deposit may consist of cash, or a Cashier's Check issued by, or a Certified Check drawn on a Bank or Trust Company authorized to do business in North Carolina, or on a Bank insured by the Federal Deposit Insurance Corporation, or a U.S. Money Order, payable to the City of Concord or 5% Bid Bond in the form required by G.S. 143-129 as amended, issued by an Insurance Company authorized to do business in North Carolina, said deposit to be retained in the event of failure of the successful bidder to execute a formal contract within ten (10) days after award or to give satisfactory surety required.

The Bid security of the Successful Bidder (if so required) will be retained until such Bidder has executed the Agreement, furnished the required contract security (if so required), 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 Agreement and furnish the required contract security within the number of days set forth in the Bid Form, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security (if so required) of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Agreement or the day after the last day the Bid remain subject to acceptance as set forth in the Bid Form, whereupon Bid security furnished by such Bidders will be returned. Bid security accompanying Bid which are deemed by Owner to be noncompetitive will be returned within 7 days after the designated Bid opening.

7. CONTRACT TIMES. The numbers of calendar days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment (the Contract Times) are set forth in the Bid Form.

8. LIQUIDATED DAMAGES. Provisions for liquidated damages, if any, are set forth in the Agreement.

9. SUBSTITUTES OR "OR-EQUAL ITEMS. Bidder's attention is directed to Article 6.5 of the General Conditions concerning substitutes and "or-equal" items. Where an item or material is specified by a proprietary name, it is done for the purpose of establishing a basis of quality and not for the purpose of limiting competition. The Engineer's intent is to consider alternative products which have the desired essential characteristics. The Engineer will consider any such products offered. Requests for acceptance of alternative products shall be made through Bidders quoting as prime Contractors. Acceptances for substitutions will not be granted directly to suppliers, distributors, or subcontractors. Pursuant to Section 133-3, General Statutes of North Carolina, the following procedures shall be used:

Bidders desiring to submit alternative product proposals for prior acceptance of the Engineers shall submit, in writing, such proposals from __n/a__, until _n/a__. Applications received after this time will not be reviewed. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute, including drawings, cuts, performance and test data, and other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment, or other work that incorporation of the substitute would require shall be included. The Engineer shall consider and either accept or reject all alternative product proposals submitted.

If, by the close of the fifth day prior to the deadline for receiving Bid, the Engineer has accepted any alternative product proposals, the Quoting Documents shall be modified to include the alternative products. The Engineer shall publish the modification in an Addenda at least 5 days prior to the deadline for receiving Bids. The Engineer's decision of acceptance or rejection of a proposed substitute shall be final.

10. SUBCONTRACTORS, SUPPLIERS, AND OTHERS. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, and other persons and organizations (including those who are to furnish the principal items of material and equipment) 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 3 days after the opening submit to Owner the List of Subcontractors completed with all such Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work for which such identification is required. The list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, person, or organization, if requested by Owner. If Owner or Engineer after due investigation has reasonable objection to any proposed Subcontractor, Supplier, or other person or organization, Owner may, before the Notice of Award is given, request the apparent Successful Bidder to submit an acceptable substitute without an increase in the Bid.

All Subcontractors shall be a licensed utility contractor in the State of North Carolina.

11. BID FORM. The Bid Form is bound in the Quoting Documents and shall not be removed therefrom. Bid Forms must be completed in ink.

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

The names of all persons signing shall be legibly printed below the signature. A Bid by a person who affixes to his signature the word "president", "secretary", "agent", or other designation without disclosing his principal may be held to be the Bid of the individual signing. When requested by Owner, evidence of the authority of the person signing shall be furnished.

All blanks in the Bid Form shall be filled. A Bid price shall be indicated for each unit price item listed therein, or the words "No Bid", "No Charge", "No Change", or other appropriate phrase shall be entered.

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

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

11.01. Bid Pricing. The Bidder shall complete the schedule of unit prices included in the Bid Form and shall accept all fixed unit prices listed therein.

The total Bid will be determined as the sum of the products of the estimated quantity of each item and the unit price Bid. The final Contract Price will be subject to adjustment according to final measured, used, or delivered quantities as provided in Article 9.7 of the General Conditions, and the unit prices in the Bid will apply to such final quantities except that unit prices will be subject to change by Change Order as stipulated in the Supplementary Conditions.

11.02. Contingency. The Contingency is to be added to the Bid price and is to be used for minor change order items. If the Contingency is to be used, a scope of work and price would be negotiated. The Contingency is for the sole use of Owner. A change order will be issued to delete any unauthorized portion of the Contingency.

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

The City of Concord
Enrique Blat, PE, Deputy City Engineer
P.O. Box 308
635 Alfred Brown Jr Court SW
Concord, North Carolina 28026-0308

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

Each Bid envelope shall be identified on the outside with the words:

"BID FOR ZION CHURCH RD. 12" WATERLINE PROJECT - 2020-077

Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

One copy of all pages of the BID FORM must be submitted with the Bid, as well as a Bid Bond and Debarred Firms Certification Form.

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

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

A conditional or qualified Bid will not be accepted.

13. MODIFICATION AND WITHDRAWAL OF BIDS. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

If, within 24 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 (if any) will be returned. Thereafter, that Bidder will be disqualified from further quoting on the Work to be provided under the Contract Documents.

14. OPENING OF BIDS. Bids will be opened at the office and at the discretion of the Director of Engineering and read aloud.

The procedure for opening Bids will follow guidelines issued by the State Building Commission dated December 10, 1990, and endorsed by the Consulting Engineers Council of North Carolina.

15. BIDS TO REMAIN SUBJECT TO ACCEPTANCE. All Bids will remain subject to acceptance for the number of days set forth in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the security (if any) prior to that date.

16. AWARD OF CONTRACT. Owner reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced, or conditional Bids, and will award to lowest responsible Bidder taking into consideration quality, performance, and time specified in Bid Form for performance of Work. Owner also reserves the right to waive informalities.

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

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

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

If the Contract is to be awarded, it will be awarded to the lowest Bidder whose evaluation by Owner indicates to Owner that the award will be in the best interests of Owner. If the Contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within the number of days set forth in the Bid

Form. The evaluation of Suppliers' or manufacturers' data submitted with the Bid, or submitted upon request prior to the Notice of Award, will include consideration of the following:

- Owner-required inventory of spare parts.
- Building design changes which would be required to accommodate the proposed materials and equipment.
- Installation requirements and related engineering, training, and operating costs.
- Experience and performance record of the Supplier or the manufacturer.
- Maintenance and frequency of inspections required to assure reliable performance of the equipment.
- Suppliers' or manufacturers' service facilities and availability of qualified field service personnel.
- Efficiency and related operating expense during the anticipated useful life of the equipment.

17. CONTRACT SECURITY. The General Conditions set forth Owner's requirements as to Performance and Payment Bonds (required). These Bonds shall be delivered to Owner with the executed Agreement.

18. SIGNING OF AGREEMENT. When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by two unsigned counterparts of the Agreement with all other written Contract Documents attached. Within the number of days set forth in the Bid Form, the Successful Bidder shall sign, leaving the dates blank, and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds and power of attorney. Within 30 days thereafter, Owner shall execute all copies of the Agreement and other Contract Documents submitted by Contractor (Successful Bidder); shall insert the date of contract on the Agreement, Bonds, and power of attorney; and shall distribute signed copies as stipulated in the Agreement.

Should the Owner not execute the Contract within the period specified, the Successful Bidder may, by written notice, withdraw his signed Contract. Such notice or withdrawal shall be effective upon receipt of the notice by the Owner.

19. SALES AND USE TAXES. Provisions for sales and use taxes, if any, are set forth in the Supplementary Conditions.

20. RETAINAGE. Provisions concerning retainage are set forth in the Agreement.

21. LAWS AND REGULATIONS. Modifications, if any, to the General Conditions concerning Laws and Regulations are set forth in the Supplementary Conditions. Additional provisions, if any, concerning Laws and Regulations are set forth in the Agreement.

21.01. Collusive Bidding. In accordance with Section 112(c) of Title 23 USC, and G.S. 75-5(b)(7) of the State of North Carolina, the Contractor (Bidder), by submission and execution of this bid or Bid, certifies that he has not entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding or quoting in connection with his Bid on this project.

End of Section

DEBARRED FIRMS CERTIFICATION FORM

2020-077 Zion Church Rd. 12" Waterline
Project No. 2020-077

The undersigned hereby certifies that the firm of _____ has not been suspended by the State of North Carolina or any agency or department thereof for conviction or indictment or any of the offenses enumerated in G.S. 133-27 nor will award subcontracts of any tier to firms that have been suspended for conviction or indictment of any of the offenses enumerated in G.S. 133-27.

_____
Name of Firm

ATTEST _____ (SEAL)

_____
Signature of Authorized Official

_____
Title

Sworn and subscribed before me this

_____ day of _____, 20__

_____
Notary Public

EXHIBIT A – BID FORM

PROJECT IDENTIFICATION:

2020-077 Zion Church Rd. 12" Waterline
Project No. 2020-077

THIS BID IS SUBMITTED TO:

Enrique Blat, PE, Deputy City Engineer
City of Concord
635 Alfred Brown Jr Court SW
P.O. Box 308
Concord, North Carolina 28026-0308

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with Owner in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents within the specified time and for the amount indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. Bidder accepts all of the terms and conditions of the Invitation to Bid and the Instructions to Bid, including without limitation those dealing with the disposition of the Bid security (if security is required by the City Manager). This Bid will remain subject to acceptance for 60 days after the day designated for reception of Bids. Bidder will sign and submit the Agreement with the Bonds and other documents required by the Quoting Documents within 10 days after the date of Owner's Notice of Award.

3. In submitting this Bid, Bidder represents that:

    a. Bidder has examined copies of all the Quoting Documents and of the following Addenda (receipt of all which is hereby acknowledged):

        No. _____ Dated_____

        No. _____ Dated_____

        No. _____ Dated_____

        No. _____ Dated_____

        No. _____ Dated_____

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

    c. Bidder is familiar with and has satisfied itself as to all Federal, State, and Local Laws and Regulations that may affect cost, progress, performance, and furnishing of Work.

d. Bidder has carefully studied all 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 provided by the owner and under the conditions normally used and identified in the Supplementary Conditions and Special Conditions as provided in Paragraph 4.2.1 of the General Conditions. Bidder accepts the determination set forth in the Supplementary Conditions and Special Conditions of the extent of the "technical data" contained in such reports and drawings upon which Bidder is entitled to rely as provided in Paragraph 4.2 of the General Conditions. Bidder acknowledges that such reports and drawings are not Contract Documents and may not be complete for Bidder's purposes. Bidder acknowledges that Owner and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Quoting Documents with respect to underground facilities at or contiguous to the site. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance, or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder and safety precautions and programs incident thereto. Bidder does not consider that any additional examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.

e. Bidder is aware of the general nature of Work to be performed by Owner and others at the site that relates to Work for which this Bid is submitted as indicated in the Contract Documents.

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

g. Bidder has given Engineer written and verbal notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Bidder, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.

h. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm, or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid Bidder has not solicited or induced any person, firm, or corporation to refrain from quoting; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.

4. Bidder will complete the Work for the following unit prices. Quantities indicated are estimated and not guaranteed; they are solely for comparing Bids and establishing the initial Contract Price. Final payment will be based on actual quantities.

EXHIBIT A – BID FORM

2020-077 Zion Church Rd. 12” Waterline - Project No. 2020-077						
No.	Item	Description	Qty.	Units	Unit Price ($)	Item Total ($)
1	WSACC 01025	Mobilization	1	LS		
2	NCDOT 801	Construction Surveying	1	LS		
3	SP-01	Traffic Control	1	LS		
4	SP-02	Comprehensive Grading	1	LS		
5	SP-03	Rock Removal	200	CY		
6	WSACC 01025	12" DIP Water Main	3064	LF		
7	WSACC 01025	12" Restrained DIP Water Main	119	LF		
8	WSACC 01025	12" DIP Bends 11-1/4 degree	17	EA		
9	WSACC 01025	12" DIP Bends 22-1/2 degree	7	EA		
10	WSACC 01025	12” DIP Bends 45 Degree	7	EA		
11	WSACC 01025	6" Restrained DIP Water Main	120	LF		
12	WSACC 01025	12"x12"x6" DIP Tee	1	EA		
13	WSACC 01025	12" Gate Valve with Box	6	EA		
14	WSACC 01025	6" Gate Valve with Box	7	EA		
15	WSACC 01025	Hydrant Assembly (incl. Hydrant Tee)	6	EA		
16	WSACC 01025	3/4" Residential Water Service - (City to Provide Meter Box)	2	EA		
17	SP-04	Plumbing and Requirements for Reconnecting Water Services	2	EA		
18	SP-05	12" Connection to Ex. 12" Water Main - Transition Fittings	2	EA		
19	SP-05	6" Connection to Ex. 6" Water Main - Transition Fittings	1	EA		
20	WSACC 01025	24" by 0.250" thick Steel Casing w/ Stainless Steel Spiders and Blocking	93	LF		
21	SP-06	Pump Around Operation	1	LS		
22	NCDOT 520	Aggregate Base Course	70	TN		

23	NCDOT 607	Incidental Milling	210	SY		
24	NCDOT 610	Asphalt Concrete Surface Course, Type S9.5B	1	TN		
25	NCDOT 610	Asphalt Concrete Surface Course, Type S9.5C	105	TN		
26	NCDOT 620	Asphalt Binder for Plant Mix	7	TN		
27	SP-07	Flowable Fill (Excavatable)	90	CY		
28	NCDOT 866	Woven Wire Fence, 47" Fabric	100	LF		
29	NCDOT 866	4" Timber Post, 7'-6" Long	3	EA		
30	NCDOT 866	5" Timber Post 8'-0" Long	8	EA		
31	SP-08	Temporary Shoring at Hwy 49 Tie-in	180	SF		
32	SP-08	Temporary Shoring at Southern Chase Ct. Tie-in	170	SF		
33	NCDOT 1170	Portable Concrete Barrier	250	LF		
34	NCDOT 1530	Remove Water Meter	2	EA		
35	NCDOT 1530	Remove Fire Hydrant	2	EA		
36	NCDOT 1605	Temporary Silt Fence	2750	LF		
37	NCDOT 1610	Sediment Control Stone	10	TN		
38	NCDOT 1630	1/4" Hardware Cloth	120	LF		
39	SP-10	Safety Fence	1400	LF		
40	NCDOT 1631	Matting for Erosion Control (Biodegradable Netting)	3600	SY		
41	SP-11	Coir Fiber Matting	100	SY		
42	SP-12	Live Staking	35	SY		
43	NCDOT 1660	Seeding and Mulching	0.75	AC		

ESTIMATED BASE COST **$ _____**

10% CONTINGENCY **$ _____**

TOTAL ESTIMATED COST **$ _____**

5. Bidder agrees that all work will be completed and ready for final payment in accordance with Paragraph 14.13 of the General Conditions within 180 days from the date of notice to proceed.

6. Liquidated damages are $250.00 per each day past the contract completion date.

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

   NAME: _____

   ADDRESS: _____

   P.O. BOX: _____

   CITY: _____

   STATE: _____

   ZIP: _____

8. The terms used in this BID, which are defined in the General Conditions (Section II), have the meanings assigned to them in the General Conditions.

SIGNATURE OF BIDDER: _____

Contractor's License Number _____

License Expiration Date_____

<u>If an Individual</u>

By_____
(signature of individual)

doing business as _____

Business address _____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE

If a Partnership

By_____
(firm name)

_____
(signature of general partner)

Business address _____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE

If a Corporation

By_____
(corporation name)

By_____
(signature of authorized person) (title)_____

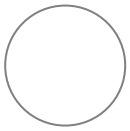
Business address _____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE _____

(Seal)



If a Joint Venture (Other party must sign below.)

By (name)_____

Contractor's License Number_____

License Expiration Date_____

If an Individual

By_____
(signature of individual)
doing business as _____

Business address _____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE

If a Partnership

By_____
(firm name)
_____
(signature of general partner)
Business address _____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE _____

If a Corporation

By_____
(corporation name)
By_____
(signature of authorized person) (title)_____

Business address _____

Phone No. _____

Date _____, 20_____

ATTEST _____ TITLE _____

(Seal)

EXHIBIT B – STANDARD FORM OF PERFORMANCE BOND

Date of Execution of this Bond _____

Name and Address of Principal (Contractor) _____

Name and Address of Surety _____

Name and Address of Contracting Body _____

Amount of Bond _____

Contract That certain contract by and between the Principal and the Contracting Body above named dated _____ for _____

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

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

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

STANDARD FORM OF PERFORMANCE BOND: (Continued)

THIS PERFORMANCE BOND is made and given pursuant to the requirements and provisions of Section 129 of Chapter 143 of the General Statutes of North Carolina and pursuant to Article 3 of Chapter 44-A of the General Statutes of North Carolina, and each and every provision set forth and contained in Section 129 of Chapter 143 and in Article 3 of Chapter 44-A of the General Statutes of North Carolina is incorporated herein, made a part hereof, and deemed to be conclusively written into this Bond.

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

WITNESS:

_____

Principal (Name of individual and trade name, partnership, corporation, or joint venture)

_____

(Proprietorship or Partnership)

Printed Name_____

BY _____(SEAL)

Printed Name_____

TITLE _____

(Owner, Partner, Office held in corporation, joint venture)

ATTEST: (Corporation)

(Corporate Seal of Principal)

BY_____

Printed Name_____

TITLE_____

(Corporation Secretary or Assistant Secretary Only)

_____

Surety (Name of Surety Company)

WITNESS:

BY_____

Printed Name_____

_____

TITLE Attorney in Fact

(Corporate Seal of Surety)

_____

(Address of Attorney in Fact)

EXHIBIT C – PROJECT SPECIAL PROVISIONS

2020-077 Zion Church Rd. 12" Waterline
Project No. 2020-077

1) Contractor shall utilize the 2018 edition of NCDOT Standard Specifications & Standard Drawings for Roads and Structures, the City of Concord Technical Standards, and Water & Sewer Authority of Cabarrus County Technical Standard specifications, the most restrictive requirement shall apply unless otherwise noted. NCDOT Article Numbers in the Bid Form and these Project Special Provisions reference the NCDOT Standard Specifications for Roadways and Structures. WSACC Technical Specifications in the Bid Form are for the measurement and payment spec, refer to full WSACC specifications for technical requirements.
2) The project is subject to an NCDOT Encroachment Agreement, see Appendix A. The Contractor shall comply with the terms of this Encroachment Agreement.
3) Hours of work within NCDOT's ROW are 9:00 am – 4:00 pm Monday through Friday, or as required by the Encroachment Agreements. Hours of work outside NCDOT's ROW are 7:00 am – 6:00 pm Monday through Friday.
4) The Contractor shall include the cost of any coordination and cooperation of utilities in his bid. No additional compensation shall be allowed for delays or inconvenience sustained by the Contractor due to utility relocation or adjustments. No additional payment will be made for re-mobilization required by the utility's failure to relocate a utility at the request of the Contractor.

SP-01 – TRAFFIC CONTROL

1.0 DESCRIPTION

Beginning Work and Street Closings: The Contractor is responsible for notifying the Concord Department of Transportation for any work where the number of travel lanes is reduced from normal conditions.

The Contractor shall install advance warning signs for the Project. These signs shall be in place for one week before construction activity begins. The Contractor shall begin construction activity on a street on the scheduled date for the closing of the travel lane.

Traffic Control Plan: The contractor shall prepare a proposal on the traffic control operations and present them to the City of Concord's Engineering department Construction Manager at least 48 hours before beginning work.

Traffic control will be performed by the Contractor based upon the Traffic Control Special Provisions. The Traffic Control Special Provisions may refer to plan sheets for major work items or details, or both.

All traffic control devices and procedures shall conform to the requirements of the current edition of the Federal Highway Administration (FHWA) *Manual on Uniform Traffic Control Devices* (MUTCD), the current edition of the North Carolina Department of Transportation (NCDOT) Supplement to the *Manual on Uniform Traffic Control Devices for Streets and Highways*, the NCDOT Roadway Standard Drawings and the current edition of the NCDOT Standard Specifications for Roads and Structures.

The Contractor shall maintain the traffic control as described herein unless the Contractor submits an alternate traffic control plan to the Engineer and it is approved by the Engineer. The Engineer may direct

the Contractor to modify the traffic control if, in the Engineer's opinion, traffic is not moving safely or efficiently.

Traffic Control Phasing for this project shall be in accordance with the Traffic Control Plans. The Contractor shall adhere rigidly to these plans. The standards are the minimum required. Additional signs, cones, drums, PCB, barricades and warning devices may be used, but at no time will less than what is specified on the plans or in the standards be acceptable.

Maintenance of Traffic: The Contractor shall maintain all travel lanes in accordance with the Traffic Control Plan sheets.

In areas of drop-offs and low shoulders, the Contractor shall backfill up to the edge and elevation of the existing pavement.

The Contractor will be required to maintain ingress and egress to all businesses and dwellings, and easy access to fire hydrants.

The Contractor shall provide adequate drainage under driveways and within the Project area for the duration of the Project.

The Contractor shall mark all hazards within the Project limits with well-maintained signs, barricades, warning and/or channelizing devices.

Traffic Control Devices: The Contractor shall furnish, install, operate, relocate, maintain and remove all temporary traffic control devices necessary for controlling traffic in accordance with the Traffic Control Plans and standards. The Contractor shall notify Engineer regarding conflicting permanent signs. Only Concord Department of Transportation personnel shall install, remove or relocate any permanent signs within the right-of-way. All construction signs and barricades shall remain in place until the appropriate permanent signs and pavement markings are installed.

Equipment and Material Storage: During periods of construction inactivity, all construction materials and equipment shall be stored by the Contractor. The right-of-way or temporary project easement may be used for this purpose, but equipment and materials must be placed safely 10 or more feet away from any open travel lane. It is recommended that all construction equipment and materials be stored on private property, which is posted against trespassing. It is the responsibility of the organization performing the work to obtain the permission to use a property for this purpose.

Excavation and Trenches: Excavations and trenches that cannot be properly backfilled and patched prior to the end of the workday shall be secured.

2.0 MEASUREMENT

There will be no separate measurement made for Traffic Control.

3.0 PAYMENT

Traffic Control will be paid at the lump sum price for "Traffic Control". This payment will be full compensation for all elements of work required to complete the Project as specified.

Partial payments will be made as follows:

- 25% of the lump sum price on the first partial payment estimate made after any work has been performed on the item of "Traffic Control".
- 25% of the lump sum price on the first partial payment after work is 25% complete.
- 25% of the lump sum price on the first partial payment after work is 50% complete.
- 25% of the lump sum price on the first partial payment after work is 100% complete.

Payment will be made under:

TRAFFIC CONTROL..... LS

SP-02, COMPREHENSIVE GRADING

1.0 DESCRIPTION

This item shall include all elements of work covered by the referenced NCDOT Specifications and the numbered Additional City Specifications provided herein.

NCDOT Specifications
200, "Clearing and Grubbing"
250, "Removal of Existing Pavement"
260, "Proof Rolling"
340, "Pipe Removal"
500, "Fine Grading Subgrade, Shoulders and Ditches"
545, "Incidental Stone Base"
1530, "Abandon or Remove Utilities"
1607, "Gravel Construction Entrance"

Additional City Specifications

1. Clearing and Grubbing: Clearing on this Project shall be performed to the slope stake line or the right-of-way or easement lines unless directed otherwise. The Contractor shall remove all trees in the easement areas.

2. Traffic Bearing Road Plates: The Contractor shall be responsible for all traffic bearing road plates needed in accordance with NCDOT Utility Cut Replacement Detail.

3. Fence Removal and Disposal and or Fence Relocation: as shown on the plans and any additional removal or relocation identified by the Contractor's means and methods shall be included in this item.

4. Hedgerow and or Planting Bed Removal and Disposal: as shown on the plans and any additional hedgerow or planting bed removal identified by the Contractor's means and methods shall be included in this item. Hedgerows to be removed shall be approved by the Engineer prior to removal.

5. Mail Boxes and Site Amenities: remove, protect, and reset mail boxes and site amenities. The Contractor shall keep mailboxes in service at all times and allow / provide for other services, including but not limited to trash pickup.

6. Existing Road Signs: remove, protect, and reset road signs. Repair or replace signs damaged in relocating. Erect signs and supports according to requirements of NCDOT Specifications 903 and 904.

7. Removal and Disposal of Existing Infrastructure: concrete curb**,** sidewalk, miscellaneous concrete, asphalt, driveways, pads, slabs, walls, culverts, structures, catch basins, manholes, etc. within the construction limits as shown on the plans and any additional infrastructure removal identified by the Contractor's means and methods, shall be included in this item.

8. Shoring: The Contractor shall be responsible for all shoring to include means, methods, materials and engineering needed to construct the project. Temporary shoring required in NCDOT's ROW will be covered and paid for in SP-08 and is excluded from this item.

9. Saw Cutting: all saw cutting required to build the Project. Where asphalt or concrete (curb, sidewalk, roadway, driveways, parking lots, etc.) is to be removed, the Contractor shall provide a neat edge along the pavement being retained by sawing the pavement a minimum of 2" deep and 1' wide before breaking and removing adjacent pavement. When the Contractor proposes to saw pavement more than one foot from the proposed pavement (curb, sidewalk, structure, etc.), the Contractor shall obtain approval from the Engineer prior to saw cutting and removing pavement. The cost of sawing asphalt or concrete shall be included in this item.

10. Stream restoration to preconstruction conditions: Stream areas impacted by the pump around operation, temporary access road or any other contractor's means and methods, shall be returned to natural conditions within 60 calendar days after the temporary impact is no longer necessary. The impacted areas shall be restored to original grade, including each stream's original cross-sectional dimensions, platform pattern, and longitudinal profile.

11. Property Access: All labor and materials required to maintain access to properties during construction as directed by the Engineer.

12. Erosion Control Permit: All costs from SP-13, EROSION & SEDIMENT CONTROL - FINANCIAL RESPONSIBILITY AND CERTIFICATE OF COVERAGE shall be included in this item.

13. NCDOT Encroachment Agreement: All means, methods, materials and costs required to comply with the requirements in NCDOT Encroachment Agreement shall be included in this item. Temporary shoring required in NCDOT's ROW will be covered and paid for in SP-08 and is excluded from this item.

2.0 MEASUREMENT

There will be no separate measurement made for Comprehensive Grading.

3.0 PAYMENT

For the above-referenced NCDOT sections and numbered Additional City Specifications, there will be no direct measurement, payment or compensation, all cost incurred to complete the work as specified shall be included in the Lump Sum price bid for "Comprehensive Grading".

There will be **no separate measurement or payment** for the items listed or referenced in this specification.

Payment will be made under:

COMPREHENSIVE GRADING .....LS

SP-03, ROCK REMOVAL

1.0 DESCRIPTION

Work covered by this special provision consists of the removal and disposal of rock encountered within the construction limits.

2.0 CONSTRUCTION METHODS

Rock shall be defined as any subsurface material (except foundations and pavements) which cannot be excavated by a backhoe, or track hoe which is capable of producing 25,000 pounds of curling force.

When rock is encountered, the Engineer shall be notified to:

- verify that the material cannot be removed as defined above or incorporated into the project feature
- determine the measurement limits

Removal methods include, but are not limited to, drilling, pneumatic hammering, blasting, etc. or as directed by the Engineer.

Blasting shall be performed as specified in Article 220-3 of the Standard Specifications.

Disposal shall be in accordance with Section 802 in the Standard Specifications.

3.0 MEASUREMENT

The quantity of rock removal to be paid for will be the actual number of cubic yards of rock, measured in its original position and computed by the average end area method, which has been removed and disposed of.

Measurements for the determination of actual quantities of rock removed shall be computed as described below or as directed by the Engineer:

Storm Drainage

- Pipe
    - Horizontally – as illustrated in NCDOT 300.01;

    - Lower Limit – as illustrated in NCDOT 300.01
- Box Culverts/Bends/Bottomless Culverts
    - Horizontally – outer width of culvert or footer plus six (6) feet (3 feet each side);
    - Lower Limit – one (1) foot below the bottom of the barrel or footing;

Channels

- Two (2) feet below the finished grade or;
- Stream/channel structures – as directed by the Engineer.

Ponds

- Below normal pool – to finished grade;
- Above normal pool – two (2) feet below finished grade;

Structures

(Includes but not limited to: headwalls, drainage structures (catch basins, drop inlets, risers, etc.), rip rap aprons, flared end sections, retaining walls, etc.)

- To the subgrade elevation as shown on the plans or details;
- Horizontally – two (2) feet from each exterior surface (outer wall of the structure or footer; boulder or rip rap extents, as approved for stream structures and rip rap aprons)

Roadways, Yards, Etc.

- Two (2) feet below finished grade;

Water & Sewer Lines

- Within and to pay limits set in WSACC 01025 Measurement and Payment Specification, Sewer Item 23.

There will be no measurement of quantities of rock removed beyond these limits. Where the Engineer makes a recommendation for incorporating the encountered rock material into the project feature, there shall be no separate payment for incorporating the in situ rock into the project feature.

4.0 PAYMENT

The quantity of rock removal, measured as provided above, will be paid for at the contract unit price per cubic yard for "Rock Removal." Such payment will be full compensation for all work covered by this special provision including but not limited to drilling, pneumatic hammering, blasting (including complying with Article 220-3 of the Standard Specifications), excavating, and disposing of rock encountered within the pay limits of the project.

Payment will be made under:

ROCK REMOVAL ..... CY

SP-04, PLUMBING PERMIT

1.0 DESCRIPTION

The Contractor shall be responsible for complying with the current plumbing requirements associated with re-establishing the sewer service connection and obtaining all necessary plumbing permits, in accordance with the most current version of the North Carolina Plumbing Code and Cabarrus County Building Code. The plumbing requirements shall include, but not be limited to, the materials, equipment, labor, and workmanship associated with the installation any required appurtenances on the private homeowners plumbing to reestablish service, in accordance with the most current version of the North Carolina Plumbing Code.

2.0 MEASUREMENT AND PAYMENT

Plumbing Permit and Requirements for Reconnecting Services will be measured and paid in units of each permit acquired.

Payment will be made under:

Pay Item	**Pay Unit**
Plumbing Permit and Requirements for Reconnecting Sewer Services	Each
Plumbing Permit and Requirements for Reconnecting Water Services	Each

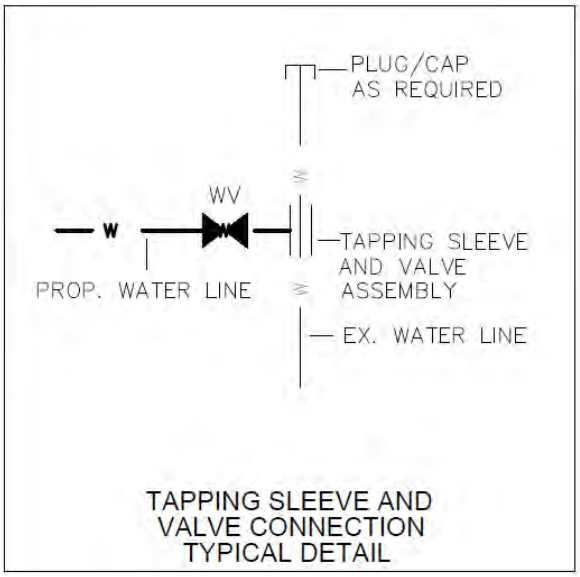
SP-05, CONNECTION TO EXISTING WATER MAIN

1.0 DESCRIPTION

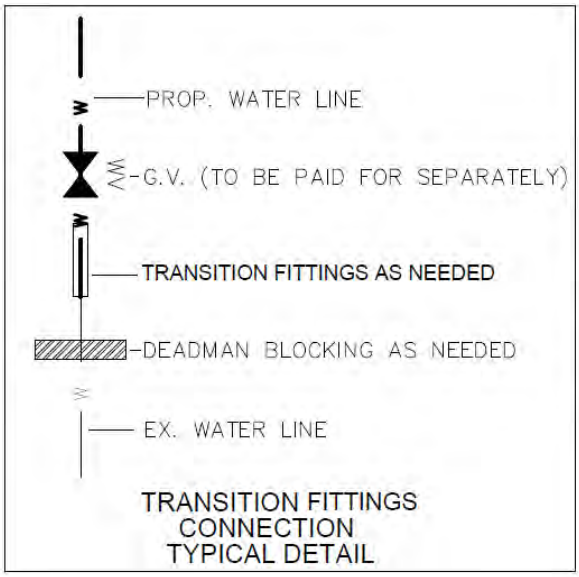
Connection to Existing Water Main will be paid at the lump sum price per each connection. The price per each connection shall include where applicable, dewatering the existing water main between the connection and the nearest existing sectionalizing valves, removing the existing water main pipe plug, cutting and removing the section of existing water main piping, deadman and thrust blocking, and associated work in replacing the section of main which was removed or furnished, and installing the tapping sleeve and valve or restrained mechanical joint transition sleeve where applicable, jointing materials including gasket and bolts, jumpers, and appurtenances, and all other work required for the installation of the connection complete, tested, and placed into satisfactory service, in accordance with the Contract Documents and plans; and all other costs not included under other bid items. In particular:

Each *Connection to Existing Water Main –Transition Fittings* item shall also include the cost of all pipe, fittings, adapters, transition sleeves and deadman blocking, in accordance to the detail below.

Each *Connection to Existing Water Main – Tapping Sleeve and Valve* item shall also include the cost of all pipe, fittings, adapters, tapping sleeve and valve assembly including valve box, and cap/plug with thrust blocking for the existing waterline, in accordance to the detail below.



TAPPING SLEEVE AND VALVE CONNECTION TYPICAL DETAIL



TRANSITION FITTINGS CONNECTION TYPICAL DETAIL

2.0 MEASUREMENT AND PAYMENT

Payment will be made under:

XX" CONNECTION TO EXISTING XX" WATER MAIN – TRANSITION FITTINGS..... EA
XX" CONNECTION TO EXISTING XX" WATER MAIN - TAPPING SLEEVE AND VALVE..... EA

SP-06, PUMP AROUND OPERATION

1.0 DESCRIPTION

Work under this section, includes all work necessary for the installation and maintenance of the pump around operation, and the stream restoration to preconstruction conditions. Work shall be performed in the dry by pumping stream base flow around project work areas for sediment and erosion control purposes as may be necessary or directed by the Engineer and to conform to the plans, specifications, details, permits, local laws, state laws and federal laws and the City of Concord's Ordinances, Policies and Standards Specifications where applicable.

The pump around shall provide a passageway for the normal stream flow through the work site. This pump around operation is for storm drainage work only and should not be considered for sanitary sewer bypass pumping.

2.0 METHODS AND MATERIALS

The measures and works shall include, but are not limited to, the following:

Pump Around Operation – A pump shall be used to convey the stream base flow around the work area during channel excavation, installation of structures, and stabilization. The pump well shall be cased and filter provided to prevent pumping of sediment fines. The intake for the drain mechanism upstream of the impervious dike should be located near the top of the water column unless otherwise specified by the City. Impervious dikes shall be installed at the upstream and downstream locations of the pump around

operations. The size of pumps used shall be determined by the onsite contractor with approval from the Engineer. The pump includes temporary flexible hose in sufficient length to pump the water from the upstream side of the active working area to the downstream end. Pumps shall be silent or quiet rated (70 decibels at 25 feet). Water removed from the pond or excavated project site shall pass through a temporary stabilized outlet to be located upstream of the receiving stream unless otherwise noted.

Dewatering Sediment Filter Bag Systems – A special sediment removal device shall be used to filter pumped water from the excavated project site during construction. The quantity of sediment filter bag systems may be increased, decreased, or eliminated entirely at the direction of the on-site Engineer.
Stream restoration to preconstruction conditions - Stream areas impacted by the pump around operation shall be regraded to its preconstruction contours and revegetated with appropriate native species.

3.0 MEASUREMENT

No measurement will be made of any materials under this item. Impervious dikes, dewatering sediment filter bag systems and any grading and revegetating will be incidental to this item.

4.0 PAYMENT

The Pump Around Operation specified under this section consists of furnishing all labor, materials, equipment, supplies, supervision, tools, and performing all work necessary for maintaining baseflow downstream of stream, culverts, and pipes, and the installation, maintenance, removal of impervious dikes and dewatering sediment filter bag systems, regarding to original contours and revegetating, in conjunction with stream restoration/stabilization construction and shall be paid for at the contract lump sum for *Pump Around Operation*.

Payment will be made under:

PUMP AROUND OPERATION.....LS

SP-07, FLOWABLE FILL (TRENCH BACKFILL)

1.0 DESCRIPTION

The work covered by this special provision includes furnishing all materials, labor, equipment, and incidentals necessary to place flowable fill material in accordance with these provisions, the plans, and as directed.

2.0 MATERIALS

All materials shall be in accordance with Division 10 of the NCDOT Standard Specifications for Roads and Structures, ACI 229 – Controlled Low Strength Materials, as shown on the plans, or directed by the Engineer.

3.0 SUBMITTALS

Provide submittal per Article 1000-6 of the NCDOT Standard Specifications for Road and Structures.

4.0 CONSTRUCTION METHODS

Discharge flowable fill material directly from the truck into the space to be filled, or by other approved methods.

The mix may be placed full depth or in lifts as site conditions dictate. Compaction of individual layers of flowable fill is not necessary.

Construct formed walls or other bulkheads to withstand the hydrostatic pressure exerted by the flowable fill. Block trench ends outside the roadway with sandbags or mounded soil rather than wood or metal forms. When backfilling utilities such as pipe culverts, distribute the flowable fill evenly to prevent any movement of the line.

Place flowable fill under pressure flow conditions into a properly vented open system until flowable fill emerges from the vent pipes. Pump flowable fill with sufficient pressure to overcome friction and to fill the abandoned pipe completely.

Protect flowable fill from freezing for a period of 36 hours after placement. Do not place flowable fill when ambient air temperature is below 40ºF. Make certain that the temperature of the flowable fill is at least 50ºF at the time of delivery.

The routine use of vibrators is prohibited. If the mix does not self-consolidate, cease placement of the flowable fill material until an acceptable product is provided. Under some conditions, the Engineer may allow placement of flowable fill under conditions of rain or standing water. Do not place flowable fill under these conditions without prior approval of the Engineer. If the flowable fill placement is not proceeding satisfactorily, the Engineer may rescind such approval at any time.

Once the flowable fill is in the trench, make provision for bleed water that is displaced during the consolidation process to run off and away from the surface of the hardening flowable fill. Do not use plastic sheets as vapor barriers.

An initial subsidence of ⅛ inch per vertical foot of depth of flowable fill is allowed as excess water is displaced.

The Engineer will determine when full traffic may be allowed on the flowable fill. If it is necessary to return traffic in less than 8 hours, or if there is concern that traffic will cause damage to the fill or any structure below, use steel plates to bridge over the hardening flowable fill. If the filled cavity is too wide to bridge, place steel plates on the surface of the hardening flowable fill as soon as it is able to support foot traffic

5.0 MEASUREMENT AND PAYMENT

Flowable Fill will be measured and paid in cubic yards, which has been incorporated into the completed and accepted work in accordance with the special provisions.

Payment is full compensation for furnishing and placing the flowable fill material as specified or directed and includes proportioning, mixing, handling, hauling, placing, maintenance, and protection of the flowable fill; providing admixtures, shoring, and steel plates; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to necessary to complete the work in accordance with the Plans, the Specifications, and as directed by the Engineer.

Payment will be made under:

FLOWABLE FILL (EXCAVATABLE)..... CY
FLOWABLE FILL (NON-EXCAVATABLE) ..... CY

SP-08, TEMPORARY SHORING

(2-20-07) (Rev. 10-19-21) SP11 R02

Description

Temporary shoring includes cantilever, braced and anchored shoring and temporary mechanically stabilized earth (MSE) walls. Temporary shoring does not include trench boxes. At the Contractor's option, use any type of temporary shoring unless noted otherwise in the plans or as directed. Design and construct temporary shoring based on actual elevations and shoring dimensions in accordance with the contract and accepted submittals. Construct temporary shoring at locations shown in the plans and as directed. Temporary shoring is required to maintain traffic when a 2:1 (H:V) slope from the top of an embankment or bottom of an excavation will intersect the existing ground line less than 5 feet from the edge of pavement of an open travelway. This provision does not apply to pipe, inlet or utility installation unless noted otherwise in the plans.

Positive protection includes concrete barrier and temporary guardrail. Provide positive protection for temporary shoring at locations shown in the plans and as directed. Positive protection is required if temporary shoring is located in the clear zone in accordance with the *AASHTO Roadside Design Guide.*

(A) Cantilever and Braced Shoring

Cantilever shoring consists of steel sheet piles or H-piles with timber lagging. Braced shoring consists of sheet piles or H-piles with timber lagging and bracing such as beams, plates, walers, struts, rakers, etc. Define "piles" as sheet piles or H-piles.

(B) Anchored Shoring

Anchored shoring consists of sheet piles with walers or H-piles with timber lagging anchored with ground or helical anchors. Driven anchors may be accepted at the discretion of the Engineer. A ground anchor consists of a grouted steel bar or multi-strand tendon with an anchorage. A helical anchor consists of a lead section with a central steel shaft and at least one helix steel plate followed by extensions with only central shafts (no helixes) and an anchorage. Anchorages consist of steel bearing plates with washers and hex nuts for bars or steel wedge plates and wedges for strands. Use a prequalified Anchored Wall Contractor to install ground anchors. Define "anchors" as ground, helical or driven anchors.

(C) Temporary MSE Walls

Temporary MSE walls include temporary geosynthetic and wire walls. Define "temporary wall" as a temporary MSE wall and "Temporary Wall Vendor" as the vendor supplying the temporary MSE wall. Define "reinforcement" as geotextile, geogrid, geostrip, welded wire grid or metallic strip reinforcement.

Temporary geosynthetic walls consist of geotextiles or geogrids wrapped behind welded wire facing or geostrips connected to welded wire facing. Define "temporary geotextile wall" as a temporary geosynthetic wall with geotextile reinforcement, "temporary geogrid wall" as a temporary geosynthetic wall with geogrid reinforcement and "temporary geostrip wall" as a temporary geosynthetic wall with geostrip reinforcement.

Temporary wire walls consist of welded wire grid or metallic strip reinforcement connected to welded wire facing. Define "Wire Wall Vendor" as the vendor supplying the temporary wire wall.

(D) Embedment

Define "embedment" for cantilever, braced and anchored shoring as the pile depth below the grade in front of shoring. Define "embedment" for temporary walls as the wall embedment below the grade at the wall face.

(E) Positive Protection

Define "unanchored or anchored portable concrete barrier" as portable concrete barrier (PCB) that meets 2018 Roadway Standard Drawing No. 1170.01. Define "concrete barrier" as unanchored or anchored PCB or an approved equal. Define "temporary guardrail" as temporary steel beam guardrail that meets 2018 Roadway Standard Drawing No. 862.02.

Materials

Refer to the *2018 Standard Specifications*.

Item	**Section**
Concrete Barrier Materials	1170-2
Flowable Fill, Excavatable	1000-6
Geosynthetics	1056
Grout, Type 1	1003
Portland Cement	1024-1
Portland Cement Concrete	1000
Select Materials	1016
Steel Beam Guardrail Materials	862-2
Steel Plates	1072-2
Steel Sheet Piles and H-Piles	1084
Untreated Timber	1082-2
Water	1024-4
Welded Wire Reinforcement	1070-3

Provide Type 6 material certifications for shoring materials in accordance with Article 106-3 of the *2018 Standard Specifications*. Use Class IV select material for temporary guardrail and Class A concrete that meets Article 450-2 of the *2018 Standard Specifications* or Type 1 grout for drilled-in piles. Provide untreated timber with a thickness of at least 3 inches and a bending stress of at least 1,000 pounds per square inch for timber lagging. Provide steel bracing that meets ASTM A36.

(A) Shoring Backfill

Use Class II, Type 1, Class III, Class V or Class VI select material or material that meets AASHTO M 145 for soil classification A-2-4 with a maximum PI of 6 for shoring backfill except do not use A-2-4 soil for backfill around culverts.

(B) Anchors

Store anchor materials on blocking a minimum of 12 inches above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign materials. Load, transport, unload and store anchor materials so materials are kept clean and free of damage. Bent, damaged or defective materials will be rejected.

(1) Ground Anchors

Use high-strength deformed steel bars that meet AASHTO M 275 or seven-wire strands that meet ASTM A886 or Article 1070-5 of the *2018 Standard Specifications*. Splice bars in accordance with Article 1070-9 of the *2018 Standard Specifications*. Do not splice strands. Use bondbreakers, spacers and centralizers that meet Article 6.3.5 of the *AASHTO LRFD Bridge Construction Specifications*.

Use neat cement grout that only contains cement and water with a water cement ratio of 0.4 to 0.5 which is approximately 5.5 gallons of water per 94 pounds of Portland cement. Provide grout with a compressive strength at 3 and 28 days of at least 1,500 and 4,000 psi, respectively.

(2) Helical Anchors

Use helical anchors with an ICC Evaluation Service, Inc. (ICC-ES) report. Provide couplers, thread bar adapters and bolts recommended by the Anchor Manufacturer to connect helical anchors together and to piles.

(3) Anchorages

Provide steel plates for bearing plates and steel washers, hex nuts, wedge plates and wedges recommended by the Anchor Manufacturer.

(C) Temporary Walls

(1) Welded Wire Facing

Use welded wire reinforcement for welded wire facing, struts and wires. For temporary wire walls, provide welded wire facing supplied by the Wire Wall Vendor or a manufacturer approved or licensed by the vendor. For temporary wire walls with separate reinforcement and facing components, provide connectors (e.g., bars, clamps, plates, etc.) and fasteners (e.g., bolts, nuts, washers, etc.) required by the Wire Wall Vendor.

(2) Geotextiles

Provide Type 2 geotextile for separation and retention geotextiles. Provide Type 5 geotextile for geotextile reinforcement with ultimate tensile strengths in accordance with the accepted submittals.

(3) Geogrid and Geostrip Reinforcement

Use geogrids with a roll width of at least 4 feet. Use geogrids for geogrid reinforcement and geostrips for geostrip reinforcement with an "approved" status code in accordance with the NCDOT Geosynthetic Reinforcement Evaluation Program. The list of approved geogrids and geostrips is available from:
connect.ncdot.gov/resources/Geological/Pages/Products.aspx

Provide geogrids and geostrips with design strengths in accordance with the accepted submittals. Geogrids and geostrips are approved for short-term design strengths (3-year design life) in the machine direction (MD) and cross-machine direction (CD) based on material type. Define material type from the website above for shoring backfill as follows:

Material Type	**Shoring Backfill**
Borrow	A-2-4 Soil
Fine Aggregate	Class II, Type 1 or Class III Select Material
Coarse Aggregate	Class V or VI Select Material

(4) Welded Wire Grid and Metallic Strip Reinforcement

Provide welded wire grid and metallic strip reinforcement supplied by the Wire Wall Vendor or a manufacturer approved or licensed by the vendor. Use welded wire grid reinforcement ("mesh", "mats" and "ladders") that meet Article 1070-3 of the *2018 Standard Specifications* and metallic strip reinforcement ("straps") that meet ASTM A572 or A1011.

Preconstruction Requirements

(A) Concrete Barrier

Define "clear distance" behind concrete barrier as the horizontal distance between the barrier and edge of pavement. The minimum required clear distance for concrete barrier is shown in the plans. At the Contractor's option or if the minimum required clear distance is not available, set concrete barrier next to and up against traffic side of temporary shoring except for barrier above temporary walls. Concrete barrier with the minimum required clear distance is required above temporary walls.

(B) Temporary Guardrail

Define "clear distance" behind temporary guardrail as the horizontal distance between guardrail posts and temporary shoring. At the Contractor's option or if clear distance for cantilever, braced and anchored shoring is less than 4 feet, attach guardrail to traffic side of shoring as shown in the plans. Place ABC in clear distance and around guardrail posts instead of pavement. Do not use temporary guardrail above temporary walls.

(C) Temporary Shoring Designs

Before beginning temporary shoring design, survey existing ground elevations in the vicinity of shoring locations to determine actual design heights (H). Submit PDF files of working drawings and design calculations for temporary shoring designs in accordance with Article 105-2 of the *2018 Standard Specifications*. Submit working drawings showing plan views, shoring profiles, typical sections and details of temporary shoring design and construction sequence. Do not begin shoring construction until a design submittal is accepted.

Have cantilever and braced shoring designed, detailed and sealed by an engineer licensed in the state of North Carolina. Use a prequalified Anchored Wall Design Consultant to design anchored shoring. Provide anchored shoring designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for an Anchored Wall Design Consultant. Include details in anchored shoring working drawings of anchor locations and lock-off loads, unit grout/ground bond strengths for ground anchors or minimum installation torque and torsional strength rating for helical anchors and if necessary, obstructions extending through shoring or interfering with anchors. Include details in the anchored shoring construction sequence of pile and anchor installation, excavation and anchor testing.

Provide temporary wall designs sealed by a Design Engineer licensed in the state of North Carolina and employed or contracted by the Temporary Wall Vendor. Include details in temporary wall working drawings of geotextile and reinforcement types, locations and directions and obstructions extending through walls or interfering with reinforcement.

(1) Soil Parameters

Design temporary shoring for the assumed soil parameters and groundwater or flood elevations shown in the plans. Assume the following soil parameters for shoring backfill:

(a) Unit weight (γ) = 120 pcf,

(b)

Friction Angle (ϕ)	**Shoring Backfill**
30°	A-2-4 Soil
34°	Class II, Type 1 or Class III Select Material
38°	Class V or VI Select Material

(c) Cohesion (c) = 0 psf.

(2) Traffic Surcharge

Design temporary shoring for a traffic surcharge of 250 pounds per square foot if traffic will be above and within H of shoring. This traffic surcharge does not apply to construction traffic. Design temporary shoring for any construction surcharge if construction traffic will be above and within H of shoring. Design temporary shoring for a traffic (live load) surcharge in accordance with Article 11.5.6 of the *AASHTO LRFD Bridge Design Specifications*.

(3) Cantilever, Braced and Anchored Shoring Designs

Use shoring backfill for fill sections and voids between cantilever, braced and anchored shoring and the critical failure surface. Use concrete or Type 1 grout for embedded portions of drilled-in H-piles. Do not use drilled-in sheet piles.

Define "top of shoring" for cantilever, braced and anchored shoring as where the grade intersects the back of sheet piles or H-piles and timber lagging. Design cantilever, braced and anchored shoring for a traffic impact load of 2,000 pounds per foot applied 18 inches above top of shoring if concrete barrier is above and next to shoring or temporary guardrail is above and attached to shoring. Extend cantilever, braced and anchored shoring at least 32 inches above top of shoring if shoring is designed for traffic impact. Otherwise, extend shoring at least 6 inches above top of shoring.

Design cantilever, braced and anchored shoring for a maximum deflection of 3 inches if the horizontal distance to the closest edge of pavement or structure is less than H. Otherwise, design shoring for a maximum deflection of 6 inches. Design cantilever and braced shoring in accordance with the plans and *AASHTO Guide Design Specifications for Bridge Temporary Works*.

Design anchored shoring in accordance with the plans and Article 11.9 of the *AASHTO LRFD Bridge Design Specifications*. Use a resistance factor of 0.80 for tensile resistance of anchors with bars, strands or shafts. Extend the unbonded length for ground anchors and the shallowest helix for helical anchors at least 5 feet behind the critical failure surface. Do not extend anchors beyond right-of-way or easement limits. If existing or future obstructions such as foundations, guardrail posts, pavements, pipes, inlets or utilities will interfere with anchors, maintain a clearance of at least 6 inches between obstructions and anchors.

(4) Temporary Wall Designs

Use shoring backfill in the reinforced zone of temporary walls. Separation geotextiles are required between shoring backfill and backfill, natural ground or culverts along the sides of the reinforced zone perpendicular to the wall face. For Class V or VI select material in the reinforced zone, separation geotextiles are also required between shoring backfill and backfill or natural ground on top of and at the back of the reinforced zone.

Design temporary walls in accordance with the plans and Article 11.10 of the *AASHTO LRFD Bridge Design Specifications*. Embed temporary walls at least 18 inches except for walls on structures or rock as determined by the Engineer. Use a uniform reinforcement length throughout the wall height of at least 0.7H or 6 feet, whichever is longer. Extend the reinforced zone at least 6 inches beyond end of reinforcement. Do not locate the reinforced zone outside right-of-way or easement limits.

Use the simplified method for determining maximum reinforcement loads in accordance with the AASHTO LRFD specifications. For geotextile reinforcement, use geotextile properties approved by the Department or default values in accordance with the AASHTO LRFD specifications. For geogrid and geostrip reinforcement, use approved geosynthetic reinforcement properties available from the website shown elsewhere in this provision. Use geosynthetic properties for the direction reinforcement will be installed, a 3-year design life and shoring backfill to be used in the reinforced zone.

Do not use more than 4 different reinforcement strengths for each temporary geosynthetic wall. Design temporary geotextile walls for a reinforcement coverage ratio (R_c) of 1.0. For temporary geogrid walls with an R_c of less than 1.0, use a maximum horizontal clearance between geogrids of 3 feet and stagger reinforcement so geogrids are centered over gaps in the reinforcement layer below.

For temporary geosynthetic walls, use "L" shaped welded wire facing with 18 to 24 inch long legs. Locate geosynthetic reinforcement so reinforcement layers are at the same level as the horizontal legs of welded wire facing. Use vertical reinforcement spacing equal to facing height. Wrap geotextile or geogrid reinforcement behind welded wire facing and extend reinforcement at least 3 feet back behind facing into shoring backfill. Attach geostrip reinforcement to welded wire facing with a connection approved by the Department.

For temporary wire walls with separate reinforcement and facing components, attach welded wire grid or metallic strip reinforcement to welded wire facing with a connection approved by the Department. For temporary geogrid, geostrip and wire walls, retain shoring backfill at welded wire facing with retention geotextiles and extend geotextiles at least 3 feet back behind facing into backfill.

(D) Preconstruction Meeting

The Engineer may require a shoring preconstruction meeting to discuss the construction, inspection and testing of the temporary shoring. If required and if this meeting occurs before all shoring submittals have been accepted, additional preconstruction meetings may be required before beginning construction of temporary shoring without accepted submittals. The Resident, District or Bridge Maintenance Engineer, Area Construction Engineer, Geotechnical Operations Engineer, Contractor and Shoring Contractor Superintendent will attend preconstruction meetings.

Construction Methods

Control drainage during construction in the vicinity of shoring. Direct run off away from shoring and shoring backfill. Contain and maintain backfill and protect material from erosion.

Install positive protection in accordance with the contract and accepted submittals. Use PCB in accordance with Section 1170 of the *2018 Standard Specifications* and 2018 Roadway Standard Drawing No. 1170.01. Use temporary guardrail in accordance with Section 862 of the *2018 Standard Specifications* and 2018 Roadway Standard Drawing Nos. 862.01, 862.02 and 862.03.

(A) Tolerances

Construct shoring with the following tolerances:

(1) Horizontal wires of welded wire facing are level in all directions,

(2) Shoring location is within 6 inches of horizontal and vertical alignment shown in the accepted submittals, and

(3) Shoring plumbness (batter) is not negative and within 2 degrees of vertical.

(B) Cantilever, Braced and Anchored Shoring Installation

If overexcavation behind cantilever, braced or anchored shoring is shown in the accepted submittals, excavate before installing piles. Otherwise, install piles before excavating for shoring. Install cantilever, braced or anchored shoring in accordance with the construction sequence shown in the accepted submittals. Remove piles and if applicable, timber lagging when shoring is no longer needed.

(1) Pile Installation

Install piles with the minimum required embedment and extension in accordance with Subarticles 450-3(D) and 450-3(E) of the *2018 Standard Specifications* except that a pile driving equipment data form is not required. Piles may be installed with a vibratory hammer as approved by the Engineer.

Do not splice sheet piles. Use pile excavation to install drilled-in H-piles. After filling holes with concrete or Type 1 grout to the elevations shown in the accepted submittals, remove any fluids and fill remaining portions of holes with flowable fill. Cure concrete or grout at least 7 days before excavating.

Notify the Engineer if refusal is reached before pile excavation or driven piles attain the minimum required embedment. When this occurs, a revised design submittal may be required.

(2) Excavation

Excavate in front of piles from the top down in accordance with the accepted submittals. For H-piles with timber lagging and braced and anchored shoring, excavate in staged horizontal lifts with a maximum height of 5 feet. Remove flowable fill and material in between H-piles as needed to install timber lagging. Position lagging with at least 3 inches of contact in the horizontal direction between the lagging and pile flanges. Do not excavate the next lift until timber lagging for the current lift is installed and if applicable, bracing and anchors for the current lift are accepted. Backfill behind cantilever, braced or anchored shoring with shoring backfill.

(3) Anchor Installation

If applicable, install foundations located behind anchored shoring before installing anchors. Fabricate and install ground anchors in accordance with the accepted submittals, Articles 6.4 and 6.5 of the *AASHTO LRFD Bridge Construction Specifications* and the following unless otherwise approved:

(a) Materials in accordance with this provision are required instead of materials conforming to Articles 6.4 and 6.5.3 of the AASHTO LRFD Specifications,

(b) Encapsulation-protected ground anchors in accordance with Article 6.4.1.2 of the

AASHTO LRFD specifications are not required, and

(c) Corrosion protection for unbonded lengths of ground anchors and anchorage covers are not required.

(d) Mix and place neat cement grout in accordance with Subarticles 1003-5, 1003-6 and 1003-7 of the *2018 Standard Specifications*. Measure grout temperature, density and flow during grouting with at least the same frequency grout cubes are made for compressive strength. Perform density and flow field tests in the presence of the Engineer in accordance with American National Standards Institute/American Petroleum Institute Recommended Practice 13B-1 (Section 4, Mud Balance) and ASTM C939 (Flow Cone), respectively.

Install helical anchors in accordance with the accepted submittals and Anchor Manufacturer's instructions. Measure torque during installation and do not exceed the torsional strength rating of the helical anchor. Attain the minimum required installation torque and penetration before terminating anchor installation. When replacing a helical anchor, embed last helix of the replacement anchor at least 3 helix plate diameters past the location of the first helix of the previous anchor.

(4) Anchor Testing

Proof test and lock-off anchors in accordance with the accepted submittals and Article 6.5.5 of the *AASHTO LRFD Bridge Construction Specifications* except for the acceptance criteria in Article 6.5.5.5. For the AASHTO LRFD specifications, "ground anchor" refers to a ground or helical anchor and "tendon" refers to a bar, strand or shaft.

(a) Anchor Acceptance

Anchor acceptance is based in part on the following criteria.

(i) For ground and helical anchors, total movement is less than 0.04 inches between the 1 and 10 minute readings or less than 0.08 inches between the 6 and 60 minute readings.
(ii) For ground anchors, total movement at maximum test load exceeds 80% of the theoretical elastic elongation of the unbonded length.

(b) Anchor Test Results

Submit PDF files of anchor test records including movement versus load plots for each load increment within 24 hours of completing each row of anchors. The Engineer will review the test records to determine if the anchors are acceptable.

If the Engineer determines an anchor is unacceptable, revise the anchor design or installation methods. Submit a revised anchored shoring design for acceptance and provide an acceptable anchor with the revised design or installation methods. If required, replace the anchor or provide additional anchors with the revised design or installation methods.

(C) Temporary Wall Installation

Excavate as necessary for temporary walls in accordance with the plans and accepted submittals. If applicable, install foundations located in the reinforced zone before placing shoring backfill or reinforcement unless otherwise approved. Notify the Engineer when foundation excavation is complete. Do not place shoring backfill or reinforcement until excavation dimensions and foundation material are approved.

Erect welded wire facing so the wall position is as shown in the plans and accepted submittals. Set welded wire facing adjacent to each other in the horizontal and vertical direction to completely cover the wall face with facing. Stagger welded wire facing to create a running bond by centering facing over joints in the row below.

Attach geostrip reinforcement to welded wire facing and wrap geotextile reinforcement and retention geotextiles behind welded wire facing as shown in the plans and accepted submittals. Cover geotextiles with at least 3" of shoring backfill. Overlap adjacent geotextile reinforcement and retention and separation geotextiles at least 18 inches with seams oriented perpendicular to the wall face. Hold geotextiles in place with wire staples or anchor pins as needed.

Place reinforcement within 3 inches of locations shown in the plans and accepted submittals. Before placing shoring backfill, pull geosynthetic reinforcement taut so it is in tension and free of kinks, folds, wrinkles or creases. Install reinforcement with the direction shown in the plans and accepted submittals. For temporary wire walls with separate reinforcement and facing components, attach welded wire grid or metallic strip reinforcement to welded wire facing as shown in the accepted submittals. Do not splice or overlap reinforcement so seams are parallel to the wall face. Contact the Engineer when unanticipated existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with reinforcement.

Place shoring backfill in the reinforced zone in 8 to 10 inch thick lifts. Compact A-2-4 soil and Class II, Type 1 and Class III select material in accordance with Subarticle 235-3(C) of the *2018 Standard Specifications*. Use only hand operated compaction equipment to compact backfill within 3 feet of welded wire facing. At a distance greater than 3 feet, compact shoring backfill with at least 4 passes of an 8 to 10 ton vibratory roller in a direction parallel to the wall face. Smooth wheeled or rubber tired rollers are also acceptable for compacting backfill. Do not use sheepsfoot, grid rollers or other types of compaction equipment with feet. Do not displace or damage reinforcement when placing and compacting shoring backfill. End dumping directly on geosynthetics is not permitted. Do not operate heavy equipment on reinforcement until it is covered with at least 8 inches of shoring backfill. Replace any damaged reinforcement to the satisfaction of the Engineer.

Backfill for temporary walls outside the reinforced zone in accordance with Article 410-8 of the *2018 Standard Specifications*. Bench temporary walls into the sides of excavations where applicable. For temporary geosynthetic walls with top of wall within 5 feet of finished grade, remove top facing and incorporate top reinforcement layer into fill when placing fill in front of wall. Temporary walls remain in place permanently unless otherwise required.

Measurement and Payment

Temporary Shoring will be measured and paid in square feet. Temporary walls will be measured as the

square feet of exposed wall face area. Cantilever, braced or anchored shoring will be measured as the square feet of exposed shoring face area with the shoring height equal to the difference between the top and bottom of shoring elevations. Define "top of shoring" as where the grade intersects the back of sheet piles or H-piles and timber lagging. Define "bottom of shoring" as where the grade intersects front of sheet piles or H-piles and timber lagging. No measurement will be made for any embedment, shoring extension above top of shoring or pavement thickness above temporary walls.

The contract unit price for *Temporary Shoring* will be full compensation for providing shoring designs, submittals and materials, excavating, backfilling, hauling and removing excavated materials and supplying all labor, tools, equipment and incidentals necessary to construct temporary shoring.

No payment will be made for temporary shoring not shown in the plans or required by the Engineer including shoring for OSHA reasons or the Contractor's convenience. No value engineering proposals will be accepted based solely on revising or eliminating shoring locations shown in the plans or estimated quantities shown in the bid item sheets as a result of actual field measurements or site conditions.

PCB will be measured and paid in accordance with Section 1170 of the *2018 Standard Specifications*. No additional payment will be made for anchoring PCB for temporary shoring. Costs for anchoring PCB will be incidental to temporary shoring.

Temporary guardrail will be measured and paid for in accordance with Section 862 of the *2018 Standard Specifications*.

Payment will be made under:

Pay Item	**Pay Unit**
Temporary Shoring	Square Foot

SP-09, TEMPORARY SOIL NAIL WALLS:

Description

Construct temporary soil nail walls consisting of soil nails spaced at a regular pattern and connected to a reinforced shotcrete face. A soil nail consists of a solid or hollow steel bar grouted in a drilled hole inclined at an angle below horizontal. At the Contractor's option, use temporary soil nail walls instead of temporary shoring for full cut sections. Design and construct temporary soil nail walls based on actual elevations and wall dimensions in accordance with the contract and accepted submittals. Use a prequalified Anchored Wall Contractor to construct temporary soil nail walls. Define "soil nail wall" as a temporary soil nail wall and "Soil Nail Wall Contractor" as the Anchored Wall Contractor installing soil nails and applying shotcrete. Define "nail" as a soil nail.

Provide positive protection for soil nail walls at locations shown in the plans and as directed. See *Temporary Shoring* provision for positive protection types and definitions.

Materials

Refer to Division 10 of the *Standard Specifications*.

Item	**Section**
Geocomposites	1056
Portland Cement	1024-1
Reinforcing Steel	1070

Shotcrete	1002
Select Material, Class IV	1016
Steel Plates	1072-2
Water	1024-4

Use neat cement grout that only contains cement and water with a water cement ratio of 0.4 to 0.5 which is approximately 5.5 gallons of water per 94 lb of Portland cement. Provide grout with a compressive strength at 3 and 28 days of at least 1,500 psi and 4,000 psi, respectively.

Use Class IV select material for temporary guardrail. Provide soil nails consisting of grouted steel bars and nail head assemblies. Use deformed solid steel bars that meet AASHTO M 275 or M 31, Grade 60, 75 or 80. Splice solid bars in accordance with Article 1070-9 of the *Standard Specifications*. Use hollow steel bars manufactured by DYWIDAG-Systems International USA Inc., Nucor Skyline, Williams Form Engineering Corp. or an approved equal.

Use centralizers that meet Article 34.3.4 of the *AASHTO LRFD Bridge Construction Specifications*. Provide nail head assemblies consisting of nuts, washers and bearing plates. Use steel plates for bearing plates and steel washers and hex nuts recommended by the Soil Nail Manufacturer.

Provide Type 6 material certifications for soil nail materials in accordance with Article 106-3 of the *Standard Specifications*. Store steel materials on blocking at least 12" above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign materials. Load, transport, unload and store soil nail wall materials so materials are kept clean and free of damage. Bent, damaged or defective materials will be rejected.

Preconstruction Requirements

(A) Concrete Barrier

Define “clear distance” behind concrete barrier as the horizontal distance between the barrier and edge of pavement. The minimum required clear distance for concrete barrier is shown in the plans. At the Contractor’s option or if the minimum required clear distance is not available, set concrete barrier next to and up against traffic side of soil nail walls except for barrier above walls. Concrete barrier with the minimum required clear distance is required above soil nail walls.

(B) Temporary Guardrail

Define “clear distance” behind temporary guardrail as the horizontal distance between guardrail posts and soil nail walls. At the Contractor’s option or if clear distance for soil nail walls is less than 4 ft, use temporary guardrail with 8 ft posts and a clear distance of at least 2.5 ft. Place ABC in clear distance and around guardrail posts instead of pavement.

(C) Soil Nail Wall Designs

Before beginning soil nail wall design, survey existing ground elevations in the vicinity of wall locations to determine actual design heights (H). Use a prequalified Anchored Wall Design Consultant to design soil nail walls. Provide designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for the Anchored Wall Design Consultant.

Design soil nail walls in accordance with the plans and the *AASHTO LRFD Bridge Design Specifications* unless otherwise required. Design soil nails that meet the following unless otherwise approved:

(1) Horizontal and vertical spacing of at least 3 ft,

(2) Inclination of at least 12° below horizontal and

(3) Diameter of 4" to 10".

Do not extend nails beyond right-of-way or easement limits. If existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with nails, maintain a clearance of at least 6" between obstructions and nails.

Design soil nail walls for a traffic surcharge of 250 psf if traffic will be above and within H of walls. This traffic surcharge does not apply to construction traffic. Design soil nail walls for any construction surcharge if construction traffic will be above and within H of walls. For temporary guardrail with 8 ft posts above soil nail walls, analyze shotcrete and top row of nails for a nominal horizontal load of 300 lb/ft of wall with a load factor of 1.0.

Place geocomposite sheet drains with a horizontal spacing of no more than 10 ft and center drains between adjacent nails. Attach sheet drains to excavation faces. Design shotcrete in accordance with Article 11.12.6.2 of the *AASHTO LRFD Bridge Design Specifications*.

Submit PDF files of working drawings and design calculations for soil nail wall designs in accordance with Article 105-2 of the *Standard Specifications*. Submit working drawings showing plan views, wall profiles, typical sections and details of soil nail wall design and construction sequence. Include details in working drawings of soil nail locations, unit grout/ground bond strengths, shotcrete reinforcement and if necessary, obstructions extending through walls or interfering with nails. Include details in construction sequence of excavation, grouting, installing reinforcement, nail testing and shotcreting with mix designs and shotcrete nozzleman certifications. Do not begin soil nail wall construction until a design submittal is accepted.

Submit design calculations for each wall section with different surcharge loads, geometry or material parameters. Include analysis of temporary conditions during construction in design calculations. At least one analysis is required for each wall section with different nail lengths. Analyze internal and compound stability with a computer software program that uses limit equilibrium methods and submit all PDF output files from the program with the design calculations. See Article C11.12.2 of the AASHTO LRFD specifications for determining the maximum soil nail force, T_{maxsn}. Once T_{maxsn} and pullout length behind slip surface, L_P, are determined from limit equilibrium methods at the target soil failure resistance factor (1 over factor of safety output from computer software), use these values for soil nail (pullout and tensile resistance) and wall facing (flexure, punching shear and headed-stud tensile resistance) design in accordance with Articles 11.12.5.2, 11.12.6.1 and 11.12.6.2 of the AASHTO LRFD specifications.

(1) When designing soil nail walls with computer software Snail manufactured by the California Department of Transportation (CALTRANS), use Snail version 2.2.0 or later, to calculate factors of safety and T_{maxsn} and L_P values in accordance with the following:Allowable Stress Design for Analysis Method with no load factors applied except those applied to factored surcharge loads from structures or traffic,

(2) Perform Below Toe Search option selected when any soil layer has a friction angle less than 30° and

(3) Default value of 0.33 for Interface Friction Reduction Factor.

When designing soil nail walls with computer software other than Snail, use bi-linear (or tri-linear, as applicable) search surfaces intended to reproduce Snail results. Factors of safety and T_{maxsn} and L_P values are acceptable if they are within 5% of the factors of safety and T_{maxsn} and L_P values calculated by the Engineer using the computer software Slide2 manufactured by Rocscience, Inc.

(D) Preconstruction Meeting

Before starting soil nail wall construction, hold a preconstruction meeting to discuss the construction, inspection and testing of the soil nail walls. If this meeting occurs before all soil nail wall submittals have been accepted, additional preconstruction meetings may be required before beginning construction of soil nail walls without accepted submittals. The Resident, District or Bridge Maintenance Engineer, Area Construction Engineer, Geotechnical Operations Engineer, Contractor and Soil Nail Wall Contractor Superintendent will attend preconstruction meetings.

Construction Methods

Control drainage during construction in the vicinity of soil nail walls. Direct run off away from soil nail walls and areas above and behind walls.

Install foundations located behind soil nail walls before beginning wall construction. Do not excavate behind soil nail walls. If overexcavation occurs, repair walls with an approved method and a revised soil nail wall design may be required.

Install positive protection in accordance with the contract and accepted submittals. Use PCB in accordance with Section 1170 of the *Standard Specifications* and Roadway Standard Drawing No. 1170.01. Use temporary guardrail in accordance with Section 862 of the *Standard Specifications* and Roadway Standard Drawing No. 862.01, 862.02 and 862.03.

(A) Excavation

Excavate for soil nail walls from the top down in accordance with the accepted submittals. Excavate in staged horizontal lifts with no negative batter (excavation face leaning forward). Excavate lifts in accordance with the following:

(1) Heights not to exceed vertical nail spacing,

(2) Bottom of lifts no more than 3 ft below nail locations for current lift and

(3) Horizontal and vertical alignment within 6" of location shown in the accepted submittals.

Remove any cobbles, boulders, rubble or debris that will protrude more than 2" into the required shotcrete thickness. Rocky ground such as colluvium, boulder fills and weathered rock may be difficult to excavate without leaving voids.

Apply shotcrete to excavation faces within 24 hours of excavating each lift unless otherwise approved. Shotcreting may be delayed if it can be demonstrated that delays will not adversely affect excavation stability. If excavation faces will be exposed for more than 24 hours, use polyethylene sheets anchored at top and bottom of lifts to protect excavation faces from changes in moisture content.

If an excavation becomes unstable at any time, suspend soil nail wall construction and temporarily stabilize the excavation by immediately placing an earth berm up against the unstable excavation face. When this occurs, repair walls with an approved method and a revised soil nail wall design may be required.

Do not excavate the next lift until nail installations and testing and shotcrete application for the current lift are accepted and grout and shotcrete for the current lift have cured at least 3 days and 1 day, respectively.

(B) Soil Nails

Drill and grout nails the same day and do not leave drill holes open overnight. Control drilling and grouting to prevent excessive ground movements, damaging structures and pavements or fracturing rock and soil formations. If ground heave or subsidence occurs, suspend soil nail wall

construction and take corrective action to minimize movement. If property damage occurs, make repairs with an approved method and a revised soil nail wall design may be required.

The drilling, steel bar and grouting requirements below are for solid bar nails and may not apply to hollow bar nails. Hollow bar nails are typically installed by simultaneously drilling and grouting as a sacrificial drill bit is advanced and grout is pumped through the bar. For hollow bar nails, submit drilling and grouting procedures for approval before installing soil nails.

(1) Drilling

Use drill rigs of the sizes necessary to install soil nails and with sufficient capacity to drill through whatever materials are encountered. Drill straight and clean holes with the dimensions and inclination shown in the accepted submittals. Drill holes within 6" of locations and 2° of inclination shown in the accepted submittals unless otherwise approved.

Stabilize drill holes with temporary casings if unstable, caving or sloughing material is anticipated or encountered. Do not use drilling fluids to stabilize drill holes or remove cuttings.

(2) Steel Bars

Center solid steel bars in drill holes with centralizers. Securely attach centralizers along bars at no more than 8 ft centers. Attach uppermost and lowermost centralizers 18" from excavation faces and ends of holes.

Do not insert solid steel bars into drill holes until hole locations, dimensions, inclination and cleanliness are approved. Do not vibrate, drive or otherwise force bars into holes. If a steel bar cannot be completely and easily inserted into a drill hole, remove the bar and clean or redrill the hole.

(3) Grouting

Mix and place grout in accordance with Subarticles 1003-5, 1003-6 and 1003-7 of the *Standard Specifications*. Remove oil, rust inhibitors, residual drilling fluids and similar foreign materials from holding tanks/hoppers, stirring devices, pumps, lines, tremie pipes and any other equipment in contact with grout before use. Measure grout temperature, density and flow during grouting with at least the same frequency grout cubes are made for compressive strength. Perform density and flow field tests in the presence of the Engineer in accordance with American National Standards Institute/American Petroleum Institute Recommended Practice 13B-1 (Section 4, Mud Balance) and ASTM C939 (Flow Cone), respectively.

Inject grout at the lowest point of drill holes through tremies, e.g., grout tubes, casings, hollow-stem augers or drill rods, in one continuous operation. Fill drill holes progressively from ends of holes to excavation faces and withdraw tremies at a slow even rate as holes are filled to prevent voids in grout. Extend tremies into grout at least 5 ft at all times except when grout is initially placed in holes.

Provide grout free of segregation, intrusions, contamination, structural damage or inadequate consolidation (honeycombing). Cold joints in grout are not allowed except for test nails. Remove any temporary casings as grout is placed and record grout volume for each drill hole.

(4) Nail Heads

Install nail head assemblies after shotcreting. Before shotcrete reaches initial set, seat bearing plates and tighten nuts so plates contact shotcrete uniformly. If uniform contact is not possible, install nail head assemblies on mortar pads so nail heads are evenly loaded.

(C) Sheet Drains

Install geocomposite sheet drains as shown in the accepted submittals. Before installing shotcrete reinforcement, place sheet drains with the geotextile side against excavation faces. For highly irregular faces and at the discretion of the Engineer, sheet drains may be placed after shotcreting over weep holes through the shotcrete. Hold sheet drains in place with anchor pins so drains are in continuous contact with surfaces to which they are attached and allow for full flow the entire height of soil nail walls. Discontinuous sheet drains are not allowed. If splices are needed, overlap sheet drains at least 12" so flow is not impeded. Cut off excess sheet drain length and expose drain ends below shotcrete when soil nail wall construction is complete.

(D) Shotcrete

Clean ungrouted zones of drill holes and excavation faces of loose materials, mud, rebound and other foreign material. Moisten surfaces to receive shotcrete. Install shotcrete reinforcement in accordance with the contract and accepted submittals. Secure reinforcing steel so shooting does not displace or vibrate reinforcement. Install approved thickness gauges on 5 ft centers in the horizontal and vertical directions to measure shotcrete thickness.

Apply shotcrete in accordance with the contract, accepted submittals and Subarticle 1002-3(F) of the *Standard Specifications*. Use approved shotcrete nozzlemen who made satisfactory preconstruction test panels to apply shotcrete. Direct shotcrete at right angles to excavation faces except when shooting around reinforcing steel. Rotate nozzle steadily in small circular patterns and apply shotcrete from bottom of lifts up.

Make shotcrete surfaces uniform and free of sloughing or sagging. Completely fill ungrouted zones of drill holes and any other voids with shotcrete. Taper construction joints to a thin edge over a horizontal distance of at least the shotcrete thickness. Wet joint surfaces before shooting adjacent sections.

Repair surface defects as soon as possible after shooting. Remove any shotcrete which lacks uniformity, exhibits segregation, honeycombing or lamination or contains any voids or sand pockets and replace with fresh shotcrete to the satisfaction of the Engineer. Protect shotcrete from freezing and rain until shotcrete reaches initial set.

(E) Construction Records

Provide 2 copies of soil nail wall construction records within 24 hours of completing each lift. Include the following in construction records:

(1) Names of Soil Nail Wall Contractor, Superintendent, Nozzleman, Drill Rig Operator, Project Manager and Design Engineer;

(2) Wall description, county, Department's contract, TIP and WBS element number;

(3) Wall station and number and lift location, dimensions, elevations and description;

(4) Nail locations, dimensions and inclinations, bar types, sizes and grades and temporary casing information;

(5) Date and time drilling begins and ends, steel bars are inserted into drill holes, grout and shotcrete are mixed and arrives on-site and grout placement and shotcrete application begins and ends;

(6) Grout volume, temperature, flow and density records;

(7) Ground and surface water conditions and elevations if applicable;

(8) Weather conditions including air temperature at time of grout placement and shotcrete application; and

(9) All other pertinent details related to soil nail wall construction.

After completing each soil nail wall or stage of a wall, provide a PDF file of all corresponding construction records.

Nail Testing

"Proof tests" are performed on nails incorporated into walls, i.e., production nails. Define "test nail" as a nail tested with a proof test. Proof tests are typically required for at least one nail per nail row per soil nail wall or at least 5% of production nails, whichever is greater. More or less test nails may be required depending on subsurface conditions encountered. The Engineer will determine the number and locations of proof tests required. Do not test nails until grout and shotcrete attain the required 3-day compressive strength.

(A) Test Equipment

Use the following equipment to test nails:

(1) Two dial gauges with rigid supports,

(2) Hydraulic jack and pressure gauge and

(3) Jacking block or reaction frame.

Provide dial gauges with enough range and precision to measure the maximum test nail movement to 0.001". Use pressure gauges graduated in 100 psi increments or less. Submit identification numbers and calibration records for load cells, jacks and pressure gauges with the soil nail wall design. Calibrate each jack and pressure gauge as a unit.

Align test equipment to uniformly and evenly load test nails. Use a jacking block or reaction frame that does not damage or contact shotcrete within 3 ft of nail heads. Place dial gauges opposite each other on either side of test nails and align gauges within 5° of bar inclinations. Set up test equipment so resetting or repositioning equipment during nail testing is not needed.

(B) Test Nails

Test nails include both unbonded and bond lengths. Grout only bond lengths before nail testing. Provide unbonded and bond lengths of at least 3 ft and 10 ft, respectively.

Steel bars for production nails may be overstressed under higher test nail loads. If necessary, use larger size or higher grade bars with more capacity for test nails instead of shortening bond lengths to less than the minimum required.

(C) Proof Tests

Test proof test nails in accordance with the accepted submittals and Article 34.5.5.3, respectively of the *AASHTO LRFD Bridge Construction Specifications*.

(D) Test Nail Acceptance

Submit 2 copies of test nail records including load versus movement and time versus creep movement plots within 24 hours of completing each proof test. The Engineer will review the test nail records to determine if test nails are acceptable. Test nail acceptance is based in part on the

acceptance criteria in Article 34.5.5.4 of the *AASHTO LRFD Bridge Construction Specifications*.

Maintain stability of unbonded lengths for subsequent grouting. If a test nail is accepted but the unbonded length cannot be satisfactorily grouted, do not incorporate the test nail into the soil nail wall and add another production nail to replace the test nail.

If the Engineer determines a test nail is unacceptable, either perform additional proof tests on adjacent production nails or revise the soil nail design or installation methods for the production nails represented by the unacceptable test nail as determined by the Engineer. Submit a revised soil nail wall design for acceptance, provide an acceptable test nail with the revised design or installation methods and install additional production nails for the nails represented by the unacceptable test nail.

After completing nail testing for each soil nail wall or stage of a wall, provide a PDF file of all corresponding test nail records.

Measurement and Payment

Temporary soil nail walls will be measured and paid in square feet. Temporary soil nail walls will be paid for at the contract unit price for *Temporary Shoring*. Temporary soil nail walls will be measured as the square feet of exposed wall face area. No measurement will be made for any embedment or pavement thickness above soil nail walls.

The contract unit price for *Temporary Shoring* will be full compensation for providing soil nail wall designs, submittals, labor, tools, equipment and soil nail wall materials, excavating, hauling and removing excavated materials, installing and testing soil nails, grouting, shotcreting and supplying sheet drains and any incidentals necessary to construct soil nail walls. No additional payment will be made and no extension of completion date or time will be allowed for repairing property damage, overexcavations or unstable excavations, unacceptable test nails or thicker shotcrete.

No payment will be made for temporary shoring not shown in the plans or required by the Engineer including shoring for OSHA reasons or the Contractor's convenience. No value engineering proposals will be accepted based solely on revising or eliminating shoring locations shown in the plans or estimated quantities shown in the bid item sheets as a result of actual field measurements or site conditions.

PCB will be measured and paid in accordance with Section 1170 of the *Standard Specifications*. No additional payment will be made for anchoring PCB for soil nail walls. Costs for anchoring PCB will be incidental to soil nail walls.

Temporary guardrail will be measured and paid for in accordance with Section 862 of the *Standard Specifications*.

SP-10, SAFETY FENCE AND JURISDICTIONAL FLAGGING

1.0 DESCRIPTION

Safety Fence shall consist of furnishing materials, installing and maintaining polyethylene or polypropylene fence along the outside riparian buffer, wetland, or water boundary, or other boundaries located within the construction corridor to mark the areas that have been approved to infringe within the buffer, wetland, endangered vegetation, culturally sensitive areas or water. The fence shall be installed prior to any land disturbing activities.
Interior boundaries for jurisdictional areas noted above shall be delineated by stakes and highly visible flagging.

Jurisdictional boundaries at staging areas, waste sites, or borrow pits, whether considered outside or interior boundaries shall be delineated by stakes and highly visible flagging.

2.0 MATERIALS

(A) Safety Fencing

Polyethylene or polypropylene fence shall be a highly visible preconstructed safety fence approved by the Engineer. The fence material shall have an ultraviolet coating.

Either wood posts or steel posts may be used. Wood posts shall be hardwood with a wedge or pencil tip at one end, and shall be at least 5 ft. in length with a minimum nominal 2" x 2” cross section. Steel posts shall be at least 5 ft. in length, and have a minimum weight of 0.85 lb/ft of length.

(B) Boundary Flagging

Wooden stakes shall be 4 feet in length with a minimum nominal 3/4” x 1-3/4” cross section. The flagging shall be at least 1” in width. The flagging material shall be vinyl and shall be orange in color and highly visible.

3.0 CONSTRUCTION METHODS

No additional clearing and grubbing is anticipated for the installation of this fence. The fence shall be erected to conform to the general contour of the ground.

(A) Safety Fencing

Posts shall be set at a maximum spacing of 10 ft., maintained in a vertical position and hand set or set with a post driver. Posts shall be installed a minimum of 2 ft. into the ground. If hand set, all backfill material shall be thoroughly tamped. Wood posts may be sharpened to a dull point if power driven. Posts damaged by power driving shall be removed and replaced prior to final acceptance. The tops of all wood posts shall be cut at a 30-degree angle. The wood posts may, at the option of the Contractor, be cut at this angle either before or after the posts are erected.

The fence geotextile shall be attached to the wood posts with one 2" galvanized wire staple across each cable or to the steel posts with wire or other acceptable means.

Place construction stakes to establish the location of the safety fence in accordance with Article 105-9 or Article 801-1 of the *Standard Specifications.* No direct pay will be made for the staking of the safety fence. All stakeouts for safety fence shall be considered incidental to the work being paid for as “Construction Surveying”, except that where there is no pay item for construction surveying, all safety fence stakeout will be performed by state forces.

The Contractor shall be required to maintain the safety fence in a satisfactory condition for the duration of the project as determined by the Engineer.

(B) Boundary Flagging

Boundary flagging delineation of interior boundaries shall consist of wooden stakes on 25 feet maximum

intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 6" into the ground. Interior boundaries may be staked on a tangent that runs parallel to buffer but must not encroach on the buffer at any location. Interior boundaries of hand clearing shall be identified with a different colored flagging to distinguish it from mechanized clearing.

Boundary flagging delineation of interior boundaries will be placed in accordance with Article 105-9 or Article 801-1 of the *Standard Specifications*. No direct pay will be made for delineation of the interior boundaries. This delineation will be considered incidental to the work being paid for as *Construction Surveying,* except that where there is no pay item or construction surveying the cost of boundary flagging delineation shall be included in the unit prices bid for the various items in the contract. Installation for delineation of all jurisdictional boundaries at staging areas, waste sites, or borrow pits shall consist of wooden stakes on 25 feet maximum intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 6" into the ground. Additional flagging may be placed on overhanging vegetation to enhance visibility but does not substitute for installation of stakes.

Installation of boundary flagging for delineation of all jurisdictional boundaries at staging areas, waste sites, or borrow pits shall be performed in accordance with Subarticle 230-4(B)(5) or Subarticle 802-2(F) of the *Standard Specifications*. No direct pay will be made for this delineation, as the cost of same shall be included in the unit prices bid for the various items in the contract.

The Contractor shall be required to maintain alternative stakes and highly visible flagging in a satisfactory condition for the duration of the project as determined by the Engineer.

4.0 MEASUREMENT AND PAYMENT

Safety Fence will be measured and paid as the actual number of linear feet of polyethylene or polypropylene fence installed in place and accepted. Such payment will be full compensation including but not limited to furnishing and installing fence geotextile with necessary posts and post bracing, staples, tie wires, tools, equipment and incidentals necessary to complete this work.

Payment will be made under:

SAFETY FENCE.....LF

SP-11, COIR FIBER MATTING

1.0 DESCRIPTION

Furnish material, install and maintain coir fiber mat in locations shown on the plans or in locations as directed. Work includes providing all materials, excavating and backfilling, and placing and securing coir fiber mat with stakes as directed.

2.0 MATERIALS

Item	**Section**
Coir Fiber Mat	1060-14

Anchors: Wooden stakes shall be used as anchors.

Provide hardwood stakes 12"- 24" long with a 2" x 2" nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

3.0 CONSTRUCTION METHODS

Place the coir fiber mat immediately upon final grading. Provide a smooth soil surface free from stones, clods, or debris that will prevent the contact of the mat with the soil. Unroll the mat and apply without stretching such that it will lie smoothly but loosely on the soil surface.

For stream relocation applications, take care to preserve the required line, grade, and cross section of the area covered. Bury the top slope end of each piece of mat in a narrow trench at least 6 in. deep and tamp firmly. Where one roll of matting ends and a second roll begins, overlap the end of the upper roll over the buried end of the second roll so there is a 6 in. overlap. Construct check trenches at least 12 in. deep every 50 ft. longitudinally along the edges of the mat or as directed. Fold over and bury mat to the full depth of the trench, close and tamp firmly. Overlap mat at least 6 in. where 2 or more widths of mat are installed side by side.

Place anchors across the mat at the ends approximately 1 ft. apart. Place anchors along the outer edges and down the center of the mat 3 ft. apart.

Adjustments in the trenching or anchoring requirements to fit individual site conditions may be required.

4.0 MEASUREMENT AND PAYMENT

Coir Fiber Mat will be measured and paid for as the actual number of square yards measured along the surface of the ground over which coir fiber mat is installed and accepted.

No measurement will be made for anchor items.

Payment will be made under:

Pay Item	Pay Unit
Coir Fiber Mat	Square Yard

SP-12, LIVE STAKING

Description

This work consists of furnishing, installing, and maintaining live stakes as shown on the plans or in locations as directed. Work includes providing all materials necessary to install the live stake cuttings. See the Live Staking Detail Sheet.

Materials

Item	Section

Live Stakes:

Live stakes shall be ½"- 2" in diameter. Stakes shall also be 2 ft. - 3 ft. in length.

Live staking plant material shall consist of a random mix made up of 50% Black Willow (*Salix nigra*) and 50% Silky Dogwood (*Cornus amomum*). Other species may be substituted upon approval of the Engineer. All plant material shall be harvested locally (within the same physiographic ecoregion and plant hardiness zone) or purchased from a local nursery, with the approval of the Engineer. All live stakes shall be dormant at time of acquisition and planting.

Stakes shall be used as anchors and shall meet the following requirements:

Wooden Stakes:

Provide hardwood stakes 12"- 24" long with a 2" x 2" nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

Construction Methods

Coir fiber matting shall be installed on the streambanks where live staking is to be planted as shown on the Live Staking Detail Sheet and in locations as directed. Work includes providing all materials, excavating and backfilling, and placing and securing coir fiber mat.

Provide a smooth soil surface free from stones, clods, or debris that will prevent the contact of the matting with the soil. Place the matting immediately upon final grading. Take care to preserve the required line, grade, and cross section of the area covered.

Unroll the matting and apply without stretching such that it will lie smoothly but loosely on the soil surface. Bury the top slope end of each piece of matting in a narrow trench at least 6" deep and tamp firmly. Where one roll of matting ends and a second roll begins, overlap the end of the upper roll over the buried end of the second roll so there is a 6" overlap. Construct check trenches at least 12" deep every 50 ft. longitudinally along the edges of the matting, or as directed. Fold over and bury matting to the full depth of the trench, close and tamp firmly. Overlap matting at least 6" where 2 or more widths of matting are installed side by side.

Wooden stakes shall be used as anchors in accordance with the Live Staking Detail Sheet and as directed. Place anchors across the matting at ends, junctions, and check trenches approximately 1 ft. apart. Place anchors along the outer edges and down the center of each strip of matting 3 ft. apart. Place anchors along all lapped edges 1 ft. apart. Refer to the Live Staking Detail Sheet for anchoring pattern. The Engineer may require adjustments in the trenching or anchoring requirements to fit individual site conditions.

During preparation of the live stakes, the basal ends shall be cleanly cut at an angle to facilitate easy insertion into the soil, while the tops shall be cut square or blunt for tamping. All limbs shall be removed from the sides of the live cutting prior to installation.

Live stakes shall be installed within 48 hours of cutting. Outside storage locations should be continually shaded and protected from wind and direct sunlight. Live cut plant material shall remain moist at all times before planting.

Stakes shall be spaced approximately 4 ft. on center. Live stakes shall be installed according to the configuration presented on the Live Staking Detail Sheet.

Tamp live stakes perpendicularly into the finished bank slope with a dead blow hammer, with buds oriented in an upward direction. Stakes should be tamped until approximately ¾ of the stake length is within the ground. The area around each live stake shall be compacted by foot after the live stake has been installed.

1"- 2" shall be cut cleanly off of the top of each live stake with loppers at an angle of approximately 15 degrees following installation. Any stakes that are split or damaged during installation shall be removed and replaced.

Seasonal Limitations: Live stakes shall be planted between November 15 and March 15.

Measurement and Payment

Live Staking will be measured and paid for as the actual number of square yards of land measured along the surface of the ground which has been acceptably planted in accordance with this section.

C*oir Fiber Mat* will be measured and paid in accordance with SP-10 Coir Fiber Matting.

Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to complete this work.

Payment will be made under:

Pay Item	**Pay Unit**
Live Staking	Square Yard

SP-13, EROSION & SEDIMENT CONTROL - FINANCIAL RESPONSIBILITY AND CERTIFICATE OF COVERAGE

If this project is subject to the "North Carolina Department of Environmental Health and Natural Resources Sediment Pollution Control Act", the City has already received approval of the Erosion and Sedimentation Control Plan. The E&SC plan letter of approval can be found as an Appendix to this document. The Contractor, upon recommendation of award shall:

a. complete Part B of the Financial Responsibility/Ownership form provided as an Appendix. The City will then transfer financial responsibility of the erosion control permit to the Contractor. The Contractor will be responsible for any fines levied for violation of the approved erosion control plan.

b. fill out and submit an electronic Notice of Intent (e-NOI) form to receive a Certificate of Coverage (COC) under the NCG01 Permit. The Contractor will be responsible for satisfying the requirements of the permit, and for any civil or criminal penalties incurred due to violations of this permit.

   All information about the NCG01 permit, including directions on how to fill the e-NOI form, can be found at deq.nc.gov/NCG01. The electronic Notice of Intent (e-NOI) form is available at https://edocs.deq.nc.gov/Forms/NCG01-NOI. The City of Concord can help fill out the technical information if needed.

   The Contractor may begin the construction activity after receipt of the COC. The contractor must print and retain a copy of the permit and the COC on site.

   After the completion of the construction project, the contractor will submit an electronic Notice of Termination (e-NOT) form to end coverage under the NCG01 Permit.

There will be no direct payment for this special provision. The Contractor shall **include** the cost of the e-NOI application fees and any other cost incurred by this specification in his bid. The cost of the e-NOI application is **$100 at the time of writing this Special Provision. It is the responsibility of the contractor to verify the correct amount** at deq.nc.gov/NCG01.

NOTICE OF AWARD

TO:

FROM: City of Concord City Council (OWNER)
P.O. Box 308
35 Cabarrus Ave. W
Concord, North Carolina 28026-0308

PROJECT: **2020-077 Zion Church Rd. 12" Waterline**
Project No. 2020-077

You are hereby notified that the bid submitted by you for the above-named project in response to the City of Concord's Invitation to Bid, dated **October 31, 2023** in the amount of

_____ and _____/100 DOLLARS

($_____) has been accepted.

You are hereby required to execute the formal AGREEMENT with the City of Concord City Council and to furnish any and all Contractor's Bond(s), Certificate of Insurance and Power of Attorney(s) along with other documents pertaining to the work as designated by the City of Concord.

If you fail to execute said AGREEMENT and to furnish this and any other required documents pertaining to the work within ten (10) days from the date of delivery of this NOTICE OF AWARD, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your bid as abandoned and to award the work covered by your proposal to another, or to re-bid the work or otherwise dispose thereof as the Owner may see fit.

Dated this the _____ day of _____, 20_____

City of Concord, North Carolina

By: _____

Title: City Manager

CONTRACTOR

By: _____

Title: _____

ACCEPTANCE OF NOTICE OF AWARD

Receipt of the above NOTICE OF AWARD is hereby acknowledged this the ____ day of _____, 20 _____.

NOTICE TO PROCEED

TO:

FROM: City of Concord City Council (OWNER)
P.O. Box 308
35 Cabarrus Ave. W
Concord, North Carolina 28026-0308

PROJECT: **2020-077 Zion Church Rd. 12" Waterline**
Project No. 2020-077

Contract Amount: _____and____/100 DOLLARS

($_____).

You are hereby notified to commence work on or before the _____ day of ____, 20__, pending acceptance of your Certificate of Insurance and any other required documents, and are to fully complete the work by the ____ day of _____, 20___.

Your project final completion date is therefore the _____ day of _____, 20___, and as set forth in the above named project's schedule unless an extension is granted by the City of Concord Director of Engineering in writing.

City of Concord, North Carolina

By: _____

Title: City Manager

Dated this the ____ day of _____, 20__.

STANDARD FORM CONTRACT

This contract (this "Contract" or this "Agreement") is made and entered into as of the ___ day of _____, 20____, by the City of CONCORD ("City") and _____ ("Contractor"), ( ) a corporation, ( ) a professional corporation, ( ) a professional association, ( ) a limited partnership, ( ) a sole proprietorship, or ( ) a general partnership; organized and existing under the laws of the State of _____.

Sec. 1. Background and Purpose.
The **2020-077 Zion Church Rd. 12" Waterline** project consists of the installation of approximately 3183 ± linear feet of 12" water main, providing a loop system on Zion Church Rd. and replacing the existing 8" water line for the purpose of improving the water supply system.

Sec. 2. Services and Scope to be Performed. The Contractor shall provide the services at the charges set forth either in this paragraph or in Exhibit "A". Additional exhibits may be used to further define this Agreement when the Contractor and City so agree. Any additional exhibits shall be designated as exhibits to the Agreement with capitalized, sequential letters of the alphabet, shall be attached hereto and incorporated herein by reference as if the same were fully recited, and shall become terms of this Agreement upon execution by both parties.

In this Contract, "services" means the services that the Contractor is required to perform pursuant to this Contract and all of the Contractor's duties to the City that arise out of this Contract. Any amendments, corrections, or change orders by either party must be made in writing signed in the same manner as the original. (This form may be used for amendments and change orders.) The City reserves the right to refuse payment for any work outside that authorized herein or pursuant to a duly approved amendment or change order.

Sec. 3. Complete Work without Extra Cost. Unless otherwise provided, the Contractor shall obtain and provide, without additional cost to the City, all labor, materials, equipment, transportation, facilities, services, permits, and licenses necessary to perform the Work.

Sec. 4. Compensation. The City shall pay the Contractor for the Work as described in this paragraph below OR as described in Exhibit "A" attached. In the event of a conflict, the provisions of this paragraph shall control. Any additional expenses or charges shall only be paid after both the City and the Contractor agree to and execute a written change order. The City shall not be obligated to pay the Contractor any fees, payments, expenses or compensation other than those authorized in this Contract or in a duly-approved change order. All payments shall be deemed inclusive of tax and other obligations.

Sec. 4a. Retainage. The City shall withhold no retainage on Contracts having a "total project cost" of less than $100,000.00. The City may withhold retainage on contracts having a total project cost between $100,000 and $200,000. The City shall withhold retainage on contracts whose total project cost exceeds $300,000. When withheld, retainage shall equal no more than five percent of each progress payment. When the project is fifty per cent complete, the City shall not retain anything from future project payments provided that (i) the surety concurs in writing, (ii) the Contractor continues to perform satisfactorily, (iii) any non-conforming work identified in writing by the architect, engineer(s) or City has been corrected by the Contractor and accepted by the architect, engineer(s) or City. However, if the City determines that the Contractor's performance is unsatisfactory, the City may withhold up to five percent retainage from each project payment. The City may withhold additional amounts above five percent for unsatisfactory job progress, defective construction not remedied, disputed work, third party claims filed against the owner or reasonable evidence that a third-party claim will be filed.

Definitions:

"Total Project Cost": Total value of the Contract and any approved change orders or amendments.

"Project is Fifty Percent Complete": When the Contractor's validly-issued gross project invoices (excluding the value of the materials stored off-site) equal or exceed fifty percent of the value of the Contract, except that the value of materials stored on-site shall not exceed twenty percent of the Contractor's gross project invoices for the purpose of determining whether the project is fifty percent complete.

Sec. 5. Term. The Contractor shall commence work within ten (10) days of the date of its receipt of written Notice to Proceed from the City. The date that is ten (10) days from the date of the Contractor's receipt of the Notice to Proceed shall be the "Commencement Date." All work as set forth in the Scope of Services in Exhibit "A" shall be completed within one hundred eighty (180) calendar days of the Commencement Date. The date that is one hundred eighty (180) calendar days from the Commencement Date shall be the "Completion Date." Time is of the essence with regard to this Project. If Contractor's obligations are not completed by the Completion Date, the City reserves the right to nullify this Agreement, order the Contractor to immediately cease all work under this Agreement and vacate the premises, and to seek professional services equivalent to those outlined in Exhibit "A." The Contractor shall be held accountable for all damages incurred by the City as a consequence of the missed Completion Date. The exercise of any of these rights by the City shall not be interpreted to prejudice any other rights the City may have under this Agreement or in law or equity. This Contract shall not be automatically extended unless agreed to in writing by the City or as provided in Exhibit "A".

Sec. 6. Contractor's Billings to City. Payments will be made in accordance with the schedule found in this section below OR attached at Exhibit "A". Contractor shall submit an original pay request (invoice) to the City Purchasing Agent by the first of each month in order to expedite payment. Upon receipt of the request the City Purchasing Agent shall verify the amounts and if correct forward the request to the Accounts Receivable Division of the Finance Dept. Final payment on the Contract shall be made in 45 days, except in the case of retainage. Within 60 days after the submission of the final pay request, the City (with the written consent of the surety) shall release to the Contractor all retainage payments IF the City receives a certificate of substantial completion from the architect, engineer or designer-in-charge of the project OR the City receives beneficial occupancy and use of the project. In either case, the City may retain up to 2.5 times the estimated value of the work to be completed or corrected.

Sec. 7. Insurance. Contractor shall maintain and cause all sub-contractors to maintain insurance policies at all times with minimum limits as follows:

Coverage	**Minimum Limits**
Workers' Compensation	$500,000 each accident, $500,000 bodily injury by disease each employee, $500,000 bodily injury by disease policy limit
General Liability	$1,000,000 per occurrence regardless of the contract size
Automobile Liability	$1,000,000 per occurrence regardless of the contract size
Umbrella	☐ $1,000,000 per occurrence if contract does not exceed 180 days and does not exceed $500,000; otherwise,
	☐ $2,000,000 per occurrence

Contractor shall provide a Certificate of Insurance to the City listing the City as an additional insured. Such Certificate shall be in a form acceptable to the City.

Sec. 8. Documentation Requirements:

A. Contractor shall provide the City with a **Certificate of Insurance** for review prior to the issuance of any contract or Purchase Order. All Certificates of Insurance will require written notice by the insurer or Contractor's agent in the event of cancellation, reduction or other modifications of coverage by the insurer. Such notice shall be not less than 30 days for nonrenewal by the insurer, not less than 10 days for cancellation due to nonpayment of the premium and as soon as possible for all other types of modifications. In addition to the notice requirement above, Contractor shall provide the City with written notice of cancellation, reduction, or other modification of coverage of insurance whether instigated by the insurer or by the Contractor immediately upon Contractor's receipt of knowledge of such modifications. Upon failure of the Contractor to provide such notice, Contractor assumes sole responsibility for all loses incurred by the City for which insurance would have provided coverage. The insurance certificate shall be for the insured period in which the initial contract period begins and shall be renewed by the Contractor for each subsequent renewal period of the insurance for so long as the contract remains in effect.

The City shall be named as an **additional insured** on all policies except Workers' Compensation and it is required that coverage be placed with "A" rated insurance companies acceptable to the City. Statement should read, "City of Concord is added as an additional insured as evidenced by an endorsement attached to this certificate." Failure to maintain the required insurance in force may be cause for termination of this Agreement. In the event that the Contractor fails to maintain and keep in force the insurance herein required, the City has the right to cancel and terminate the Agreement without notice.

B. Contractor shall provide a completed W-9 form to the City prior to execution by the City of this Agreement.

Sec. 9. Performance of Work by Contractor.

(a) The Contractor warrants that all work performed under this Contract conforms to the Contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall continue for a period of 1 year from the date of issuance by the City of written final completion of the work.

(b) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to City - owned or controlled real or personal property, when that damage is the result of--

(1) The Contractor's failure to conform to contract requirements; or

(2) Any defect of equipment, material, workmanship, or design furnished.

(c) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

(d) The City shall notify the Contractor, in writing, within a reasonable time, not to exceed 30 days, after the discovery of any failure, defect, or damage.

(e) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time, not to exceed 30 days unless otherwise agreed in writing and signed by the City Manager or his designee, after receipt of notice, the City shall have the right to replace repair, or otherwise remedy the failure, defect, or damage at the Contractor s expense.

(f) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this Contract, the Contractor shall--

(1) Obtain all warranties that would be given in normal commercial practice,

(2) Require all warranties to be executed, in writing, for the benefit of the City, if directed to do so by the City; and

(3) Enforce all warranties for the benefit of the City, if directed to do so by the City

(g) In the event the Contractor's warranty has expired, the City may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(h) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the City nor for the repair of any damage that results from any defect in City-furnished material or design.

Sec. 10. Performance of Work by City. If the Contractor fails to perform the Work in accordance with the schedule referred to in Exhibit "A", the City may, in its discretion, perform or cause to be performed some or all of the Work, and doing so shall not waive any of the City's rights and remedies. Before doing so, the City shall give the Contractor reasonable notice of its intention. The Contractor shall reimburse the City for all costs incurred by the City in exercising its right to perform or cause to be performed some or all of the Work pursuant to this section.

Sec. 11. Attachments. Additional exhibits may be used to further define this Agreement when the Contractor and City so agree. Any additional exhibits shall be designated as exhibits to the Agreement with capitalized, sequential letters of the alphabet, shall be attached hereto and incorporated herein by reference as if the same were fully recited, and shall become terms of this Agreement upon execution by both parties.

The following attachments are made a part of this Contract and incorporated herein by reference:

(a) Exhibit "A" – Bid Form
(b) Exhibit "B" – Standard Form of Performance Bond
(c) Exhibit "C" – Special Provisions
(d) Exhibit "D" – Contractor must execute the Affidavit attached as Exhibit D, attesting to compliance with state and federal laws related to E-Verify.
(e) Exhibit "E" – Tax Form(s).
(f) Exhibit "F" – Certificate of Insurance.
(g) Exhibit "G" - Drawings

In case of conflict between an attachment and the text of this contract excluding the attachment, the text of this contract shall control. Any attachment that materially alters the standard terms contained herein must be reviewed by the City Attorney and approved by the City in writing.

Sec. 12. Notice. (a) All notices and other communications required or permitted by this Contract shall be in writing and shall be given either by personal delivery, fax, or certified United States mail, return receipt requested, addressed as follows:

To the City:	To the Contractor:
Sue Hyde, Director of Engineering	VaLerie Kolczynski, Esq.
City of Concord	City Attorney
P.O. Box 308	PO Box 308
Concord, NC 28026	Concord, NC 28026
Fax Number: (704) 786-4521	Fax Number: (704) 784-1791

(b) **Change of Address, Date Notice Deemed Given**: A change of address, fax number, or person to receive notice may be made by either party by notice given to the other party. Any notice or other communication under this Contract shall be deemed given at the time of actual delivery, if it is personally delivered or sent by fax. If the notice or other communication is sent by US Mail, it shall be deemed given upon the third calendar day following the day on which such notice or other communication is deposited with the US Postal Service or upon actual delivery, whichever first occurs.

Sec. 13. Indemnification. To the maximum extent allowed by law, the Contractor shall defend, indemnify, and save harmless the City of Concord, its agents, officers, and employees, from and against all charges that arise in any manner from, in connection with, or out of this Contract as a result of the acts or omissions of the Contractor or subcontractors or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable except for damage or injury caused solely by the negligence of the City its agents, officers, or employees. In performing its duties under this section, the Contractor shall at its sole expense defend the City of Concord, its agents, officers, and employees with legal counsel reasonably acceptable to City. As used in this subsection – "Charges" means claims, judgments, costs, damages, losses, demands, liabilities, duties, obligations, fines, penalties, royalties, settlements, expenses, interest, reasonable attorney's fees, and amounts for alleged violations of sedimentation pollution, erosion control, pollution, or other environmental laws, regulations, ordinances, rules, or orders. Nothing in this section shall affect any warranties in favor of the City that are otherwise provided in or arise out of this Contract. This section is in addition to and shall be construed separately from any other indemnification provisions that may be in this Contract. This section shall remain in force despite termination of this Contract (whether by expiration of the term or otherwise) and termination of the services of the Contract under this Contract.

Sec. 14. Corporate Status. If the Contractor is dissolved or suspended and the Contractor does not notify the City of such dissolution within three (3) business days from date of dissolution or suspension, and/or the corporate status is not reinstated within thirty (30) days, this Contract, at the sole option of the City and without prejudice to City's other remedies, shall be declared null and void or the Contractor shall execute a new contract showing the Contractor's correct legal entity.

Sec. 15. Miscellaneous.

(a) Choice of Law and Forum. This Contract shall be deemed made in Cabarrus County, North Carolina. This Contract shall be governed by and construed in accordance with the laws of North Carolina. The exclusive forum and venue for all actions arising out of this Contract shall be the appropriate division of the North Carolina General Court of Justice, in Cabarrus County. Such actions shall neither be commenced in nor removed to federal court. This section shall not apply to subsequent actions to enforce a judgment entered in actions heard pursuant to this section.

(b) Waiver. No action or failure to act by the City shall constitute a waiver of any of its rights or remedies that arise out this Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

(c) Performance of Government Functions. Nothing contained in this Contract shall be deemed or construed so as to in any way estop, limit, or impair the City from exercising or performing any regulatory, policing, legislative, governmental, or other powers or functions.

(d) Severability. If any provision of this Contract shall be unenforceable, the remainder of this Contract shall be enforceable to the extent permitted by law.

(e) Assignment, Successors and Assigns. Without the City's written consent, the Contractor shall not assign (which includes to delegate) any of its rights (including the right to payment) or duties that arise out this Contract. Unless the City otherwise agrees in writing, the Contractor and all assigns shall be subject to all of the City's defenses and shall be liable for all of the Contractor's duties that arise out of this Contract and all of the City's claims that arise out of this Contract. Without granting the Contractor the right to assign, it is agreed that the duties of the Contractor that arise out of this Contract shall be binding upon it and its heirs, personal representatives, successors, and assigns.

(f) Compliance with Law. In performing all of the Work, the Contractor shall comply with all applicable law. Without limitation, Contractor shall comply with the requirements of Article 2, Chapter 64 (Verification of Work Authorization) of the North Carolina General Statutes relating to E-Verify. Further, if Contractor utilizes a subcontractor, Contractor shall require the subcontractor to comply with the requirements of Article 2 of Chapter 64 of the General Statutes. Pursuant to the requirements of the Iran Divestment Act, N.C.G.S. § 143C-6A-1, et. seq., Contractor certifies that that as of the Effective Date of this Agreement, Contractor is not on the Final Divestment List as created by the State Treasurer in compliance with N.C.G.S. § 143-6A-4 and located at www.nctreasurer.com/Iran. Furthermore, Contractor agrees that it will not enter into any subcontracts for the performance of this Agreement with any entity on the Final Divestment List.

(g) City Policy. THE CITY OPPOSES DISCRIMINATION ON THE BASIS OF RACE AND SEX AND URGES ALL OF ITS CONTRACTORS TO PROVIDE A FAIR OPPORTUNITY FOR MINORITIES AND WOMEN TO PARTICIPATE IN THEIR WORK FORCE AND AS SUBCONTRACTORS AND VENDORS UNDER CITY CONTRACTS.

(h) EEO Provisions. During the performance of this Contract the Contractor agrees as follows: (1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, political affiliation or belief, age, or disability. The Contractor shall take affirmative action to insure that applicants are employed and that employees are treated equally during employment, without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or disability. The Contractor shall post in conspicuous places available to employees and applicants for employment, notices setting forth these EEO provisions. (2) The Contractor in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, political affiliation or belief, age, or disability.

(i) No Third Party Right Created. This Contract is intended for the benefit of the City and the Contractor and not any other person.

(j) Principles of Interpretation. In this Contract, unless the context requires otherwise the singular includes the plural and the plural the singular. The pronouns "it" and "its" include the masculine and feminine. Reference to statutes or regulations include all statutory or regulatory provisions consolidating, amending, or replacing the statute or regulation. References to contracts and agreements shall be deemed to include all amendments to them. The word "person" includes natural persons, firms, companies associations, partnerships, trusts, corporations, governmental agencies and units, and any other legal entities.

(k) Modifications, Entire Agreement. A modification of this Contract is not valid unless signed by both parties and otherwise in accordance with requirements of law. Further, a modification is not enforceable against the

City unless the City Manager or other duly authorized official signs it for the City. This Contract contains the entire agreement between the parties pertaining to the subject matter of this Contract. With respect to that subject matter, there are no promises, agreements, conditions, inducements, warranties, or understandings, written or oral, expressed or implied, between the parties, other than as set forth or referenced in this Contract.

(l) Corporate Seal. If a corporate seal is included by any party to this Contract, it is only for authentication purposes. This Contract is not signed under seal.

(m) No Employment Relationship. For all matters relating to this Agreement, Contractor shall be deemed an Independent Contractor. Nothing in this Agreement shall be construed in such a manner as to create an employee-employer relationship between City and Contractor.

(The following section applies to construction contracts only if the total amount of contracts awarded for the project is $300,000 or more.)

Sec. 16. Bonding. Both performance and payment bonds for the full amount of this Contract are required to be attached. Instead of bonds, you may submit a deposit of money, certified check or government securities for the full amount of the Contract. The performance bond shall have a value equal to 100% of this Contract. This bond shall be conditioned upon faithful performance of the Contract in accordance with the plans, specifications and conditions of the Contract. The performance bond shall be solely for the protection of the City. The payment bond shall be in an amount equal to 100% of the Contract, and conditioned upon the prompt payment for all labor or materials for which a contractor or subcontractor is liable. The payment bond shall be solely for the protection of the persons furnishing materials or performing labor for which a contractor, subcontractor or construction manager at risk is liable.

When the total amount of contracts awarded for any project exceeds three hundred thousand dollars ($300,000), performance and payment bonds are required from any contractor or construction manager at risk with a contract amount of or exceeding fifty thousand dollars ($50,000).

Sec. 17. Dispute Resolution. It is understood and agreed that NCGS 143-128(f1-g) requires that disputes arising under an agreement for the erection, construction, alteration or repair of a building be subject to a dispute resolution process specified by the City. The amount in controversy shall be at least $15,000.00 before this dispute resolution procedure may be used. In compliance with this statutory provision, the City specifies this Section as the dispute resolution process to be used on this Project. It is further understood and agreed that this dispute resolution process is based on non-binding mediation and will only be effective to the extent that the Parties to any mediated dispute participate in the mediation in good faith. It is also understood and agreed that the City is under no obligation under any circumstance to secure or enforce the participation of any other Party in the mediation of any dispute subject to this Section and NCGS 143-128(f1-g).

This Section 17 does not apply to:

(a) The purchase and erection of prefabricated or relocatable buildings or portions of such buildings, except that portion of the work that must be performed at the construction site; or

(b) The erection, construction alteration or repair of a building when the cost of such building is $300,000 or less.

17.1 Any dispute arising between or among the Parties listed in Section 17.3 that arises from an agreement to construct the Project, including without limitation a breach of such agreement, shall be subject to non-binding mediation administered by the American Arbitration Association under its Construction Industry Mediation Rules ("Rules"), except as otherwise expressly set forth in this Section. To the extent any provision of the Rules is inconsistent with the provisions of this Section, the provisions of this Section shall control. The mediation provided in this Section shall be used pursuant to this Agreement and NCGS 143-128(f1-g) and is in lieu of any dispute resolution process adopted by the North Carolina State Building Commission, which process shall not apply to this Project.

17.2 For purposes of this Section the following definitions shall apply:

a. *Agreement to construct the Project* means an agreement to construct the Project that is

subject to the requirements of NCGS 143-128 and does not include any agreement related to the Project that is not subject to said statute.

b. *Construct* or *construction* refers to and includes the erection, construction, alteration or repair of the Project.

c. *Party* or *Parties* refers to the parties listed in Section 16.4.

d. *Project* means the building to be erected, constructed, altered or repaired pursuant to this Agreement.

17.3 The City and any Party contracting with the City or with any first-tier or lower-tier subcontractor for the construction of the Project agree to participate in good faith in any mediation of a dispute subject to this Section and NCGS 143-128(f1-g), including without limitation the following Parties (if any): architect(s), engineer(s), surveyor(s), construction manager, construction manager at risk, prime contractor(s), surety(ies), subcontractor(s), and supplier(s).

17.4 In order to facilitate compliance with NCGS 143-128(f1-g), the Contractor and all other Parties shall include this Section 17 in every agreement to which it (any of them) is a Party for the construction of the Project without variation or exception. Failure to do so will constitute a breach of this Agreement, and the Contractor or other Party failing to include this Section in any agreement required by this Section shall indemnify and hold harmless the remaining Parties from and against any and all claims, including without limitation reasonable attorney fees and other costs of litigation, arising in any manner from such breach. Notwithstanding the foregoing provisions of this Section, it is expressly understood and agreed that the Parties are intended to be and shall be third-party beneficiaries of the provisions of this Section and can enforce the provisions hereof.

17.5 The following disputes are not subject to mediation: (i) a dispute seeking a non-monetary recovery; and (ii) a dispute seeking a monetary recovery of $15,000 or less.

17.6 A dispute seeking the extension of any time limit set forth in an agreement to construct the Project shall be subject to mediation pursuant to this Section and NCGS 143-128(f1-g), but only if the damages which would be suffered by the Party seeking the extension would exceed $15,000 if the disputed extension is denied. To the extent that liquidated damages are set forth in such agreement as the measurement of damages for failure by such Party to meet such time limit, such liquidated damages shall be the exclusive standard for determining the amount of damages associated with such dispute.

17.7 For purposes of this Section, a dispute is limited to the recovery of monetary damages from the same transaction or occurrence against a single Party or two or more Parties alleged to be liable jointly, severally or in the alternative. Two or more disputes may not be consolidated or otherwise combined without the consent of all Parties to such disputes.

17.8 In addition to such matters as are required by the Rules, a request for mediation shall include the amount of the monetary relief requested.

17.9 Prior to requesting mediation, a Party must form a good faith belief that it is entitled under applicable law to recover the monetary amount to be included in the request from one or more of the remaining Parties. Such belief must be based on a reasonable and prudent investigation into the dispute that is the subject of the request. The request for mediation must be based on such investigation and may not include any amount or the name of any remaining Party, unless supported by such investigation and good faith belief by the Party requesting the mediation.

17.10 If a Party breaches any provision of Section 17.9, it shall indemnify and hold harmless all other Parties from any costs, including reasonable attorney fees and other costs of litigation, and damages incurred by such other Parties that arise from such breach.

17.11 All expenses incurred by a Party to a dispute in preparing and presenting any claim or defense at the mediation shall be paid by the Party. Such expenses include without limitation preparation and production

of witnesses and exhibits and attorney fees. All other expenses of the mediation, including filing fees and required traveling and other expenses of the mediator, shall be borne as follows: one half by the Party requesting the mediation, with the remaining parties paying equal shares of the remaining expenses and costs; provided that, if the City is named as a party to the mediation, the City shall pay at least one-third of the mediation expenses and costs divided among the Parties. If more than one Party to a dispute requests a mediation, the mediation expenses and costs to be divided among the Parties shall be borne equally by the Parties to the dispute; provided that, if the City is named as a Party to the mediation, the City shall pay at least one-third of the mediation expenses and costs divided among the Parties.

17.12 The mediation shall be held at a location agreeable to the mediator and all of the Parties; provided that, if no agreement can be reached, the mediation will be held at such location in Cabarrus County as the mediator shall determine.

17.13 The provisions of this Section are subject to any other provision of this Agreement concerning the submission, documentation and/or proof of any claim or dispute. Such other provisions shall apply in full force and shall be satisfied as a condition precedent to mediation pursuant to this Section.

17.14 The Parties understand and agree that mediation in accordance with this Section shall be a condition precedent to institution of any legal or equitable proceeding seeking monetary recovery based on any dispute that is subject to mediation pursuant to this Section.

Sec. 18. Breach. In the event of a violation of any material term of this Agreement, the non-violating party may terminate the Agreement upon written notice. Such notice shall state the violation with specificity and shall give ten (10) days to cure the violation. The cure period shall be measured as ten (10) days from the date of receipt of notice by the violating party, or, if the date is not known, then thirteen (13) days from the date the notice is placed in the United States Post. If the violation remains uncorrected at the end of the cure period, the Agreement shall be terminated without any further action by the non-violating party. Any remaining disputes shall be subject to the dispute resolution procedure set forth above, if applicable.

[Signature Page to Follow]

IN WITNESS WHEREOF, the City of Concord and the Contractor have caused this Contract to be executed by their respective duly authorized agents or officers.

CITY OF CONCORD:

By: _____
City Manager

Date: _____

ATTEST BY:

_____
City Clerk

APPROVED AS TO FORM:

_____
Attorney for the City of Concord

(Typed or Printed Legal Name of Contractor)

By: _____
Signature of President/Vice President/Manager/Partner

Printed Name: _____

Title: _____

Date: _____

ATTEST:

BY: _____
Signature of Vice President, Secretary, or other officer

Printed Name: _____

Title _____

SEAL

APPROVAL BY CITY FINANCE OFFICER

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

_____
Signature

EXHIBIT "D"

STATE OF NORTH CAROLINA

AFFIDAVIT

COUNTY OF CABARRUS

****

I, _____(the individual signing below), being duly authorized by and on behalf of _____ (the legal name of the entity entering the contract, "Employer") after first being duly sworn hereby swears or affirms as follows:

1. Employer understands that E-Verify is the federal E-Verify program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law in accordance with NCGS §64-26.

2. Employer understands that Employers Must Use E-Verify. Each employer (as such term is defined in NCGS § 64-25), after hiring an employee (as such term is defined in NCGS § 64-25) to work in the United States, shall verify the work authorization of the employee through E-Verify in accordance with NCGS§64-26(a). Employer attests that Employer is in compliance with the requirements of the federal and state laws relevant to E-verify.

3. Employer is a person, business entity, or other organization that transacts business in the State of North Carolina. Employer employs 25 or more employees in this State. (mark Yes or No)

a. YES _____, or b. NO _____.

4. Employer attests that all subcontractors employed by it as part of this contract comply with the requirements of E-Verify, and Employer will ensure compliance with E-Verify by any subcontractors subsequently hired by Employer as part of any contract with the City of Concord.

5. Employer shall have a continuing duty to inform the City of Concord of any changes to this sworn information.

This ____ day of _____, 20___.

_____

Signature of Affiant
Print or Type Name: _____

_____

State of North Carolina County of Cabarrus

Signed and sworn to (or affirmed) before me, this the _____

day of _____, 20___.

My Commission Expires:

_____

_____

Notary Public

(Affix Official/Notarial Seal)

EXHIBIT "E"

TAX FORM(S)

EXHIBIT "F"

CERTIFICATE OF INSURANCE

4824-4465-9749, v. 1

City of Concord
Post Office Box 308
Concord, North Carolina 28026-0308

For City Use Only
Charge to PO #

Project Name	
Date Notice to Proceed	
Final Completion Date	
Days Remaining in Contract	
Percent Work Complete	
Percent Time Complete	
Percent Payment Complete	

APPLICATION FOR PAYMENT NO.
PERIOD FROM: TO:

CERTIFICATE OF THE CONTRACTOR

To the best of my knowledge and belief, I certify that this periodical estimate is correct and all work has been performed and materials supplied in full accordance with the terms and condtions of the contract documents between the undersigned contractor and the City of Concord.

GROSS AMOUNT OF PARTIAL PAYMENT		$
RETAINAGE AT 5.0000%	$	
PREVIOUS PAYMENTS	$	
LIQUIDATION DAMAGES 0.00 DAYS AT $0.00 PER DAY, $0.00 this period.	$	
OTHER DEDUCTIONS $0.00 this period.	$	
TOTAL DEDUCTIONS		$
NET AMOUNT DUE THIS ESTIMATE		$

Name of Contractor: Address:

Signed: _____ Title: _____ Date: _____

CERTIFICATE OF CONSTRUCTION ADMINISTRATOR/ENGINEER

I certify that I have verified this periodical estimate and that to best of my knowledge and belief, it is a true and correct statement of work performed and materials supplied under the contract.

Consultant Engineer: _____ Date: _____

Engineering Construction Manager: _____ Date: _____

APPROVED AND PAYMENT RECOMMENDED: CITY OF CONCORD

Signed: _____ Title: _____ Date: _____

Engineering's Application for Payment Form

Project Title: **Zion Church Rd. 12" Waterline**
Project No. 2020-077

ITEM	DESCRIPTION	QUANTITY		UNIT PRICE	TOTAL PRICE	QUANT. THIS EST.	TOTAL THIS EST.	QUANT. PREV. EST.	TOTAL PREVIOUS	QUANT. TO DATE	TOTAL TO DATE	QUANT. DIFF.	TOTAL DIFF.
1			LF		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
2			LF		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
3			LF		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
4			LF		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
5			LF		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
6			LF		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
7					$ -		$ -		$ -	0.00	$ -	0.00	$0.00
8			EA		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
9			LBS		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
10			SF		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
11			SF		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
12			LF		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
13													
a			EA		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
b			EA		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
c			EA		$ -		$ -		$ -	0.00	$ -	0.00	$0.00
Add 1			EA				$ -		$ -	0.00	$ -	0.00	$0.00
Add 2			LS				$ -		$ -	0.00	$ -	0.00	$0.00
Add 3			LF				$ -		$ -	0.00	$ -	0.00	$0.00
Add 4			SY				$ -		$ -	0.00	$ -	0.00	$0.00
Add 5			SY				$ -		$ -	0.00	$ -	0.00	$0.00
	Base Bid $				$ -		$ -		$ -		$ -		$0.00
	10 % Contingency $				$ -								$ -
	Total Base Bid $				$ -								$0.00

CITY OF CONCORD
CONCORD, NORTH CAROLINA
CONTRACT CHANGE ORDER

Date: _____

Project Title: Zion Church Rd. 12" Waterline **Project #: 2020-077**

Owner: **City of Concord** **Change Order No.**

To:
(CONTRACTOR)
Account No.
Purchase Order No.

You are hereby requested to make the following changes in this Contract to comply with the provisions of the attached and/or the original Contract Documents.

Item No.	Description of Changes	Additions	Deductions
		$0.00	$0.00

Original Contract Amount
Net Changes by Previous Change Orders
Net Changes this Change Order **$0.00**

New Contract Amount **$0.00**

The Contract Time will be _____ by _____ calendar days.
The Completion Date as of this Change Order is:

Accepted: **(Contractor)**
By: **Date:**

Accepted: **CITY OF CONCORD**
By: **Date:**

This instrument has been pre-audited in the manner required by Local Government Budget and Fiscal Control Act.

By: **Date:**
Finance Director

Concord
NORTH CAROLINA
High Performance Living
635 Alfred Brown Jr Court SW, P.O. Box 308, Concord, NC 28026 - concordnc.gov

Certificate of Infrastructure Completion

Project Name & Number: **Zion Church Rd. 12" Waterline** **Project #: 2020-077**	
Contractor Name & Address:	Owner Name & Address:
Miscellaneous Information:	
Inspector:	Signature:

The following items have been inspected, reviewed and found to be complete in substantial accordance with the approved plans and specifications. The dates of completion are those agreed upon by the City of Concord when all construction Work and testing was completed. These dates DO NOT initiate the start of any Warranty periods of said item(s). Warranty periods shall begin as specified on the CERTIFICATION OF FINAL COMPLETION.

Sanitary Sewer:	Approved: Initial: Date:
Potable Water:	Approved: Initial: Date:
Storm Water:	Approved: Initial: Date:
Asphalt Base Course:	Approved: Initial: Date:
Asphalt Surface Course:	Approved: Initial: Date:
Curb & Gutter	Approved: Initial: Date:
Sidewalks:	Approved: Initial: Date:
Street Trees:	Approved: Initial: Date:
Other:	Approved: Initial: Date:

Engineering
Phone (704) 920-5425 ● Fax (704) 786-4521

FIELD ORDER

CITY OF CONCORD
ENGINEERING DEPARTMENT

Post Office Box 308
Concord, North Carolina 28026-0308

Project Title: **Zion Church Rd. 12" Waterline** **Project No. 2020-077**

FIELD ORDER NO _____ CONTRACT _____ DATE _____

PROJECT _____

LOCATION _____

TO: _____

_____

THIS ORDER AUTHORIZES YOU TO PROCEED WITH THE ALTERATIONS AND/OR ADDITIONS TO THE WORK AS DESCRIBED HEREIN, IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF OUR STANDARD FORM OF CONTRACT.

DESCRIPTION OF WORK: _____
_____
_____
_____
_____

• QUOTATION RECEIVED AND APPROVED BY THE CITY OF CONCORD.

☐ QUOTATION NOT RECEIVED. PLEASE FURNISH QUOTATION IMMEDIATELY TO THE CITY OF CONCORD FOR CHECK AND APPROVAL.

☐ TIME AND MATERIAL BASIS. FURNISH TIME AND MATERIAL REPORTS DAILY TO THE CITY OF CONCORD FOR VERIFICATION AND SIGNATURE.

☐ OTHER _____

AUTHORIZED BY: _____

NORTH CAROLINA SALES TAX REPORT

OWNER: _____ CONTRACTOR: _____

PROJECT: _____ PURCHASE ORDER #: _____

TIME PERIOD: FROM: _____ TO: _____

DATE	VENDOR NAME	INVOICE #	TAXABLE ITEM SUBTOTAL	COUNTY PAID	STATE TAX AMOUNT	COUNTY TAX	TRANSIT TAX	TOTAL TAX PAID
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
					$ -	$ -	$ -	$ -
		TOTAL:	$ -		$ -	$ -	$ -	$ -

I certify that the above listed vendors were paid sales tax upon purchase of materials during the period covered by the Construction Estimate, the proeprty upon which such taxes were paid or will be used in the performance of this contract. No tax on purchases or rentals of tools and/or equipment is included in the above list. All of the materials became part of or is annexed to the building or structure being erected, altered, or repaired.

_____

Contractor or Subcontractor Name (Print)

SWORN AND SUBSCRIBED BEFORE ME

THIS _____ DAY OF _____ , _____

Signature: _____

_____

NOTARY PUBLIC

Name (Print): _____

Title: _____

MY COMMISSION EXPIRES: _____

North Carolina One Call Center, Inc.

North Carolina One Call Center, Inc., a non-profit organization funded by participating utility companies and municipalities in the interest of community and job safety and improved service through damage reduction to the utilities.

A ONE CALL TOLL FREE TELEPHONE NUMBER, 811 or 1-800-632-4949, PROVIDES AN AVENUE TO ALL OF THE PARTICIPATING MEMBERS FROM ANY POINT WITHIN THE STATE OF NORTH CAROLINA.

Anyone proposing to excavate, dig, bore, tunnel, blast or disturb the earth in any manner in which buried utilities may be damaged is requested to call the toll-free number between the hours of 6:00 a.m. and 10:00 p.m., Monday through Friday, forty-eight hours before starting the proposed work.

Within minutes of your telephone call, the participating members will be made aware of your plans and will be given pertinent information that has been provided by you about your planned work. You will be told the names of the participating members from whom you can expect a response - if there are buried facilities in the path of your activity, the route of the utilities will be staked and/or marked at no expense to you. If there are no facilities in the area of the planned work, you will be called or notified by a representative of a participating company accordingly.

Should a non-participating utility operator be serving your area, we recommend that you call them on an individual basis. All utility operators, whether company or municipality, will be provided an opportunity to become a member of North Carolina One Call Center, Inc.

Naturally, knowing the route of utilities, the excavator is expected to exercise caution and to avoid damage as the project progresses.

Damage prevention does not just happen – it is a planned and orderly process through which each of us can participate - **YES, WE CAN AND WE WILL DRAMATICALLY REDUCE DAMAGES TO THE UTILITIES IN THE STATE OF NORTH CAROLINA!! THANKS FOR YOUR HELP.**

BEFORE YOU DIG
IN THE INTEREST OF COMMUNITY AND JOB SAFETY AND IMPROVED SERVICE

CALL NORTH CAROLINA ONE CALL CENTER, INC.
811 or 1-800-632-4949

North Carolina One Call Center, Inc
2300 West Meadowview Rd., Suite 227
Greensboro, NC 27407
www.nc811.org

SECTION II

GENERAL CONDITIONS

Please reference online at:

https://concordnc.gov/Portals/0/Concord/Departments/Engineering/Documents/Old%20Site%20Standards/10%2001%2005%20General%20Conditions%20Horizontal.pdf?ver=D9zcv1hzhy5VHaHl1P4Ntg%3d%3d

Dated: 01/08/2010

APPENDIX A

GEOTECHNICAL EXPLORATION REPORT

STEWART

STRONGER BY DESIGN

GEOTECHNICAL EXPLORATION REPORT

Zion Church Road Water Line Extension

Zion Church Road
Concord, North Carolina

May 27, 2022

GEOTECHNICAL EXPLORATION REPORT

Zion Church Road Water Line Extension

Zion Church Road
Concord, North Carolina

May 27, 2022

Prepared For:

City of Concord
Brown Operations Center
635 Alfred Brown Jr Court SW
Concord, NC 28025

Prepared By:

STEWART
9801-E Southern Pines Blvd
Charlotte, NC 28273

Stewart Project No.: F22019.00

5/27/2022

NORTH CAROLINA PROFESSIONAL SEAL 028422 ENGINEER DONALD W. BROWN JR.

DocuSigned by:
Donald W. Brown Jr.
C06817F5F770411...

Donald W. Brown Jr., PE, LEED AP
VP | Practice Leader
Geotechnical & Construction Services
NC PE License No. 28422

Stewart License No. C-1051

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

Stewart has completed a geotechnical exploration for a proposed water line extension along Zion Church Road in Concord, North Carolina. This Executive Summary is provided as a brief overview of our geotechnical engineering evaluation for the project and is not intended to replace more detailed information contained elsewhere in this report. A summary of our findings, opinions, and recommendations is provided below.

- The current plan for this project includes installing a new water line along Zion Church Road.
- A total of 17 soil test borings were performed for this geotechnical exploration. Borings were advanced to depths ranging from approximately 7 feet to 18.9 feet below the existing grade.
    - The subgrade soils encountered at the boring locations consist of fill, alluvial, and residual soils. The soil types encountered primarily consist of SILT (ML) and Silty SAND (SM), with lesser amounts of fat CLAY (CH) and Clayey SILT (MH).
    - Weathered rock was encountered in 12 borings at variable depths ranging from approximately 2 inches to 14 feet below the existing grades.
    - Rock was encountered in three borings at depths ranging from approximately 7 feet to 17 feet below the current ground surface
    - Groundwater was encountered in three borings at approximate depths ranging from 3 to 6 feet below the existing grades.
- Water inflow into trench excavations should be anticipated at the creek crossing, as well as the area of Optimist Club Road.
- Difficult excavations caused by weathered rock should be expected sporadically during trench excavation.

The owner/designer/contractor should not rely solely upon the summary above. This report should be read in its entirety prior to implementing the information herein.

2 PROJECT INFORMATION

2.1 Project Understanding

As we understand it, the City of Concord intends to extend water service along Zion Church Road, starting just north of Litaker Lane North and ending at Highway 49 to the south. Approximately 3,184 linear feet of 12-inch diameter ductile iron pipe (DIP) is planned, which will be installed in open cut excavations. The provided profile indicates that the pipe will be placed approximately 4 to 6 feet below the current grade. The plans also indicate that the pipe will be installed in 24-inch diameter steel casing below the creek.

Two additional borings (B-16 and B-17) were requested in areas that were not on the profile. We assume that these are at locations of future connections.

2.2 Site Location and Description

The northern 370± feet of the easement is on industrial property and the final 500± feet is on undeveloped land. The remainder of the easement traverses single-family residential properties. The area is generally grass covered.

2.3 Geologic Area Overview

The project site is located in western Cabarrus County, North Carolina, which lies within the Charlotte Belt of the Piedmont Physiographic Province of North Carolina. Review of the *Geologic Map of the Charlotte 1° x 2° Quadrangle, North Carolina and South Carolina (compiled by Richard Goldsmith, Daniel J. Milton, and J. Wright Horton, Jr., 1988)* shows that the corridor is underlain by metavolcanics (mv).

Based on our local experience, differential weathering of parent bedrock often results in highly variable subsurface conditions over relatively short horizontal and vertical distances. Furthermore, suspended boulders, discontinuous rock layers/lenses, rock pinnacles and/or zones of weathered and/or fractured rock are commonly encountered within the residual soils in this region.

3 SUBSURFACE EXPLORATION

3.1 Field Testing

The subsurface conditions below the site were explored with a total of 17 soil test borings (B-1 thru B-17) at locations selected by the City of Concord. The boring locations are illustrated in Figures A2 and A3 in Appendix A of this report. Borings were advanced to depths of approximately 7 feet to 18.9 feet below the current ground surface. The soil test borings were performed by RDL Drilling of Tobaccoville, North Carolina with a truck-mounted Mobil B-47 drill rig using 2¼-inch (ID) hollow-stem, continuous flight augers in general accordance with ASTM D6151.

Sampling operations were conducted in general accordance with ASTM D1586. At predetermined intervals, soil samples were obtained with a split-barrel sampler (standard 2-inch O.D.). The sampler was rested on the bottom of the borehole and driven to a penetration of 18 inches (or fraction thereof) with blows of a 140-pound manual drop hammer falling a distance of 30 inches. Of the 18 inches, the number of hammer blows required to achieve 6 inches of penetration is recorded for three consecutive segments. The sum of the blow counts for the second and third 6-inch segment is termed the Standard Penetration Test (SPT) resistance, or N-value. The N-values presented on the Boring Logs and Boring Snapshot are the actual, field-recorded blow counts and do not include correction factors for hammer energy or overburden soil pressures.

All borings were backfilled with auger cuttings (soil) immediately after drilling for public safety.

3.2 Subsurface Conditions

The soil samples obtained during the drilling operations were placed in labeled containers and transported to our laboratory where they were visually-manually classified in general accordance with ASTM D2488 and logged by a member of Stewart's geotechnical engineering staff. The Boring Logs are included in Appendix B of this report. The samples will be stored for two months before discarding.

The subsurface descriptions in this section of the report are of a generalized nature, provided to highlight the major soil strata encountered. The stratification of the subsurface materials illustrated on the exhibits herein represent the conditions at the actual test locations; therefore, variations should be expected between borings. Stratigraphy boundaries only represent the approximate depth/elevation of a noticed material change but the transition between material types is typically gradual. The soil types are based on the Unified Soil Classification System (USCS).

Please note that the ground surface elevations in this report, including those shown on logs and other illustrations in the appendices, were interpolated from the provided topographic survey (performed by others) and should therefore be considered approximate. If greater elevation accuracy is necessary, the boreholes should be surveyed by a professional land surveyor.

3.2.1 Ground Cover

A layer of surficial organic soil (topsoil) was encountered at the ground surface in all 17 borings ranging in thickness from approximately 2 to 10 inches.

3.2.2 Fill

Soil that appeared to be fill material, placed during previous grading activities, was encountered in borings B-1, B-3, B-4, B-8, and B-10. This fill was classified as medium stiff to stiff Sandy SILT (ML), medium dense Silty SAND (SM), and stiff Clayey SILT (MH) and fat CLAY (CH). The SPT N-values

recorded in the fill material ranged from 5 to 15 blows per foot (bpf), generally indicating a poorly to moderately well compacted material.

Although not encountered in all of the borings, please note that some quantity/depth of fill is likely present along most of the corridor from past roadwork, minor residential lot grading, and/or and utility installations.

3.2.3 Alluvium

Alluvial soils are water-deposited sediments that are typically poorly consolidated due to the nature of their deposition. Alluvium was encountered below the aforementioned fill to a depth of approximately 5.5 feet below the ground surface adjacent to the creek (boring B-3). The alluvial soil consisted of very soft, saturated, SILT (ML).

3.2.4 Residuum

Residual soil, which is the undisturbed, fully weathered remains of the parent bedrock, was encountered beneath the fill and alluvial soils previously described or directly below the topsoil layer. The residuum at the boring locations largely consisted of soft to hard SILT (ML) and medium dense to very dense Silty SAND (SM). Lesser amounts of medium stiff to stiff Clayey SILT (MH) and fat CLAY (CH) were also encountered. Six of the 17 borings were terminated in residual soil (B-2, B-5, B-7, B-8, B-12, B-17).

3.2.5 Weathered Rock / Rock

For engineering purposes, weathered rock (WR) is defined by SPT N-values of 50 bpf with 6 inches or less penetration. Geologically, weathered rock is a geomaterial that is structurally between the parent rock and soil. Weathered rock was encountered in 12 of the 17 borings at variable depths ranging from approximately 2 inches to 14 feet below the existing grades.

Rock is typically defined as material of sufficient hardness to refuse mechanical drilling equipment. Rock was encountered in three borings (B-3, B-4, and B-14) at depths ranging from approximately 7 feet to 17 feet below the current ground surface.

3.2.6 Groundwater

Groundwater measurements were attempted immediately after drilling at each boring location. Groundwater was encountered in three boreholes (B-3, B-4, and B-8) at approximate depths ranging from 3 to 6 feet below the existing grades.

The groundwater conditions represent the conditions at the time of the exploration. Fluctuations in groundwater levels are common and should be expected. Common factors that influence groundwater levels include, but are not limited to, soil stratification, climate/weather, nearby bodies of water (lakes, ponds, etc.), underground springs, streams, rivers and surface water discharge. At the onset, as well as continually throughout the construction process, the contractor should monitor groundwater levels if determined to be detrimental to the project.

4 ENGINEERING ASSESSMENT

4.1 Groundwater

Groundwater should be expected at the creek crossing as well as the low-lying areas adjacent to Optimist Club Road. The utility contractor should anticipate water inflows and provide the necessary means/equipment to control it during pipe installation.

4.2 Difficult Excavations

Based on conditions encountered during the subsurface exploration, difficult excavations should be expected along segments of the easement. Of the 17 boring locations, nine have weathered rock near or above the anticipated trench bottom elevation. These are illustrated in orange on the Boring Location Diagrams in Appendix A of this report.

4.3 Shoring

We expect that open trench excavations will be utilized for the water line installation. Although the excavation walls along most of the easement are expected to be stable during the proposed trenching, we recommend the use of trench boxes and observing all applicable OSHA regulations for all excavations. We expect that the area of greatest instability will likely be at/near the creek crossing where alluvium is present and the water table is shallow. When designing/selecting the shoring system, the weight/impact of nearby surcharge loads should also be taken into consideration (i.e., roadway embankments, soil stockpiles, structure foundations, etc.)

All open cuts should be excavated in a manner that is safe to workers entering the excavation. This shall be accomplished in accordance with the "Construction Standards for Excavations, 29 CFR, Part 1926, Subpart P" published by the United States Department of Labor, Occupational Safety and Health Administration (OSHA). This federal mandate requires that all excavations (e.g., utility trenches, basement excavations, footing, shafts, etc.) be construction in accordance with OSHA guidelines. These regulations shall be strictly enforced to avoid penalties that could be assessed to the owner and/or contractor.

The contractor is solely responsible for designing, constructing stable, and maintaining temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's responsible person, as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures.

4.4 Trench Backfill

4.4.1 Selection

We anticipate the soil removed during trench excavation will be used as backfill after the water line is installed. As such, we recommend the following of the backfill material:

- No excessive deleterious material
- Organic content no greater than 3% (by weight)
- No rocks or other rigid inclusions greater than 3 inches in diameter within 1 foot of the pipe

4.4.2 Moisture Conditioning

To facilitate adequate compaction, the water content of the backfill should be maintained within ±3% of the material's optimum water content as determined by the Standard Proctor Compaction Test (ASTM D698). We anticipate much of the backfill to be wet of optimum, which will hamper compaction efforts. Furthermore, soil excavated in the areas of the creek and boring B-8 is expected to be saturated and will likely require imported backfill.

Please note that soils can be deemed unusable due to water content but shall not be classified as unsuitable based solely on water content. When soil water content falls outside of the requirements set herein, the contractor shall be responsible for taking appropriate measures (drying or wetting) to render the soil usable unless otherwise agreed to by the Owner.

4.4.3 Compaction

Lift thicknesses should be 4 to 6 inches when using small, Rammax-type compactors and no more than 4 inches thick for sled and jumping-jack tampers. Backfill should be compacted to at least 95% of the material's maximum dry density as determined by ASTM D698, unless otherwise directed/specified by the project's civil engineer or the City.

It is recommended that the placement and compaction of trench backfill be monitored and documented by an engineering technician. Field compaction testing should be performed in accordance with ASTM D1556 (Sand Cone Method), ASTM D2937 (Drive Cylinder Method), or ASTM D6938/D8167 (Nuclear Methods).

4.5 Existing Utilities

The proposed water line will be installed along an area that contains many existing utilities in close proximity – buried and aerial. These include natural gas, electric, water, and communications. Extreme caution should be exercised with excavating near existing utilities.

APPENDIX A

SITE VICINITY MAP
BORING LOCATION DIAGRAMS

©2022: All documents including computer files and drawings prepared by Stewart are instruments of professional service intended for one-time use. They are subject to copyright and other property right laws and shall remain the property of Stewart. They are not to be copied, modified, or changed in any manner whatsoever nor assigned to a third party without prior written permission of Stewart.

Note: All test locations are approximate (unless otherwise reported) and intended for illustration purposes only.

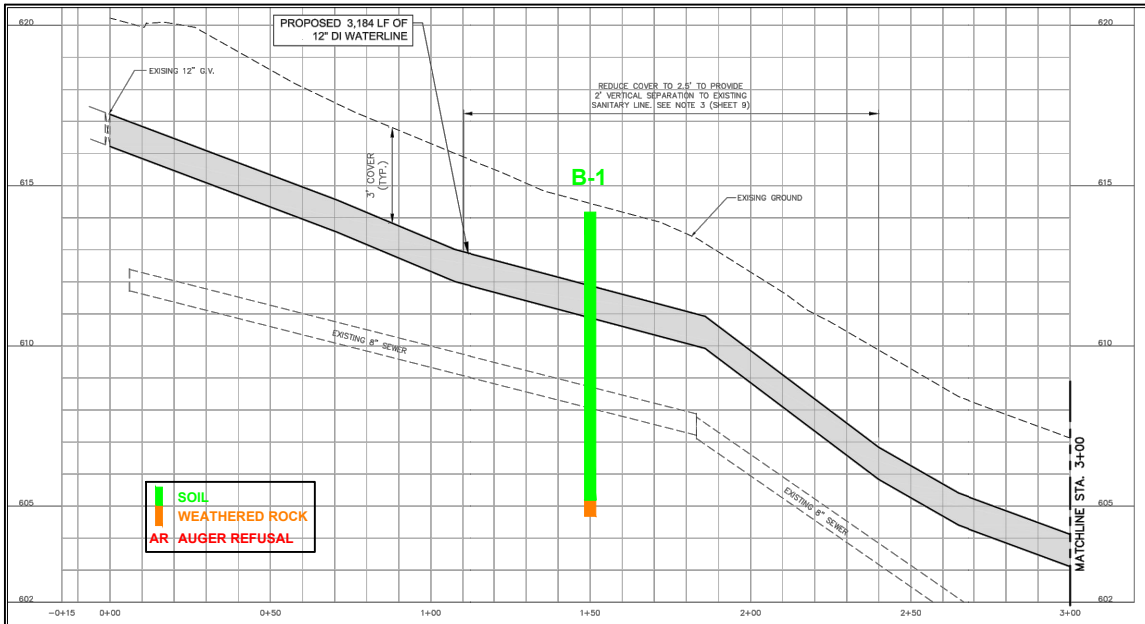
STEWART
9801-E SOUTHERN PINE BLVD
CHARLOTTE, NC 28273
T 704.334.7925
FIRM LICENSE #: C-1051
www.stewartinc.com

SITE VICINITY MAP
Zion Church Road
Water Line Extension
Zion Church Road
Concord, NC

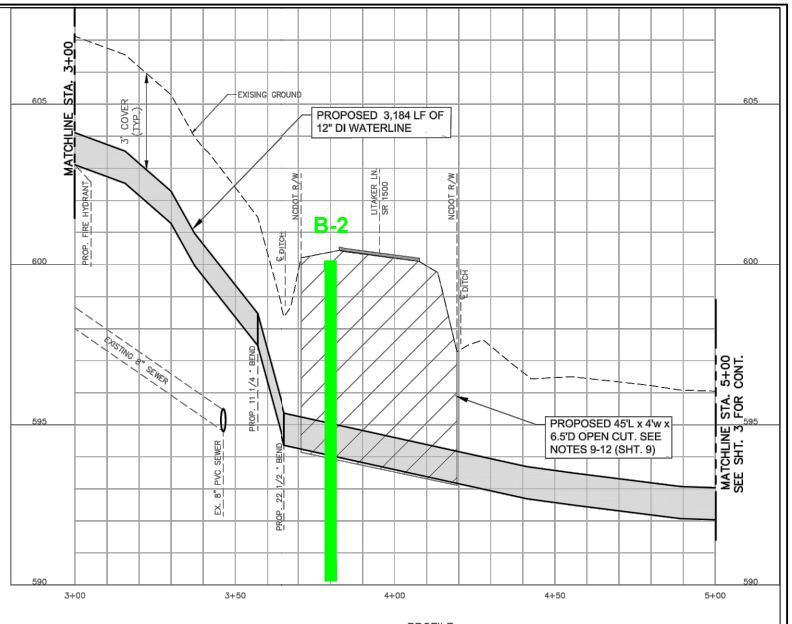
Project No.:	F22019.00
Scale:	NTS
Prepared by:	DB
Date:	05-26-22

Figure No.:

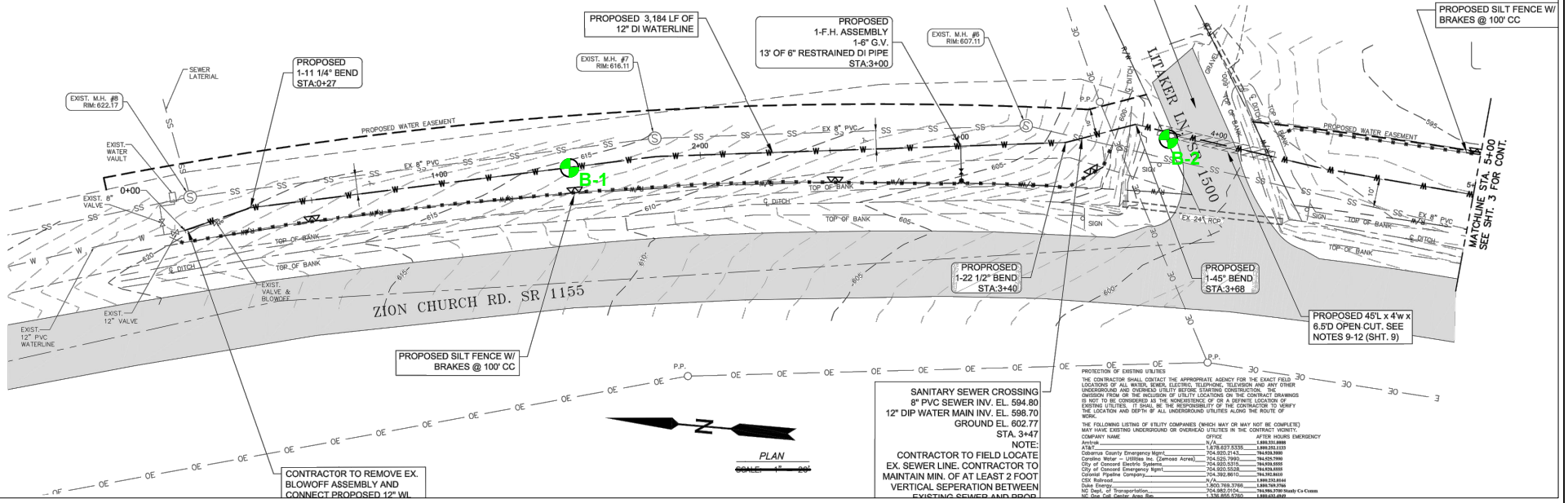
A1



PROFILE
SCALE: HORZ: 1" = 20'
VERT: 1" = 2'



PROFILE
SCALE: HORZ: 1" = 20'
VERT: 1" = 2'



PLAN
SCALE: 1" = 20'

©2022: All documents including computer files and drawings prepared by Stewart are instruments of professional service intended for one-time use. They are subject to copyright and other property right laws and shall remain the property of Stewart. They are not to be copied, modified, or changed in any manner whatsoever nor assigned to a third party without prior written permission of Stewart.

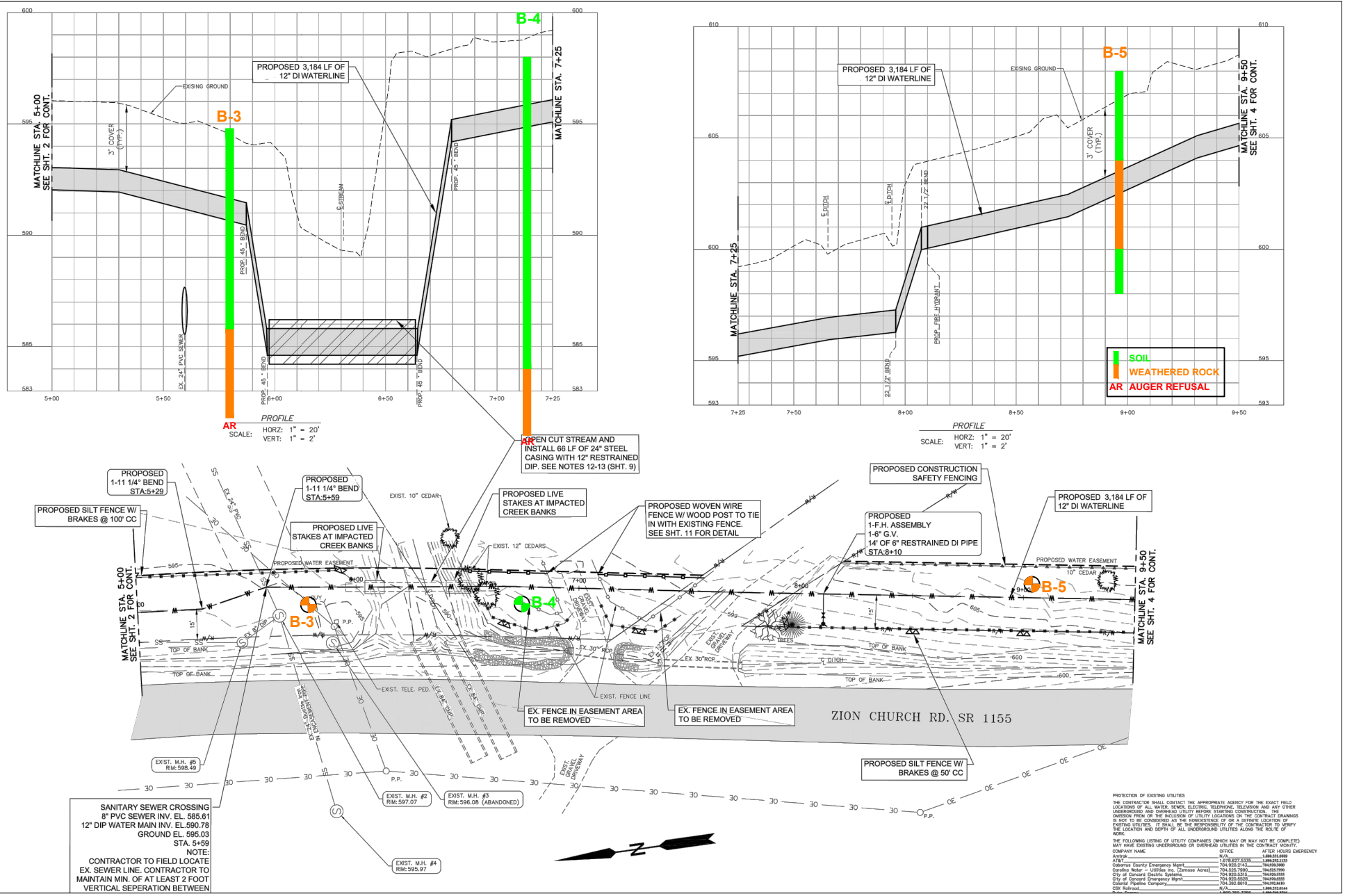
Note: All test locations are approximate (unless otherwise reported) and intended for illustration purposes only.

STEWART
9801-E SOUTHERN PINE BLVD
CHARLOTTE, NC 28273
T 704.334.7525
FIRM LICENSE #: C-1051
www.stewartinc.com

BORING LOCATION DIAGRAM
Zion Church Road
Water Line Extension
Zion Church Road
Concord, NC

Project No.:	F22019.00
Scale:	1 in = 60 ft
Prepared by:	DB
Date:	05-26-22

Figure No.: A2



©2022: All documents including computer files and drawings prepared by Stewart are instruments of professional service intended for one-time use. They are subject to copyright and other property right laws and shall remain the property of Stewart. They are not to be copied, modified, or changed in any manner whatsoever nor assigned to a third party without prior written permission of Stewart.

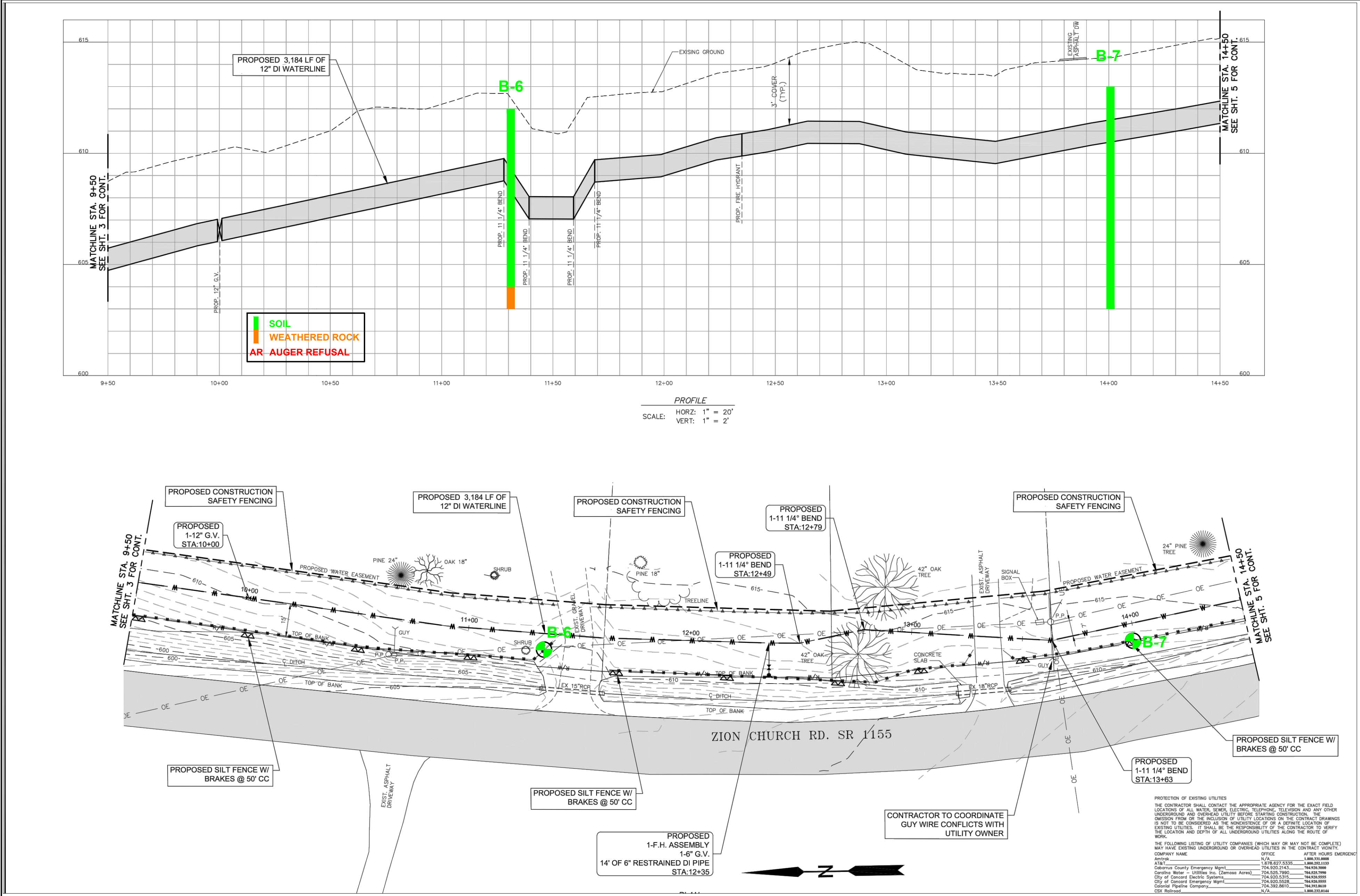
Note: All test locations are approximate (unless otherwise reported) and intended for illustration purposes only.

STEWART
9801-E SOUTHERN PINE BLVD
CHARLOTTE, NC 28273
T 704.334.7525
FIRM LICENSE #: C-1051
www.stewartinc.com

BORING LOCATION DIAGRAM
Zion Church Road
Water Line Extension
Zion Church Road
Concord, NC

Project No.:	F22019.00
Scale:	1 in = 60 ft
Prepared by:	DB
Date:	05-26-22

Figure No.: A3



©2022: All documents including computer files and drawings prepared by Stewart are instruments of professional service intended for one-time use. They are subject to copyright and other property right laws and shall remain the property of Stewart. They are not to be copied, modified, or changed in any manner whatsoever nor assigned to a third party without prior written permission of Stewart.

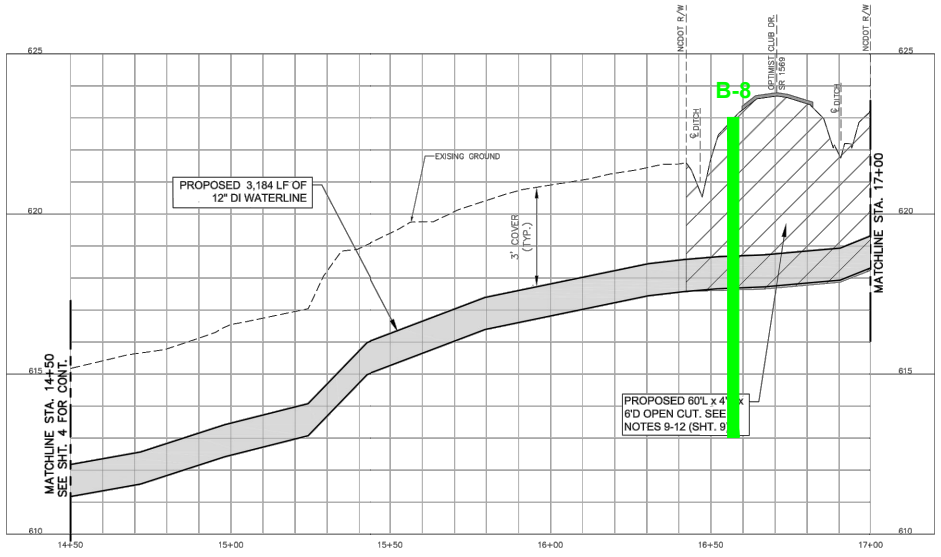
Note: All test locations are approximate (unless otherwise reported) and intended for illustration purposes only.

STEWART
9801-E SOUTHERN PINE BLVD
CHARLOTTE, NC 28273
T 704.334.7925
FIRM LICENSE #: C-1051
www.stewartinc.com

BORING LOCATION DIAGRAM

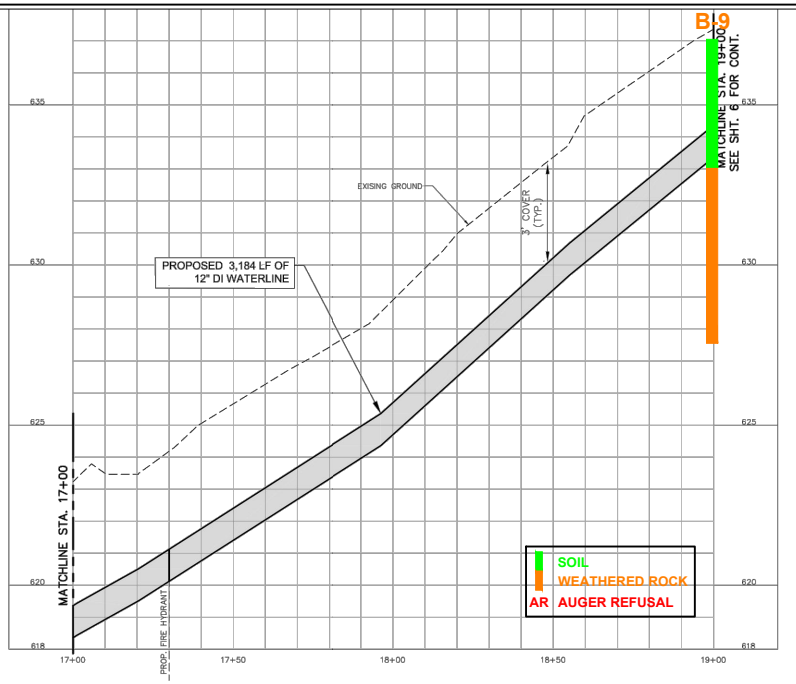
Zion Church Road
Water Line Extension
Zion Church Road
Concord, NC

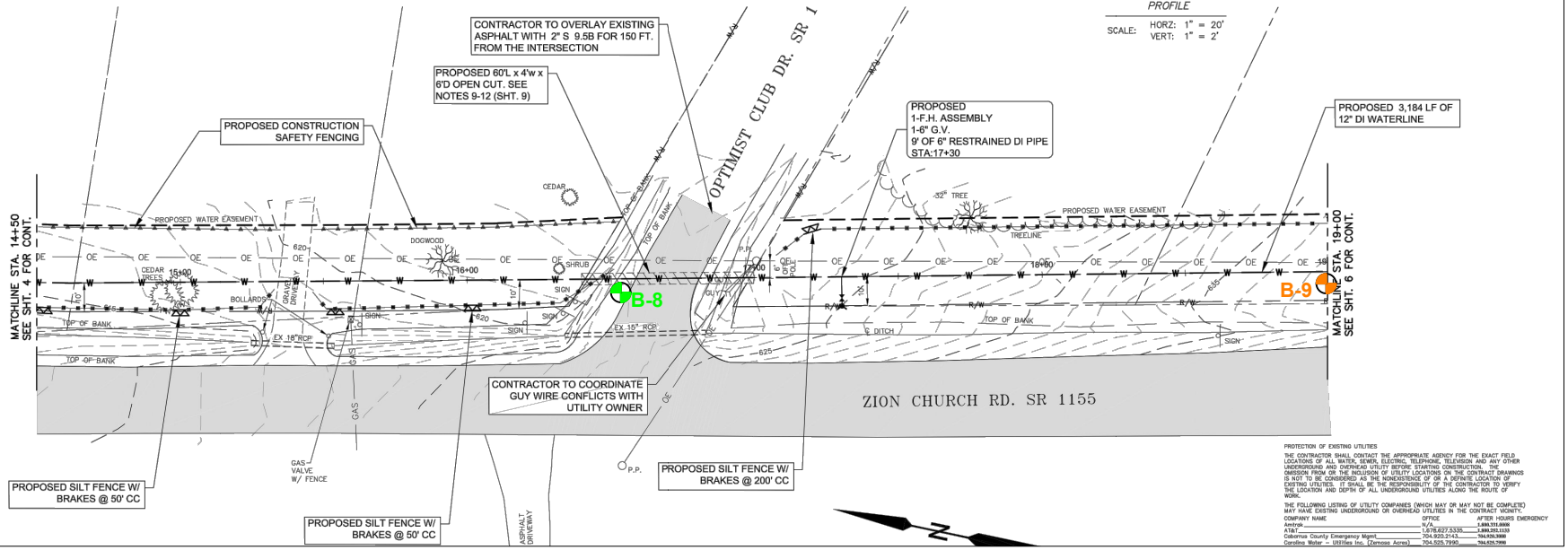
Project No.:	F22019.00
Scale:	1 in = 60 ft
Prepared by:	DB
Date:	05-26-22
Figure No.:	A4



PROFILE

SCALE: HORZ: 1" = 20'
VERT: 1" = 2'





PROFILE

SCALE: HORZ: 1" = 20'
VERT: 1" = 2'

PROTECTION OF EXISTING UTILITIES

THE CONTRACTOR SHALL CONTACT THE APPROPRIATE AGENCY FOR THE EXACT FIELD LOCATIONS OF ALL WATER, SEWER, ELECTRIC, TELEPHONE, TELEVISION AND ANY OTHER UNDERGROUND AND OVERHEAD UTILITY BEFORE STARTING CONSTRUCTION. THE OMISSION FROM OR THE INCLUSION OF UTILITY LOCATIONS ON THE CONTRACT DRAWINGS IS NOT TO BE CONSIDERED AS THE NONEXISTENCE OF OR A DEFINITE LOCATION OF EXISTING UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES ALONG THE ROUTE OF WORK.

THE FOLLOWING LISTING OF UTILITY COMPANIES (WHICH MAY OR MAY NOT BE COMPLETE) MAY HAVE EXISTING UNDERGROUND OR OVERHEAD UTILITIES IN THE CONTRACT VICINITY:

COMPANY NAME	OFFICE	AFTER HOURS EMERGENCY
Amtrak	N/A	1.800.331.0088
AT&T	1.978.627.5335	1.800.251.1133
Cabarrus County Emergency Mgmt.	704.920.2143	704.920.3000
Carolina Water – Utilities Inc. (Zemosa Acres)	704.525.7990	704.525.7990

©2022: All documents including computer files and drawings prepared by Stewart are instruments of professional service intended for one-time use. They are subject to copyright and other property right laws and shall remain the property of Stewart. They are not to be copied, modified, or changed in any manner whatsoever nor assigned to a third party without prior written permission of Stewart.

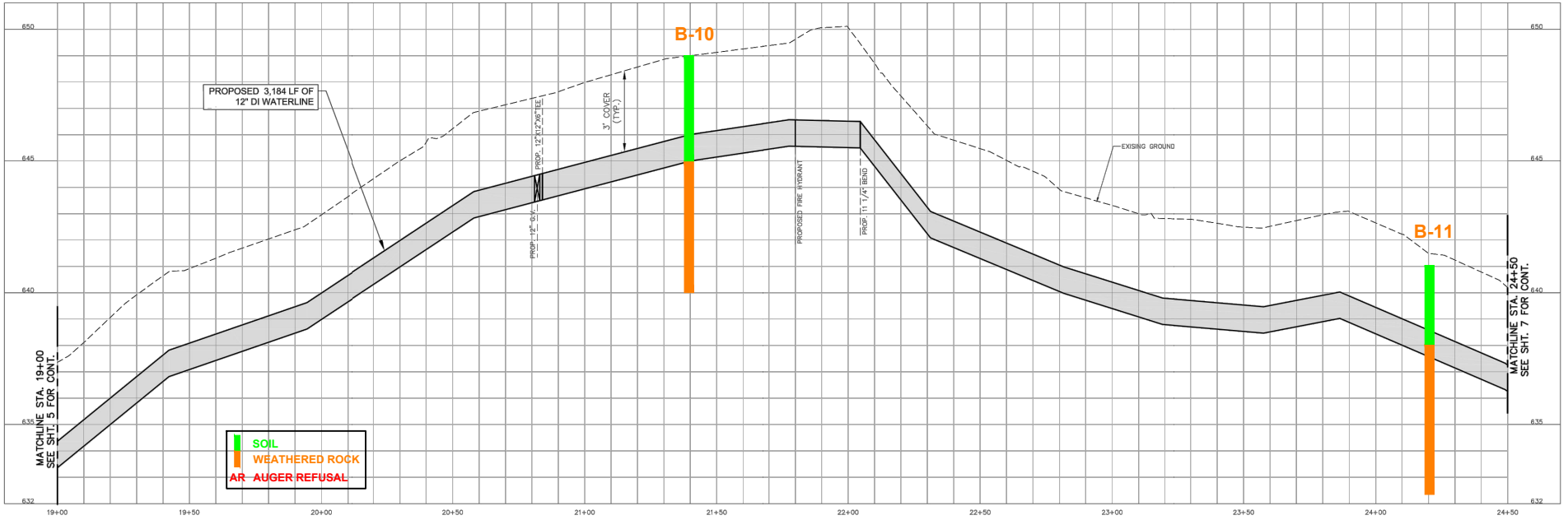
Note: All test locations are approximate (unless otherwise reported) and intended for illustration purposes only.

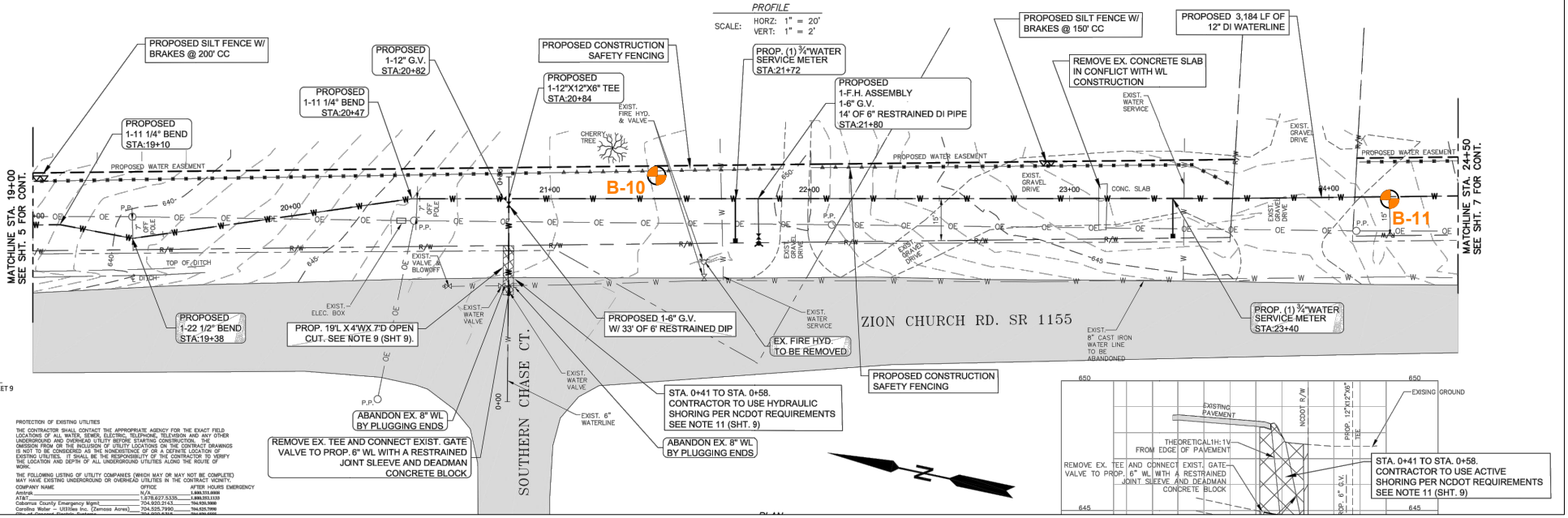
STEWART
9801-E SOUTHERN PINE BLVD
CHARLOTTE, NC 28273
T 704.334.7525
FIRM LICENSE #: C-1051
www.stewartinc.com

BORING LOCATION DIAGRAM
Zion Church Road
Water Line Extension
Zion Church Road
Concord, NC

Project No.:	F22019.00
Scale:	1 in = 60 ft
Prepared by:	DB
Date:	05-26-22

Figure No.: A5





©2022: All documents including computer files and drawings prepared by Stewart are instruments of professional service intended for one-time use. They are subject to copyright and other property right laws and shall remain the property of Stewart. They are not to be copied, modified, or changed in any manner whatsoever nor assigned to a third party without prior written permission of Stewart.

Note: All test locations are approximate (unless otherwise reported) and intended for illustration purposes only.

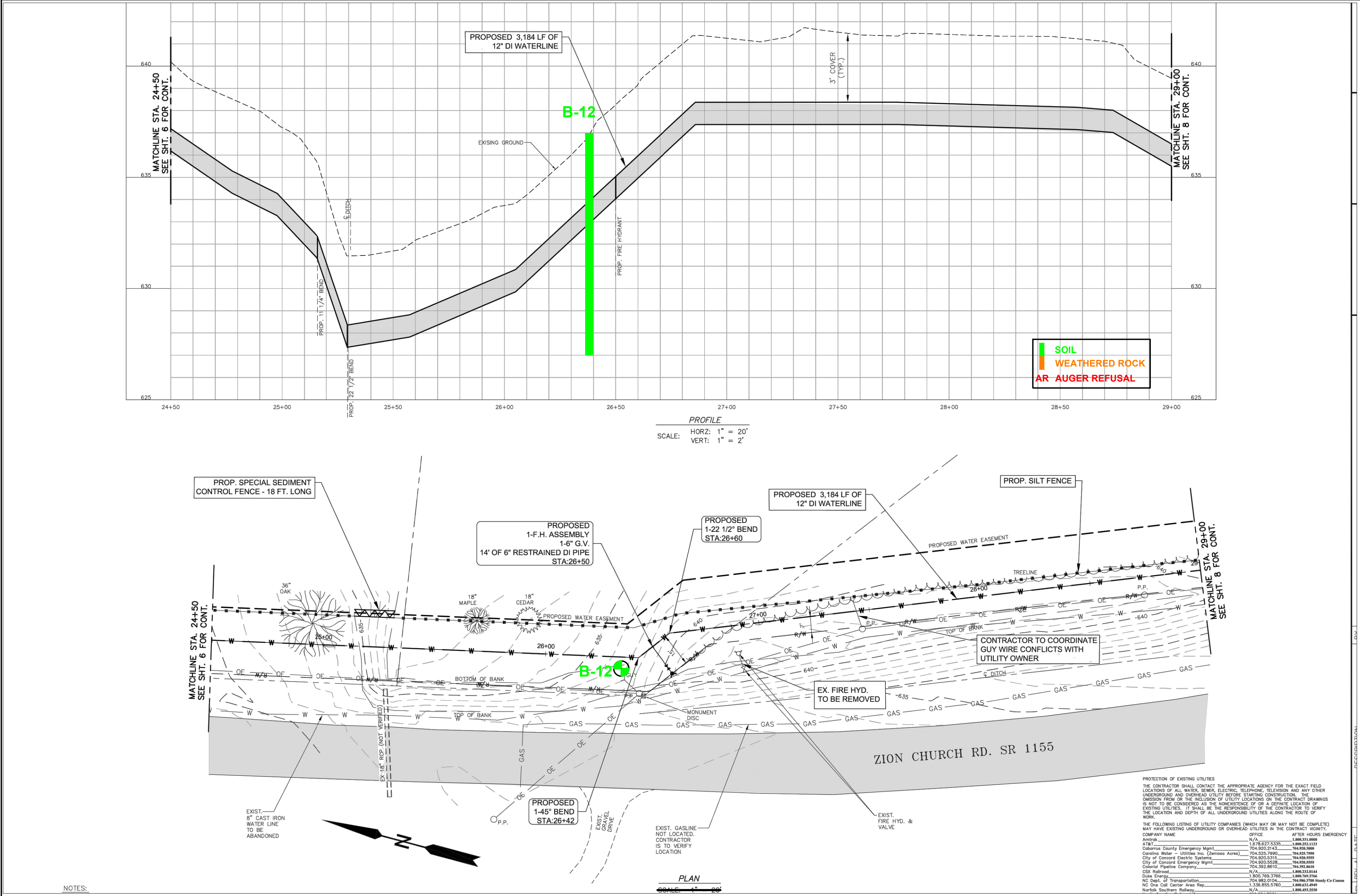
STEWART
9801-E SOUTHERN PINE BLVD
CHARLOTTE, NC 28273
T 704.334.7525
FIRM LICENSE #: C-1051
www.stewartinc.com

BORING LOCATION DIAGRAM

Zion Church Road
Water Line Extension
Zion Church Road
Concord, NC

Project No.:	F22019.00
Scale:	1 in = 60 ft
Prepared by:	DB
Date:	05-26-22

Figure No.: A6



©2022: All documents including computer files and drawings prepared by Stewart are instruments of professional service intended for one-time use. They are subject to copyright and other property right laws and shall remain the property of Stewart. They are not to be copied, modified, or changed in any manner whatsoever nor assigned to a third party without prior written permission of Stewart.

Note: All test locations are approximate (unless otherwise reported) and intended for illustration purposes only.

STEWART

9801-E SOUTHERN PINE BLVD
CHARLOTTE, NC 28273
T 704.334.7925

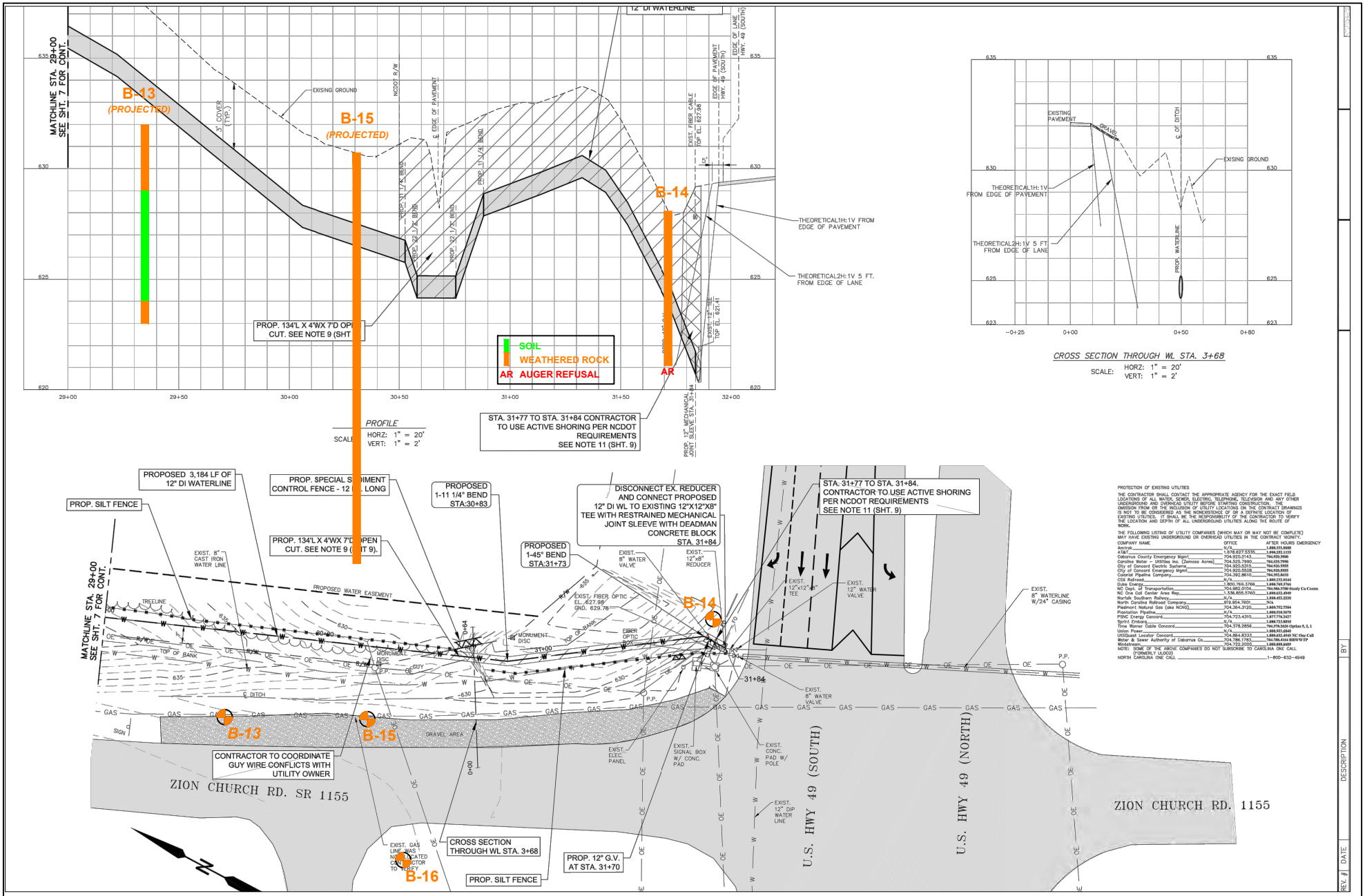
FIRM LICENSE #: C-1051
www.stewartinc.com

BORING LOCATION DIAGRAM

Zion Church Road
Water Line Extension
Zion Church Road
Concord, NC

Project No.:	F22019.00
Scale:	1 in = 60 ft
Prepared by:	DB
Date:	05-26-22

Figure No.: A7



©2022: All documents including computer files and drawings prepared by Stewart are instruments of professional service intended for one-time use. They are subject to copyright and other property right laws and shall remain the property of Stewart. They are not to be copied, modified, or changed in any manner whatsoever nor assigned to a third party without prior written permission of Stewart.

Note: All test locations are approximate (unless otherwise reported) and intended for illustration purposes only.

STEWART
9801-E SOUTHERN PINE BLVD
CHARLOTTE, NC 28273
T 704.334.7525
FIRM LICENSE #: C-1051
www.stewartinc.com

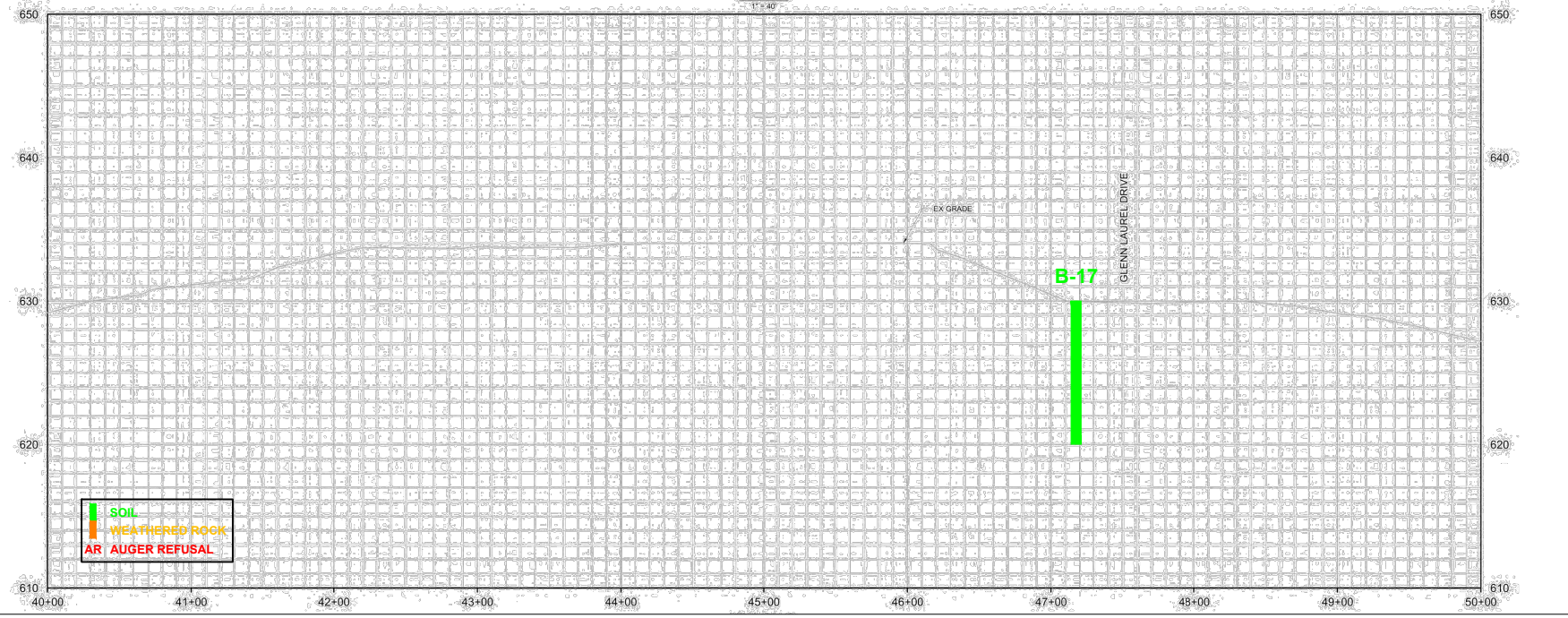
BORING LOCATION DIAGRAM
Zion Church Road
Water Line Extension
Zion Church Road
Concord, NC

Project No.:	F22019.00
Scale:	1 in = 60 ft
Prepared by:	DB
Date:	05-26-22

Figure No.: A8

PLAN

1" = 40'



©2022: All documents including computer files and drawings prepared by Stewart are instruments of professional service intended for one-time use. They are subject to copyright and other property right laws and shall remain the property of Stewart. They are not to be copied, modified, or changed in any manner whatsoever nor assigned to a third party without prior written permission of Stewart.

Note: All test locations are approximate (unless otherwise reported) and intended for illustration purposes only.

STEWART
9801-E SOUTHERN PINE BLVD
CHARLOTTE, NC 28273
T 704.334.7525
FIRM LICENSE #: C-1051
www.stewartinc.com

BORING LOCATION DIAGRAM

Zion Church Road
Water Line Extension
Zion Church Road
Concord, NC

Project No.:	F22019.00
Scale:	1 in = 60 ft
Prepared by:	DB
Date:	05-26-22

Figure No.:

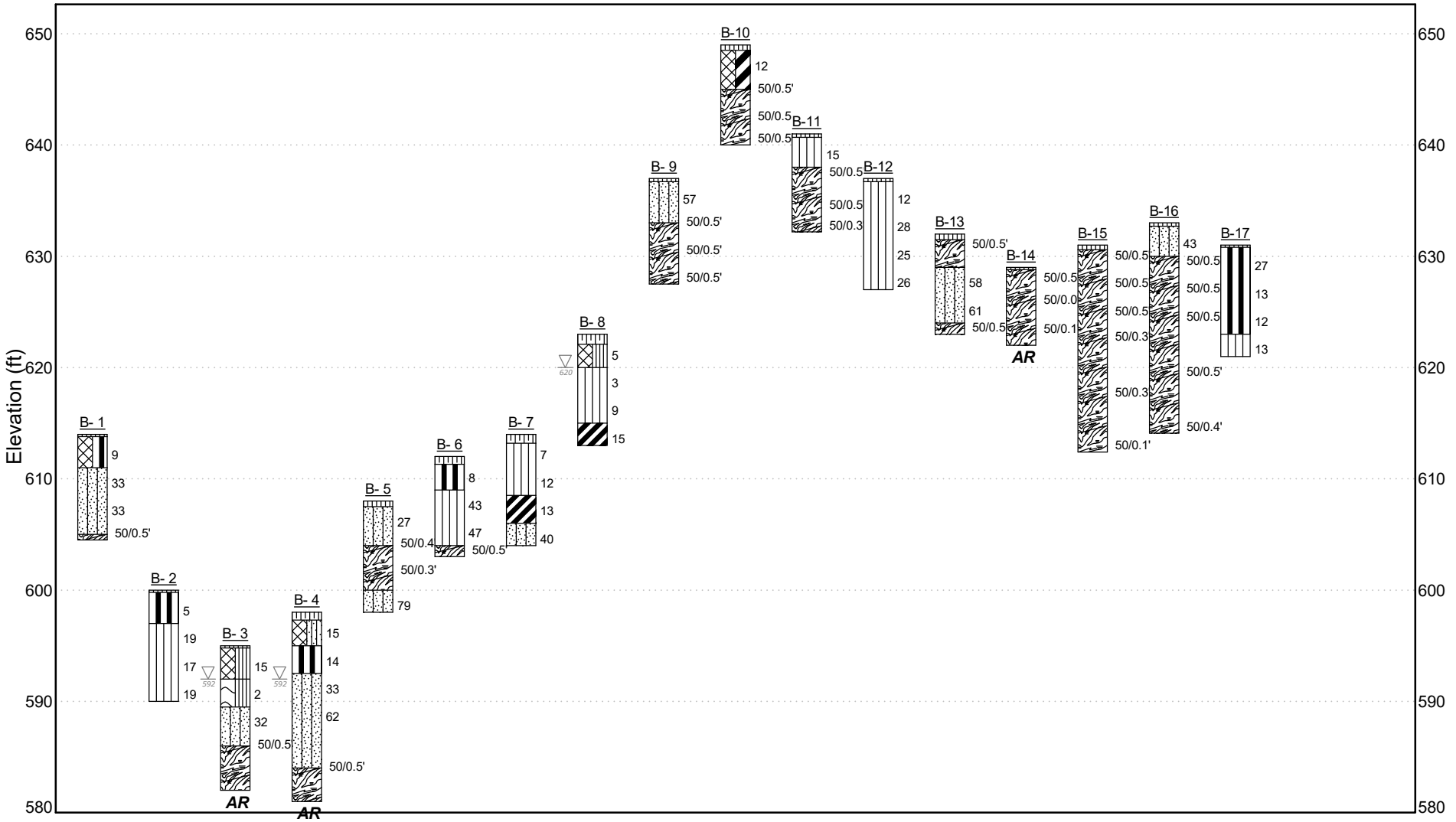
A9

APPENDIX B

BORING SNAPSHOT
BORING SUMMARY TABLE
BORING LOGS
LEGEND TO SOIL DESCRIPTIONS

STEWART

BORING SNAPSHOT



The borings in this snapshot are arranged in alphabetical order and do not represent a profile or cross section of the subsurface conditions.

LITHOLOGY GRAPHICS

- Topsoil / Organic Layer
- Fill - Elastic Silt (MH)
- Silty Sand (SM)
- Weathered Rock (WR)
- Elastic Silt (MH)
- Silt (ML)
- Fill - Silt (ML)
- Alluvium (ML)
- Fill - Silty Sand (SM)
- Fat Clay (CH)
- Fill - Fat Clay (CH)

ZION CHURCH ROAD WATER LINE EXTENSION

CONCORD, NC

PROJECT NO.: F22019.00

STEWART

BORING SUMMARY TABLE

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION **CLIENT** CITY OF CONCORD

LOCATION CONCORD, NC **PROJECT NO.** F22019.00

Borehole ID	Date Completed	Ground Surface El. (ft)	Boring Depth (ft)	Time of Drilling GW		After Drilling GW		Weathered Rock		Rock/Refusal	
				Depth (ft)	El. (ft)	Depth (ft)	El. (ft)	Depth (ft)	El. (ft)	Depth (ft)	El. (ft)
B- 1	5/16/2022	614	9.5	DRY		FIAD		9	605		
B- 2	5/16/2022	600	10	DRY		FIAD					
B- 3	5/16/2022	595	13	3	592	FIAD		9	586	13	582
B- 4	5/16/2022	598	17	6	592	FIAD		14	584	17	581
B- 5	5/16/2022	608	10	DRY		FIAD		4	604		
B- 6	5/16/2022	612	9	DRY		FIAD		8	604		
B- 7	5/16/2022	614	10	DRY		FIAD					
B- 8	5/16/2022	623	10	3	620	FIAD					
B- 9	5/16/2022	637	9.5	DRY		FIAD		4	633		
B-10	5/16/2022	649	9	DRY		FIAD		4	645		
B-11	5/16/2022	641	8.8	DRY		FIAD		3	638		
B-12	5/16/2022	637	10	DRY		FIAD					
B-13	5/17/2022	632	9	DRY		FIAD		0.5	631.5		
B-14	5/17/2022	629	7	DRY		FIAD		0.2	628.8	7	622
B-15	5/17/2022	631	18.6	DRY		FIAD		0.4	630.6		
B-16	5/17/2022	633	18.9	DRY		FIAD		3	630		
B-17	5/17/2022	631	10	DRY		FIAD					

Note: Blank cells indicate not encountered or not measured/recorded. Refer to the individual boring log and report for additional details

BORING LOG: B- 1

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN **GROUND SURFACE EL.** 614 ft **BORING DEPTH** 9.5 ft
DRILLING CONTRACTOR RDL DRILLING **TIME OF DRILLING: WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID) **AFTER DRILLING: WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.2		TOPSOIL	613.8						
	MH	**FILL** STIFF, RED-BROWN, MOIST TO WET, CLAYEY SILT WITH TRACE MICA AND GRAVEL			1 2.5	SS	1	3 4 5	9
3.0			611.0						
	SM	**RESIDUAL** DENSE, BROWN AND TAN, MOIST, SILTY MEDIUM TO COARSE SAND			3.5 5	SS	2	10 16 17	33
					6 7.5	SS	3	8 14 19	33
9.0			605.0						
9.5	WR	**WEATHERED ROCK** BROWN METAVOLCANICS, SAMPLED AS SILTY SAND	604.5		8.5 9.5	SS	4	12 50/0.5'	50/0.5
		BORING TERMINATED							

▲ SPT N-VALUE (BPF) 10 20 30 40 50 60 70 80 90
PL ● WC LL 10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%) 10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B- 2

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 600 ft **BORING DEPTH** 10 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.2		TOPSOIL	599.8						
	MH	**RESIDUAL** MEDIUM STIFF, BROWN AND ORANGE, MOIST TO WET, CLAYEY SILT			1 2.5	SS	1	2 2 3	5
3.0			597.0						
		VERY STIFF, GRAY AND TAN, WET, SANDY SILT WITH MICA			3.5 5	SS	2	4 8 11	19
	ML				6 7.5	SS	3	5 6 11	17
					8.5 10	SS	4	4 7 12	19
10.0		BORING TERMINATED	590.0						

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B- 3

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 595 ft **BORING DEPTH** 13 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: WL 3 ft **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: WL FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.2		TOPSOIL	594.8						
	ML	**FILL** STIFF, RED-BROWN, MOIST, SANDY SILT			1 2.5	SS	1	7 7 8	**15**
3.0			592.0	592					
	ML	**ALLUVIAL** VERY SOFT, DARK GRAY, SATURATED, SANDY SILT WITH TRACE ROOTLETS			3.5 5	SS	2	1 1 1	**2**
5.5			589.5						
	SM	**RESIDUAL** DENSE, GRAY AND TAN, MOIST TO WET, SILTY SAND WITH TRACE MICA			6 7.5	SS	3	4 10 22	**32**
9.0			586.0		8.5 9.5	SS	4	20 50/0.5'	**50/0.5'**
	WR	**WEATHERED ROCK** BROWN AND TAN METAVOLCANICS, SAMPLED AS SILTY FINE SAND							
13.0			582.0						

AUGER REFUSAL

▲ SPT N-VALUE (BPF) 10 20 30 40 50 60 70 80 90
PL ● WC LL 10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%) 10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B- 4

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 598 ft **BORING DEPTH** 17 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: WL 6 ft **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: WL FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.7		TOPSOIL	597.3						
	SM	**FILL** MEDIUM DENSE, BROWN, DRY, SILTY FINE SAND WITH TRACE ROCK FRAGMENTS			1 – 2.5	SS	1	5 8 7	**15**
3.0			595.0						
	MH	**RESIDUAL** STIFF, RED-BROWN AND TAN, MOIST, CLAYEY SILT			3.5 – 5	SS	2	5 6 8	**14**
5.5			592.5						
	SM	DENSE TO VERY DENSE, GRAY AND TAN, MOIST, SILTY SAND WITH MICA		592	6 – 7.5	SS	3	15 11 22	**33**
					8.5 – 10	SS	4	32 30 32	**62**
14.0			584.0						
	WR	**WEATHERED ROCK** BROWN AND TAN METAVOLCANICS, SAMPLED AS SILTY FINE SAND			13.5 – 14.5	SS	5	31 50/0.5'	**50/0.5'**
17.0			581.0						

AUGER REFUSAL

▲ SPT N-VALUE (BPF) 10 20 30 40 50 60 70 80 90
PL ● WC LL 10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%) 10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B- 5

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 608 ft **BORING DEPTH** 10 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.5		TOPSOIL	607.5						
	SM	**RESIDUAL** MEDIUM DENSE, TAN AND BROWN, MOIST, SILTY SAND WITH TRACE MICA			1 2.5	SS	1	9 13 14	27
4.0			604.0		3.5 4.4	SS	2	24 50/0.4'	50/0.4'
	WR	**WEATHERED ROCK** TAN AND BROWN METAVOLCANICS, SAMPLED AS SILTY SAND			6 6.8	SS	3	31 50/0.3'	50/0.3'
8.0			600.0						
	SM	VERY DENSE, BROWN, MOIST, SILTY SAND			8.5 10	SS	4	31 35 44	79
10.0		BORING TERMINATED	598.0						

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B- 6

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 612 ft **BORING DEPTH** 9 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.7		TOPSOIL	611.3						
	MH	**RESIDUAL** MEDIUM STIFF, BROWN, MOIST, CLAYEY SILT			1 2.5	SS	1	2 4 4	8
3.0			609.0						
	ML	HARD, GRAY AND TAN, DRY, FINE SANDY SILT			3.5 5	SS	2	12 18 25	43
					6 7.5	SS	3	11 19 28	47
8.0			604.0						
9.0	WR	**WEATHERED ROCK** BROWN METAVOLCANICS, SAMPLED AS SILTY FINE SAND	603.0		8.5 9	SS	4	50/0.5'	50/0.5'
		BORING TERMINATED							

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B- 7

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 614 ft **BORING DEPTH** 10 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.8		TOPSOIL	613.2						
	ML	**RESIDUAL** MEDIUM STIFF, BROWN, MOIST TO WET, CLAYEY SANDY SILT			1 2.5	SS	1	5 3 4	7
					3.5 5	SS	2	3 5 7	12
5.5			608.5						
	CH	STIFF, GRAY, TAN AND BROWN, WET, SILTY FAT CLAY			6 7.5	SS	3	4 5 8	13
8.0			606.0						
	SM	DENSE, GRAY AND BROWN, WET, CLAYEY SILTY SAND WITH MICA			8.5 10	SS	4	12 20 20	40
10.0		BORING TERMINATED	604.0						

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B- 8

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 623 ft **BORING DEPTH** 10 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: WL 3 ft **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: WL FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.9		TOPSOIL	622.1						
	ML	**FILL** MEDIUM STIFF, DARK BROWN, WET, SANDY SILT			1 2.5	SS	1	3 3 2	5
3.0			620.0	620					
	ML	**RESIDUAL** SOFT TO STIFF, TAN AND BROWN, SATURATED, SANDY SILT			3.5 5	SS	2	2 1 2	3
					6 7.5	SS	3	4 4 5	9
8.0			615.0						
	CH	STIFF, GRAY AND BROWN, WET, SILTY FAT CLAY			8.5 10	SS	4	6 7 8	15
10.0		BORING TERMINATED	613.0						

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B- 9

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 637 ft **BORING DEPTH** 9.5 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.3		TOPSOIL	636.7						
	SM	**RESIDUAL** VERY DENSE, TAN AND BROWN, MOIST, SILTY SAND WITH TRACE MICA			1 2.5	SS	1	25 26 31	57
4.0			633.0		3.5	SS	2	39 50/0.5'	50/0.5'
	WR	**WEATHERED ROCK** TAN AND BROWN METAVOLCANICS, SAMPLED AS SILTY SAND			4.5 6 7	SS	3	28 50/0.5'	50/0.5'
9.5		BORING TERMINATED	627.5		8.5 9.5	SS	4	32 50/0.5'	50/0.5'

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B-10

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 649 ft **BORING DEPTH** 9 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.5		TOPSOIL	648.5						
	CH	**FILL** STIFF, BROWN, MOIST, SILTY FAT CLAY			1 2.5	SS	1	4 5 7	12
4.0			645.0		3.5	SS	2	23	
	WR	**WEATHERED ROCK** GRAY AND BROWN METAVOLCANICS, SAMPLED AS SILTY SAND			4.5 6 7	SS	3	50/0.5' 30 50/0.5	**50/0.5'** **50/0.5**
9.0		BORING TERMINATED	640.0		8.5 9	SS	4	50/0.5'	**50/0.5'**

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B-11

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 641 ft **BORING DEPTH** 8.8 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.3		TOPSOIL	640.7						
	ML	**RESIDUAL** STIFF, RED-BROWN AND TAN, MOIST, SANDY SILT			1 2.5	SS	1	7 7 8	15
3.0			638.0						
	WR	**WEATHERED ROCK** TAN METAVOLCANICS, SAMPLED AS SILTY FINE SAND			3.5 4	SS	2	50/0.5'	50/0.5'
					6 7	SS	3	23 50/0.5'	50/0.5'
8.8		BORING TERMINATED	632.2		8.5 8.8	SS	4	50/0.3'	50/0.3'

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B-12

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/16/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 637 ft **BORING DEPTH** 10 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.3		TOPSOIL	636.7						
	ML	**RESIDUAL** STIFF TO VERY STIFF, TAN AND BROWN, MOIST, SILT WITH MICA			1 2.5	SS	1	4 5 7	12
					3.5 5	SS	2	10 12 16	28
					6 7.5	SS	3	7 10 15	25
					8.5 10	SS	4	8 12 14	26
10.0		BORING TERMINATED	627.0						

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

SILT (ML) IN UPPER 3 FEET POSSIBLY LIGHTWEIGHT.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B-13

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/17/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 632 ft **BORING DEPTH** 9 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.5		TOPSOIL	631.5						
	WR	**WEATHERED ROCK (LENS)** BROWN AND TAN METAVOLCANICS, SAMPLED AS SILTY SAND			1 1.5	SS	1	50/0.5'	50/0.5'
3.0			629.0						
	SM	**RESIDUAL** VERY DENSE, BROWN AND TAN, MOIST, SILTY SAND WITH MICA			3.5 5	SS	2	24 25 33	58
					6 7.5	SS	3	18 27 34	61
8.0			624.0						
9.0	WR	**WEATHERED ROCK** BROWN AND TAN METAVOLCANICS, SAMPLED AS SILTY SAND	623.0		8.5 9	SS	4	50/0.5'	50/0.5'
		BORING TERMINATED							

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B-14

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/17/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 629 ft **BORING DEPTH** 7 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.2		TOPSOIL	628.8						
	WR	**WEATHERED ROCK** GRAY AND TAN METAVOLCANICS, SAMPLED AS SILTY FINE TO MEDIUM SAND			1 / 1.5	SS	1	50/0.5'	**50/0.5'**
					3.5	SS	2	50/0.0'	**50/0.0'**
7.0		AUGER REFUSAL	622.0		6 / 6.1	SS	3	50/0.1'	**50/0.1'**

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

HARD DRILLING BELOW ~3 FEET

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B-15

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/17/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 631 ft **BORING DEPTH** 18.6 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.4		TOPSOIL	630.6						
	WR	**WEATHERED ROCK** GRAY AND TAN METAVOLCANICS, SAMPLED AS SILTY FINE TO MEDIUM SAND			1 – 1.5	SS	1	50/0.5'	50/0.5'
					3.5 – 4	SS	2	50/0.5'	50/0.5'
					6 – 6.5	SS	3	50/0.5'	50/0.5'
					8.5 – 8.8	SS	4	50/0.3'	50/0.3'
					13.5 – 13.8	SS	5	50/0.3'	50/0.3'
18.6		BORING TERMINATED	612.4		18.5 – 18.6	SS	6	50/0.1'	50/0.1'

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B-16

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/17/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 633 ft **BORING DEPTH** 18.9 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.3		TOPSOIL	632.7						
	SM	**RESIDUAL** DENSE, BROWN, GRAY AND TAN, MOIST, SILTY SAND			1 2.5	SS	1	9 18 25	43
3.0			630.0						
	WR	**WEATHERED ROCK** GRAY AND TAN METAVOLCANICS, SAMPLED AS SILTY FINE TO MEDIUM SAND			3.5 4	SS	2	50/0.5'	**50/0.5'**
					6 6.5	SS	3	50/0.5'	**50/0.5'**
					8.5 9	SS	4	50/0.5'	**50/0.5'**
					13.5 14	SS	5	50/0.5'	**50/0.5'**
18.9		BORING TERMINATED	614.1		18.5 18.9	SS	6	50/0.4'	**50/0.4'**

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

BORING LOG: B-17

STEWART

PROJECT ZION CHURCH ROAD WATER LINE EXTENSION
CLIENT CITY OF CONCORD
LOCATION CONCORD, NC
PROJECT NO. F22019.00

DATE DRILLED 05/17/22 **LOGGED BY** D. BROWN
GROUND SURFACE EL. 631 ft **BORING DEPTH** 10 ft
DRILLING CONTRACTOR RDL DRILLING
TIME OF DRILLING: **WL** DRY **CAVE-IN**
DRILLING METHOD HSA **AUGER SIZE** 2-1/4 INCH (ID)
AFTER DRILLING: **WL** FIAD **CAVE-IN**
DRILL RIG MOBILE B-47 **HAMMER TYPE** MANUAL

DEPTH (ft)	MATERIAL TYPE	MATERIAL DESCRIPTION	ELEVATION (ft)	WL / CAVE EL (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.2		TOPSOIL	630.8						
	MH	**RESIDUAL** STIFF TO VERY STIFF, RED-BROWN AND TAN, MOIST, CLAYEY SILT WITH TRACE MICA			1 2.5	SS	1	10 12 15	27
					3.5 5	SS	2	4 5 8	13
					6 7.5	SS	3	4 6 6	12
8.0			623.0						
	ML	STIFF, BROWN-TAN, MOIST, SILT WITH MICA			8.5 10	SS	4	4 6 7	13
10.0		BORING TERMINATED	621.0						

▲ SPT N-VALUE (BPF)
10 20 30 40 50 60 70 80 90
PL ● WC LL
10 20 30 40 50 60 70 80 90
☐ FINES CONTENT (%)
10 20 30 40 50 60 70 80 90

NOTE(S):
GSE INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE.

Note: SPT Blow Counts are per 6 inches of penetration unless otherwise noted.

UNIFIED SOIL CLASSIFICATION (ASTM D-2487)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	Cu>4 AND 1<Cc<3	GW	WELL-GRADED GRAVEL
			Cu>4 AND 1>Cc>3	GP	POORLY-GRADED GRAVEL
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR CL	GM	SILTY GRAVEL
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL
	SANDS >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	Cu>6 AND 1<Cc<3	SW	WELL-GRADED SAND
			Cu>6 AND 1>Cc>3	SP	POORLY-GRADED SAND
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR CL	SM	SILTY SAND
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT<50	INORGANIC	PI>7 AND PLOTS>"A" LINE	CL	LOW PLASTICITY (LEAN) CLAY
			PI>4 AND PLOTS<"A" LINE	ML	LOW PLASTICITY SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT
	SILTS AND CLAYS LIQUID LIMIT>50	INORGANIC	PI PLOTS >"A" LINE	CH	HIGH PLASTICITY (FAT) CLAY
			PI PLOTS <"A" LINE	MH	HIGH ELASTICITY SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT

MATERIAL TYPES ENCOUNTERED ONSITE

- Alluvium (ML)
- Fill - Fat Clay (CH)
- Fill - Silt (ML)
- Elastic Silt (MH)
- Silty Sand (SM)
- Weathered Rock (WR)
- Fat Clay (CH)
- Fill - Elastic Silt (MH)
- Fill - Silty Sand (SM)
- Silt (ML)
- Topsoil / Organic Layer

SAMPLE TYPES

- Split Spoon

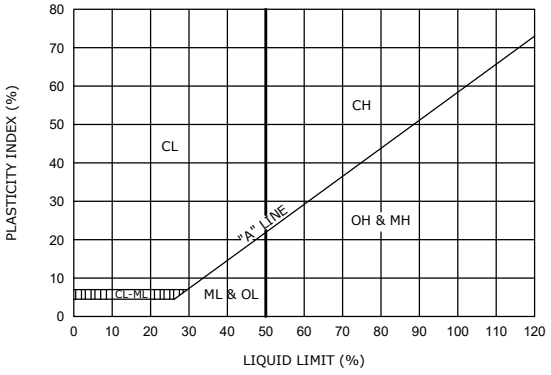
ADDITIONAL ABBREVIATIONS, TERMS, & SYMBOLS

HSA - HOLLOW-STEM AUGER
HA - HAND AUGER
SPT - STANDARD PENETRATION TEST
BPF - BLOWS PER FOOT
PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT
SS - SPLIT SPOON
AP - AUGER PROBE
WL - WATER LEVEL
USCS - UNIFIED SOIL CLASSIFICATION SYSTEM
WOH - WEIGHT OF HAMMER
WOR - WEIGHT OF RODS
EOD - END OF DAY

FIAD - FILLED IMMEDIATELY AFTER DRILLING/DIGGING
DRY - REQUIRES WETTING TO REACH OPTIMUM
MOIST - AT OR NEAR OPTIMUM
WET - REQUIRES DRYING TO REACH OPTIMUM
SAT - SATURATED, NEARLY LIQUID
TRACE - < 5%
FEW - 5 - 10% FEW - 15 - 25%
LITTLE - 15 - 25% SOME - 30 - 45%

▽ WATER LEVEL AT TIME OF DRILLING
▼ WATER LEVEL AFTER DRILLING
CAVE-IN LEVEL

PLASTICITY CHART



PENETRATION RESISTANCE

(RECORDED AS BLOWS PER 6 IN.)

SAND & GRAVEL		SILT & CLAY		
RELATIVE DENSITY	BLOWS/FOOT*	CONSISTENCY	BLOWS/FOOT*	UNDRAINED SHEAR STRENGTH (KSF)
VERY LOOSE	0 - 3	VERY SOFT	0 - 1	0 - 0.25
LOOSE	4 - 9	SOFT	2 - 4	0.26 - 0.50
MEDIUM DENSE	10 - 30	MEDIUM STIFF (FIRM)	5 - 8	0.51 - 1.0
DENSE	31 - 50	STIFF	9 - 15	1.1 - 2.0
VERY DENSE	51+	VERY STIFF	16 - 30	2.1 - 4.0
		HARD	31+	4.0+

* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

STEWART

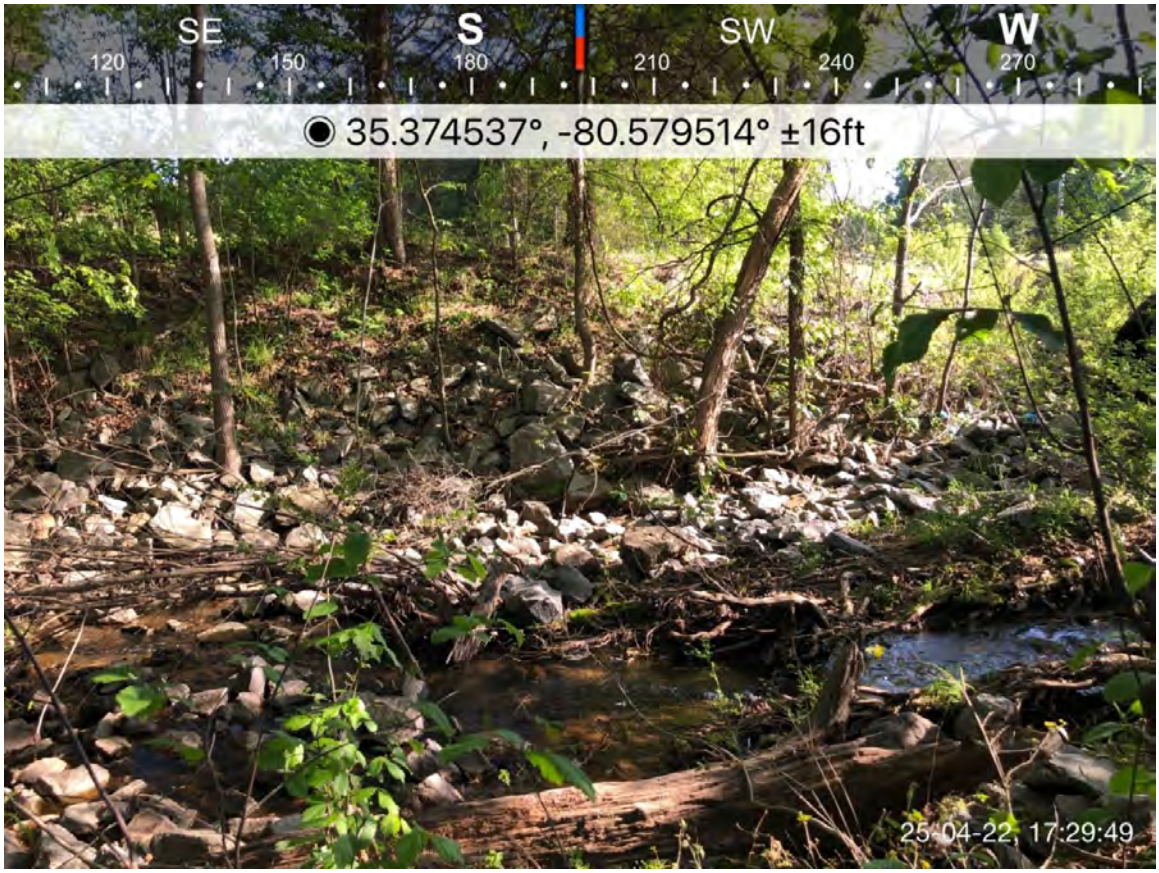
LEGEND TO SOIL DESCRIPTIONS

PROJECT NUMBER: F22019.00

APPENDIX C

SITE PHOTOGRAPHS

Photograph 1: Beginning of the project (boring B-1 in view).



Photograph 2: Conditions at the creek crossing between borings B-3 and B-4.

Photograph 3: Existing culvert between borings B-3 and B-4.

Photograph 4: Typical conditions along the residential properties.

Photograph 5: Open area at boring B-5.

Photograph 6: Looking south from just north of Optimist Club Drive.

Photograph 7: View looking south along the easement, toward the Hwy 49 intersection, from atop the slope.

Photograph 8: View looking west along Hwy 49 at Glen Laurel Drive (boring B-17).

APPENDIX B

NCDOT ENCROACHMENT AGREEMENT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

Mr. Enrique A. Blat
City of Concord
P.O. Box 308
Concord NC 2806-0308

JUN 29 2023

Subject: RW 16.1 Utility Encroachment Contract No. **E101-013-23-00120**
Location: NC49, SR1155, SR1500, & SR1569

Dear Mr. Blat:

Enclosed is an executed copy of the subject utility encroachment contract that has been reviewed by the appropriate authorities of the Department of Transportation's Division of Highways.

Scope of work to be performed:

The proposed installation consists of 227.5 LF of 12" DIP waterline and 19 LF of 6" DIP waterline by open cut trench within the NCDOT right of way.

Please contact **Marc Morgan** at mmorgan@ncdot.gov and/or **Darin Bratton** at dkbratton@ncdot.gov or by phone at 704-983-4360 before proceeding with this encroachment to schedule a pre-construction meeting before any work begins. Contact must be made a minimum of three (3) business days in advance to schedule the pre-construction meeting. A complete copy of this encroachment must be on site at all times during construction.

This approval is subject to the attached Special Provisions. Please reference the attached vicinity map and Plan Sheet with Typical Details that further illustrate this utility encroachment. This proposal shall conform to the new NCDOT Utilities Accommodations Manual, with strict adherence to NCDOT Standard Roadway Specification Requirements. **The new Utilities Manual can be found at https://connect.ncdot.gov/municipalities/Utilities/Pages/UtilitiesManuals.aspx.**

Sincerely,

Brett D. Canipe, PE
Division Engineer

mpm/dkb
Attachments
Cc: E-copy on online database

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION 10 DISTRICT 01
615 CONCORD ROAD
ALBEMARLE, NC 28001

Telephone: (704) 983-4360
Fax: (704) 982-9659
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
615 CONCORD ROAD
ALBEMARLE, NC 28001

ROUTE NC-49, SR-1155, SR-1500, SR-1569 PROJECT Zion Church Rd to NC-49 12-inch WL (CoC 2020-077) COUNTY OF CABARRUS STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

-AND-

CITY OF CONCORD
P.O. BOX 308
NC 2806-0308

RIGHT OF WAY ENCROACHMENT AGREEMENT
PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 29 day of June 20 23 by and between the Department of Transportation, party of the first part; and the City of Concord party of the second part,

WITNESSETH

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) NC-49, SR-1155, SR-1500, SR-1569, located at the intersection of NC-49 and SR-1155 Zion Church Rd, across SR-1500 Litaker Ln near the intersection with ST-1155, and across SR-1569 Optimist Club Dr near the intersection with SR-1155 Zion Church Rd with the construction and/or erection of: 134 LF of 12-in DIP waterline along SR-1155 Zion Church Rd at the NE corner of the intersection with NC-49; 19 LF of 6-in DIP waterline into SR-1155 Zion Church Rd, installed in a 19'L x 4'W x 4'D open cut trench; 34.5 LF of 12-in DIP waterline across SR-1500 Litaker Ln, installed in a 34.5'L x 4'W x 6.5'D open cut trench; and 59 LF of 12-in DIP waterline across SR-1569 Optimist Club Dr., installed in a 59'L x 4'W x 6'D open cut trench.

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the installation, operation, and maintenance of the above described facility will be accomplished in accordance with the party of the first part's latest UTILITIES ACCOMMODATIONS MANUAL, and such revisions and amendments thereto as may be in effect at the date of this agreement. Information as to these policies and procedures may be obtained from the Division Engineer or State Utilities Manager of the party of the first part.

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the construction site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

During the performance of this contract, the second party, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor"), agrees as follows:

a. Compliance with Regulations: The contractor shall comply with the Regulations relative to nondiscrimination in Federally-assisted programs of the U. S. Department of Transportation, Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

b. Nondiscrimination: The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials

and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

c. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

d. Information and Reports: The contractor shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Department of Transportation or the Federal Highway Administration to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the Department of Transportation, or the Federal Highway Administration as appropriate, and shall set forth what efforts it has made to obtain the information.

e. Sanctions for Noncompliance: In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the Department of Transportation shall impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to,

(1) withholding of payments to the contractor under the contract until the contractor complies, and/or
(2) cancellation, termination or suspension of the contract, in whole or in part.

f. Incorporation of Provisions: The contractor shall include the provisions of paragraphs "a" through "f" in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the Department of Transportation or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that, in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the Department of Transportation to enter into such litigation to protect the interests of the State, and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

R/W (161) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

BY: Butt D. Craig, mpa
DIVISION ENGINEER

ATTEST OR WITNESS:
City of Concord

Kim Deason
Kim Deason, City Clerk

City of Concord

Enrique A. Blat
Enrique A. Blat, P.E., Deputy City Engineer
Second Party

INSTRUCTIONS

When the applicant is a corporation or municipality this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official. In a way of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the State Utilities Manager. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the existing and/or proposed encroachment.
4. Length, size and type of encroachment.
5. Method of installation.
6. Dimensions showing the distance from the encroachment to edge of pavement, shoulders, etc.
7. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
8. Drainage structures or bridges if affected by encroachment (show vertical and horizontal dimensions from encroachment to nearest part of structure).
9. Method of attachment to drainage structures or bridges.
10. Manhole design.
11. On underground utilities, the depth of bury under all traveled lanes, shoulders, ditches, sidewalks, etc.
12. Length, size and type of encasement where required.
13. On underground crossings, notation as to method of crossing - boring and jacking, open cut, etc.
14. Location of vents.

GENERAL REQUIREMENTS

1. Any attachment to a bridge or other drainage structure must be approved by the State Utilities Manager in Raleigh prior to submission of encroachment agreement to the Division Engineer.
2. All crossings should be as near as possible normal to the centerline of the highway.
3. Minimum vertical clearances of overhead wires and cables above all roadways must conform to clearances set out in the National Electric Safety Code.
4. Encasements shall extend from ditch line to ditch line in cut sections and 5' beyond toe of slopes in fill sections.
5. All vents should be extended to the right of way line or as otherwise required by the Department.
6. All pipe encasements as to material and strength shall meet the standards and specifications of the Department.
7. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
8. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.

Pre-Construction

Contact Offices & Outside Agency issues/contacts/info

1. Approval may be rescinded upon failure to follow any of the provisions in this permit and may be considered a violation of the encroachment agreement.

2. The Encroaching party or their contractor shall provide the following notices prior to scheduling a preconstruction meeting for any construction activity within the NCDOT Right of Way:
    a. Three (3) business days advance phone call at telephone (704)983-4360 or email to Marc Morgan, mmorgan@ncdot.gov, or Darin Bratton, dkbratton@ncdot.gov, in the District Engineer's office
    ~~b. If the construction falls within the limits of an NCDOT managed construction project, five (5) business days advance phone call to the Resident Engineer, Mr. Chris Fine at 704-983-4380 or email to lcfine@ncdot.gov.~~

    Failure to provide these notifications prior to beginning construction is subject to the Division Engineer's discretion to cease construction activity for this encroachment. NCDOT reserves the right to cease any construction or maintenance work associated with this installation by the encroaching party until the construction or maintenance meets the satisfaction of the Division Engineer or their representative.

3. Prior to beginning work, it is the requirement of the Encroaching Party to contact the appropriate Utility Companies involved and make arrangements to adjust or relocate any utilities that conflict with the proposed work. The contractor must also reach out to local municipalities to obtain any maps they may have of utilities in the area. (ie. City of Concord, Stanly County Utilities etc.)

4. It shall be the responsibility of the encroaching party to determine the location of utilities within the encroachment area. NCGS § 87-115 through § 87-130 of the Underground Utility Safety and Damage Prevention Act requires underground utilities to be located by calling 811 prior to construction. The encroaching party shall be responsible for notifying other utility owners and providing protection and safeguards to prevent damage or interruption to existing facilities and maintain access to them.

5. The encroaching party shall notify the appropriate municipal office prior to beginning any work within the municipality's limits of jurisdiction.

~~6. This installation is within the Toll NC XXX right of way. The encroaching party shall notify the North Carolina Turnpike Authority (NCTA) at telephone (919) 825-2612 or e-mail neta_tmc@ncdot.gov at least ten (10) business days prior to beginning construction. The NCTA fiber trunk line shall be located prior to any excavation or boring within the Toll NC XXX right of way. The cost to repair or relocate any signage, cables, signals or associated equipment due to this installation shall be the responsibility of the encroaching party.~~

~~7. The encroaching party is made aware that the XXXXXX Expressway is a toll facility and as such, toll revenue is required to operate and maintain the facility. If any NCTA owned asset is damaged as a result of the encroaching party's construction, it shall be repaired at no cost to NCTA. Additionally, if the damage results in the failure or hindrance of NCTA to properly collect toll revenue (damaged~~

toll fiber, road closure, safety concern, etc.) the encroaching party will be sought to reimburse NCTA for the lost revenue.

8. This installation is within the NCDOT Division XX Interstate Corridor right of way. The encroaching party shall notify the following at least ten (10) business days prior to beginning construction: NCDOT Division XX Interstate Maintenance: Name, email@ncdot.gov or by phone at XXX-XXX-XXXX.

9. This installation is within the Mobility Partners (NCDOT Contractor) Managed I-77 Toll Corridor right of way. The encroaching party shall notify the following at least ten (10) business days prior to beginning construction:
    a. Mobility Partners: David Hannon, dhannon@i77partners.com or by phone at 980-337-2396 AND documentcontrol@i77partners.com.
    b. NCDOT Division 10 Interstate Maintenance: Michael Mariano, mamariano@ncdot.gov or by phone at 980-262-6260.
    c. The North Carolina Turnpike Authority (NCTA) at telephone (919) 825-2612 or e-mail ncta_tmc@ncdot.gov.

    The NCTA fiber trunk line shall be located prior to any excavation or boring within the Toll I-77 right of way. The cost to repair or relocate any structure, signage, cables, signals or associated equipment due to this installation shall be the responsibility of the encroaching party.

10. If any work is within 1000 feet of a signalized intersection, the encroaching parties shall contact NC811 for a locate before any work can begin. Cost to replace or repair NCDOT signs, signals, pavement markings or associated equipment and facilities shall be the responsibility of the encroaching party.

11. This agreement does not authorize installations within nor encroachment onto railroad rights of way. Permits for installations within railroad right of way must be obtained from the railroad and are the responsibility of the encroaching party.

12. At the option of the District Engineer, a preconstruction meeting including representatives of NCDOT, the encroaching party, contractors and municipality, if applicable, shall be required. A pre-construction conference held between a municipality (or other facility owner) and a contractor without the presence of NCDOT personnel with subsequent construction commencing may be subject to NCDOT personnel ceasing any work on NCDOT right-of-way related to this encroachment until such meeting is held. Contact the District office to schedule.

13. At the discretion of the District Engineer, a NOTIFICATION FOR UTILITY / NON-UTILITY ENCROACHMENT WITHIN NCDOT R/W form (See corresponding attachment) with the scheduled pre-construction meeting and associated construction schedule details must be completed and submitted to the District Engineer's office a minimum of one week prior to construction.

14. At the discretion of the District Engineer, the encroaching party (not the utility contractor) shall make arrangements to have a qualified inspector, under the supervision of a Professional Engineer registered in North Carolina, on site at all times during construction at no cost to the NCDOT. The registered Professional Engineer shall be required to submit a signed and PE sealed certification that the utility was installed in accordance with the encroachment agreement.

Legal & Right-of-Way Issues

15. This approval and associated plans and supporting documents shall not be interpreted to allow any design change or change in the intent of the design by the Owner, Design Engineer, or any of their representatives. Any revisions or changes to these approved plans or intent for construction must be obtained in writing from the Division Engineer's office or their representative prior to construction or during construction if an issue arises during construction to warrant changes.

16. NCDOT does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought about by any property owner by reason of this installation. It is the responsibility of the encroaching party to verify the right of way.

17. Encroaching party shall be responsible for obtaining all necessary permanent and/or temporary construction, drainage, utility and/or sight distance easements.

18. All Right of Way and easements necessary for construction and maintenance shall be dedicated to NCDOT with proof of dedication furnished to the District Engineer prior to beginning work.

19. No commercial advertising shall be allowed within NCDOT Right of Way.

20. The encroaching party shall obtain proper approval from all affected pole owners prior to attachment to any pole.

21. The installation within the Control of Access fence shall not adversely affect the design, construction, maintenance, stability, traffic safety or operation of the controlled access highway, and the utility must be serviced without access from the through-traffic roadways or ramps.

Bonds

~~22. A Performance and Indemnity Bond in the amount of $x,xxx.xx shall be posted with the District Engineer's Office by the Party of the Second Part prior to beginning any work within the NCDOT Right of Way. The bond shall be held for a minimum of one year after a satisfactory final inspection of the installation by NCDOT. The bond may be held for a period longer than one year after completion if, in the opinion of NCDOT, the size or complexity of the installation warrants a longer period.~~

~~23. The release of the bond is subject to a final inspection by NCDOT. Contact the District office to schedule a Final Inspection and to request release of the bond.~~

Work Zone Traffic

24. Traffic control shall be coordinated with the District Engineer's representative/inspector prior to construction.

25. WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM

    All personnel performing any activity inside the highway right of way are required to be familiar with the NCDOT Maintenance / Utility Traffic Control Guidelines (MUTCG). No specific training course or test is required for qualification in the Maintenance /Utility Traffic Control Guidelines (MUTCG).

    All flagging, spotting, or operating Automated Flagger Assist Devices (AFAD) inside the highway right of way requires qualified and trained Work Zone Flaggers. Training for this certification is provided by NCDOT approved training resources and by private entities that have been pre-approved to train themselves.

All personnel involved with the installation of Work Zone Traffic Control devices inside the highway right of way are required to be qualified and trained Work Zone Installers. Training for this certification is provided by NCDOT approved training resources and by private entities that have been pre-approved to train themselves.

All personnel in charge of overseeing work zone Temporary Traffic Control operations and installations inside the highway right of way are required to be qualified and trained Work Zone Supervisors. Training for this certification is provided by NCDOT approved training resources and by private entities that have been pre-approved to train themselves.

For questions and/or additional information regarding this training program please refer to https://connect.ncdot.gov/projects/WZTC/Pages/Training.aspx or call the NCDOT Work Zone Traffic Control Section (919) 814-5000.

26. The party of the second part shall employ traffic control measures that are in accordance with the prevailing federal, state, local, and NCDOT policies, standards, and procedures. These policies, standards, and procedures include, but are not limited to the following:
    a. Manual on Uniform Traffic Control Devices (MUTCD) – North Carolina has adopted the MUTCD to provide basic principles and guidelines for traffic control device design, application, installation, and maintenance. North Carolina uses the MUTCD as a minimum requirement where higher supplemental standards specific to North Carolina are not established. Use fundamental principles and best practices of MUTCD (Part 6, Temporary Traffic Control).
    b. NCDOT Maintenance / Utility Traffic Control Guidelines – This document enhances the fundamental principles and best practices established in MUTCD Part 6, Temporary Traffic Control, incorporating NCDOT-specific standards and details. It also covers important safety knowledge for a wide range of work zone job responsibilities.

27. If the Traffic Control Supervisor determines that portable concrete barrier (PCB) is required to shield a hazard within the clear zone, then PCB shall be designed and sealed by a licensed North Carolina Professional Engineer. PCB plans and design calculations shall be submitted to the District Engineer for review and approval prior to installation.

28. Ingress and egress shall be maintained to all businesses and dwellings affected by the project. Special attention shall be paid to police, EMS and fire stations, fire hydrants, secondary schools, and hospitals.

29. Traffic shall be maintained at all times. All lanes of traffic are to be open during the hours of 7:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 6:00 P.M. Monday through Friday, during any time of inclement weather, **or as directed by the District Engineer**. Any violation of these hours will result in ceasing any further construction by the Encroaching Party or their contractor.

30. Nighttime and weekend operations will NOT be allowed unless written approval is received from the District Engineer. If nighttime or weekend work is allowed or required, all signs must be retro-reflective, and a work zone lighting plan must be submitted for approval prior to construction.

31. Two-way traffic shall be maintained at all times unless designated by the District Engineer. Traffic shall not be rerouted or detoured without the prior written approval from the District Engineer. No utility work will be allowed on state holidays from 7:00 PM the night before through 9:00 AM the day prior to, following or during local events without prior approval from the District Engineer. If the construction is within 1000 feet of a school location or on a designated bus route, the construction shall be coordinated with the school start and end times to avoid traffic delays.

32. Work requiring lane or shoulder closures shall not be performed on both sides of the road simultaneously within the same area.

33. Any work requiring equipment or personnel within 5 feet of the edge of any travel lane of an undivided facility and within 10 feet of the edge of any travel lane of a divided facility shall require a lane closure with appropriate tapers per current *NCDOT Roadway Standard Drawings or MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES*.

34. At the discretion of the District Engineer, a traffic control plan shall be developed and submitted under the seal and signature of a Licensed North Carolina Professional Engineer prior to construction. The plan shall be specific to the site and adequately detailed. Issues such as the close proximity to intersections shall be addressed.

35. Temporary and final pavement markings are the responsibility of the encroaching party. Final pavement markings and sign plans shall be submitted with the encroachment request to the Division Traffic Engineer prior to construction. Final pavement markings shall be thermoplastic unless otherwise directed by the Division Traffic Engineer or District Engineer.

36. Any pavement markings that are damaged or obliterated shall be restored by the encroaching party at no expense to NCDOT.

37. Sidewalk closures shall be installed as necessary. Pedestrian traffic shall be detoured around these closures and shall be signed appropriately and in accordance with The American with Disabilities Act Accessibility Guidelines. The encroaching party must adhere to the guidelines for accommodating pedestrians in encroachment work zones as described in the NCDOT Pedestrian Work Zone Accommodations Training found at https://www.youtube.com/watch?v=AOuYa5IW3dg&feature=youtu.be

Roadside Environmental

38. The encroaching party shall comply with all applicable Federal, State and local environmental regulations and shall obtain all necessary Federal, State and local environmental permits, including but not limited to, those related to sediment control, stormwater, wetland, streams, endangered species and historical sites. Additional information can be obtained by contacting the NCDOT Roadside Environmental Engineer regarding the North Carolina Natural Heritage Program or the United States Fish and Wildlife Services. Contact the Division Roadside Environmental Engineer's Office at 704-244-8260.

39. When surface area in excess of one acre will be disturbed, the Encroacher shall submit a Sediment and Erosion Control Plan which has been approved by the appropriate regulatory agency or authority prior to beginning any work on the Right of Way. Failure to provide this information shall be grounds for suspension of operations. Proper temporary and permanent measures shall be used to control erosion and sedimentation in accordance with the approved sediment and erosion control plan.

40. The Verification of Compliance with Environmental Regulations (VCER-1) form is required for all non-utility encroachment agreements or any utility encroachments when land disturbance within NCDOT right of way exceeds 1 acre. The VCER-1 form must be PE sealed by a NC registered professional engineer who has verified that all appropriate environmental permits (if applicable) have been obtained and all applicable environmental regulations have been followed.

41. All erosion control devices and measures shall be constructed, installed, maintained, and removed by the Encroacher in accordance with all applicable Federal, State, and Local laws, regulations,

ordinances, and policies. Permanent vegetation shall be established on all disturbed areas in accordance with the recommendations of the Division Roadside Environmental Engineer. All areas disturbed (shoulders, ditches, removed accesses, etc.) shall be graded and seeded in accordance with the latest *NCDOT Standards Specifications for Roads and Structures* and within 15 calendar days with an approved NCDOT seed mixture (all lawn type areas shall be maintained and reseeded as such). Seeding rates per acre shall be applied according to the Division Roadside Environmental Engineer. Any plant or vegetation in the NCDOT planted sites that is destroyed or damaged as a result of this encroachment shall be replaced with plants of like kind or similar shape.

42. No trees within NCDOT shall be cut without authorization from the Division Roadside Environmental Engineer. An inventory of trees measuring greater than 4 caliper inches (measured 6" above the ground) is required when trees within C/A right of way will be impacted by the encroachment installation. Mitigation is required and will be determined by the Division Roadside Environmental Engineer's Office.

43. Prior to installation, the Encroaching Party shall contact the District Engineer to discuss any environmental issues associated with the installation to address concerns related to the root system of trees impacted by boring or non-utility construction of sidewalk, roadway widening, etc.

44. The applicant is responsible for identifying project impacts to waters of the United States (wetlands, intermittent streams, perennial streams and ponds) located within the NCDOT right-of-way. The discharge of dredged or fill material into waters of the United States requires authorization from the United States Army Corps of Engineers (USACE) and certification from the North Carolina Division of Water Quality (NCDWQ). The applicant is required to obtain pertinent permits or certification from these regulatory agencies if construction of the project impacts waters of the United States within the NCDOT right-of-way. The applicant is responsible for complying with any river or stream Riparian Buffer Rule as regulated by the NCDWQ. The Rule regulates activity within a 50-foot buffer along perennial streams, intermittent streams and ponds. Additional information can be obtained by contacting the NCDWQ or the USACE.

45. The contractor shall not begin the construction until after the traffic control and erosion control devices have been installed to the satisfaction of the Division Engineer or their agent.

46. The contractor shall perform all monitoring and record keeping and any required maintenance of erosion and sediment control measures to maintain compliance with stormwater regulations.

STIP (or Division Managed) Projects

47. ~~State Transportation Improvement Project (STIP) U-5806 is currently under construction. Any encroachment determined to be in conflict with the construction of this NCDOT project shall be removed and/or relocated at the encroaching party's expense. Contractor must coordinate with NCDOT inspector during construction to ensure there is no conflict.~~

Construction

General

48. An executed copy of the encroachment agreement, provisions and approved plans shall be present at the construction site at all times. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.

49. The Encroaching Party and/or their Contractor shall comply with all OSHA requirements. If OSHA visits the work area associated with this encroachment, the District Office shall be notified by the encroaching party immediately if any violations are cited.

50. Any REVISIONS marked in RED on the attached non-PE sealed plans shall be incorporated into and made part of the approved encroachment agreement.

51. All disturbed areas are to be fully restored to current NCDOT minimum roadway standards or as directed by the Division Engineer or their representative. Disturbed areas within NCDOT Right-of-Way include, but not limited to, any excavation areas, pavement removal, drainage or other features.

52. The encroaching party shall notify the Division Engineer or their representative immediately in the event any drainage structure is blocked, disturbed or damaged. All drainage structures disturbed, damaged or blocked shall be restored to its original condition as directed by the Division Engineer or their representative.

53. A minimum of 5 feet clearance is required for utility installations beneath or near drainage pipes, headwalls, and a minimum of two-foot clearance below the flowline of streams. If directional drilling, a minimum ten-foot clearance distance is required from drainage structures and a minimum of 5 feet below flowline of streams.

54. At points where the utility is placed under existing storm drainage, the trench will be backfilled with excavatable flowable fill up to the outside diameter of the existing pipe.

55. Unless specified otherwise, during non-working hours, equipment shall be located away from the job site or parked as close to the right of way line as possible and be properly barricaded in order not to have any equipment obstruction within the Clear Zone. Also, during non-working hours, no parking or material storage shall be allowed along the shoulders of any state-maintained roadway.

56. No access to the job site, parking or material storage shall be allowed along or from the **Control of Access Roadway.**

57. Guardrail removed or damaged during construction shall be replaced or repaired to its original condition, meeting current NCDOT standards or as directed by the Division Engineer or their representative.

58. The resetting of the Control of Access fence shall be in accordance with the applicable NCDOT standard and as directed by the Division Engineer or their representative.

59. Right of Way monuments disturbed during construction shall be referenced by a registered Land Surveyor and reset after construction.

60. All Traffic signs moved during construction shall be reinstalled as soon as possible to the satisfaction of the Division Engineer or their representative.

61. Any utility markers, cabinets, pedestals, meter bases and services for meter reading required shall be as close to the Right of Way line as possible. If it is not feasible to install at or near Right of Way line, then written approval shall be obtained from NCDOT prior to installation.

62. Detection tape, where required by NCGS § 87-115 through § 87-130 of the Underground Utility Safety and Damage Prevention Act, shall be buried in the trench approximately 1 foot above the installed facility. Where conduit is installed in the right of way and is not of ferrous material, locating tape or detection wire shall be installed with the conduit.

63. All driveways disturbed during construction shall be returned to a state comparable with the condition of the driveways prior to construction.

64. Conformance with driveway permit review should be required in conjunction with this encroachment agreement. In the event there is a conflict between the driveway permit and the encroachment agreement, the District Engineer should resolve the conflict and notify the parties involved.

65. If the approved method of construction is unsuccessful and other means are required, prior approval must be obtained through the District Engineer before construction may continue.

66. The encroaching party and their construction contractor must sign and submit the NCDOT *Workforce Safety Plan for Encroachment Activities: COVID-19* form to the District Engineer prior to construction.

67. The attached Duke Energy response to the NCDOT *COVID-19 Workforce Safety Plan* shall be applied for all employees on the job site unless otherwise directed by the District Engineer.

Engineering

68. All traffic control, asphalt mixes, structures, construction, workmanship and construction methods, and materials shall be in compliance with the most-recent versions of the following resources: *ASTM Standards*, *Manual on Uniform Traffic Control Devices, NCDOT Utilities Accommodations Manual, NCDOT Standard Specifications for Roads and Structures, NCDOT Roadway Standard Drawings,* NCDOT *Asphalt Quality Management System* manual, **and the approved plans.**

69. Prior approval for any blasting must be obtained from the Division Engineer or their representative.

70. Regulator stations, risers, metering stations, cathodic test stations, and anode beds are not permitted within NCDOT right of way. Header wires are permitted.

71. Non-Utility Communication and Data Transmission installations (ground mounted type or Small Cell pole-mounted type) must adhere to guidelines in the Utilities Accommodations Manual and, when located within municipal jurisdictions, are subject to review and approval by municipal ordinances and any additional municipal approval for proximity to historic districts and landmarks. All wiring and related telecommunications work shall conform to the latest regulations by the Federal Communications Commission.

72. All wiring and related electrical work shall conform to the latest edition of the National Electrical Safety Code.

Location within R/W

73. All utility access points, such as manholes, vaults, handholes, splice boxes and junction boxes shall be located as close to the right of way line as possible and shall not be placed in the ditch line, side slopes of the ditches or in the pavement. All manholes, handholes, splice boxes, junction boxes and vaults and covers shall be flush with the ground when located within the vehicle clear zone. Slack loops for telecommunications in industry standard housing units shall be buried a minimum of 18 inches when buried or meet minimum NCDOT vertical and horizontal clearances when installed aerially.

74. Fire Hydrants shall be of the breakaway type. Hydrants shall be placed near the right of way line. In curb and gutter sections with written approval from the District, the hydrants may be placed at 6' behind the back of the curb or minimum 2' back of sidewalk.

75. Luminaire and/or utility poles and guy wires shall be set as close to the Right of Way line as practical and outside the Clear Zone in accordance with the latest version of the AASHTO Roadside Design Guide (See corresponding attachment) or made breakaway in accordance with the requirements of NCHRP Report 350. Any relocation of the utility poles from the original design due to Clear Zone requirements shall require a re-submittal for the utility design.

76. Luminaire and/or utility poles shall be set a minimum of 5'-6" behind face of any guardrail or otherwise sufficiently protected. However, standard placement may be reduced to 3'-6" behind face of guardrail when posts are spaced 3'-1 ½", or where speed limit is less than 55 MPH.

77. Hot box (aka ASSE 1060) or Safe-T-Cover type enclosures covering utility main pipe joints, backflow preventers, valves, vent pipes, cross connections, pumps, grinders, irrigation assemblies, transformers, generators, and other similar large appurtenances shall be located outside sight distance triangles and off of the NCDOT Right-of-Way.

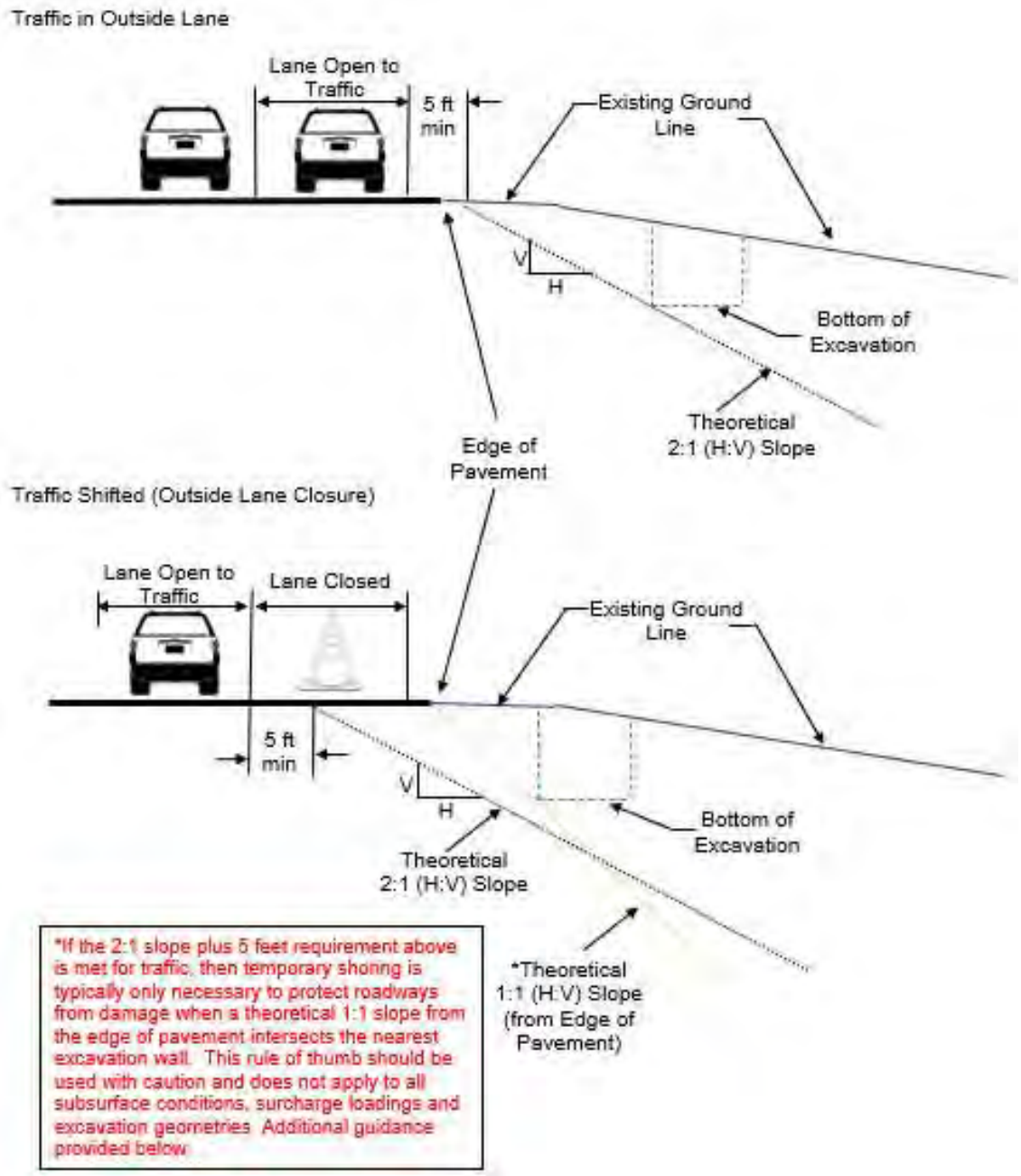
78. Sprinkler heads shall be located a minimum of 10 feet from the edge of pavement, edge of shoulder, or back of curb whichever is greater and shall be directed so that water does not spray or drain on the roadway surface, sidewalk, or passing vehicles at any time. Upon completion of the installation and prior to activation of the system, the Encroacher shall contact the District Engineer to schedule a test of the system to verify the spray pattern. Sprinkler systems shall not be operated during periods of high wind or freezing weather, or to the extent that the subgrade adjacent to the pavement structure becomes saturated. NCDOT reserves the right to require immediate termination and removal of any sprinkler system which in its judgement and opinion adversely affects safety, maintenance, or operation of the roadway.

Excavation

79. Excavation material shall not be placed on pavement.

80. It is the responsibility of the encroaching party or their contractor to prevent any mud/dirt from tracking onto the roadway. Any dirt which may collect on the roadway pavement from equipment and/or truck traffic on site shall be immediately removed to avoid any unsafe traffic conditions.

81. The utility shall be installed within 5 feet of the right of way line and outside the 5-foot minimum from travel lane plus theoretical 2:1 slope from the edge of pavement to the bottom of the nearest excavation wall for temporary shoring. Temporary shoring is required when a theoretical 2:1 slope from the bottom of excavation will intersect the existing ground line less than 5 feet from the outside edge of an open travel lane as shown in the figure below or when a theoretical 2:1 slope from the bottom of excavation will intersect any existing structure, support, utility, property, etc. to be protected.



If the 2:1 slope plus 5 feet requirement above is met for traffic, then temporary shoring is typically only necessary to protect roadways from damage when a theoretical 1:1 slope from the edge of pavement intersects the nearest excavation wall. This rule of thumb should be used with caution and does not apply to all subsurface conditions, surcharge loadings and excavation geometries. Situations where this 1:1 slope is not recommended include groundwater depth is above bottom of excavation or excavation is deeper than 10 feet or in Type B or C soils as defined by OSHA Technical Manual. Temporary shoring may be avoided by locating trenches, bore pits, and other excavations far enough away from the open travel lane, edge of pavement and any existing structure, support, utility, property, etc. to be protected.

Temporary shoring shall be designed and constructed in accordance with current NCDOT Standard Temporary Shoring provisions (refer to https://connect.ncdot.gov/resources/Specifications/Pages/2018-Specifications-and-Special-Provisions.aspx and see SP11 R002

a. Temporary excavation shoring, such as sheet piling, shall be installed. The design of the shoring shall include the effects of traffic loads. The shoring system shall be designed and sealed by a licensed North Carolina Professional Engineer. Shoring plans and design calculations shall be submitted to the Division Engineer for review and approval prior to construction. (See NCDOT *Utilities Accommodations Manual* for more information on requirements for shoring plans, design calculations, and subsurface investigation report.) **Trench boxes shall not be accepted as temporary shoring and will not be approved for use in instances where shoring is required to protect the highway, drainage structure, and/or supporting pavement or structure foundation**.
b. All trench excavation inside the limits of the theoretical two-to-one slope plus 5 feet requirement, as defined by the policy, shall be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight. Any excavation that is not backfilled by the end of the workday must address any safety and traveling public concerns including accommodations for bicycles, pedestrians and persons with disabilities.
c. The trench backfill material shall meet the Statewide Borrow Criteria. The trench shall be backfilled in accordance with Section 300-7 of the latest *NCDOT Standard Specifications for Roads and Structures,* which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted to at least 95% of the density obtained by compacting a sample in accordance with AASHTO T99 as modified by DOT.
d. At the discretion of the Division Engineer, a qualified NCDOT inspector shall be on the site at all times during construction. The encroaching party shall reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector, under the supervision of a licensed North Carolina Professional Engineer, on the site at all times. The Professional Registered Engineer shall certify that the utility was installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.
e. The length of parallel excavation shall be limited to the length necessary to install and backfill one joint of pipe at a time, not to exceed twenty-five (25) feet.

82. All material to a depth of 8 inches below the finished surface of the subgrade shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the Department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade. The option to backfill any trenches with dirt or either #57 stone or #78 stone with consolidation with a plate tamp and without a conventional density test may be pursued with the written consent of the District Engineer. If this option is exercised, then roadway ABC stone and asphalt repair as required will also be specified by the District Engineer.

Directional bore

83. Boring equipment will be provided of a type and size to facilitate boring in the local geologic conditions and shall be able to facilitate the encroachment work.

84. When Horizontal Directional Drilling (HDD) is used, the following stipulations apply:
    a. Use drilling fluids as appropriate for the type soils but use of water alone is prohibited. Pump drilling fluids only while drilling or reaming. Directional boring using jetting with a Bentonite (or equivalent material) slurry is recommended. Monitor flow rates to match the amount leaving the bore hole and do not increase pressure or flow to free stuck drill heads, reamers or piping. Open cutting to retrieve stuck drill heads is not allowed without prior permission from the District Engineer.
    b. The minimum depth shall adhere to the table below for transverse (under non-controlled access, partial controlled access, or limited controlled access roadway) installations and refers to maximum diameter of hole drilled and not the dimension of the carrier or encasement pipe.

Diameter of Drilled Hole (Backream)	Minimum Depth of Cover
2" to 6”	5 feet
>6” to 15”	12 times hole diameter (e.g. 6-inch hole means 6 feet minimum depth)
>15” to 36”	15 feet or greater

    c. Under fully controlled access roadway installations, the minimum depth for transverse crossings shall be 15 feet under any pavement (ramps or thru lanes)
    d. An overbore (backream diameter) shall not be more than 1.5 times the outside diameter of the pipe or encasement under any highway for pipes 12 inches in diameter or less. For pipes with outer diameter larger than 12 inches, the overbore may be no larger than outer diameter of pipe plus 6 inches. An overbore exceeding 1.5 times greater than the outside diameter of the pipe or encasement may be considered if the encroachment agreement includes a statement signed and sealed by a licensed North Carolina Professional Engineer indicating that an overbore in excess of 1.5 times the outside diameter of the pipe or encasement will appropriately arch and no damage will be done to the pavement or sub-grade.
    e. Directional boring is allowed beneath embankment material in naturally occurring soil.
    f. Any parallel installation utilizing the directional boring method shall be made at a minimum depth of five (5’) feet (cover) below the ground surface and outside the theoretical 1:1 slope from the existing edge of pavement except where the parallel installation crosses a paved roadway.
    g. All directional bores shall maintain ten (10) feet minimum (clear) distance from the nearest part of any structure, including but not limited to bridges, footings, pipe culverts or box culverts. Directional bores are not allowed beneath bridge footings, culvert wingwall footings, slope protection or retaining walls.
    h. The tip of the drill string shall have a cutter head.
    i. Detection wire shall be installed with non-ferrous material.
    j. HDPE pipe installed by directional boring shall not be connected to existing pipe or fittings for one (1) week from the time of installation to allow tensional stresses to relax.

Aerial clearances

85. Vertical clearance of overhead power and communication lines shall meet the National Electrical Safety Code requirements except the minimum vertical clearance shall be 18' for crossings over NCDOT roadways (24' over Fully Controlled Access roadways) and 16' for parallel installations.

86. In relation to the bridge, the utility line shall be located with minimum clearances as indicated on the attachment for NCDOT **Required Clearances for Aerial Installations by Encroachment Near Bridge Structures**.

Pavement Detail and Repair

87. The paving of this roadway shall be in accordance with the latest version of NCDOT Standard Specifications, Sections 610, 1012 and 1020. The Contractor shall follow all procedures of the Quality Management System (QMS) for asphalt pavement - Maintenance Version (see https://connect.ncdot.gov/resources/Materials/MaterialsResources/2018%20QMS%20Asphalt%20Manual.pdf). The Contractor must adhere to all testing requirements and quality control requirements specified. The Contractor shall contact the NCDOT Division QA Supervisor prior to producing plant mix and make the Supervisor aware that the mix is being produced for a future NCDOT road. Contact the District Engineer to determine the NCDOT Division QA Supervisor. Only NCDOT approved mix designs will be acceptable. A Quality Control Plan shall be submitted (as Directed by the District Engineer) to the District Engineer's Office prior to asphalt production utilizing form QMS-MV1. Failing mixes and/or densities are subject to penalties including monetary payments or removal and replacement. To minimize traffic queuing in construction areas, the possibility of traffic detours may be considered when working on high traffic routes even if traffic control is used. The District Engineer may require traffic detours.

88. When paving beyond utility installation is involved, a Roadway certification report sealed by a Professional Engineer shall be submitted to the District Engineer's office indicating the following:
    - Pavement thickness by type
    - Pavement density, core and/or test locations
    - Base thickness
    - Base density
    - Subgrade density

    Test frequency and method shall be in conformance with the NCDOT *Materials and Tests Manual*. Test must be performed by a Certified Technician including name and Certification number on report.

89. "Potholing" pavement cores to expose existing utilities shall be made with an 18" diameter keyhole pavement core. Pavement core locations shall not be placed in the wheel path whenever possible. Vacuum excavation shall be utilized to expose underground utilities. Pavement cores shall be repaired within the same working day. The pavement core shall be retained and reused to fill the core hole.

    The excavation shall be backfilled and compacted with select material to the bottom of the existing pavement structure or as indicated by the District Engineer. The retained core shall be placed in the hole and secured with a waterproof, mechanical joint. If the pavement core is damaged and cannot be re-used, the core may be replaced with the surface mix, S9.5C. The asphalt patch shall match the thickness of the existing asphalt or four inches, whichever is greater. All materials must be listed on the NCDOT Approved Products List (APL) found at: https://apps.ncdot.gov/vendor/approvedproducts/.

90. The minimum pavement design for pavement repair shall be according to NCDOT Standard Drawing 654.01 (https://connect.ncdot.gov/resources/Specifications/2018StandardRdwyDrawings/Division%2006%20Asphalt%20Bases%20and%20Pavements.pdf) and shall include a mechanical overlay extent to be a minimum of 25 feet each side of the pavement repair area OR as directed by the District Engineer.
91. Pavement cuts shall be repaired the same day the cuts are made unless an asphalt patch cannot be accomplished the same day due to material availability or time restrictions. When the asphalt patch is not feasible, the following apply:
    a. The pavement cut shall be filled to the surface with ABC stone or Flowable Fill per NCDOT's Standards and Specifications.
    b. Once the cut is filled, a minimum ¾-inch steel plate shall be placed and pinned to prevent moving. Plates shall be designed large enough to span a minimum of 1-foot on all sides on the pavement cut.
    c. When flowable fill is used, it shall cure for 72 hours prior to any asphalt material placement. Flowable fill bleed water shall not be present during paving operations. Paving shall not cause damage (shoving, distortion, pumping, etc.) to the flowable fill.
    d. Install and leave "BUMP" signs according to MUTCD until the steel plate has been removed. Once the flowable fill has cured, remove the steel plate, and mill/fill according to the directions of the District Engineer.
    e. All pavement cuts must be sealed with NCDOT approved sealant to prevent future pavement separation or cracking.
92. Any pavement damaged because of settlement of the pavement or damaged by equipment used to perform encroachment work, shall be re-surfaced to the satisfaction of the District Engineer. This may include the removal of pavement and a 50' mechanical overlay. All pavement work and pavement markings (temporary and final) are the responsibility of the Encroaching Party.

Post Construction

Close out/ Inspection

93. The Encroaching party shall notify the District Engineer's office within 2 business days after construction is complete. The District Engineer may perform a construction inspection. Any deficiencies may be noted and reported to the encroaching party to make immediate repairs or resolve any issues to restore the right-of-way to a similar condition prior to construction, including pavement, signage, traffic signals, pavement markings, drainage, structures/pipes, or other highway design features.
94. At the discretion of the District Engineer, a final inspection report may be provided to the encroaching party upon satisfactory completion of the work.
95. A written acknowledgement of the completed work by the District Engineer's office begins the one-year warranty period associated with the performance bond.

96. If the actual construction differs from the approved plans associated with this encroachment, a copy of "as-built" plans shall be submitted to the District Engineer's office in a PDF format and in a current ESRI GIS format within 4 weeks of construction.

97. The encroaching party shall provide the North Carolina Turnpike Authority **(**NCTA) with an electronic copy of coordinate correct as-built plans within two weeks of installation completion. Failure to provide the as-built plans may jeopardize future approvals within NCTA right of way.

98. A copy (in PDF format) of the completed ground water analysis shall be given to the District Engineer, including detailed drawings of the "as-built" wells showing location, depth and water level in well.

ATTACHMENT FORM

NOTIFICATION FOR UTILITY / NON-UTILITY ENCROACHMENT WITHIN NCDOT R/W

Instructions for use:
This form must be completed in its entirety and submitted directly to the designated personnel in the District Engineer's office via email, fax or hand delivery a minimum of one week prior to construction for the encroachment. If the designated NCDOT personnel names are unknown by the person completing this form, please contact the District Engineer's office to determine that contact info.

Date: _____ Submitted by Name: _____

To: District Personnel Name: _____
District Personnel Email: _____
District Fax No.: _____

This notification is to inform you that we (encroaching party or their contractor) will begin construction work on the following project in a minimum of one week.

Encroachment number
(assigned by NCDOT) for the project: _____

Construction start date: _____

Approximate ending date: _____

Contact NCDOT inspector a minimum of 72 hrs. in advance to set-up Preconstruction meeting in the District Engineer's office or other location as directed by the District Engineer

Preconstruction meeting date & time: _____

Preconstruction meeting address: _____
_____

Type of project: _____
[Examples: power, telecommunication, water, sewer, gas, petroleum, other (describe)]

Contact Info for this project:

Contractor Company Name:
_____
Contractor Contact Name:
_____
Contractor Phone Number:
_____
Contractor Email:
_____

NCDOT Utility Inspector Name:
_____
NCDOT Utility Inspector Phone:
_____
NCDOT Utility Inspector Email:
_____
NCDOT Utility Project Manager Name:
_____
NCDOT Utility Project Manager Phone:
_____
NCDOT Utility Project Manager Email:
_____

Private Facility Encroachment
Hold Harmless Declaration

Encroachment Agreement Second Party: _____

_____

_____

Encroachment Number: _____

County: _____

The party of the second part of the above-referenced encroachment agreement agrees to indemnify and save harmless the North Carolina Department of Transportation from all claims of liability for the overburdening of right of way easements caused by the installation of private facilities owned by the party of the second part and installed under the approval of the above-referenced encroachment agreement.

Second Party: _____

_____

_____

Attest or Witness: _____

_____

_____

Date: _____

Published by NCDOT Utilities Unit 7/17/2017
Separate Form to be signed by each property owner affected by the installation.

Attachment for Clear Zone Guidelines from AASHTO

Clear - Zone Table

TABLE 3.1 (Cont'd)

[U.S. Customary Units]

DESIGN SPEED	DESIGN ADT	FORESLOPES			BACKSLOPES		
		1V:6H or flatter	1V:5H TO 1V:4H	1V:3H	1V:3H	1V:5H TO 1V:4H	1V:6H or flatter
40 mph or less	UNDER 750	7 – 10	7 – 10	**	7 – 10	7 – 10	7 – 10
	750 – 1500	10 – 12	12 – 14	**	10 – 12	10 – 12	10 – 12
	1500 – 6000	12 – 14	14 – 16	**	12 – 14	12 – 14	12 – 14
	OVER 6000	14 – 16	16 – 18	**	14 – 16	14 – 16	14 – 16
45–50 mph	UNDER 750	10 – 12	12 – 14	**	8 – 10	8 – 10	10 – 12
	750 – 1500	14 – 16	16 – 20	**	10 – 12	12 – 14	14 – 16
	1500 – 6000	16 – 18	20 – 26	**	12 – 14	14 – 16	16 – 18
	OVER 6000	20 – 22	24 – 28	**	14 – 16	18 – 20	20 – 22
55 mph	UNDER 750	12 – 14	14 – 18	**	8 – 10	10 – 12	10 – 12
	750 – 1500	16 – 18	20 – 24	**	10 – 12	14 – 16	16 – 18
	1500 – 6000	20 – 22	24 – 30	**	14 – 16	16 – 18	20 – 22
	OVER 6000	22 – 24	26 – 32 *	**	16 – 18	20 – 22	22 – 24
60 mph	UNDER 750	16 – 18	20 – 24	**	10 – 12	12 – 14	14 – 16
	750 – 1500	20 – 24	26 – 32 *	**	12 – 14	16 – 18	20 – 22
	1500 – 6000	26 – 30	32 – 40 *	**	14 – 18	18 – 22	24 – 26
	OVER 6000	30 – 32 *	36 – 44 *	**	20 – 22	24 – 26	26 – 28
65–70 mph	UNDER 750	18 – 20	20 – 26	**	10 – 12	14 – 16	14 – 16
	750 – 1500	24 – 26	28 – 36 *	**	12 – 16	18 – 20	20 – 22
	1500 – 6000	28 – 32 *	34 – 42 *	**	16 – 20	22 – 24	26 – 28
	OVER 6000	30 – 34 *	38 – 46 *	**	22 – 24	26 – 30	28 – 30

* Where a site specific investigation indicates a high probability of continuing crashes, or such occurrences are indicated by crash history, the designer may provide clear-zone distances greater than the clear-zone shown in Table 3.1. Clear zones may be limited to 30 ft for practicality and to provide a consistent roadway template if previous experience with similar projects or designs indicates satisfactory performance.

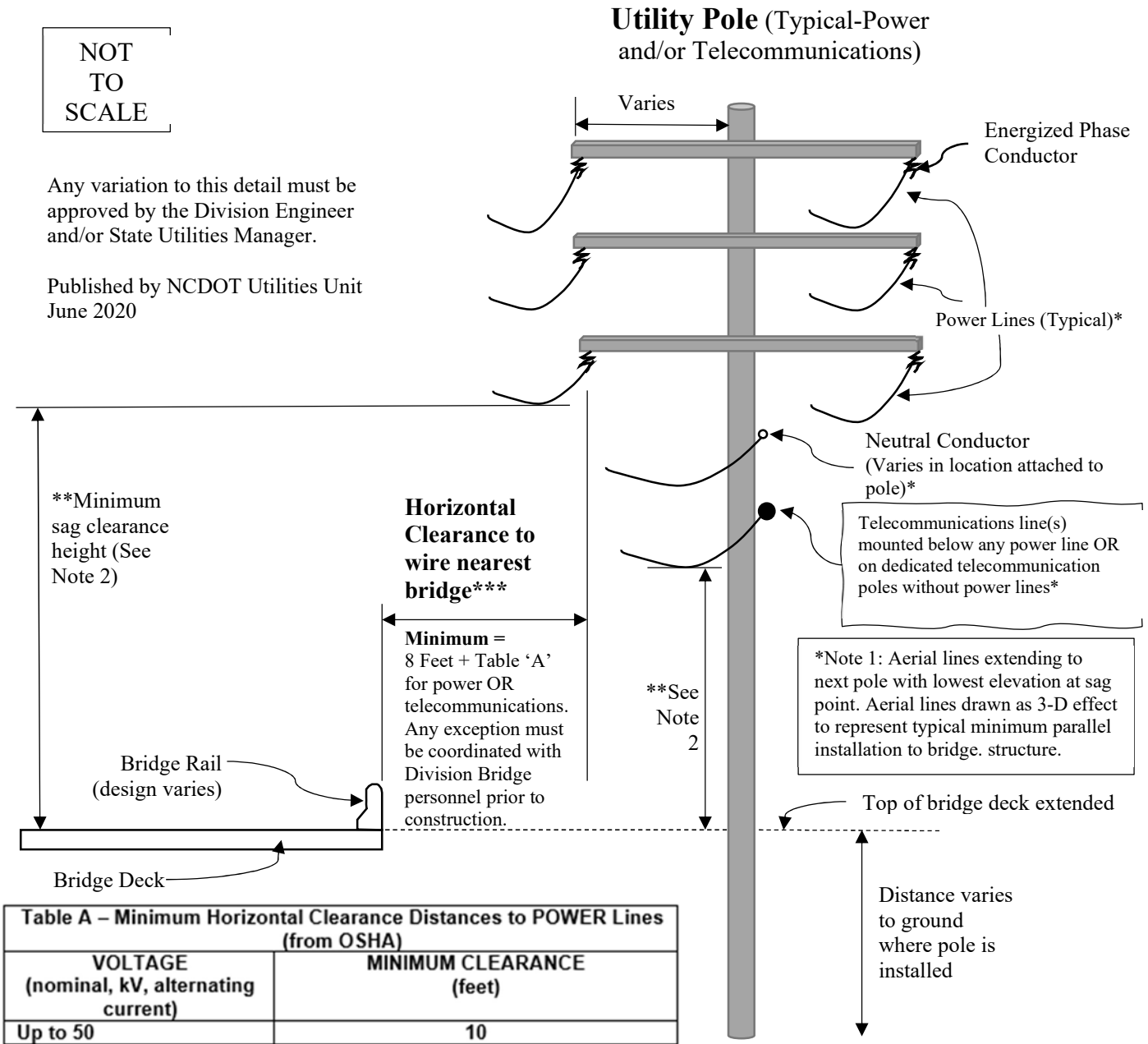
** Since recovery is less likely on the unshielded, traversable 1V:3H slopes, fixed objects should not be present in the vicinity of the toe of these slopes. Recovery of high-speed vehicles that encroach beyond the edge of the shoulder may be expected to occur beyond the toe of slope. Determination of the width of the recovery area at the toe of slope should take into consideration right-of-way availability, environmental concerns, economic factors, safety needs, and crash histories. Also, the distance between the edge of the through traveled lane and the beginning of the 1V:3H slope should influence the recovery area provided at the toe of slope. While the application may be limited by several factors, the foreslope parameters which may enter into determining a maximum desirable recovery area are illustrated in Figure 3.2.

NCDOT Required Clearances for Aerial Installations Near Bridge Structures

NOT TO SCALE

Any variation to this detail must be approved by the Division Engineer and/or State Utilities Manager.

Published by NCDOT Utilities Unit
June 2020



Note 2- **MINIMUN SAG CLEARANCE HEIGHT is 25 feet (applies to telecommunications AND power).

Table A – Minimum Horizontal Clearance Distances to POWER Lines (from OSHA)	
VOLTAGE (nominal, kV, alternating current)	MINIMUM CLEARANCE (feet)
Up to 50	10
Over 50 to 200	15
Over 200 to 350	20
Over 350 to 500	25
Over 500 to 750	35
Over 750 to 1000	45
Over 1000	As established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution

***Note 3: HORIZONTAL CLEARANCE EXCEPTION. If vertical sag clearance height for power above bridge deck is ≥ 45 feet AND voltage is ≤ 350kV, then Minimum Horizontal Clearance may be reduced to 3 feet. Any telecommunications attachment to power pole allowed in this exception must have a minimum 25 feet sag clearance height above bridge deck.

APPENDIX C

NCDEQ CERTIFICATE OF PLAN APPROVAL

ROY COOPER
Governor

ELIZABETH S. BISER
Secretary

WILLIAM E. TOBY VINSON, JR
Interim Director

NORTH CAROLINA
Environmental Quality

September 27, 2023

LETTER OF APPROVAL WITH MODIFICATIONS

City of Concord
Attention: Lloyd Payne, City Manager
P.O. Box 308
Concord, North Carolina 28026

RE: Project Name: Zion Church Rd. (SR 1155) 12" Waterline Project No. 2020-077
Project ID: CABAR-2024-014
Acres Approved: 2.50 acres.
County: Cabarrus
City: Concord
Location: Zion Church Rd. (SR 1155)
River Basin: Yadkin-PeeDee
Stream Classification: Other
Submitted By: Engineering department City of Concord
Date Received by LQS: September 06, 2023
Plan Type: New

Dear Mr. Payne:

This office has reviewed the subject erosion and sedimentation control plan. We find the plan to be acceptable with modifications and hereby issue this letter of Approval with Modifications. The Modifications Required for Approval are listed on the attached page. This plan approval shall expire three (3) years following the date of approval, if no land-disturbing activity has been undertaken, as is required by Title 15A NCAC 4B .0129.

As of April 1, 2019, all new construction activities are required to complete and submit an electronic Notice of Intent (eNOI) form requesting a Certificate of Coverage (COC) under the NCG010000 Construction General Permit. After the form is reviewed and found to be complete, you will receive a link with payment instructions for the $100 annual permit fee. After the fee is processed, you will receive the COC via email. As the Financially Responsible Party shown on the FRO form submitted for this project, you MUST obtain the COC prior to commencement of any land disturbing activity. The eNOI form may be accessed at deq.nc.gov/NCG01. Please direct questions about the eNOI form to the Stormwater Program staff in the Raleigh central office. If the owner/operator of this project changes in the future, the new responsible party must obtain a new COC.

Title 15A NCAC 4B .0118(a) and the NCG01 permit require that the following documentation be kept on file at the job site:

1. The approved E&SC plan as well as any approved deviation.

2. The NCG01 permit and the COC, once it is received.

3. Records of inspections made during the previous 30 days.

Also, this letter gives the notice required by G.S. 113A-61.1(a) of our right of periodic inspection to ensure compliance with the approved plan.

North Carolina's Sedimentation Pollution Control Act is performance-oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project, it is determined that the erosion and sedimentation control plan is inadequate to meet the requirements of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statute 113A-51 through 66), this office may require revisions to the plan and implementation of the revisions to ensure compliance with the Act.

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations, and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility Form, which you provided. You are requested to file an amended form if there is any change in the information included on the form. In addition, it would be helpful if you notify this office of the proposed starting date for this project.

Your cooperation is appreciated.

Sincerely,

Mena Awad, PE
Assistant Regional Engineer
Land Quality Section

MA

Enclosure: Certificate of Approval
Modifications Required for Approval
NCG01 Fact Sheet

c: Engineering Department City of Concord
Attention: Carolina Garcia-Zaragoza Villa, PE
P.O. Box 308
Concord North Carolina, 28026

MODIFICATIONS REQUIRED FOR APPROVAL

Project Name: Zion Church Rd. (SR 1155) 12" Waterline Project No. 2020-077
Project ID: CABAR-2024-014
County: Cabarrus
Reviewed by: Mena Awad, PE

1. All potentially affected property owners must be notified prior to utility construction even though the activity is covered under an easement or occurs within a right-of-way [G.S. 113A-54.1(a1)].

2. Silt fencing is a perimeter measure suitable for a drainage area of no greater than ¼ acre per 100 feet of fence. This is the maximum drainage area when the slope is less than 2 percent. It appears that the drainage area is more than ¼ acres per 100 feet between stations 8+00 to 16+50. Additional measures may be required between stations 8+00 to 16+50. However, do not leave any dirt and/or backfilling material along those stations overnight. Cleanup of the construction area, existing ditch and any adjacent property must occur immediately after any portion of the line installation, and at the end of each day. The applicant is responsible for the control of sediment on-site. If the approved erosion and sedimentation control measures prove insufficient, the applicant must take those additional steps necessary to stop sediment from leaving this site. [15A NCAC 4B .0115]

Ref: G.S. 113A-54.1 through G.S. 113A-57
Sections 15A NCAC 04A.0101 through 15A NCAC 04E.0504
General Permit NCG 010000 NPDES for Construction Activities

CERTIFICATE OF PLAN APPROVAL

The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by the North Carolina Department of Environmental Quality in accordance with North Carolina General Statute 113A – 57 (4) and 113A – 54 (d) (4) and North Carolina Administrative Code, Title 15A, Chapter 4B.0107 (c). This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent groundcover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0127 (b).

Zion Church Rd. (SR 1155) 12" Waterline Project No. 2020-077 - Zion Church Rd. (SR 1155) – Concord – Cabarrus County

Project Name and Location

September 27, 2023,

Date of Plan Approval

CABAR-2024- 014

Project Number

NCG01 Certificate of Coverage #

, P.E.

Asst. Regional Engineer

Fact Sheet on the New NCG01 Permit
April 2019

The NC Construction General Permit (also known as "NCG01") was renewed on April 1, 2019. The updated permit does not significantly change the measures that are required to be implemented on construction sites. However, there are some organizational and technical updates to the permit as described below. Most notably, there is a new process in which construction sites will obtain official coverage under an NCG01 permit through an electronic process. DEMLR worked with a broad team of stakeholders to make all of these updates. If you have questions, contact Annette Lucas at Annette.lucas@ncdenr.gov or (919) 707-3639.

Organizational Updates

The new permit:

- Repeats state requirements for E&SC Plans and organizes them with federal construction activity requirements;
- Is clearly organized by topic; and
- Has less text and more tables.

Technical Updates

The new permit:

- Requires that the E&SC Plan meet SWPPP requirements (p. 2);
- Provides a list of items that must be included in the SWPPP, such as the construction sequence, plans, calculations, etc. (p. 2-4);[1]
- Has updated language on bypasses and upsets that is tailored to construction activities (p. 10);
- Puts all timeframes for inspections, record-keeping and reporting in "calendar days" for clarity and consistency (p. 11-14);[2]
- Changes the inspection frequency (during business hours) to at least once per 7 calendar days and after every storm $\geq$ 1.0 inch (previously 0.5 inch);[3] and
- Excludes weekends, state and federal holidays from normal business hours unless construction activities take place (p. 23).

[1] This list is based on website guidance by the DEMLR Sediment Program.

[2] The number of calendar days was selected to be as equivalent as possible with the previous permit.

[3] The intent is to provide predictability to the inspection schedule.

Acronyms to Know

COC: Certificate of Coverage, proof of coverage under an NCG01 permit
DEMLR: NC Division of Energy, Mineral, and Land Resources
E&SC: Erosion & Sedimentation Control
e-NOI: Notice of Intent, application form for the NCG01 permit
e-NOT: Notice of Termination, form for closing out the NCG01 permit
SWPPP: Stormwater Pollution Prevention Plan, required by the NCG01

The NCG01 Process

The new NCG01 applies to permits approved on or after April 1, 2019.

Permittees will no longer receive a copy of the NCG01 permit in the mail with their E&SC Plan approvals and be considered as covered under the permit. Federal rules require that DEMLR receive an NOI on each construction project and issue each construction project its own COC.

Under the new NCG01 process, construction sites will continue to receive approval for E&SC Plans from either DEMLR or the delegated local E&SC program just like before. After receiving E&SC Plan approval, permittees will officially obtain coverage under the NCG01 by completing an e-NOI (available at deq.nc.gov/NCG01). The e-NOI will only take about 20 minutes to fill out and submit on-line.

Initially, there will be no charge associated with applying for an NCG01 permit but on or around June 1, 2019, DEMLR will begin charging a $100 annual general permit fee as required per §143-215.3D.

DEMLR is working on creating a single application form that will allow an applicant to simultaneously apply for an E&SC permit and an NCG01 COC. That effort is part of a larger Permit Transformation project at DEMLR.

Q&A About the New NCG01 Permit

Why do construction sites have to do this extra application step?
DEMLR is required by the EPA to issue a specific COC to every construction site that disturbs one acre or more. DEMLR is working to create a form that combines the E&SC plan approval and e-NOI processes, but that will take more time. For now, DEMLR has created an efficient e-NOI process.

If an E&SC Plan is approved before April 1, which permit applies?
Projects with already approved E&SC Plans will automatically follow the new NCG01 permit, but will not need to fill out an e-NOI or pay an annual permit fee. However, the permittees should print the new permit and the two standard detail sheets and have them on site.

Will DEMLR offer tools to help permittees comply with the new NCG01?
Yes, DEMLR will provide two sample plan sheets at deq.nc.gov/NCG01 that can be placed into the E&SC plan set. The first covers the site stabilization and materials handling portions of the permit. The second sheet covers the inspection, record-keeping and reporting portions of the permit.

How will the new e-NOI submittal and COC process work?
Permittees will apply for E&SC Plan approvals from DEMLR or the local E&SC program like before. The E&SC approval letter will instruct the permittee to visit deq.nc.gov/NCG01 to submit an e-NOI form to DEMLR. The permittee may begin the construction activity after receipt of the COC (within three days*). The permittee must print and retain a copy of the permit and the COC on site. Initially, the COC will be issued for free but on or around June 1, 2019, a $100 annual general permit fee will be charged.

Who is allowed to submit an e-NOI form?
Submittal must be by a responsible corporate officer that owns or operates the activity, such as a president, secretary, treasurer, or vice president or a manager that is authorized in accordance with IV.B.6 of the NCG01 permit. Additional signatory options are set forth in IV.B.6 of the permit. It is possible for consultant to prepare the e-NOI, save it as a draft, and email it to the responsible entity for signature & submittal.

What happens to the COC when the construction activity is complete?
When a project is complete, the permittees will contact DEMLR or the local delegated program to close out the E&SC Plan. After DEMLR or the local E&SC program inform the permittee of the project close out via inspection report, the permittee will visit deq.nc.gov/NCG01 to submit an e-NOT.

Will there be a grace period for adherence to the new process?
DEMLR does not have the authority to grant a grace period from a federally mandated permit. Permittees will be informed of the new process via web site, E&SC Plan approval letters and list servs. If a construction activity disturbs one acre or more (or is part of common plan of development that disturbs one acre or more) fails to submit an e-NOI after approval of its E&SC Plan, this is a violation of federal permitting requirements and the permittee could be subject to a penalty assessment.

How does the new NCG01 affect the delegated local E&SC Programs?
Local programs will continue to review and approve E&SC plans. However, they will no longer send copies of the NCG01 with E&SC Plan approvals. DEMLR will provide sample language to use in local E&SC Plan approvals to advise permittees that they must submit an e-NOI to DEMLR.

Local programs are not required to check if permittees have submitted e-NOIs to DEMLR. However, if they wish to do this voluntarily, there will be a tool available on DEMLR's web site for them to view a list of construction projects that have submitted e-NOIs.

When local programs close out an E&SC Plan, the close-out letter will advise permittees that they must submit an e-NOT. DEMLR will provide sample language.

Local programs may approve E&SC plans that meet state sediment laws and rules even if those plans are not compliant with all of the NCG01 requirements. However, their permittees will be required to add two plan sheets (which will be provided by DEMLR) to their E&SC Plans to ensure that they fully comply with the ground stabilization, materials handling, and inspection, record-keeping and reporting portion of the NCG01 permit.

* *Or 24 business hours for a project approved under the DEMLR Express review program.*

APPENDIX D

NCDEQ FINANCIAL RESPONSIBILITY/OWNERSHIP FORM

Check if this project is ARPA-funded ☐
Attach a copy of the Letter of Intent to Fund

FINANCIAL RESPONSIBILITY/OWNERSHIP FORM
SEDIMENTATION POLLUTION CONTROL ACT

No person may initiate any land-disturbing activity on one or more acres as covered by the Act, including any activity under a common plan of development of this size as covered by the NCG01 permit, before this form and an acceptable erosion and sedimentation control plan have been completed and approved by the Land Quality Section, N.C. Department of Environmental Quality. Submit the completed form to the appropriate Regional Office. (Please type or print and, if the question is not applicable or the e-mail address or phone number is unavailable, place N/A in the blank.)

Part A.

1. Project Name Zion Church Rd. (SR 1155) 12" Waterline Project No. 2020-077

   **If this project involves American Rescue Plan Act (ARPA) funds, list the Project Name or Project Number (e.g., SRP-D-ARP-0121) below under which you were approved for funding through the Division of Water Infrastructure (DWI).*

2. Location of land-disturbing activity: County Cabarrus City or Township Concord

   Highway/Street Zion Church Rd. (SR 1155) Latitude(dec deg) 35.367784 Longitude(dec deg) 80.577992

3. Approximate date land-disturbing activity will commence: Spring 2024

4. Purpose of development (residential, commercial, industrial, institutional, etc.): Residential & commercial

5. Total acreage disturbed or uncovered (including off-site borrow and waste areas): 2.50 acres

6. Amount of fee enclosed: $ n/a . The application fee of $100.00 per acre (rounded up to the next acre) is assessed without a ceiling amount (Example: 8.10-acre application fee is $900). Checks should be addressed to NCDEQ.

7. Has an erosion and sediment control plan been filed? Yes ☒ Enclosed ☐ No ☐

8. Person to contact should erosion and sediment control issues arise during land-disturbing activity:

   Name _____ E-mail Address _____

   Phone: Office # _____ Mobile # _____

9. Landowner(s) of Record (attach accompanied page to list additional owners):

   City of Concord | (704) 920-5555 | _____
   Name | Phone: Office # | Mobile #

   PO Box 308 | 35 Cabarrus Ave. W
   Current Mailing Address | Current Street Address

   Concord | NC | 28026-0308 | Concord | NC | 28025
   City | State | Zip | City | State | Zip

10. Deed Book No. n/a Page No. n/a Provide a copy of the most current deed.

Part B.

1. Company(ies) who are financially responsible for the land-disturbing activity (Provide a comprehensive list of all responsible parties on accompanied page.) *If the company is a sole proprietorship or if the landowner(s) is an individual(s), the name(s) of the owner(s) may be listed as the financially responsible party(ies).*

_____ _____
Company Name E-mail Address

_____ _____
Current Mailing Address Current Street Address

_____ _____
City State Zip City State Zip

Phone: Office # _____ Mobile # _____

Note: If the Financially Responsible Party is not the owner of the land to be disturbed, include with this form the landowner's signed and dated written consent for the applicant to submit a draft erosion and sedimentation control plan and to conduct the anticipated land disturbing activity.

2. (a) If the Financially Responsible Party is a domestic company registered on the NC Secretary of State business registry, give name and street address of the Registered Agent:

_____ _____
Name of Registered Agent E-mail Address

_____ _____
Current Mailing Address Current Street Address

_____ _____
City State Zip City State Zip

Phone: Office # _____ Mobile # _____

_____
Name of Individual to Contact (if Registered Agent is a company)

(b) If the Financially Responsible Party is not a resident of North Carolina, give name and street address of the designated North Carolina agent who is registered on the NC Secretary of State business registry:

_____ _____
Name of Registered Agent E-mail Address

_____ _____
Current Mailing Address Current Street Address

_____ _____
City State Zip City State Zip

Phone: Office # _____ Mobile # _____

_____
Name of Individual to Contact (if Registered Agent is a company)

(c) If the Financially Responsible Party is engaging in business under an assumed name, give name under which the company is Doing Business As. If the Financially Responsible Party is an individual, General Partnership, or other company not registered and doing business under an assumed name, **attach a copy of the Certificate of Assumed Name.**

_____
Company DBA Name

The above information is true and correct to the best of my knowledge and belief and was provided by me under oath. (This form must be signed by the Financially Responsible Person if an individual(s) or his attorney-in-fact, or if not an individual, by an officer, director, partner, or registered agent with the authority to execute instruments for the Financially Responsible Party). I agree to provide corrected information should there be any change in the information provided herein.

_____ _____
Type or print name Title or Authority

_____ _____
Signature Date

I, _____, a Notary Public of the County of _____

State of North Carolina, hereby certify that _____appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him/her.

Witness my hand and notarial seal, this _____day of _____, 20_____

_____
Notary

Seal

My commission expires_____