

**A-B Tech Parking Lot
Stormwater Green Infrastructure Retrofit Project
13 Facilities Way
Asheville, North Carolina 28801**

**A Collaboration of
A-B Tech Community College and RiverLink**



**Scope of Work and
Construction and Material Specifications**

Prepared by



North Carolina Firm License No. C-4545

May 2024



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June 1, 2024

TO ALL BIDDERS

Subject: Invitation to Bid
Buncombe County General Services
A-B Tech Parking Lot Stormwater Green Infrastructure Retrofit Project
13 Facilities Way, Asheville, NC 28801

To Whom It May Concern:

You are invited to prepare an individual bid for the A-B Tech Parking Lot Stormwater Green Infrastructure Retrofit Project as described in the attached project information package.

This project conducted for Buncombe County, involves retrofitting an existing parking lot with stormwater green infrastructure on the campus of A-B Tech Community College in Asheville, North Carolina. The purpose of this project is to reduce the potential for pollution from stormwater runoff draining into the receiving stream, Haith Branch and to provide educational opportunities. Blue Earth Planning, Engineering & Design, PC (Blue Earth) will assist the bidding process and manage certain aspects of the project on behalf of Buncombe County including construction observation, as specified. This document includes the Bidding and Contract Documents and Site Requirements, known as the "Bid Documents," for the stormwater green infrastructure retrofit project.

A MANDATORY PRE-BID SITE WALK IS SCHEDULED FOR MONDAY JUNE 10, 2024 AT 10:00 AM. Attached you will find a Bid Form, and you are requested to prepare your bid, entitled **A-B Tech Parking Lot Stormwater Green Infrastructure Retrofit Project**, in accordance with the Bid Documents. Your sealed bids must be submitted and delivered by 1:00 p.m. on Friday, June 28, 2024, and no bids will be accepted after that time. Bids received after 1:00 p.m. will be returned to the bidder unopened. Bid content will remain confidential. Bids shall be delivered to the following address:

Buncombe County General Services Department
40 McCormick Place
Asheville, North Carolina 28801

Upon complete review and evaluation of the submitted bids, Buncombe County or its authorized representative will notify the successful bidder and issue a contract and Notice-to-Proceed by 5:00 p.m. July 1, 2024. The project is planned to start on July 8, 2024.

Buncombe County reserves the right to modify or delete any bid item listed on the Bid Itemization, to reject any or all bids, and to waive any irregularities. The bidders agree that such deletion or rejection shall be without liability on the part of Blue Earth or Buncombe County for any penalty brought by the bidder because of such deletion or rejection. Contracts will be awarded to the lowest and best bidder, taking into consideration the qualities of the articles to be supplied, their conformity with specifications, and their suitability to the requirements of the local government.

Invitation to Bid

June 1, 2024

Page 2 of 2

No bidder may withdraw his bid for a period of sixty days following the day of the bid opening. All bids shall be guaranteed for a period of sixty days following the bid date. The submission of the bid in response to this invitation shall constitute an agreement of the bidder to all conditions set forth in the Bid Documents.

Questions on this bid should be submitted to Mr. Tim Ormond, P.E. by email (tormond@blueearth.us) or to the following address:

Tim Ormond, P.E.
Blue Earth
1 Haywood St, Suite 414
Asheville, NC 28801
828.989.8075

Questions shall be submitted no later than 5:00 pm June 17, 2024. All questions submitted before this date will be answered prior to the bid submission date and relayed to all bidders.

Sincerely,

A handwritten signature in black ink, appearing to read "Timothy Ormond", with a stylized flourish at the end.

Timothy Ormond, P.E.
Project Manager

PROJECT DESCRIPTION

The A-B Tech Parking Lot Stormwater Green Infrastructure retrofit project is part of the Central Asheville Watershed Restoration Plan, aimed at managing stormwater and improving water quality in the French Broad River watershed. Currently, stormwater runoff is conveyed through a storm sewer collection system from the A-B Tech campus, without water quality treatment or volume control, into an eroded gully. The system flows into Haith Branch, a tributary within an impaired reach of the French Broad River.

This stormwater green infrastructure retrofit project will provide the following features and benefits:

- 1) Capture and treat stormwater runoff from approximately 16.4 acres of highly impervious surfaces on the A-B Tech Campus.
- 2) Remove an existing asphalt parking lot and reduce total impervious cover by 0.64 acre.
- 3) Construct an interconnected stormwater treatment train system consisting of two infiltration basins and a stormwater wetland, with a total storage volume of 77,300 cubic ft.
- 4) Establish native rain garden and wetland vegetation to provide habitat for pollinators and other wildlife.
- 5) Provide a walking path, observation area and educational components for the A-B Tech community.
- 6) Provide stormwater volume and peak flow reduction, improve water quality and reduce the urban heat island impact.
- 7) Install a flow splitter that will direct smaller water quality storms to flow through the surface green infrastructure system. Excess flow from larger storms will bypass the green infrastructure system and continue to flow into the existing 30-inch diameter subsurface system.
- 8) The project will connect to the downstream Haith Branch restoration project and the A-B Trek trail system to provide both educational and recreational value to the larger community.
- 9) The system will reduce peak flows and stormwater volumes from the campus for all storm events from the 1-inch rainfall through the 100-year storm compared to existing conditions.

1.0 ADVERTISEMENT FOR BIDS

Sealed bids for the project entitled **A-B Tech Parking Lot Stormwater Green Infrastructure Retrofit Project** will be received by the Buncombe County General Services Department at 1:00 p.m. local time on the date noted in the invitation to bid letter at 40 McCormick Place, Asheville, NC 28801 and then publicly opened and read aloud.

The project generally consists of constructing retrofitting a parking lot with stormwater green infrastructure.

The Bidding and Contract Documents may be examined at the following locations:

- Buncombe County General Services Department, 40 McCormick Place, Asheville, North Carolina 28801

A mandatory pre-bid conference will be held at 10:00 AM on the date noted in the invitation to bid letter at the site, located at A-B Tech Community College, 13 Facilities Way, Asheville, North Carolina 28801. Interested parties are invited to attend this meeting to review the plans, ask for additional information or clarifications, and visit the project site. Bidding and Contract Documents will be provided at the pre-bid conference. Additional copies of the Bidding and Contract Documents may be obtained at the office of the Engineer, Blue Earth Engineering, located at 1 Haywood St, Suite 414, Asheville, North Carolina 28801. Please notify Mr. Tim Ormond, P.E. of Blue Earth by telephone 828.989.8075, or email (tormond@blueearth.us) if you plan on attending the pre-bid conference.

A certified check or cashier's check payable to Buncombe County or a satisfactory bid bond executed by a corporate surety licensed under the laws of North Carolina to execute such bonds in the amount equal to five percent (5%) of the total of the bid shall be submitted with each bid.

Buncombe County, hereinafter called "Owner" reserves the right to waive any informalities or reject any or all bids. The Owner reserves the right to award the contract to the lowest, responsive, responsible bidder.

The successful bidder or bidders shall be required to furnish both an acceptable performance bond and payment bond, each in the amount of one hundred percent (100%) of the contract price. The performance bond shall be in full force and effect for one year after the date of final acceptance of the project by the Owner. The bid deposit shall be retained by the Owner if the successful bidder fails to provide the required bonds, as stated above, within ten days after award of the contract.

All Bidders must be licensed contractors as required by the State of North Carolina.

A conditional or qualified bid will not be accepted.

2.0 BID CONDITIONS

INSTRUCTIONS TO BIDDERS

A-B Tech Parking Lot Stormwater Green Infrastructure Retrofit Project
13 Facilities Way, Asheville, North Carolina 28801

2.1 Preparation and Submission of Bids

All bids shall be prepared in accordance with the following requirements:

1. The Bid Form furnished by the Engineer shall be used and shall not be altered.
2. All entries including signatures shall be written in ink.
3. The bidder shall submit a unit or lump sum price for every item in the Bid Itemization. The unit or lump sum prices shall be written figures.
4. Changes in any entry shall be made by marking through the entry in ink and making the correct entry adjacent thereto in ink. The individual signing the Bid Documents shall initial the change in ink.
5. The Bid Documents shall be properly executed. In order to constitute proper execution, the Bid Documents shall be executed in strict compliance with the following. No other forms of execution will be accepted.
 - a. If a bid is by an individual, it shall show the name and address of the individual and shall be signed by the individual.
 - b. If the bid is by a corporation, it shall be executed in the name of the corporation by the President or Vice President. It shall be attested by the Secretary or Assistant Secretary. The seal of the Corporation shall be affixed. The bid shall show the address of the principal office of the corporation.
 - c. If the bid is made by a partnership, it shall be executed in the name of the partnership by one of the partners. The address of the partnership shall also be shown.
 - d. If the bid is a joint venture, it shall be executed by each of the joint venturers in the appropriate manner set out above. The address of the joint venture shall be shown.
6. The Bid Documents shall not contain any unauthorized additions, deletions, or conditional bids.
7. The bidder shall not add any provision reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.
8. The Bid Documents shall not contain irregularities of any kind which make the bid incomplete, indefinite, or ambiguous as to its meaning.
9. Alternative bids will not be considered unless specifically called for. Where numbered alternate bid items are provided under any contract, each bidder must submit a bid price for each number alternate item.
10. All attachments, certifications or acknowledgements attached to the bid shall be executed in the same manner as the bid.

All bids shall be submitted in accordance with the following requirements:

1. The Bid Documents shall be submitted at the time and place indicated in the Invitation to Bid.
2. The Bid Documents shall be submitted in an opaque sealed envelope, marked with the project title, name and address of the bidder, and accompanied by the required documents. If the bid is sent through the mail or other delivery systems the sealed envelope shall be enclosed in a separate envelope with the notation "Bid Enclosed" and the project title marked on the face thereof.

2.2 Examination of Bid Documents and Site

Before submitting a bid, each bidder must:

- Examine the Bid Documents thoroughly.
- Visit the site to become familiar with local conditions that may in any manner affect cost, progress or performance of the work.
- Become familiar with federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, safety, progress or performance of the work.
- Study and carefully correlate bidder's observations with the Bid Documents.

The bidder is obligated to verify all documents relied upon to prepare the bid. Test borings and other exploratory operations may be undertaken by the Bidder at his own expense, provided such operations are acceptable to the Owner. The submission of a bid will constitute an incontrovertible representation by the bidder that he has complied with every requirement of these instructions and that the Bid Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the work.

2.3 Interpretations

All questions about the meaning or intent of the Bid Documents shall be submitted in writing to the Engineer at the following address:

Tim Ormond, P.E.
Blue Earth
1 Haywood St, Suite 414
Asheville, NC 28801
Email: tormond@blueearth.us

Questions shall be submitted no later than 5:00 pm on the date specified in the invitation to bid letter. All questions submitted before this date will be answered prior to the bid submission date and relayed to all bidders.

2.4 Modification and Withdrawal of Bids

The Owner reserves the right to modify or delete any bid item listed on the Bid Itemization, to reject any or all bids, and to waive any irregularities. The bidders agree that such deletion or rejection shall be without liability on the part of Blue Earth or the Owner for any penalty brought by the bidder because of such deletion or rejection. Contracts will be awarded to the lowest and best bidder, taking into consideration the qualities of the articles to be supplied,

their conformity with specifications, and their suitability to the requirements of the local government.

No bidder may withdraw his bid for a period of sixty days following the day of the bid opening. All bids shall be guaranteed for a period of sixty days following the bid date. The submission of the bid in response to this invitation shall constitute an agreement of the bidder to all conditions set forth in the Bid Documents.

2.5 Other Requirements

The bidder shall, on the Contract Document, submit to the Owner the name of the Person working "On Site" responsible for safety. The representative must be certified in Red Cross First Aid and CPR. **NOTE: Before the start of construction, the Contractor shall submit a written Health and Safety Plan, and the Contractor shall conduct daily safety meetings for the duration of the project. A record of each safety meeting is to be available on site at all times. Records of all meetings are to be included as part of the invoice.**

The bidder shall comply with the North Carolina Erosion and Sediment Control Planning and Design Manual.

The bidder shall, on the Contract Document, submit to the Owner a list of all Subcontractors and other persons and organizations (including those who are to furnish the principal items of material equipment) proposed for those portions of the work. These listed Subcontractors will not be changed without prior written approval of the Owner.

The bidder shall be responsible for location and care of all utilities, asphalt, curbs, gutters, and landscape materials present at the work site in compliance with the Natural Resources Conservation Service (NRCS) utility safety policy [National Engineering Manual, Part 503-Safety, Subpart A 503.00 – 503.06].

If the bidder has ever defaulted on a Contract, a letter including details and reasons of defaulting must be included with the Bid Form.

Certificates of Insurance(s) shall be submitted as evidence of the appropriate insurance coverage(s). The insurance requirements are as follows:

INSURANCE	MINIMUM LIMITS
Workers Compensation, Disability	Statutory
Employers Liability	\$1,000,000
Commercial General Liability	\$1,000,000
Personal and Automobile Liability	\$1,000,000
Excess Liability /Umbrella	\$1,000,000

The Owner and Blue Earth are to be named on the insurance certificate as an additional insured, and a waiver of subrogation is to be given in their names. Insurance certificates shall be supplied by the time of contract award.

The Contractor is required to complete all cost and pricing data in the written format specified.

2.6 Submittals with Bid

The Contractor shall submit with his bid the following:

- Bid Form completed in the format provided in the bid documents
- Bid Bond in the amount equal to five percent (5%) of the total of the bid
- A Performance and Payment Bond will be due at Notice to Proceed for 100 percent of the project
- Proof of insurance
- Proof of ability to provide payment and performance bonds
- Names of proposed key personnel and list of personnel that will perform the work
- Name and credentials of proposed site Health and Safety Officer
- List of proposed equipment and number of pieces that will perform the work
- Names of proposed subcontractors and major vendors proposed for this project
- A schedule that describes or shows the amount of time necessary to perform the work. It shall as a minimum detail time for preparation, mobilization, work periods at the site, simultaneous activities, and the total time necessary to complete the work from notice to proceed to final demobilization
- A letter stating details and reasons for any default of contract that has occurred
- HUB Certified/ Minority Business Participation Forms (Attachment B)

2.7 Award of Contract

In evaluating bids, The Owner will consider the qualifications and financial status of bidders, whether or not the bids comply with the prescribed requirements, unit prices, and other data as requested in the Bid Documents. The Owner may also consider the experience and qualifications of proposed subcontractors.

The Owner reserves its right to reject any or all Bids, including without limitation, the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional bids, and to reject the bid of any bidder if the Owner believes that it would not be in the best interest of the project to make an award to that bidder.

2.8 Contract Form and Execution of Contract Form

When The Owner gives a Notice of Award to a successful bidder, unsigned copies of the Contract Form will accompany it. A copy of the Contract Form that will be utilized by the Owner is included with the Bid Documents.

Within 5 days after receipt of Notice of Award, the Contractor shall sign and deliver the copies of Contract and required documents to the Owner. Thereafter, the Owner will deliver one fully executed copy to the Contractor.

3.0 BID FORM

A-B Tech Community College
Parking Lot Stormwater Green Infrastructure Retrofit Project
13 Facilities Way, Asheville, North Carolina 28801

Deliver one (1) copy of bid to:

**Buncombe County General Services Department
40 McCormick Place, Asheville, NC 28801
Phone: (828) 250-4233**

Bidder: _____ Date: _____

Bid Contact(s) _____

Contractor's NC License (Where applicable) Class _____ Contractor No. _____

Bidder is: (Complete as Appropriate)

An Individual

By: _____ (SEAL)

Doing business as: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

A Partnership

By: _____ (SEAL)
(Firm Name)

(General partner)

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

A Joint Venture

By: _____
(Name)

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

By: _____
(Name)

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

By: _____
(Name)

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

(Each Joint Venturer must sign. Each individual, partnership and corporation that is a party to the joint venture should sign in the manner indicated above).

A Corporation

By: _____
(Corporation Name)

A Corporation of the State of: _____

Corporate Officers: _____ President: _____

SEAL Secretary: _____

Treasurer: _____

Designated by Officers authorized to sign Contracts

Attest By: _____ Title: _____

Witness: _____ Title: _____

4.0 CONTRACT DOCUMENTS

All work shall be performed under a formal agreement to be entered into between The Owner and the selected Contractor using the Owner's Contract Form, which is included in this document. The Contract and all other Contract Documents referred to herein form the Total Agreement.

4.1 Documents

I have received, examined, understand and agree to comply with the requirements of the following:

- Invitation to Bid including Attachments
- Bid Conditions
- Bid Form
- Contract Document
- Contract Form
- Drawings
- Addenda No: _____

The bidder shall insert the number of each Addendum received and agrees that issued Addenda are hereby made part of the Bid Documents. The bidder further agrees that this bid includes all costs and schedule impacts resulting from said Addenda.

Additional Declarations:

- The bidder accepts the terms and conditions and requirements of the above documents.
- The bid includes cost of specified insurance.
- The bidder accepts contract schedule set forth herein.
- The bidder has included all sales and use taxes and permit fees.

Acknowledgment By: _____ Date: _____

4.2 On Site Representatives

Safety - Red Cross Emergency and CPR trained: _____

Project Leader: _____

4.3 Bid Itemization Worksheet Submittal

The bidder agrees to accept as full payment for the work within the Bid Documents including sales, consumer use, and other taxes, permit fees, fuel, materials, labor, and overhead and profit, the total amount listed on the Bid Itemization worksheet.

The quantities listed on the Bid Itemization worksheet are engineering estimates of the actual quantities needed for the project. Contractor shall promptly report in writing to Engineer any

conflict, error, ambiguity, or discrepancy identified in the quantities listed on the Bid Itemization worksheet.

The value of any work covered by a Change Order or of any claim for an adjustment in the Contract Price will be determined based upon the Bid Itemization worksheet as follows:

- Where the Work involved is covered by unit prices, by application of such unit prices to the quantities of the items involved.
- Where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum.

In submitting this bid, the Contractor certifies that the Contractor has made a careful examination of the location and the work, and determined the amount and character of the work and the equipment and materials necessary to complete the same in compliance with the Contract Documents. The Contractor also certifies that he has become acquainted with labor conditions and all other conditions which would affect the work and shall complete the work in and under Conditions he may encounter or create, without delay or extra cost to the Owner. Additional services will not commence without written authorization from the Owner. The Owner reserves the right to terminate any contract for convenience at any time.

Price includes all costs for labor, supervision, material, equipment, hauling, disposal, overheads, profit, and applicable taxes for the line item and constitutes a total price to perform the work. Price includes all fuel, transportation, and maintenance associated with all equipment.

Price is based on using qualified labor for all field work performed under the Contract.

4.4 Subcontractor List

Provide name(s), addresses, and license numbers (if available) of all subcontractors to be used in the execution of the work.

Name	Address	Trade and Contractor License Number

5.0 CONTRACT FORM

See following page.

FORM OF SINGLE PRIME CONSTRUCTION CONTRACT

THIS AGREEMENT, made the ____ day of _____ in the year of 20____ by and between _____, hereinafter called the Party of the First Part (the “Contractor”), and Buncombe County, a body politic and corporate organized under the laws of the state of North Carolina, hereinafter called the Party of the Second Part (the “Owner”).

W I T N E S S E T H :

That the Party of the First Part and the Party of the Second Part for the consideration herein named agree as follows:

1. Scope of Work: This agreement concerns _____ to be performed by The Party of the First Part. The Party of the First Part shall furnish and deliver all materials, and perform all of the work in the manner and form as provided by the approved design drawings and specifications from the preconstruction phase, and those items not on the approved design to ensure the project is functional and complete. These plans, specifications and documents to be titled “_____,” are attached hereto and made a part hereof as if fully contained herein (*such documents may include: advertisements; Instructions to Bidders; General Conditions; Supplementary General Conditions; specifications; accepted proposal; contract; performance bond; payment bond; power of attorney; workmen’s compensation; public liability; property damage and builder’s risk insurance certificates*):
 - i. **Scope of Work**
 - ii. **Buncombe County Construction Contract General Conditions of the Contract**
 - iii. **Buncombe County’s Invitation for Construction Bids**
 - iv. **Responsive Bid Bond**
 - v. **RFP Bidder Info Workbook**
 - vi. **Certificate of Insurance**
 - vii. **Performance and Payment Bonds**

Project Name: _____

2. That the Party of the First Part shall commence work to be performed under this agreement on a date to be specified in a written order of the Party of the Second Part and shall fully complete all work hereunder within ____ consecutive calendar days from said date. For each day in excess thereof, liquidated damages shall be as stated in General and Supplementary General Conditions. The Party of the First Part, as one of the considerations for the awarding of this contract, shall furnish to the Party of the Second Part a construction schedule setting forth planned progress of the project broken down by the various divisions or part of the work and by calendar days as outlined in Article 14 of the General Conditions of the Contract.

3. The Party of the Second Part hereby agrees to pay to the Party of the First Part for the faithful performance of this agreement, subject to additions and deductions as provided in the specifications or proposal, in lawful money of the United States as follows:

_____ dollars and 00/100 Dollars (\$_____)

4. In accordance with Article 31 and Article 32 of the General Conditions of the Contract, the Party of the Second Part shall review, and if approved, process the Party of the First Party's pay request within 30 days upon receipt. The Party of the Second Part, after reviewing and approving said pay request, shall make payments to the Party of the First Part on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the First Party, less five percent (5%) of the amount of such estimate which is to be retained by the Second Party until all work has been performed strictly in accordance with this agreement and until such work has been accepted by the Second Party. The Second Party may elect to waive retainage requirements after 50 percent of the work has been satisfactorily completed on schedule as referred to in Article 31 of the General Conditions.
5. The Party of the First Part shall perform the work associated with this Agreement in such a manner as not to void any warranties, including those for labor, materials, or parts, that are held by the Owner and/or schools systems, colleges, and/or their respective governing bodies, and/or that are applicable to the property on which any activities under this contract occur, and/or that remain in effect on any of the locations at which the Party of the First Part is performing work associated with this Agreement. The Owner and/or schools systems, colleges, and/or their respective governing bodies upon whose property any activities under this contract occur, may allow for the issuer of any such warranties to inspect the drawings, specifications, and/or the work performed by the Party of the First Part to ensure that any such warranties remain valid for their remaining term. The Owner of the property on which the work is being performed shall be responsible for providing notice to the issuers of any warranties, unless such property is occupied by a schools system, college, and/or its respective governing body, in which case the school system, college, or its respective governing bodies for which the work is being performed shall be responsible for providing such notice.
6. Upon submission by the First Party of evidence satisfactory to the Second Party that all payrolls, material bills and other costs incurred by the First Party in connection with the construction of the work have been paid in full, final payment on account of this agreement shall be made within thirty (30) days after the completion by the First Party of all work covered by this agreement and the acceptance of such work by the Second Party.
7. It is further mutually agreed between the parties hereto that if at any time after the execution of this agreement and the surety bonds hereto attached for its faithful performance, the Second Party shall deem the surety or sureties upon such bonds to be unsatisfactory, or if, for any reason, such bonds cease to be adequate to cover the performance of the work, the First Party shall, at its expense, within five (5) days after the receipt of notice from the Second Party so to do, furnish an additional bond or bonds in such form and amount, and

with such surety or sureties as shall be satisfactory to the Second Party. In such event no further payment to the First Party shall be deemed to be due under this agreement until such new or additional security for the faithful performance of the work shall be furnished in manner and form satisfactory to the Second Party.

8. The Party of the First Part attests that it and all of its subcontractors have fully complied with all requirements of NCGS 64 Article 2 in regards to E-Verification as required by Section 2.(c) of Session Law 2013-418, codified as N.C. Gen. Stat. § 143-129(j).

{Signature Pages Follow}

NOW THEREFORE, the parties hereby make, agree, and execute this Contract by the below signatures of duly authorized officials or agents.

CONTRACTOR

By: _____
(Signature)

(Printed Name)

(Title)

(Date)

STATE OF _____
COUNTY OF _____

I, _____, a Notary Public of the county and State aforesaid, do hereby certify that _____ personally appeared before me this day and voluntarily acknowledged the due execution of the foregoing instrument.

Witness my hand and notarial seal this _____ day of _____, 20_____

My commission expires: _____

Notary Public

BUNCOMBE COUNTY

By: _____
(Signature)

(Printed Name)

(Title)

(Date)

STATE OF _____
COUNTY OF _____

I, _____, a Notary Public of the county and State aforesaid, do hereby certify that _____ personally appeared before me this day and voluntarily acknowledged the due execution of the foregoing instrument.

Witness my hand and notarial seal this _____ day of _____, 20_____

My commission expires: _____

Notary Public

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

Buncombe County Finance Director

FORM OF PERFORMANCE BOND

Date of Contract: _____

Date of Execution: _____

Name of Principal (Contractor): _____

Name of Surety: _____

Name of Contracting Body: Buncombe County, a body politic and Corporate

Amount of Bond: _____

Project: _____

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety, a surety company authorized to do business in North Carolina, above named, are held and firmly bound unto the above named contracting body, hereinafter called the contracting body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind, ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

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

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

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

{Signature Pages Follow}

NOW THEREFORE, the parties hereby make, agree, and execute this Performance Bond by the below signatures of duly authorized officials or agents.

CONTRACTOR

WITNESS

By: _____
(Signature)

(Signature)

(Printed Name)

(Printed Name)

(Title)

(Title)

(Date)

(Date)

SURETY COMPANY

WITNESS

_____,
A Company Licensed to do Business in N.C.

By: _____
(Signature)

(Signature)

(Printed Name)

(Printed Name)

(Title)

(Title)

(Date)

(Date)

(Surety Corporate Seal)

REGISTERED AGENT

(An authorized agent of the Surety Company who is licensed to do business in North Carolina must Countersign)

(Signature)

(Printed Name)

(Title)

(Date)

Sheet for Attaching Insurance Certificates

6.0 GENERAL CONDITIONS

See Attachment A for Buncombe County General Conditions. In the event that any conflicts or inconsistencies exist between the provisions of this bid package and Attachment A, Buncombe County General Conditions shall prevail and take precedence.

6.1 Scope of Work

The Scope of Work to be accomplished by the Contractor for this project is described in detail in the Contract Documents and generally includes the following:

- Mobilize all personnel, equipment, and supplies
- Construct the stormwater infiltration basin and wetland system and all associated appurtenances
- Repair any damaged property resulting from access and construction operations
- Demobilize all personnel, equipment, supplies, and excess material

6.2 Storage

The Contractor may establish a site construction trailer, storage area, and equipment lay down yard for the work. The Contractor shall secure and maintain the site in accordance with the Owner requirements and shall ensure storage is placed outside of the area that could be impacted by stormwater during the course of the project.

6.3 Haul Routes

The Contractor shall follow the haul route provided and approved by the Owner. The Contractor shall use appropriate signage and traffic controls depending on the truck traffic and location. This activity also needs to be coordinated to meet any Federal, State, or County law enforcement or highway requirements.

6.4 Supervision

The Contractor shall identify a Project Leader (PL) to manage this project from project award through project completion. The PL shall be the primary point of contact for correspondence related to cost, schedule, and scope, as well as for providing all required submittals. During construction, the Contractor shall maintain adequate on-site supervision at all times when work is being performed. The PL shall be identified who shall be responsible for field execution and safety of all work being conducted. Both the PL shall be conversant in English (both speaking and writing) or have on-site translation services available at all times. Personnel changes of the PL shall only be made upon prior approval from the Owner.

6.5 Waste Management

If contaminated material is generated during this work, the Contractor will immediately notify the Owner and Engineer's representative. The Contractor will not excavate, transport, or otherwise disturb any material that is suspected to be contaminated until a waste management plan is developed to describe how the soil is to be handled, stored, analyzed, and disposed.

6.6 Health and Safety

The Contractor shall be responsible for the health and safety of their employees and their lower-tiered subcontractor personnel. The primary objectives of the Health and Safety Program are to protect personnel on site, to comply with applicable health and safety regulations, and to minimize health and safety liabilities.

6.7 Project Meetings

The Contractor shall facilitate and attend meetings through progress of site construction work. The project meetings shall include, but are not limited to, a pre-construction meeting and daily tailgate safety meetings. At a minimum, the PL shall be in attendance at the pre-construction meeting. Meetings conducted will be recorded in Project Status Meeting minutes prepared by the contractor and submitted to the Engineer. The PL must review and approve all meeting minutes. The PL and all on-site workers shall be present at the daily tailgate meetings. At a minimum, the PL shall be in attendance at the pre-construction and weekly progress meetings. The following shall be accomplished at each weekly progress meeting:

- 1) Review the minutes of the previous meeting.
- 2) Review the schedule (updated schedule to be provided by Contractor prior to each weekly meeting).
 - a) Work or testing accomplished since last meeting.
 - b) Rework items identified since last meeting.
 - c) Rework items completed since last meeting.
- 3) Review the status of submittals.
 - a) Submittals reviewed and approved since last meeting.
 - b) Submittals required in the near future.
- 4) Review the work to be accomplished in the next week and documentation required.
 - a) Completion dates established for rework items.
 - b) Inspections required.
 - c) Testing required.
 - d) Status of offsite work or testing.
 - e) Documentation required.
- 5) Resolve quality control and production problems.
- 6) Address items that may require revising the plan, such as changes in procedures.

Meetings conducted will be recorded in Project Status Meeting minutes prepared by the PL or designated representative. The PL must review and approve all meeting minutes. The PL and all on-site workers shall be present at the daily tailgate meetings.

6.8 Work Schedule

The Contractor shall propose a work schedule to achieve the project scope within the given period of performance and state the number of hours per day and number of days per week necessary. The Contractor will ensure that the Owner's inspection team has an opportunity to inspect all activities. All inspections will be scheduled Monday through Friday from 8:00 a.m. to 5:00 p.m. local time. Any deviations from the Contractor's submitted schedule must be approved in advance by the Owner or approved representative. The Contractor shall assume a reasonable number of

“no workdays” in his schedule due to weather and state the number of days included in the schedule.

6.9 Site Security

The site shall be properly secured at the end of each day. Security of the site and all equipment and materials is the responsibility of the Contractor. All work areas shall be clean, neat, and maintained at all times. Where existing fencing and structures are removed during the course of the work by the Contractor, they shall be reset if not damaged, or replaced by Contractor. All non-contaminated debris removed during the course of the work shall be disposed of at appropriate disposal facilities off-site if the Contractor cannot use such materials for subsequent installations on site for the project.

6.10 Permits, Licenses, and Certifications

The Contractor shall be in possession of all permits, licenses, and certifications required by federal, state, and local agencies necessary to perform the work. See Attachment D for City of Asheville Grading Permit.

6.11 Utility Clearance and Lock-Out Requirements

The Contractor shall be responsible for the identification and protection of all utilities, above and below ground, in the designated work areas. Utilities shall be identified by reviewing appropriate drawings, conducting utility sounding, and performing site visits with appropriate utility representatives. The Contractor shall be responsible for implementing a lock-out/tag-out program on all utilities to be cut to facilitate work activities, including temporary diversion of stormwater runoff.

6.12 Changes in Scope/Technical Direction

The Contractor shall submit in writing (along with an estimate of the cost of the change) any notice of change in this scope of work prior to initiating or implementing any change. A Change Order form is provided with the bid documents. Any work performed by the Contractor outside of the approved scope of work without the authorized Owner representative's prior written acceptance shall not be considered for compensation. Any change submitted by the Contractor is subject to a reasonable time for review by the Owner. The value of any Work covered by a Change Order or of any claim for an adjustment in the Contract Price will be determined as described in Item 4.3 - Bid Itemization Worksheet Submittal.

6.13 Warranty of Construction

Contractor shall provide a one-year warranty of construction from the date of completion for all workmanship. Should any work accomplished by the Contractor fail to meet acceptable standards during this period, the Contractor shall repair the workmanship at no cost to the Owner. This shall include but not be limited to failure of earthwork, erosion control features, concrete, and asphalt when subjected to reasonably anticipated load and weather conditions, erosion or degradation of site restoration work, planting, and repairs to facilities and/or structures accomplished by the Contractor. Should repairs be required during the one-year warranty period,

an additional one-year warranty shall be applied to repairs from the date of completion. Repairs required during the warranty period(s) and the extension of warranty period(s) due to Contractor's workmanship shall not be grounds for additional or increased payment.

6.14 Substantial Completion

When Contractor finishes the Work, Contractor shall notify Engineer in writing that the Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion. Within a reasonable time thereafter, Engineer shall inspect the Work to determine the status of completion.

Engineer will review the status of completion with the Owner.

If Engineer and Owner do not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefore.

If Engineer and Owner consider the Work substantially complete, Engineer will prepare and deliver to Contractor a certificate of Substantial Completion, which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final inspection and payment.

6.15 Final Inspection

Following completion of the work, Engineer will make a final inspection of the Work. Engineer will review the results of the inspection with the Owner. Following review with the Owner, Engineer will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

6.16 Application for Payment

After receipt of the Certificate of Substantial Completion (i.e., after completion of the Work), Contractor may make application for payment of 80% of the Contract Price. The Application for Payment shall be accompanied by complete and legally effective releases or waivers (satisfactory to Engineer) of all Liens arising out of or filed in connection with the Work.

After Contractor has completed all corrections mentioned in the final inspection report to the satisfaction of Engineer, Contractor may make application for payment for 10% of the Contract Price. The Application for Payment shall be accompanied by complete and legally effective releases or waivers (satisfactory to Engineer) of all Liens arising out of or filed in connection with the Work.

The remaining 10% of the total Contract Price will be set aside as a retainer designated for establishment of vegetation within the system. Once the vegetation is considered substantially established by the Engineer, the Contractor may make application for payment for the remaining 10% of the Contract Price.

6.17 Payment and Acceptance

If Engineer is satisfied that the Work has been completed, and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will recommend that the Owner pay Contractor for the Work. Otherwise, Engineer will recommend that Owner return the Application to Contractor, indicating in writing the reasons for refusing payment, in which case Contractor shall make the necessary corrections and resubmit the Application. Owner will pay Contractor the amount due from the Application for Payment in accordance with Item 5.0 - Contract Form.

7.0 INSPECTION OF WORK STATEMENT

The undersigned affirms that the contract price submitted here-in is made after an inspection of the work site and the Contractor has availed himself of a thorough knowledge of the site and the scope of work in the preparation of this bid.

Contract Name:_____

County:_____

Firm Name:_____

Address:_____

By:_____

Title:_____

Date:_____

8.0 CHANGE ORDER

A-B Tech Parking Lot Stormwater Green Infrastructure Retrofit Project
13 Facilities Way, Asheville, North Carolina 28801

Change Requested By: _____

Organization: _____

Date: _____

PURPOSE OF CHANGE: _____

COST: _____

SCHEDULE IMPACT: _____

COMMENTS: _____

Owner Approval

Authorized Representative: _____

Date: _____

Contractor

Company Name: _____

Authorized Representative: _____

Date: _____

9.0 BID ITEMIZATION

See next page.

A-B Tech Parking Lot Stormwater Green Infrastructure Retrofit Project
Bid Itemization
May 30, 2024

Item	Spec.	Item Description	Quantity	Units	Unit Price	Total Amount
1. Mobilization, Demobilization, Misc.						
1	10.0	Mobilization and Demobilization	1	LS		
2	10.3	Construction Survey	1	LS		
3	10.4	Traffic Control	1	LS		
4	10.5	Safety Fence	465	LF		
5	12.4	Temporary Construction Entrance	2	EA		
2. Demolition						
6	13.2	Breakup and Loading of Existing Asphalt Pavement	1,120	SY		
7	13.2	Haul and Disposal of Asphalt Pavement	62	CY		
3. Stormwater Flow Splitter						
8	15.0	Precast Flow Splitter with Flashboards and Connection Piping (Installed)	1	LS		
4. Infiltration Basins (Cells 1 and 2)						
9	13.0	Excavation	440	CY		
10	13.0	Haul and Disposal of Soil Material	440	CY		
11	13.8	Backfill Material	170	CY		
12	13.0	Earth Work - Fine Grading	40	HR		
13	17.0	Coir matting for channels and infiltration basins (installed)	730	SY		
14	16.0	River rock apron in Cell 1 (installed)	200	SF		
15	19.0	Shrubs (3 gallon installed)	28	EA		
16	19.0	Plug Planting (installed)	768	EA		
5. Stormwater Wetland (Cell 3)						
17	13.0	Excavation	1,500	CY		
18	13.0	Haul and Disposal of Soil Material	1,500	CY		
19	14.0	Reinforced Geosynthetic Clay Liner (installed)	13,050	SF		
20	13.8	Backfill Material	445	CY		
21	13.0	Earth Work - Fine Grading	60	HR		
22	20.1	15-inch HDPE Pipe	24	LF		
23	18.0	Agri-drain Outlet Riser, Base & Connection Piping installed	1	LS		
24	20.2	Cap existing stormwater inlet	1	LS		
25	17.0	Coir Matting for Wetland (installed)	1,450	SY		
26	19.0	Shrubs (3 gallon installed)	51	EA		
27	19.0	Plug Planting (installed)	2,816	EA		
28	20.3	12-18" Boulder stone (hailed and installed)	5	CY		

A-B Tech Parking Lot Stormwater Green Infrastructure Retrofit Project
Bid Itemization
May 30, 2024

Item	Spec.	Item Description	Quantity	Units	Unit Price	Total Amount
6. Pedestrian Paths and Structures						
29	13.0	Earth Work - Fine Grading	16	HR		
30	20.5	Granite Fines on Compacted ABC	2,563	SF		
31	20.5	Metal Edging	1,280	LF		
32	19.0	Mulch (delivered and installed)	10	CY		
33	20.4	Pedestrian Bridge Installed	1	LS		
7. General Landscaping & ESC						
34	12.0	Install, Inspect, Maintain and Remove Temporary ESC Measures	1	LS		
35	19.0	Trees (15 gallon installed)	7	EA		
36	19.0	Shrubs (3 gallon installed)	12	EA		
37	17.0	Coir Matting (installed)	50	SY		
38	19.0	Mulch (delivered and installed)	15	CY		
39	19.0	Conservation Seed Mixes (Ernst Seed Mix127 and 303 installed)	16,610	SF		
40	19.0	Eco-Grass Seed Mix (installed)	7,000	SF		
Total Lump Sum Bid						

CONSTRUCTION AND MATERIAL SPECIFICATIONS

**A-B Tech Parking Lot
Stormwater Green Infrastructure Retrofit Project
13 Facilities Way
Asheville, North Carolina 28801**

Note: Contractor should reference construction drawings for additional details and specifications.

10.0 MOBILIZATION AND DEMOBILIZATION

10.1 Scope

The work consists of the mobilization and demobilization of the Contractor's forces and equipment necessary for performing the work required under the contract. It does not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract.

10.2 Equipment and Materials

Mobilization shall include all activities and associated costs for transportation of Contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary general facilities for the Contractor's operations at the site; premiums paid for performance and payment bonds including coinsurance and reinsurance agreements as applicable.

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; including the disassembly, removal, and site cleanup of offices, buildings, and other facilities assembled on the site specifically for this contract.

This work includes mobilization and demobilization required by the contract at the time of award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of changed, deleted, or added items of work for which the Contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the item or items of work changed or added.

10.3 Construction Survey

Contractor shall perform construction survey and shall include but not be limited to the layout of the stormwater treatment system and related structures. Contractor shall maintain a level and rod on-site at all times for use by the Engineer to evaluate grades. Contractor may elect to use traditional stakeout methods or Global Positioning System (GPS) methods. For traditional stakeout methods, stakeout shall be performed in such a way that the Owner can verify the layout of the system prior to construction activities commencing. The Contractor shall mark the proposed location of the infiltration basins, wetland and related infrastructure. Prior to executing work, the Contractor shall review stakeout or review the proposed plans as indicated in their GPS system with the Engineer.

10.4 Safety Fence

Contractor shall install 4-ft high construction safety fence along the project area adjacent to Facilities Way as shown on the construction drawings. Fencing material will be safety orange in color of polyethylene or polypropylene, approved by the Owner. Steel posts are required for fence installation and will be at least five (5) feet in length.

Safety fence will be installed in the work area within one working day of mobilization. Failure to install the safety fence in areas as directed by the Owner will result in stoppage of all work

operations until the fence is properly installed. The Contractor will be required to maintain the safety fence in a satisfactory condition throughout the project. Posts may be set with a post driver or by hand. If set by hand, all backfill material must be thoroughly tamped. Posts will be set and maintained in a vertical position. The fence fabric will be attached to the steel posts with wire or other acceptable means.

10.5 Traffic Control

Public and worker safety must be maintained. Contractor shall furnish materials and personnel, install and maintain traffic control devices, as required by Owner. Traffic control shall be placed prior to commencing work. Appropriate approvals for any lane, sidewalk or other closures shall be obtained. Advanced warning signs shall be placed for visibility and shall not interfere with access or function of other roadway, sidewalk or signage.

10.6 Payment

Payment will be made as the work proceeds, after presentation of paid invoices or documentation of direct costs by the Contractor showing specific mobilization and demobilization costs and supporting evidence of the charges of suppliers, subcontractors, and others. When the total of such payments is less than the lump sum contract price, the balance remaining will be included in the final contract payment. Payment of the lump sum contract price for mobilization and demobilization will constitute full compensation for completion of the work.

Payment will not be made under this item for the purchase costs of materials having a residual value, the purchase costs of materials to be incorporated in the project, or the purchase costs of operating supplies.

11.0 POLLUTION CONTROL

11.1 Scope

Work included in this Section is to be completed by the Contractor, and is to include furnishing all labor, materials, and equipment and performing all operations necessary to control erosion and minimize the production of sediment and other pollutants to water and air from construction activities.

11.2 Material

All material furnished shall meet the requirements of the material specifications listed in the bid documents.

11.3 Erosion and sediment control measures and works

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

Staging of earthwork activities – The excavation and moving of soil materials shall leave areas unprotected from erosion for the shortest reasonable time and be scheduled to minimize the size of areas disturbed.

Seeding – Seeding to protect disturbed areas shall occur as soon as reasonably possible following completion of that earthwork activity.

Sediment Fence Installation – Sediment fencing shall be placed on downslope areas of construction activities as shown on the Erosion Control Plan for this project and in accordance with North Carolina Erosion and Sediment Control Planning and Design Manual.

Other – Additional protection measures as specified in this Section or required by Federal, State, or local government.

Additional detail is provided in *Section 12.0 – Erosion Control Measures*.

11.4 Chemical Pollution

The Contractor shall provide watertight tanks or barrels or construct a sump sealed with plastic sheets to dispose of chemical pollutants, such as drained lubricating or transmission fluids, grease, soaps, concrete mixer wash water, or asphalt, produced as a by-product of the construction activities. At the completion of the construction work, sumps shall be removed and the area restored to its original condition. Sump removal shall be conducted without causing pollution.

Sanitary facilities, such as chemical toilets, shall not be located next to live streams, wells, or springs. They shall be located at a distance sufficient to prevent contamination of any water source.

11.5 Air Pollution

The burning of brush or slash and the disposal of other materials is prohibited.

All public access or haul roads used by the Contractor during construction of the project shall be sprinkled or otherwise treated to fully suppress dust. All dust control methods shall ensure safe construction operations at all times. If chemical dust suppressants are applied, the material shall be a commercially available product specifically designed for dust suppression, shall be non-toxic, and shall be suitable for use near aquatic resources. Application of the suppressant shall follow manufacturer's requirements and recommendations. A copy of the product data sheet and manufacturer's recommended application procedures shall be provided to the Engineer at least five working days before the first application.

11.6 Maintenance, Removal, and Restoration

All pollution control measures and temporary works shall be adequately maintained in a functional condition for the duration of the construction period. All temporary measures shall be removed, and the site restored to near original condition after construction is complete.

12.0 EROSION AND SEDIMENT CONTROL

12.1 Scope

Work included in this Section is to be completed by the Contractor, and is to include furnishing all labor, materials, and equipment and performing all operations necessary to complete the installation of erosion control measures.

12.2 Temporary Sediment Fence

Temporary sediment fence shall be installed according to the Sediment and Erosion Control Details on the construction drawings. Sediment fence shall be installed on-contour and not within concentrated flow paths.

12.3 Temporary Inlet Protection

Temporary inlet protection shall be installed according to the Sediment and Erosion Control Details on the construction drawings.

12.4 Temporary Construction Entrances

Two temporary construction entrances shall be constructed as shown on the Sediment and Erosion Control Details allowing access from Facilities Way. Contractor shall repair any damage that occurs to existing roads, gates, fences, or vegetation adjacent to the construction entrances by restoring these areas to pre-construction conditions. The Contractor is responsible for conducting and the cost of these repairs. Each construction entrance shall be composed of geotextile fabric and aggregate stone per the detail in the plans.

The entrance shall be maintained in a condition which prevents the tracking of flowing of sediment onto public rights of way. This may require periodic top dressing with additional stone as conditions demand and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed, or tracked onto public rights of way must be removed immediately.

13.0 EARTHWORK

13.1 Scope

Work included in this Section is to be completed by the Contractor, and is to include furnishing all labor, materials, and equipment and performing all operations necessary to complete the following work:

- a) Removal of existing asphalt pavement and disposal.
- b) Clearing and removal of debris and unsuitable material, including invasive plant species.
- c) Grading and proof-rolling of the site to the prescribed elevations.
- d) Stockpiling of any excess cut material for providing acceptable material as required to obtain the desired grades.
- e) Removal and hauling of any unused excavated material for disposal.

Notable efforts include stormwater infiltration basins, stormwater wetland and other stormwater infrastructure. Grade to final surface elevations along the project as shown on the plans, sections, profile and details.

13.2 Demolition

Work under this section consists of removal and disposal of existing asphalt pavement as shown on the construction drawings. Break up, remove and satisfactorily dispose of the asphalt within the limits shown on the plans. Break up and remove the pavement for its entire depth and where pavement is to be removed, provide a neat edge along the pavement being retained by sawing the pavement approximately 2 inches deep before breaking the adjacent pavement away. Properly dispose of all materials resulting from the pavement removal.

The Contractor is responsible for complying with all applicable local, state or federal regulations for offsite disposal of materials. Materials shall not be disposed of on-site without permission of the Owner. Other waste material including pavement, metal, non-inert substances, and encountered trash or debris, shall not be buried on-site, and will be properly disposed of by the Contractor. Pavement and metal should be recycled at local recycling facilities.

13.3 Site conditions

A Limited Geotechnical Exploration Report, conducted by S&ME in November 2023 is available for this project and included in Attachment E. Additional test borings and other exploratory operations may be undertaken by the Contractor at his own expense, provided such operations are acceptable to the Owner.

13.4 Limits of Disturbance

Site disturbance shall be limited to area contained within Limits of Disturbance as indicated on the construction drawings. Contractor shall not injure or deface vegetation or structures that are not directly located within project limits of disturbance. Any vegetation, including trees, located on or

near the boundary of the limits of disturbance shall be protected to the maximum extent practicable.

13.5 Materials

Broken rock and boulders larger than four inches in any dimension may not be used as fill without the specific approval of the Engineer. Saturated soil may not be used as fill without the specific approval of the Engineer. Frozen soil shall not be used for fill. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently for proper compaction.

13.6 Preparation

The surface shall be prepared according to the following:

- a) Clear areas within limits of disturbance as required for project. Fell any trees within project area so that they fall away from facilities and vegetation not designated for removal.
- b) Grub areas within limits as required for project.
- c) Strip areas within limits of disturbance as required for project. Carefully remove topsoil and stockpile in an accessible location for later use. Strip areas to minimal depths needed. Stockpile topsoil in sufficient quantity to meet project fill and backfill needs. Over-excavate the wetland area such that when stockpiled topsoil is spread over the basin and other disturbed areas after preliminary grading, in advance of planting, the final grade is accurate. Soils excavated from beneath topsoil should be segregated, stockpiled, reused or removed from the site. If soil is removed from the site, it shall be disposed of properly at a landfill.
- d) After removal of all undesirable material, the areas which are to receive fill, which have been cut to the desired grade, or which are at the approximate required subgrade elevation without additional earthwork, should be proof-rolled to locate any soft or yielding area. Proof-rolling shall be done with at least five overlapping passes of a fully-loaded single axel dump truck, or by its approved equivalent.
- e) Any soft, or excessively yielding material revealed by the proof-rolling shall be removed and replaced with inert controlled fill. The Contractor's engineer shall be the sole judge of what constitutes soft or excessively yielding material.
- f) Subgrade shall be kept free of water, debris, and foreign matter during compaction or proof-rolling.
- g) Do not use sections of prepared ground surface as haul roads. Protect prepared subgrade from traffic.
- h) Do not over-excavate without prior written authorization from Engineer.

13.7 Stockpiling Excavated Material

Stockpiling shall be carried out according to the following:

- a) Stockpile excavated material that is suitable for use as fill or backfill until material is needed.

- b) Post signs indicating proposed use of material stockpiled. Post signs that are readable from all directions of approach to each stockpile. Signs should be clearly worded and readable by equipment operators from their normal seated position.
- c) Confine stockpiles to within easements, rights-of-way, and approved work areas. Do not obstruct roads or streets.
- d) Do not stockpile excavated material adjacent to trenches and other excavations, unless excavation side slopes and excavation support systems are designed by Contractor's geotechnical engineer and are constructed and maintained for stockpile loads.
- e) Do not stockpile excavated materials near or over existing facility, adjacent property, or completed work if weight of stockpiled material could induce excessive settlement.

13.8 Backfill for Infiltration Basins

Soil backfill for the infiltration basins should be developed by removing the existing soil and replacing it with mix of sand, fines, and organic material in a 12-inch deep planting layer. The soil material shall be a homogeneous soil blend, similar to the NC Stormwater Design Manual bioretention media mix with approximate volumes of:

- 75 to 85 percent medium to coarse washed sand (ASTM C33, AASHTO M 6/M 80, ASTM C330, AASHTO M195, or the equivalent);
- 8 to 15 percent fines (silt and clay); and
- 5 to 15 percent organic matter (such as pine bark fines).

Suitable topsoil should be stockpiled for use in this application from other grading activities. Contractor is responsible for mixing materials. The soil, sand and organic matter must be uniformly mixed and graded. Excavate the basins to the specified dimensions and depth, removing all unsuitable materials. Ensure the subgrade is free of debris, large rocks. Place soil backfill material in layers not exceeding 8 inches in loose thickness. Each layer shall be evenly spread and graded. Avoid over-compaction of the final layer to maintain surface infiltration rates and support root growth.

13.9 Backfill for Wetland

Suitable topsoil should be stockpiled for use in this application from other grading activities. Ensure the backfill material, recovered or imported, is free of debris and rocks. The planting layer should be a blended mix of soil components to achieve the desired physical and chemical properties. The recommended composition is as follows:

- Topsoil: 30-40%, rich in organic matter, free of contaminants and invasive species, pH range: 5.5 to 7.5.
- Organic Matter: 20-30%
- Sand: 20-30%, clean, well-graded sand with a particle size range of 0.05 to 2 mm.
- Clay and Silt: 10-20%, clay content should be sufficient to aid water retention.

Place soil backfill material in layers not exceeding 8 inches in loose thickness. Each layer shall be evenly spread and graded. Adjust the pH, compaction and other attributes of the soil backfill, if necessary, to promote plant establishment and growth.

13.9 Installation

Filling and compaction shall be prepared according to the following:

- a) After a stable non-yielding surface has been established, the surface of the area to be filled shall be scarified with a disc or harrow to a depth of four to six inches. An initial three-inch layer of fill material shall then be spread over the scarified surface and the entire area compacted as specified below.
- b) No fill shall be placed on any area until that area has been inspected and approved by the Engineer. Fill shall not be placed on a snow covered or frozen surface. Fill materials shall be spread in uniform horizontal layers not exceeding eight (8) inches in uncompacted thickness. Alternating layers of cohesive and granular fill soils shall not be permitted. Spreading and compacting of fill material should be started at the lowest portion of site. All fill must be placed in horizontal layers. Sloping fill planes will not be permitted. Fill material shall be distributed over the full width of the embankment, and in no case will deep ruts be allowed to form.
- c) Each layer of fill material shall be compacted until its density is not less than 95% of the maximum laboratory dry density for the same material. The Contractor will be responsible for costs concerning compaction testing.
- d) Cut slope – Shape, trim, and finish cut slopes to conform with lines, grades, and cross-sections shown, with proper allowance for topsoil or slope protection. Remove stones and rocks that exceed 3 inches in diameter and that are loose and may roll down slope. Remove exposed roots from cut slopes. Round tops of cut slopes to not less than a 6-foot radius, provided such rounding does not extend offsite or outside easements and rights-of-way, or adversely impacts existing facilities, adjacent property, or completed work.
- e) All cut areas shall be rolled and compacted to produce a compaction equal to that of the filled area. If soft or yielding material is encountered in cuts, or fills as a result of trapping water, over-rolling or improper control of construction traffic, and cannot be satisfactorily stabilized by moisture control, compaction, or other means approved by the Engineer, the unstable material shall be excavated to the depth required by the Engineer. The excavation shall then be filled with suitable compacted material in accordance with the requirements outlined above.
- f) At the close of each day's work, or where work is to be interrupted for a period of time, the surface of the site shall be shaped to drain freely, and sealed. If after a prolonged rainfall, the surface of the area to be filled or cut is too wet to work properly, the wet material shall be removed to expose workable soil. The wet material removed may be dried and reused. Construction traffic shall be controlled so as to prevent rutting of graded areas and to avoid over-rolling of any section.

13.10 Grading

Grading shall be completed according to the construction drawings. Elevations shown on the plans are finished ground unless otherwise noted. Shape all surfaces to within a tolerance of 0.10 feet above or below the required subgrade elevations and free from irregular surface changes.

13.11 Maintenance

The Contractor shall be responsible during construction and until final acceptance for the maintenance of all grading activities. The Contractor shall replace, at no cost to the Owner, any portion of embankment which have become displaced or damaged due to carelessness or neglect on the part of the Contractor. Where the work has been properly constructed, completely drained and properly maintained, and damage occurs due to unforeseeable natural causes including rainfall events in excess of a 10-year storm event, the Contractor will be paid at the contract unit price for the excavated material required to make necessary repairs to such damage.

13.12 Disposal

Dispose of debris from clearing and grubbing activities offsite. Dispose of strippings that are unsuitable for topsoil or that exceed quantity required for topsoil offsite. Limit debris and stripping material disposal to locations that are approved by federal, state, and local authorities. Burning of materials onsite will not be allowed.

All elevations shall be brought to the grade shown on the plans or established by the Engineer, prior to final inspection and acceptance by the Engineer.

14.0 GEOSYNTHETIC CLAY LINER (GCL) FOR WETLAND

14.1 Scope

Work included in this Section is to be completed by the Contractor, and is to include furnishing all labor, materials, and equipment and performing all operations necessary to complete the installation of the geosynthetic clay liner (GCL) for the stormwater wetland (Cell 3).

14.2 Material

The GCL product shall be Bentofix Thermal Lock CNSL Geosynthetic Clay Liner (GCL) or equivalent that meets the product specifications on the following pages.

14.3 Installation

The GCL product shall be installed according to the Bentofix Specification Guidelines in the following pages (or installation specifications for equivalent GCL product).

The wetland area shall be over excavated such that the GCL will have a minimum soil cover of one foot and the finished grades shown in the construction drawings can be achieved. The GCL Installer shall provide to the engineer sufficient evidence of installation experience and competence with the specified geosynthetic materials. The GCL installer shall demonstrate a GCL installation experience or shall provide sufficient evidence of installation experience and competence with other geosynthetic products (geotextiles/geogrids, geoliners) or shall demonstrate an acceptable level of training and supervision will be utilized in order to ensure the quality of the installation or shall receive initial assistance from the GCL manufacturer and/or from the GCL distributor in order to ensure a quality installation.

The Contractor shall have a GCL construction quality assurance (CQA) inspector on this project, provided at the Contractor's expense, to ensure proper GCL installation. The geotechnical consultant for this project, S&ME, may be able to provide a qualified GCL inspector and can be contacted at Christopher Fujita-Mentch, P.E., S&ME, 44 Buck Shoals Road, Suite C-3, Arden, NC 28704, 828.687.9080.

14.4 GCL Penetration for Wetland Riser Outlet

Penetrations into the GCL for installation of the wetland outlet shall be installed according to the Bentofix Specification Guidelines including all proper sealing techniques to ensure the water tight sealing of the GCL.

BENTOFIX® CNSL

CNSL

Thermal Lock® Geosynthetic Clay Liners

Bentofix Thermal Lock® CNSL Geosynthetic Clay Liner (GCL) is a needlepunched, thermally reinforced composite comprised of a core of natural sodium bentonite clay between two durable geotextile layers to form a low permeability hydraulic barrier. The top layer is a staple fiber nonwoven (NW) geotextile while the bottom layer is a woven (W) geotextile. The bottom woven (W) geotextile contains a rugged adhesive geofilm to provide a geomembrane type of hydraulic conductivity. The product is intended for applications that require excellent hydraulic conductivity properties.

Property	ASTM Test Method	Frequency	Value Imperial Units	Value Metric Units
Typical Geotextile Properties				
• Top / Cap Nonwoven	D 5261	200,000 sq ft (20,000 m ²)	6.0 oz./yd ² MARV	200 g / m ² MARV ⁽¹⁾
• Woven	D 5261		3.1 oz./yd ² MARV	105 g / m ² MARV
• Mass of flexible geofilm	D 5261		6 oz./yd ² MARV	200 g/m ² MARV
Bentonite Properties (SI Units Only)				
• Swell Index	D 5890	100,000 lbs.	24 ml/ 2 g min	24 ml/ 2 g min
• Moisture Content	D 4643	(50,000 kg)	12 % max	12 % max
• Fluid Loss	D 5891		18 ml max	18 ml max
Finished GCL Properties				
• Bentonite Mass/Unit Area ²	D 5993	40,000 ft ² (4,000 m ²)	0.75 lbs/ft ² MARV	3.66 kg/m ² MARV
• Tensile Strength ³	D 6768	200,000 ft ² (20,000 m ²)	45 lb/in MARV	7.8 kN/m MARV
• Peel Strength	D 6496	40,000 ft ² (4,000 m ²)	3.5 lbs/in min	610 N/m min
• Permeability ⁴	D 5887	Weekly	5 x 10 ⁻¹⁰ cm/s max	5 x 10 ⁻¹⁰ cm/s max 5 x 10 ⁻¹³ cm/s E96
• Index Flux ⁴	D 5887	Weekly	1 x 10 ⁻⁹ m ³ /m ² /s max	1 x 10 ⁻⁹ m ³ /m ² /s max
• Internal Shear Strength ⁵	D 6243 D 5231	Periodic	500 psf Typical	24 kPa Typical

(1) Minimum Average Roll Value.

(2) Oven-dried measurement. Equates to 0.84 lb/sqft (4.1 kg/m²) when indexed to 12% moisture content.

(3) Tested in machine direction.

(4) Deaired, deionized water @ 5 psi (34.5 kPa) maximum effective confining stress and 2 psi (13.8 kPa) head pressure.

(5) Typical peak value for specimen hydrated for 24 hours and sheared under a 200 psf (9.6 kPa) normal stress.

BENTOFIX[®]**Thermal Lock Geosynthetic Clay Liner**

• Technical Bulletin •

BENTOFIX

SPECIFICATION

GUIDELINES

THE FOLLOWING SPECIFICATION GUIDELINE REFLECTS INDUSTRY ACCEPTED INSTALLATION PROCEDURES AND THE MOST CURRENT BENTOFIX QUALITY CONTROL TEST PROTOCOL. IT IS INTENDED TO BE USED AS THE GENERAL FORMAT, NOT AS A DIRECT SUBSTITUTE FOR A PROJECT SPECIFIC GEOSYNTHETIC CLAY LINER (GCL) SPECIFICATION.

- 1.0 GENERAL Scope** - This specification details the technical requirements for the supply and installation of a needlepunched Geosynthetic Clay Liner (GCL). The material(s) furnished and installation performed shall be in strict accordance with these requirements and the contract drawings.
- 1.1. Definitions** - For the purposes of this specification the following definitions shall apply:
- 1.1.1. Geosynthetic Clay Liner (GCL) - A factory manufactured hydraulic barrier consisting of granular sodium bentonite clay, sandwiched between, supported and encapsulated by two geotextiles, held together by needlepunching.
 - 1.1.2. Geotextile - A semi-permeable woven or nonwoven fabric or scrim-reinforced nonwoven used to contain the bentonite used in a GCL.
 - 1.1.3. Sodium Bentonite - The high swelling clay component of GCLs consisting primarily of the mineral Montmorillonite.
 - 1.1.4. Needlepunching - A GCL manufacturing process whereby boards of barbed needles incorporate the staple fibers from a nonwoven geotextile, through a sodium bentonite clay layer, into the matrix of a second geotextile layer.
 - 1.1.5. Thermal Locking - A needlepunching enhancement process utilizing heat to bond the needlepunched fibers and more permanently lock them into the second geotextile to increase the internal shear strength characteristics and lower the bulk void ratio of the bentonite.
 - 1.1.6. Minimum Average Roll Value (MARV) - The minimum average value of the material in a particular lot calculated as the mean of the tested values minus two standard deviations providing a 95% confidence level.
- 1.2. References** - The following test methods shall be incorporated into this specification in their entirety, subject to the indicated test modifications:
- ASTM D 4632, "Standard Test Method for Grab Breaking Load and Elongation of Geotextiles". (Note: D6496 & D6768 are now used instead of D4632).
 - ASTM D 4643, "Determination of Water (Moisture) Content of Soil by the Microwave Oven Method".
 - ASTM D 5084, "Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter".
 - ASTM D 5261, "Standard Test Method for Measuring Mass Per Unit Area of Geotextiles".
 - ASTM D 5321, "Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method".
 - ASTM D 5887, "Measurement of Index Flux Through Saturated Geosynthetic Clay Liner Specimens Using a Flexible Wall Permeameter".
 - ASTM D 5888, "Standard Guide for Storage and Handling of Geosynthetic Clay Liners".

- ASTM D 5889, “Standard Practice for Quality Control of Geosynthetic Clay Liners”.
- ASTM D 5890, “Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners”.
- ASTM D 5891, “Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners”.
- ASTM D 5993, “Standard Test Method for Measuring Bentonite Mass Per Unit of Geosynthetic Clay Liners
- ASTM D 6243, “Standard Test Method for Determining the Internal and Interface Shear Resistance of Geosynthetic Clay Liners by Direct Shear Method”.
- ASTM D 6496, “Standard Test Method for Determining Average Bonding Peel Strength Between the Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners”.
- ASTM D 6768, “Standard Test Method for Tensile Strength of Needle-Punched Geosynthetic Clay Liners”.

2.0 QUALIFICATIONS - The GCL Manufacturer, Installer and Construction Quality Assurance (CQA) inspector shall all be skilled in accordance with the following experience requirements. Any exceptions must be approved by the project engineer prior to the project bid.

2.1. GCL Manufacturer - The GCL manufacturer selected for use on this project shall have successfully produced at least 10,000,000 square meters of needlepunched GCL product.

2.2. GCL Installer - The installer shall provide to the engineer sufficient evidence of installation experience and competence with the specified geosynthetic materials.

The GCL installer shall demonstrate a minimum of 5,000 square meters of GCL installation experience **or** shall provide sufficient evidence of installation experience and competence with other Geosynthetic products (geotextiles/geogrids,geoliners) **or** shall demonstrate an acceptable level of training and supervision will be utilized in order to ensure the quality of the installation **or** shall receive initial assistance from the GCL manufacturer and/or from the GCL distributor in order to ensure a quality installation.

2.3. Construction Quality Assurance (CQA) Inspector - (if required) – The engineering consultant shall have a CQA inspector on this project. The CQA inspector shall be an employee of the engineering consultant on this project.

2.4. Submittals - Three copies of the project submittals shall be forwarded to the project engineer as designated below:

2.4.1. Unit Prices Bid - The square footage and associated pricing shall be based on “measured in place” quantities **or** quantity delivered to the project site as determined by the project engineer.

2.4.1.1. Measured In Place - Measured in place quantities shall be determined from the project drawings, including any allowances for waste, overlap, and anchoring. Final quantities will be payable based on the as-built drawings.

2.4.1.2. Delivered to Site - Delivered pricing quantities shall be determined from the manufacturer's shipping documents and reflect the total square footage delivered to the project site.

2.4.2. Information With Bid - The following shall be submitted with the bid:

2.4.2.1. Statement of experience from the proposed GCL supplier.

2.4.2.2. Statement of experience from the proposed GCL Installer.

2.4.3. Prior to Installation - The following information shall be supplied to the project engineer for review within 10 business days of the Contract Award to ensure that the materials and parties selected for use on the project meet the requirements of this specification:

2.4.3.1. Samples of GCL proposed for use on the project.

2.4.3.2. Reference list supplied by GCL Manufacturer indicating the appropriate experience level as required by the specification.

2.4.3.3. Reference list supplied by the GCL Installer indicating the appropriate experience level as required by the specification.

2.4.4. Prior to Deployment - The following information shall be submitted by the Lining Contractor to the Project Engineer prior to the deployment of any GCL material to ensure that the materials and subgrade preparation meet the requirements of this specification:

2.4.4.1. GCL Manufacturer's Quality Control Certifications.

2.4.4.2. Certifications of subgrade acceptance for each area covered by GCL, signed by the earthwork Contractor and CQA inspector.

3.0 GCL MATERIALS - The GCL product supplied to the project shall be in full accordance with the requirements of this section.

The GCL shall be manufactured by mechanically bonding the geotextiles using a needlepunching process to enhance frictional and internal shear strength characteristics.

In order to maintain these characteristics, no glues, adhesives or other non-mechanical bonding processes shall be used in lieu of the needlepunch process. Their use to enhance the physical properties of the GCL is permitted.

- 3.1. **Description** - Acceptable GCLs for this project include the Bentofix Thermal Lock, or any other needlepunched GCLs which meet the requirements of this specification and the GCL Technical Data sheet listed for this project.
- 3.2. **GCL Manufacturing** - The GCL supplied in accordance with this project shall be manufactured by needlepunching as described in Section 1.2 – Definitions and the GCL Technical Data Sheet of this Project.
- 3.2.1. The needlepunched GCL shall be thermally locked. The thermal lock process must heat set the nonwoven fibers where they protrude from the second geotextile (woven or nonwoven or scrim-nonwoven depending upon product) to more permanently secure the reinforcement in place. Other means may be used to lock the fibers in place if the process demonstrates similar performance to the thermal lock process.
- 3.2.2. To demonstrate the uniformity of the manufacturing process, no delamination of the geotextile components from the bentonite core shall occur when the GCL is exposed to 80 degree tap water for one hour.
- 3.3. **Alternative Materials** - Prior to considering an alternative GCL material, the Contractor shall submit certified test results and statements of quality from the proposed GCL supplier to the engineer, indicating without exception that the proposed GCL meets the requirements of this specification. Submittals shall be delivered to the engineer a minimum of five business days in advance of the bid.
- No other manufacturing techniques shall be approved unless it can be suitably demonstrated that the GCL exhibits uniform shear strength characteristics across the entire width of the panel. Isolated sewn or stitched rows do not constitute uniform reinforcement for the purposes of this specification.
- 3.4. **GCL Physical Properties** - The GCL material shall be in accordance with the test methods, test frequencies and material physical properties as listed in the Appendix (GCL - Technical Data Sheet).
- 3.4.1. **Standard Conditions** - For projects where a standard nonwoven - bentonite - woven GCL will provide sufficient interface shear properties, the GCL supplied for this project shall be in accordance with the test methods, test frequencies and material physical properties as listed in the Appendix (GCL – Technical Data Sheet).
- 3.4.2. **Steep Slopes** - For slope applications where the interface shear strengths require a nonwoven - bentonite - “scrim-nonwoven” GCL, the GCL supplied for this project shall be in accordance with the test methods, test frequencies and material physical properties as listed in the Appendix (GCL – Technical Data Sheet).

- 3.5. **Dimensions** - The minimum acceptable dimensions for the GCL panels shall be 15 feet wide and 150 feet long. Short rolls (rolls less than 150 feet long) may be supplied, but at a rate not to exceed 5% of the total square footage produced for this project.
- 3.6. **Overlap Markings** - A minimum overlap guide-line and a construction match-line delineating the overlap zone shall be imprinted with non-toxic ink on both edges of the GCL panel to ensure the accuracy of the seam. These lines shall be used during CQA to ensure the minimum overlap is achieved. The minimum overlap guideline shall indicate where the edge of the panel must be placed in order to achieve a twelve inch of panel overlap.
- 3.7. **Manufacturing Quality Control** - The GCL shall be tested for compliance with this specification by the test methods and frequencies indicated on the material specification (GCL Technical Data Sheet) as appropriate. GCL materials may be tested pre-approved at the manufacturing location.
- 3.7.1. **Manufacturer Quality Control Certification** - Quality Control certificates shall be issued by the GCL manufacturer to the project engineer, or other designated party for each delivery of material. The certifications shall be signed by the quality control manager of the GCL manufacturer or other responsible party and shall include the following information:
- **Shipment Packing List** - A list indicating the rolls shipped on a particular truckload.
 - **Bill of Lading** - The shipping documents for the truck used for the shipment.
 - **Letter of Certification** - The letter indicating the material is in conformance with the physical properties specified.
 - **Physical Properties Sheet** - The material specification for the GCL supplied in accordance with this specification.
- 3.7.2. **Manufacturer Quality Control Submittal** - Quality Control submittals shall be issued by the GCL manufacturer to the project engineer, or other designated party for each lot of material if necessary. The submittals shall include the following information:
- 3.7.2.1. **Bentonite Manufacturer Certification** - Bentonite manufacturer quality documentation for the particular lot of clay used in the production of the rolls delivered.
- 3.7.2.2. **Geotextile Manufacturer Certification** - Geotextile manufacturer quality control documentation for the particular lots of geotextiles used in the production of the rolls delivered.
- 3.7.2.3. **GCL Manufacturer Tracking List** - Cross referencing list delineating the corresponding geotextile and bentonite lots for the materials used in the production of the rolls delivered.
- 3.7.2.4. **Manufacturing Quality Control Data** - The manufacturing quality control test data indicating the actual test values obtained when tested at the appropriate frequencies for the properties specified in the GCL Technical Data Sheet.

- 3.8. **Packaging** - All GCL rolls shall be packaged in moisture resistant plastic sleeves. The cardboard cores shall be sufficiently strong to resist collapse during transit and handling. All rolls shall have two straps to facilitate offloading on site.
- 3.9. **Roll Identification and Labeling** - Prior to shipment, the manufacturer shall label each roll, both on the GCL roll and on the surface of the plastic protective sleeve. Labels shall be resistant to fading and moisture degradation to ensure legibility at the time of the installation. At a minimum the roll labels shall identify the following:
- Length and width of roll
 - Total weight of roll
 - Type of GCL material
 - Production Lot number and Individual Roll number
- 3.10. **Accessory Bentonite** - Any accessory bentonite used for sealing seams, penetrations, or repairs, shall be the same granular bentonite as used in the production of the GCL itself.
- 4.0 **EXECUTION** - The following installation procedures are as specific as possible while recognizing that the specific requirements of the project may necessitate minor modifications. Significant deviations from these procedures shall be pre-approved by the project engineer or other designated party.
- 4.1. **Shipping and Handling Equipment** - The party responsible for unloading the GCL shall contact the manufacturer prior to shipment to determine the correct unloading methods and equipment if different from the pre-approved and specified methods.

Bentofix Geosynthetic Clay Liner (GCL) must be supported during handling to ensure worker safety and prevent damage to the liner. Under no circumstances should the rolls be dragged, lifted from one end, lifted with only the forks of a lift truck or pushed to the ground from the delivery vehicle.

The CQA inspector shall verify that proper handling equipment exists which does not pose any danger to installation personnel or risk of damage or deformation to the liner material itself. Suitable handling equipment is described below:

- 4.1.1. **Spreader Bar Assembly** - A spreader bar assembly shall include both a core pipe or bar and a spreader bar beam. The core pipe shall be used to uniformly support the roll when inserted through the GCL core while the spreader bar beam will prevent chains or straps from chafing the roll edges.

- 4.1.2. Stinger - A stinger is a rigid pipe or rod with one end directly connected to a forklift or other handling equipment. If a stinger is used, it should be fully inserted to its full length into the roll to prevent excessive bending of the roll when lifted.
- 4.1.3. Roller Cradles - Roller cradles consist of two large diameter rollers spaced approximately 3 inches apart which both support the GCL roll and allow it to freely unroll. The use of roller cradles shall be permitted if the rollers support the entire width of the GCL roll.
- 4.1.4. Straps - Straps may be used to support the ends of spreader .

4.2. GCL Inspection Upon Delivery - Each roll shall be visually inspected when unloaded to determine if any packaging or material has been damaged during transit. Repairs to damaged GCL shall be performed in accordance with Section 4.6.5 of this specification.

- 4.2.1. Rolls exhibiting damage shall be marked and set aside for closer examination during deployment.
- 4.2.2. Minor rips or tears in the plastic packaging shall be repaired with moisture resistant tape prior to being placed in storage to prevent moisture damage.
- 4.2.3. GCL rolls delivered to the project site shall be only those indicated on GCL manufacturing quality control certificates.

4.3. Storage / Stockpiling / Staging - Storage of the GCL rolls shall be the responsibility of the installer or other designated party. All GCL rolls shall be stock-piled and maintained dry in a flat location area away from high-traffic areas but sufficiently close to the active work area to minimize handling.

- 4.3.1. GCL should be stored no higher than three to four rolls high or limited to the height at which the handling apparatus may be safely handled by installation personnel. Stacks or tiers of rolls should be situated in a manner that prevents sliding or rolling by “choking” the bottom layer of rolls.
- 4.3.2. Rolls shall not be stacked on uneven or discontinuous surfaces in order to prevent bending, deformation, damage to the GCL or cause difficulty inserting the core pipe.
- 4.3.3. An additional tarpaulin or plastic sheet shall be used over the stacked rolls to provide extra protection for GCL material stored outdoors.
- 4.3.4. Bagged bentonite material shall be stored and tarped next to GCL rolls unless other more protective measures are available. Bags shall be stored on pallets or other suitably dry surface which will prevent undue prehydration.

- 4.4. **Manufacturing Quality Assurance Documentation** - Third party GCL MQA sampling and testing for compliance with this specification shall be coordinated by the project engineer to support the manufacturer's MQC data.
- 4.5. **Subgrade Preparation** - The surfaces upon which the GCL shall be suitable for the placement of GCL material, subject to the applicable section of this specification (Earthen - 4.5.1 or Geosynthetic - 4.5.2).
- 4.5.1. **Earthen Subgrade** - The surface upon which the GCL material will be installed shall be inspected by the CQA inspector and certified by the earthwork contractor to be in accordance with the requirements of this specification.
- 4.5.1.1. The subgrade soil shall be well graded containing less than 20% gravel two inches or larger and no sharp stones larger than 1/2 the thickness of the subgrade/foundation layer.
- 4.5.1.2. In applications where the GCL is the sole barrier and will be subjected to a hydraulic head that exceeds the confining stress, subgrade surfaces consisting of gravel or granular soils may not be appropriate due to their large void content. Where subgrade surfaces consist of gravel or granular soils, a scrim-reinforced GCL shall be used, where the bottom fabric of the GCL shall contain a scrim-nonwoven fabric. For these applications, the top six inches of the subgrade soil should possess a particle size distribution where at least 80 percent of the soil is finer than 0.2 mm (#60 sieve).
- 4.5.1.3. Site specific compaction requirements should be followed in accordance with the project drawings and specifications. At a minimum, the level of compaction should be such that no excessive rutting is caused by installation equipment or other construction vehicles which traffic the area of deployment (typically 85% of standard proctor or greater).
- 4.5.1.4. The surfaces to be lined shall be smooth and free of any debris, vegetation, roots, sticks, sharp rocks, or other deleterious materials larger than two inches as well as free of any voids, large cracks.
- 4.5.1.5. Directly prior to deployment of the GCL, the subgrade shall be final-graded to fill remaining voids or desiccation cracks, and proof-rolled to eliminate sharp irregularities or abrupt elevation changes. The surfaces to be lined shall be maintained in this smooth condition.
- 4.5.2. **Geosynthetic Subgrade** - Prior to GCL deployment the geosynthetic surface as well as other underlying geosynthetics upon which the GCL material will be installed shall be inspected and approved by the project engineer in accordance with the requirements of the project specification documents.

4.5.3. Anchor Trench - An anchor trench shall be excavated by the earthwork contractor or liner installer to the lines and grades shown on the project drawings at the top of slopes greater than 7h:1v.

4.5.3.1. The anchor trench shall be constructed free of sharp edges or corners and maintained in a dry condition. No loose soil shall be permitted beneath the GCL within the trench.

4.5.3.2. The anchor trench shall be inspected as well as approved by the project engineer prior to GCL placement, back-filling and compaction of the anchor key material.

4.5.4. Subgrade Inspection - The earthen or geosynthetic subgrade shall be continuously inspected, approved and certified by the project engineer prior to GCL placement.

Subsequent to the project engineer's approval, it shall be the installer's responsibility to indicate to the Engineer any change in the subgrade condition that could cause it to be out of compliance with any of the requirements of this section or the project specification.

4.6. GCL Placement - GCL Material shall be placed in general accordance with the procedures specified below, or modified to account for site specific conditions.

4.6.1. GCL Orientation - In the absence of specific guidelines, GCL panels should be placed with the nonwoven side up on slopes to maximize the shear strength characteristics.

In base or flat areas, the GCL does not require any particular orientation, however, in composite liner applications, intimate contact may be facilitated by placing the woven face of the GCL against the overlying FML.

4.6.2. GCL Panel Position - Where possible, all slope panels should be installed parallel to the maximum slope while panels installed in flat areas require no particular orientation.

4.6.3. Panel Deployment - GCL materials shall be installed in general accordance with the procedures set forth in this section, subject to site specific conditions which would necessitate modifications.

Reinforced GCL shall be used on both slopes as well as the flat areas to ensure the GCL withstands the rigors of the installation and subsequent low load hydration.

4.6.3.1. Deployment should proceed from the highest elevation to the lowest to facilitate drainage in the event of precipitation. For deployment of lowest to highest elevation upon approval by the project engineer.

4.6.3.2. The GCL may be deployed on slopes by pulling the material from a suspended roll, or securing a roll end into an anchor trench and unrolling each panel as the handling equipment slowly moves backwards.

- 4.6.3.3. Deployment on flat areas shall be conducted in the same manner as that for the slopes, however, care should be taken to minimize “dragging” the GCL. Slip-sheet may be used to facilitate positioning of the liner while ensuring the GCL is not damaged from underlying sources.
- 4.6.3.4. Overlaps shall be a minimum of 12 inches and be free of wrinkles, folds or more importantly “fish-mouths”.
- 4.6.3.5. The contractor shall only install as much GCL that can be covered at the end of the day. No GCL shall be left exposed overnight unless approved the project engineer.
- 4.6.4. Anchoring- All GCL material installed on slopes greater than 7:1 shall be anchored to prevent potential GCL panel movement.
- 4.6.4.1. Standard Anchor - The GCL shall be placed into and across the base of the excavated trench, stopping at the back wall of the excavation.
- 4.6.4.2. “Run-Out” Anchor - On gentle slopes or locations where it is difficult to create an anchor trench, the GCL may alternatively be anchored by a material run-out past the crest of the slope. The length of the run-out shall be pre-approved by the project engineer prior to the use of this method.
- 4.6.5. Seaming - A 9-inch lap line and a 12-inch match line shall be imprinted on both edges of the upper geotextile component of the GCL to assist in installation overlap quality control. Lines shall be printed as continuous dashes in easily observable non-toxic ink.
- 4.6.5.1. Overlap seams shall be a minimum of twelve inches on panel edges and twenty four inches on panel ends.
- 4.6.5.2. Loose granular bentonite should be placed between panels at a rate of ¼ pound per lineal foot of seam if the GCL is the primary hydraulic seal.
- 4.6.5.3. The addition of bentonite to the seam area is optional when the GCL will be acting as a leak isolator for an overlying FML in composite liner applications.
- 4.6.6. Detailing - Detail work, defined as the sealing of the liner to pipe penetrations, foundation walls, drainage structures, spillways, and other appurtenances, shall be performed as per the project drawings.
- 4.6.7. Damage Repair - Prior to cover material placement, damage to the GCL shall be identified and repaired by the installer. Damage is defined as any rips or tears in the geotextiles, delamination of geotextiles or a displaced panel.

- 4.6.7.1. Rip and Tear Repair (Flat Surfaces) - Rips or tears may be repaired by completely exposing the affected area, removing all foreign objects or soil, and by then placing a patch cut from unused GCL over the damage (damaged material may be left in place), with a minimum overlap of 12 inches on all edges.

Accessory bentonite should be placed between the patch edges and the repaired material at a rate of a quarter pound per lineal foot of edge spread in a continuous six inch fillet.

- 4.6.7.2. Rip and Tear Repair (Slopes) - Damaged GCL material on slopes shall be repaired by the same procedures above, however, the edges of the patch should also be adhered to the repaired liner with an adhesive to keep the patch in position during backfill or cover operations.

- 4.6.7.3. Displaced Panels - Displaced panels shall be adjusted to the correct position and orientation. The adjusted panel shall then be inspected for any geotextile damage or bentonite loss. Damage shall be repaired by the above procedure.

- 4.6.7.4. Excessive Premature Hydration - If the GCL is prematurely hydrated (excessive hydration), installer shall notify the QA/QC technician and project engineer for a site specific determination as to whether the material is acceptable or if alternative measures must be taken to ensure the quality of the design - dependent upon the degree of damage if any.

- 4.7. Cover Material - The cover materials shall be compatible as well as suitable for use over the GCL, and placed in a manner appropriate to the particular subgrade.

- 4.7.1. Earthen Cover Soil - If the cover material is soil or gravel, a minimum thickness of 12 inches shall be placed over the GCL. The soil cover shall be free of sharp-edged stones greater than 2 inches in size. Laboratory analysis of especially calcareous cover material shall be required to ensure compatibility with the GCL.

- 4.7.1.1. Equipment - Soil cover shall be placed with low ground pressure equipment. Care should be taken to avoid damaging the GCL by making sharp turns or pivots with equipment as well as sudden starts or stops.

- 4.7.1.2. Placement - Soils may be placed on the GCL by pushing with a track dozer or by carefully placing it with a loader or a back-hoe. The use of scrapers or pans directly over the GCL is strictly prohibited.

- 4.7.1.3. Thickness - A minimum thickness of 12 - 24 inches of cover shall be kept between heavy equipment and the GCL at all times, except when final-grading. No heavy vehicles should be driven directly on the GCL until the proper thickness of cover has been placed. A cover of 36 inches should be used in heavy equipment traffic areas.

- 4.7.1.4. Compaction - To prevent damage to the GCL, the initial lift(s) of soil cover shall not be compacted in excess of 85 percent Modified Proctor density or as specified by the engineer.
- 4.7.1.5. Slope Placement - When covering GCL on sloped areas steeper than 4H:1V, cover should be pushed up-slope to minimize tension on the GCL. Cover placement from top to bottom slope shall be approved by the project engineer.
- 4.7.2. Geosynthetic Cover - Precautions shall be taken to prevent damage to the GCL by restricting the use of heavy equipment over the liner system.
- 4.7.2.1. Equipment - Installation of the overlying geosynthetic component can be accomplished through the use of *lightweight*, rubber-tired equipment such as a 4-wheel all-terrain vehicle (ATV) or pick up truck/all terrain forklift. This vehicle can be driven directly on the GCL, provided the ATV/truck/forklift makes no sudden stops, starts, or turns.
- 4.7.2.2. Placement - Smooth HDPE may be dragged across the GCL surface with equipment or by hand labour during positioning. Similarly, the HDPE may be unrolled with the use of low ground pressure equipment.
- 4.7.2.3. Use of Textured Liners - If a textured geomembrane is placed over the GCL, a slip sheet (such as 20-mil smooth HDPE) shall first be placed over the GCL in order to allow the geomembrane to slide into its proper position. Once the overlying geomembrane is properly positioned, the slip-sheet shall be carefully removed paying close attention to avoiding any movement to the geomembrane.
- 5.0 **ACTIVATION** - If the GCL will be utilized for the control of non-aqueous phase liquids, prehydration may be necessary. The GCL manufacturer shall be contacted for these cases for site specific recommendations.
- 6.0 **WARRANTY** - GCL material as well as installation warranties provided by the manufacturer and installer shall be made a part of the final submittal documents.
- 6.1. **Material** - A five year pro-rated material and workmanship warranty shall be provided by the manufacturer of the GCL, stating that the GCL product supplied to the project was manufactured in accordance with industry accepted practices and meets the manufacturer's specified certified properties.
- 6.2. **Installation** - The installer of the GCL material shall provide a one year installation workmanship warranty, repairing and or replacing any material not installed in full compliance with the requirements of the specification.

15.0 FLOW SPLITTER

15.1 Scope

Work included in this Section is to be completed by the Contractor, and is to include furnishing all labor, materials, and equipment and performing all operations necessary to complete the installation of a flow splitter designed to divert a portion of the flow from the existing 30-inch RCP storm sewer into the surface system of infiltration basins (Cells 1 and 2) and the stormwater wetland (Cell 3). The flow splitter must accurately direct the water quality design flow to the surface treatment cells and redirect excess flows back into the existing 30-inch storm sewer system.

15.2 Material

The flow splitter shall be constructed of reinforced precast concrete as per the design drawings and specifications, with the following characteristics.

- The splitter may be a Type 2 precast manhole or vault.
- Outer diameter = 6.0 feet.
- The height of the splitter is expected to be 12.0 feet, as shown in the construction details and maybe constructed of 4-ft segments. Because the depth of the existing 30-inch diameter RCP storm sewer that will be cut and connected to the flow splitter is currently unknown, the height of the manhole may need to be adjusted accordingly. Contractor is responsible for verifying the depth and condition of the existing 30-inch RCP storm sewer.
- The baffle wall must be made of reinforced concrete or another suitable material resistant to corrosion, and have a minimum 4-inch wall thickness.
- Removable metal flashboards, metal slide gate, or equivalent shall be installed within water tight tracks within the upper 4.0 feet of the baffle wall, in order to adjust water levels, as shown on the details.
- All metal parts must be corrosion resistant. Examples of preferred materials include stainless steel or aluminum. Zinc and galvanized materials are discouraged because of aquatic toxicity. Painted metal parts should not be used because of poor longevity.
- **Baffle Wall:** The baffle wall shall use concrete with a minimum compressive strength of 4,000 psi at 28 days and reinforcement of deformed steel bars conforming to ASTM A615, Grade 60 or welded wire fabric conforming to ASTM A1064.
 - o Waterproofing: Use a suitable waterproofing membrane or sealant for joints and penetrations.
 - o Formwork: Use smooth, clean formwork to provide a uniform surface finish.
 - o Flashboard Material: Use stainless steel or other durable, non-corrosive material for adjustable weirs.
- **Cover:** A metal grate cover and frame shall be installed that sits at the top level, providing access to the flow splitter as well as allowing viewing of the flow splitter. The cover shall be secured and locked to prevent unauthorized access.

15.3 Installation

Excavation: Excavate to the required depth and dimensions, ensuring a stable and level base.

Foundation Preparation: Compact subgrade and place a 12-inch layer of compacted gravel or crushed stone, as shown on the construction drawings and details.

Baffle Installation: Install baffle and adjustable flashboards as per the design, ensuring correct elevation and alignment.

Orifice: drill 3-inch diameter orifice, as shown in the details, for full draining of flow splitter between storm events.

Pipe Connections: Connect inlet and outlet pipes to the splitter chamber using watertight seals and/or gaskets.

Surface outlet: Install and connect the surface outlet to ensure water quality flows are properly diverted to the surface treatment system.

Joint Sealing: Apply waterproofing sealant to all construction joints and pipe penetrations to ensure watertight integrity.

15.4 Testing and Inspection

Leakage Test: Perform a leakage test to verify watertightness of all joints and connections.

Flow Test: Conduct a flow test to confirm that the splitter correctly distributes flows according to the design criteria.

Final Inspection: The installation shall be inspected by Engineer for compliance with specifications.

16.0 ROCK OUTLET PROTECTION

16.1 Scope

Work included in this Section is to be completed by the Contractor, and is to include furnishing all labor, materials, and equipment and performing all operations necessary to complete the installation of rock outlet protection at the 18-inch diameter outlet from the flow splitter into the infiltration basin (Cell 1).

16.2 Material

The rock outlet protection shall consist of rounded river rock, clean and free of soil and other materials, of the size classes indicated. River stone samples shall be subject to approval.

The subgrade surface on which the rock riprap is to be placed shall be cut or filled and graded to the lines and grades shown on the construction plans. When fill to subgrade lines is required, it shall consist of approved material and shall conform to the requirements of the specified class of earthen fill. River rock, bedding, or geotextile shall not be placed until the foundation preparation is completed, and the subgrade surface has been inspected and approved.

16.3 Outlet Pipe Rock Protection

A river rock apron shall be installed at the outlet from the flow splitter into the first infiltration basin (Cell 1) to protect the infiltration basin from the erosive forces of stormwater from the flow splitter (see construction drawings). Install a geotextile liner consistent with AASHTO M288 Standard Specifications Class 2 between the subgrade and rock apron. The minimum thickness of the rock apron shall be 1.8 feet with a median stone diameter, D_{50} , of 0.8 feet. If the specified D_{50} size of river stone is not available from the material supplier, then the next larger available size shall be used. The apron shall be constructed with minimal slope along its length.

17.0 COIR MATTING

17.1 Scope

Work included in this Section is to be completed by the Contractor, and is to include furnishing all labor, materials, and equipment and performing all operations necessary to complete the installation of the coir matting lining of the spillways, channels and basins as shown on the construction drawings.

17.2 Material

The coir matting product shall be Rolanka BioD-Mat® 70 or an equivalent product which meets the specifications on the following pages. Use manufacturer recommended biodegradable stakes or wooden stakes as specified on the plans.

17.3 Installation

The Rolanka BioD-Mat® 70 shall be installed on the spillways, infiltration basins (Cells 1 and 2), the connecting channels, and the stormwater wetland to the supplier specifications and installation instructions.

Contractor will install Rolanka BioD-Mat® 70 in locations and to the widths and lengths as shown on the plans and details or as directed. Prior to coir matting placement, proposed grades shall be achieved with no voids in the surfaces. The area will be treated with fertilizer, soil amendments, and or seeding as specified elsewhere in the plans and specifications.

Before installing Rolanka BioD-Mat® 70, the seedbed shall be inspected by the Owner's Representative to ensure it has been properly compacted and fine graded to remove any existing rills. It shall be free of obstructions, such as tree roots, projections such as stones, and other foreign objects. The Contractor shall proceed when satisfactory conditions are present.



BioD-Mat[®] 70

Semi-Permanent Woven
Brown Bristle Coir Mat

Sri Lanka patent # 11159

Completely Wildlife Safe!

Woven Coir blanket with unit weight of 780 g/m².

Description

The BioD-Mat[®] 70 blanket is woven from machine twisted bristle coir twines, the best quality coir fiber. This 100% biodegradable, strong and durable blanket provide higher erosion resistance while supporting growth and development of vegetation. This semi-permanent mat has functional field longevity of 4-6 years. If the vegetation fails to establish, the open weave in the mat allows seeding over the mat. BioD-Mat[®]70 blanket is manufactured to conform to the following physical properties.

Specifications

Property	Test Method	BioD-Mat [®] 70
Weight	ASTM D 3776	23 oz/SY (780 g/m ²)
Wide width tensile strength Wet Machine direction Cross direction	ASTM D 4595	1488 lbs./ft (21.7 kN/m) 1032 lbs./ft (15.1 kN/m)
Wide width tensile strength Dry Machine direction Cross direction	ASTM D 4595	1740 lbs./ft (25.4 kN/m) 1176 lbs./ft (17.2 kN/m)
Elongation at failure Wet Machine direction Cross direction	ASTM D 4595	38% 25%
Open area	Calculated	48%
Thickness	ASTM D 1777	0.35 inch (9 mm)
Recommended shear stress		4.5lbs./sq.ft.(215N/q.m.)
Recommended flow		12 fps (3.7m/s)
Recommend slope		1:1
Minimum twine count per foot MD x CD		27 x 18
Fiber type in twine		Brown bristle coir fiber

BioD-Mat[®] 70 is available in following roll sizes

3.28ft x 83ft (30SY) = 1m x 25m (25 sq. m)
6.5ft x 166ft (120SY) = 2m x 50m (100 sq. m)
9.8ft x 166ft (180SY) = 3m x 50m (150 sq. m)
13.1ft x 83ft (120SY) = 4m x 25m (100 sq. m)



RoLanka
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THE TRUE GREEN SOLUTION

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155 Andrew Drive, Stockbridge, GA 30281

DOT DBE Certified

General Installation Instructions for Blankets In Channels with Natural Check dams

- Grade the channel to a trapezoidal shape as possible. Prepare the surface of the soil to be smooth and free of rocks, roots and other obstructions. Apply lime, fertilizer and seed mix appropriate for the location and time of the year.
- If the channel entrance is a concentrated flow such as a culvert, provide additional support to reduce the impact of the flow. We recommend installing BioD-Pillow to cover the culvert opening as shown . Be sure to lay the coir pillows loosely on the ground allowing a good contact between the soil and the pillow.
- Start installing a strong, durable BioD-Mat™ woven coir blankets from the upstream end of the channel by anchoring the blanket in a 6-in deep and 6-in wide initial anchor trench with minimum 8-in long metal staples. In environmentally sensitive areas, use minimum 12 in long wooden pegs.
- Place a suitable diameter coir wattle or coir siltcheck (Table 1) in the trench and on the blanket and anchor the wattle and the blanket to the ground tightly with metal staples placing every foot from the up-slope side and pine wedges with nail on the top in the downstream side (Figure 2).
- We recommend using 18 in long wedges with a nail on the top for 9 in diameter coir wattle or coir siltcheck and 24 in long wedges with a nail on the top for 12 diameter coir wattle or coir siltcheck. These pine wedges should be placed 3 ft. apart and the nail should completely be pressing the wattle to the ground. Anchor the check dam with 6 in. long metal staples as shown in Figure 2.
- Be sure to lay the blankets loosely on the ground allowing a good contact between the soil and the blanket. Start placing anchors from the bottom of the channel and go up on both banks. The anchors should be placed in a staggered pattern. This assures good contact between blanket and soil and prevents undercutting.
- Place a coir wattle or coir siltcheck check dams in every 20 -30 feet of the channel according to the water flow.
- Overlap the ends of each blanket roll at least 12-in with the up-slope blanket on the top. Use two rows of staples to anchor blankets. Six-inch spacing with a staggered pattern is recommended. Overlap sides of blankets at least 12-in and place two rows of staples along the overlap at 6-in spacing. The open edges and the sides of the blanket must be anchored in a 6 in x 6 in trench and back fill.
- Complete installing the channel liner with a 6 in deep and 6 in wide final anchor trench at the end of the channel and anchor the liner in the trench with suitable anchors and place a final coir wattle or coir siltcheck check dam in the trench and on the blanket
- The procedure should be altered at the discretion of the site engineer / architect to meet the need of individual site conditions.

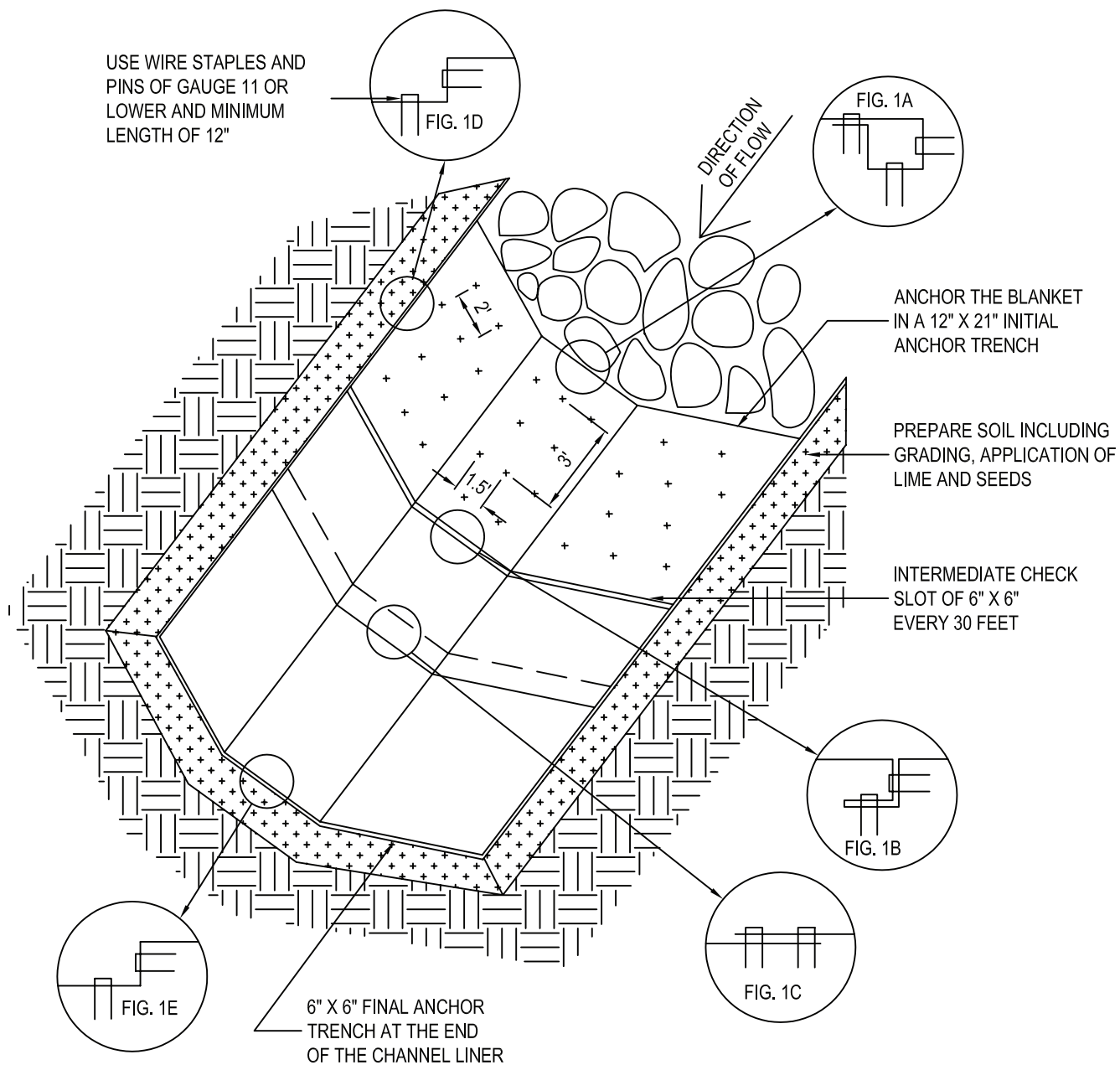
Table 1: General guide for product selection

Size of the stream	Channel liner	Check dam
Flow velocity about 16 fps	BioD-Mat 90	BioD-Watl 12 or BioD-SiltCheck 12
Flow velocity about 12 fps	BioD-Mat 70	BioD-Watl 9 or BioD-Siltcheck 9
Flow velocity less than 12 fps	BioD-Mat 60 with mulch	BioD-Watl 6



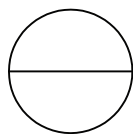
RoLanka
International, Inc.
THE TRUE GREEN SOLUTION

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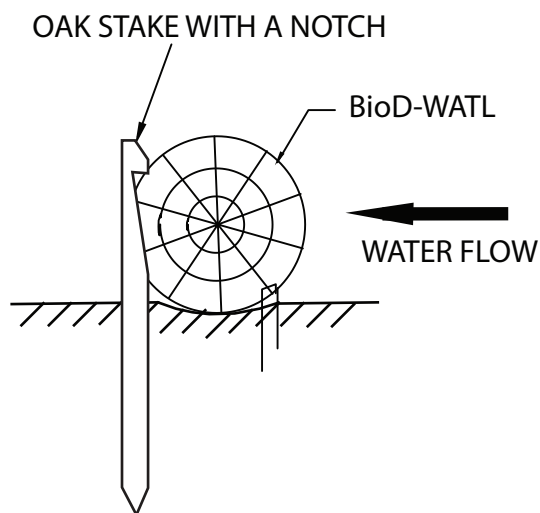
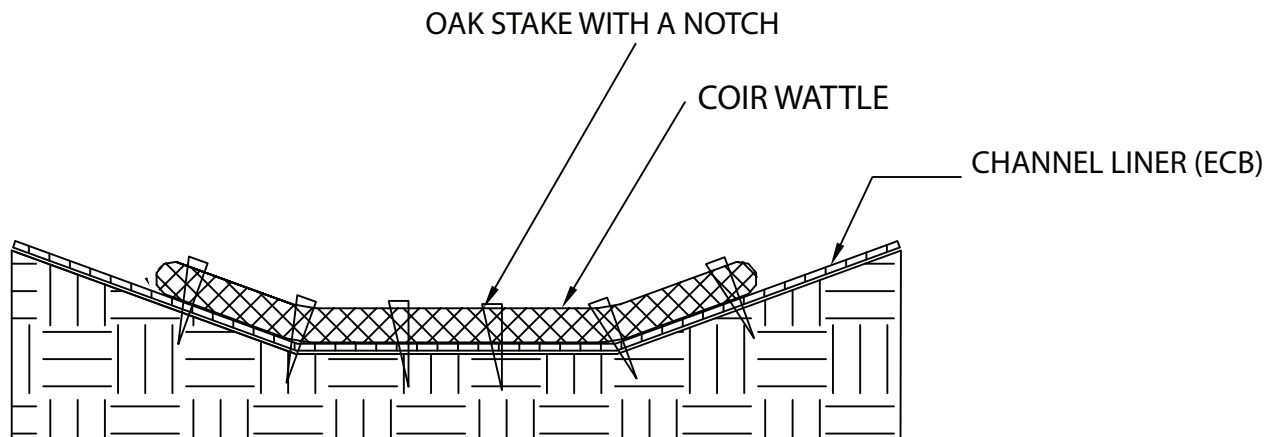


NOTES:

1. DO NOT SCALE DRAWING.



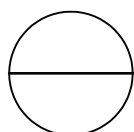
INSTALLATION OF TRM AND BLANKET FOR CHANNELS



COIR WATTLE CHECK DAM

NOTES

1. DO NOT SCALE DRAWINGS.
2. CHANNEL BOTTOM SHOULD BE LINED WITH A EROSION CONTROL BLANKET.
3. USE COIR WATTLE OR COIR SILTCHECK CHECK DAMS.
4. POINT A SHOULD BE HIGHER THAN POINT B.



PLACEMENT OF COIR WATTLE CHECK DAMS ON CHANNELS

18.0 AGRIDRAIN INLINE WATER LEVEL CONTROLLER

18.1 Scope

Work included in this Section is to be completed by the Contractor, and is to include furnishing all labor, materials, and equipment and performing all operations necessary to complete the installation of an Agridrain Inline Water Level Controller (Agridrain) connecting to an 18-inch diameter double-walled smooth interior HDPE outlet pipe with an anti-seep collar.

18.2 Agridrain Inline Water Level Controller with Outlet Pipe

An Agridrain Inline Water Level Controller, or equivalent, shall be installed by the Contractor according to the construction plans and details and manufacturer's installation instructions. The Agridrain Inline Water Level Controller will function as the outlet from the stormwater wetland (Cell 3). The inline water level controller shall have 18-inch diameter inlet and outlet connections and a height of 4 feet. Upon order, Contractor shall instruct the manufacturer to supply the Agridrain with a custom metal platform that can be anchored to a reinforced concrete footing, as shown on the construction drawings. The Agridrain shall also include an inlet screen.

18.3 Reinforced Concrete Footing

The Agridrain shall be secured to a reinforced concrete footing with a thickness of 12 inches and the dimensions shown on the construction drawings. The water level controller shall be secured to the concrete footing with concrete bolts or other acceptable connection. The concrete footing shall be set at the location and elevation shown on the construction plans, above the geosynthetic clay liner (GCL) according to GCL manufacturer recommendations. The stop logs within Agridrain shall be set to maintain a permanent water level at elevation 2112.0 feet, as shown in the plans.

18.4 Outlet Pipe

The outlet riser shall be connected to a new 18-inch diameter double-walled smooth interior HDPE outlet pipe with 90-degree bend to connect to the existing 30-inch diameter RCP outlet pipe, as in the construction details, forming a watertight connection, by the use of gaskets or by grouting. Pipe bedding for the outlet pipe shall be of Class B type. Penetration of the outlet pipe through the geosynthetic clay liner (GCL) shall follow GCL manufacturer instructions (See Section 14.0).

18.5 Anti-Seep Collar

An HDPE anti-seep collar, set into the earth at a sufficient depth to fully cover the collar, shall be installed per the construction details and manufacturer instructions. The anti-seep collar should be placed within the saturated zone and the Contractor shall make all efforts to ensure uniform compaction of the backfill around and against the anti-seep collar to ensure a tight fit and to reduce seepage. The anti-seep collar shall also meet the criteria specified in NRCS Anti-Seep Collar Conservation Practice Standard, (CPS) 378.

Manufactured by:



PO Box 458 · 1462 340th Street · Adair, Iowa 50002

Phone: 1-800-232-4742 · Fax: 1-800-282-3353

www.agridrain.com · email: info@agridrain.com

Inline Water Level Control Structure™

- Available in manual or automated.
- Constructed of rugged ½" PVC with lockable plastic lid.
- Stainless steel screws and custom anodized aluminum corner extrusions used for strength and durability.*
- Flexible couplers allow PVC, plastic pipe, or other materials to be easily attached. *(Please specify type of pipe when ordering.)*
- Rugged injection molded stoplogs in 5" and 7" heights for adjustability (included in structures with 4" through 12" pipe sizes).
- PVC stoplogs with metal hooks in 5" and 7" heights for adjustability (included in structures with 15" through 24" pipe sizes).
- Stoplog maintenance recommended: Remove stoplogs and grease seal with Ultra Lube (included). Ensure there is no debris in the tracks or along the bottom of the structure. Replace stoplogs after greasing, ensuring bottom stoplog is installed first.
- To minimize seepage, align stoplogs firmly against one side of the stoplog track.
- Stoplogs must remain in track during structure installation.
- Structures are intended for gravity flow; some seepage may occur.
- 5-year warranty on all standard structures.

**For water that is caustic, acid, corrosive, salt, or pH below 5 pH or above 9 pH, please notify us of your requirements to ensure structures are built with compatible hardware. For these applications, Agri Drain recommends stainless steel.*

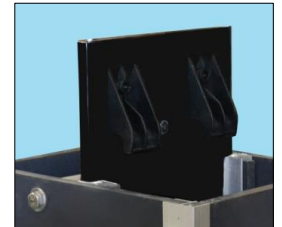


US Patent No. 6,715,508 B2
US Patent No. 6,786,234 B2
Canadian Patent No. 2,403,456
Canadian Patent No. 2,466,976

Comes with a handle to install and remove stoplogs.



Stoplog seal ensures a tight fit to prevent leakage.



Rugged injection molded stoplogs used in structures with 4", 6", 8", 10", and 12" pipe sizes.



PVC stoplogs with stainless steel lifting hooks used in structures with 15", 18", and 24" pipe sizes.

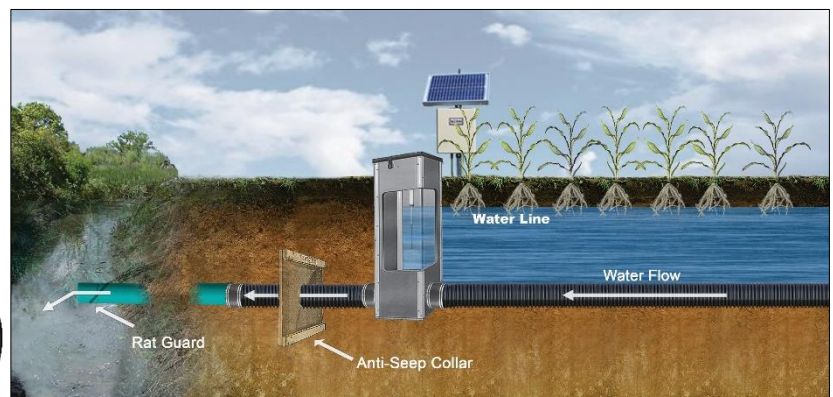


Inline Water Level Control Structure™

Pipe Size	Available Heights	Width	Depth
4"	2' - 12'	8"	10"
6"	2' - 12'	8"	10"
8"	2' - 12'	11 5/8"	12"
10"	2' - 12'	14"	16"
12"	2' - 12'	16"	20"
15"	2' - 12'	20"	24"
18"	2' - 12'	24"	28"
24"	3' - 10'	31"	39"

Stoplog Retainer Hold extra stoplogs up & out of the way!

- Stainless steel retainer hooks to lowest stoplog that you want to hold up within your Inline Water Level Control Structure™.



INLINE WATER LEVEL CONTROL STRUCTURE™ INSTALLATION INSTRUCTIONS

Important! —To minimize seepage, align stoplogs firmly against one side of the stoplog track.
—Stoplogs must remain in track during structure installation.
—Structures are intended for gravity flow: Low pressure and some seepage may occur.

1.) EXCAVATION AND GRADING

Structure base, inlet pipe, & outlet pipe must be set on compacted soil or fill sand to provide a solid, stable base. This will reduce settling and reduce stress or misalignment of pipe connections.

2.) PIPE CONNECTION

Remove stainless steel clamps from inside structure. Place pipe inside flex couplers and tighten SS clamps.

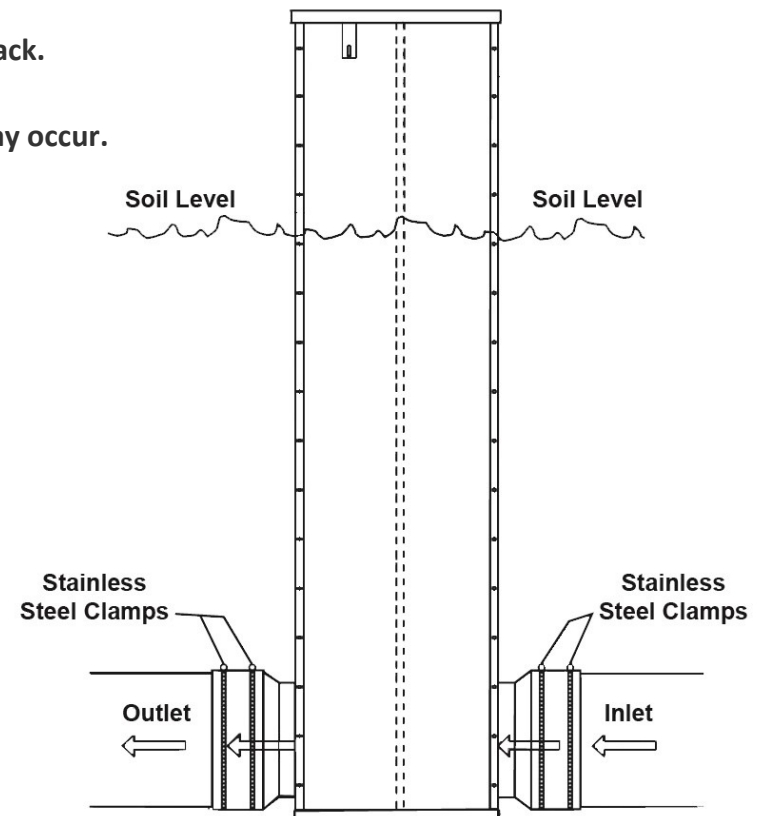
3.) BACKFILL AND COMPACTION

Level structure vertically before placing backfill. Backfill around control structure by hand in 6" lifts. Hand tamp only - **do not** mechanically compact. **Do not** use a backhoe or blade to place backfill directly against the water control structure.

—Seal on stoplog faces downstream/outlet side of structure.

Excessive compaction may cause structural damage or failure.

- ◆ Either the inlet or inline structure may be used for primary or secondary outlet, with larger pipe or emergency spillway as primary.
- ◆ Inline structure removes subsurface water.
- ◆ On the inline installation, the inlet end of the pipe should be held off the bottom of the impoundment to allow for siltation, and be protected with an inlet guard. The outlet end of the structure should be protected with a rodent guard.
- ◆ In a controlled drainage or subsurface irrigation application, the structure nearest the outlet should be installed with a minimum of 20' of non-perforated pipe on the downstream end. Anti-Seep Collars are recommended.



Agri Drain
CORPORATION

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— Since 1976 —

Water Level Control Structures

The **Water Level Control Structures** manufactured by *Agri Drain Corp.* are constructed of rugged $\frac{1}{2}$ "-thick PVC sheets, connected at the corners by means of specially extruded anodized aluminum profiles sealed with waterproof caulking and secured with stainless steel screws.* The bottom of the structure is sealed with either a $\frac{1}{2}$ "- or 1"-thick PVC sheet (dependent upon structure size) and also utilizes waterproof caulking for sealant and stainless steel screws to hold it in place. *For water that is caustic, acid, corrosive, salt, or pH below 5 pH or above 9 pH, please notify us of your requirements to ensure structures are built with compatible hardware. For these applications, Agri Drain recommends stainless steel.

The stoplogs* are constructed of PVC and utilize a seal that mates against the downstream surface of the extruded aluminum track and the top of the stoplog that it rests upon. The stoplogs are equipped with hooks to facilitate their removal by means of a special handle/hook assembly. ***Important!** To minimize seepage, align stoplogs firmly against one side of the stoplog track. Stoplogs must remain in track during structure installation.

In order to obtain inch-by-inch water level adjustment capabilities, the stoplogs are built in two heights: 5" and 7" tall. This allows for various combinations and nearly infinite adjustability. An additional, 7"-tall stoplog is specified with a sticker stating "Bottom Board", and this stoplog must be placed in the bottom of the structure. Examples: 7"+7"=14", 5"+5"+5"=15", 5"+5"+7"=17", 5"+7"+7"=19", 5"+5"+5"+5"=20", etc.

The means of connecting to the downstream and upstream pipe is a flexible rubber sewer coupler. It will accommodate corrugated plastic tubing, PVC pipe, corrugated metal pipe or virtually any other conduit material.

The units are available in two different types. The first type (Inlet) is designed to be installed on the upstream end of the conduit so the water must enter the structure before it enters the pipe. The Inlet must be anchored down when installed or it may have the tendency to float. The second type (Inline) is designed to be installed in the pipe line, so the water enters the pipe, then flows into the box, over the stoplogs, then out the downstream side of the structure. The Inline structure is equipped with a lockable plastic lid and is available in manual or automated. Both structures come with a handle to remove, install, or adjust the stoplogs.

The structures are manufactured in various sizes based on diameter of the conduit and engineered to provide a minimum of 30% greater capacity than the conduit it is connected to. They are available in heights to suit the specific installation.

INLINE WATER LEVEL CONTROL STRUCTURE™ SHIPPING WEIGHTS								
Pipe Size	HEIGHT							
	2'	3'	4'	5'	6'	8'	10'	12'
4"	50U	64U	81U	102U	121T	216T	244T	278T
6"	52U	66U	83U	103U	164T	222T	272T	320T
8"	64U	84U	105U	176T	198T	264T	320T	392T
10"	79U	107U	168T	210T	238T	300T	375T	458T
12"	99U	157T	190T	242T	294T	366T	480T	542T
15"	154T	222T	270T	322T	382T	502T	614T	722T
18"	191T	236T	340T	402T	450T	592T	710T	834T
24"	N/A	348T	454T	524T	600T	766T	946T	N/A

INLET WATER LEVEL CONTROL STRUCTURE™ SHIPPING WEIGHTS					
Pipe Size	HEIGHT				
	2'	3'	4'	5'	6'
4"	26U	38U	51U	64U	76U
6"	35U	41U	52U	67U	78U
8"	37U	51U	67U	86U	132T
10"	49U	62U	85U	130T	150T
12"	55U	76U	125T	164T	152T
15"	82U	126T	158T	196T	216T
18"	110T	150T	186T	224T	250T
24"	178T	192T	248T	310T	336T

UPS=U
TRUCK LINE=T

Larger CMP structures also available. Call for details on custom sizes and pricing.

19.0 SEEDING AND PLANTING

19.1 Scope

Work included in this Section is to be completed by the Contractor and is to include furnishing all labor, materials, and equipment and performing all operations necessary to complete the planting for the project. Refer to Sheet 8 of the construction drawings for a map of planting areas and additional planting instructions.

After final grading is complete or if the project is delayed more than one week, all disturbed areas shall be fertilized, temporarily seeded, and mulched with straw. Fertilizer application and rates for all areas of the project should be dictated by agronomic testing of the soils in which vegetation is to be established. Temporary seed mixes shall consist at a minimum of an annual grain appropriate for the season. Alleopathic seed such as winter rye grass shall not be used for temporary seeding. Appropriate seed mixes for this project are available through Ernst Conservation Seeds (<http://www.ernstseed.com/default.aspx>).

19.2 Vegetation

- a) Contractor shall adhere to the planting plan and list of plant species and quantities shown on Sheet 8. Contractor shall follow detailed planting recommendations from nursery for all plant species. Additional specifications are provided below.
- b) Permanent vegetation shall be planted only after the basins have been completely constructed, re-graded as necessary to achieve required final elevations (including the application of stockpiled topsoil), and accurately surveyed. Topsoil is defined as friable clay loam surface soil found in depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, weeds, roots, and other objectionable material.
- c) Planting of basin plants shall occur in moist, well-aerated soil. Except in periods of wet weather, Contractor shall irrigate the site regularly until vegetation becomes established.
- d) Establishment of the wetland plant community will be enhanced by installation of nursery stock into the infiltration basins and stormwater wetland during the optimal period for transplanting of late spring to early summer for herbaceous plants (April 15-June 1) so plants have a full growing season to build root reserves for winter, or as specified by the nursery. Woody species such as trees and shrubs shall be planted in late fall and winter while leaves are off and plants are dormant (October 15-April 1), or as specified by the nursery. Contractor shall contact nursery three weeks prior to construction to ensure desired species will be available.
- e) Wetland Plants: Bare root plants should be used when available. Wetland plants shall be planted with their leaves sticking out of the water. Wetland vegetation should be planted just deep enough to provide the plants stability – planting too deep can stress new wetland vegetation in wet conditions. Shallow planting encourages better root growth when the wetland has plenty of water.
- f) Post-nursery care of wetland plants is very important during the interval between delivery of the plants to the site and their subsequent installation because they are prone to desiccation. Nursery stock shall be watered, fertilized, and shaded in accordance with the nursery's recommendations, prior to installation.

- g) Perennials: Set the plants at the depth they were grown allowing for soil settlement. Spread out bare roots and then firm backfill over them by hand, leaving no air pockets. If rootballs were densely packed, slice the root ball across the bottom, loosen the roots, spread out the halves and proceed as above. Mulch as specified.
- h) Shrub Bed Preparation: Scoop out a broad shallow hole in the middle of the loosened area for the root ball. Set rootball on a layer of compacted planting soil mixture, plumb and in center of pit with top of ball at least one to two inches above finish grade. Backfill with native soil in layers, and work each layer to eliminate voids. When excavation is 2/3 filled, water thoroughly before placing final layer of backfill. Water again after placing final layer of backfill. Apply mulch as specified.
- i) Tree Planting: Till and loosen to a depth of 12 inches, an area four times the diameter of the rootball, space permitting. Minimum area is twice the diameter of the rootball. Organic matter may be added if it is mixed uniformly throughout the loosened area. Scoop out a shallow hole in the middle of the loosened area for the rootball. Set the root ball on undisturbed soil with the top of the ball two to four inches above the surrounding soil. Remove at least the top two-thirds of the wire basket and burlap. Backfill with native soil and gently step or water the planting area to remove any pockets. Apply mulch as specified.
- j) Fertilizer: Apply only superphosphate or bonemeal at time of planting. Trees: 1/2 cup per inch of caliper size. Shrubs: 1/4 cup per gallon size of container. Groundcover and Perennials: Broadcast 4-8-6 fertilizer at 2 lbs. per 100 SF.
- k) Mulch: Mulch shall be aged (greater than six months and less than two years old) shredded and screened (no pieces larger than three inches in dimension) triple ground hardwood non-dyed mulch. Trees and Shrubs: apply a three-inch depth of mulch on all planting beds and tree rings. Do not allow mulch to touch the tree trunks or shrub stems.
- l) No trees shall be planted within 10 feet of inlet or outlet pipes, or manmade drainage structures such as spillways or flow spreaders. Species with roots that seek water (e.g. willow and poplar) should be avoided within 50 feet of pipes or manmade structures.
- m) Trees and shrubs shall not be planted either permanently or temporarily on berms that impound water during storm events. This restriction does not apply to cut slopes that form pond banks or berms to the basin.
- n) Contractor shall apply seed mixes by broadcasting and hand seeding. Recommended tools and methods for seeding may be referenced at www.ernstseed.com. Soils in disturbed areas shall be scarified to one half-inch prior to seeding.
- o) Seed mix for spillways and channels/swales from infiltration basins shall use Ernst Conservation Seed Retention Basin Wildlife Mix - ERNMX-127. Seed mix for adjacent areas shall use either Ernst NC Mountains UPL Meadow Mix - ERNMX-303 or Prairie Moon Nursery Eco-Grass, as indicated on the construction plans.



ERNST SEEDS

Ernst Conservation Seeds
8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

Date: May 29, 2024

Retention Basin Wildlife Mix - ERNMX-127

	Botanical Name	Common Name	Price/Lb
30.00 %	<i>Carex vulpinoidea</i> , PA Ecotype	Fox Sedge, PA Ecotype	24.00
30.00 %	<i>Panicum clandestinum</i> , Tioga	Deertongue, Tioga	18.20
20.20 %	<i>Elymus virginicus</i>	Virginia Wildrye	7.37
7.00 %	<i>Carex lurida</i> , PA Ecotype	Lurid Sedge, PA Ecotype	56.00
7.00 %	<i>Carex scoparia</i> , PA Ecotype	Blunt Broom Sedge, PA Ecotype	68.00
1.50 %	<i>Juncus effusus</i>	Soft Rush	40.00
1.40 %	<i>Heliopsis helianthoides</i> , PA Ecotype	Oxeye Sunflower, PA Ecotype	28.00
1.00 %	<i>Verbena hastata</i> , PA Ecotype	Blue Vervain, PA Ecotype	32.00
0.50 %	<i>Agrostis perennans</i> , Albany Pine Bush-NY Ecotype	Autumn Bentgrass, Albany Pine Bush-NY Ecotype	14.00
0.50 %	<i>Asclepias incarnata</i> , PA Ecotype	Swamp Milkweed, PA Ecotype	148.00
0.20 %	<i>Scirpus cyperinus</i> , PA Ecotype	Woolgrass, PA Ecotype	96.00
0.10 %	<i>Aster lanceolatus</i>	Lance Leaved Aster	360.00
0.10 %	<i>Aster novae-angliae</i> , PA Ecotype	New England Aster, PA Ecotype	280.00
0.10 %	<i>Aster puniceus</i> , PA Ecotype	Purplestem Aster, PA Ecotype	360.00
0.10 %	<i>Lobelia siphilitica</i> , PA Ecotype	Great Blue Lobelia, PA Ecotype	320.00
0.10 %	<i>Lycopus americanus</i> , PA Ecotype	American Water Horehound, PA Ecotype	60.00
0.10 %	<i>Mimulus ringens</i> , PA Ecotype	Square Stemmed Monkeyflower, PA Ecotype	180.00
0.10 %	<i>Scirpus atrovirens</i> , PA Ecotype	Green Bulrush, PA Ecotype	120.00
100.00 %		Mix Price/Lb Bulk:	\$26.82

Seeding Rate: 20 lbs per acre, or 0.5-1 lb/1,000 sq ft with a cover crop. For a cover crop use one of the following: grain rye (1 Sep to 30 Apr; 30 lbs/acre), Japanese millet (1 May to 31 Aug; 10 lbs/acre), or barnyard grass (1 May to 31 Aug; 10 lbs/acre).

Grasses & Grass-like Species - Herbaceous Perennial; Herbaceous Flowering Species - Herbaceous Perennial; Stormwater Management; Wildlife Habitat & Food Plots

The grasses, grass-like species and forbs provide a diverse cover in retention basins where mowing is not anticipated. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

Price quotes guaranteed for 30 days.
All prices are FOB Meadville, PA.
Please check our web site at www.ernstseed.com
for current pricing when placing orders.



ERNST SEEDS

Ernst Conservation Seeds

8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

Date: May 30, 2024

NC Mountains UPL Meadow Mix - ERNMX-303

	Botanical Name	Common Name	Price/Lb
64.10 %	<i>Schizachyrium scoparium, Fort Indiantown Gap-PA Ecotype</i>	Little Bluestem, Fort Indiantown Gap-PA Ecotype	13.86
17.00 %	<i>Elymus virginicus, Madison-NY Ecotype</i>	Virginia Wildrye, Madison-NY Ecotype	9.96
3.50 %	<i>Chamaecrista fasciculata, PA Ecotype</i>	Partridge Pea, PA Ecotype	12.00
3.00 %	<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis	28.80
3.00 %	<i>Rudbeckia hirta</i>	Blackeyed Susan	31.20
2.00 %	<i>Heliopsis helianthoides, PA Ecotype</i>	Oxeye Sunflower, PA Ecotype	33.60
1.50 %	<i>Tradescantia subaspera, VA Ecotype</i>	Zigzag Spiderwort, VA Ecotype	144.00
1.40 %	<i>Monarda fistulosa, Fort Indiantown Gap-PA Ecotype</i>	Wild Bergamot, Fort Indiantown Gap-PA Ecotype	96.00
1.00 %	<i>Asclepias tuberosa</i>	Butterfly Milkweed	312.00
1.00 %	<i>Liatris spicata</i>	Marsh Blazing Star	252.00
0.80 %	<i>Aster novae-angliae, PA Ecotype</i>	New England Aster, PA Ecotype	336.00
0.70 %	<i>Aster pilosus, PA Ecotype</i>	Heath Aster, PA Ecotype	264.00
0.50 %	<i>Solidago nemoralis, PA Ecotype</i>	Gray Goldenrod, PA Ecotype	264.00
0.30 %	<i>Penstemon canescens, WV Ecotype</i>	Eastern Gray Beardtongue, WV Ecotype	480.00
0.10 %	<i>Solidago bicolor, PA Ecotype</i>	White Goldenrod, PA Ecotype	240.00
0.10 %	<i>Solidago odora, PA Ecotype</i>	Licorice Scented Goldenrod, PA Ecotype	384.00

100.00 %

Mix Price/Lb Bulk: \$30.53

Seeding Rate: 20 lb per acre with a cover crop. For a cover crop use oats (30 lbs/acre; 1 Jan to 30 Apr), brown top millet (10 lbs/acre; 1 May to 31 Aug), or grain rye (30 lbs/acre; 1 Sep to 31 Dec).

Grasses & Grass-like Species - Herbaceous Perennial; Herbaceous Flowering Species - Herbaceous Perennial; Pollinator Favorites; Uplands & Meadows

Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

Price quotes guaranteed for 30 days.
All prices are FOB Meadville, PA.
Please check our web site at www.ernstseed.com
for current pricing when placing orders.

20.0 MISCELLANEOUS

20.1 Stormwater Pipe

Contractor shall follow current City of Asheville Standard Specifications and Details Manual subsections under the heading Pipe Trenches. When required under OSHA regulations, the Contractor shall be responsible for temporary shoring.

The work of installing or replacing stormwater pipe shall include all excavation, bedding and backfill in accordance with the standard details, the cost of disposal and all costs to furnish material, equipment, labor and supervision to complete the work to the grades shown on the plans or as modified by the Engineer in the field. Contractor shall not leave trenches open overnight.

20.2 Cap for Existing Inlet

Contractor shall install capping for an unused stormwater inlet, ensuring it is secured and accessible for future use if needed. The cap material shall be HDPE, reinforced concrete or another suitable material. The cap should be sized to match the existing inlet dimensions, and include a hinged or lift-off cover for future access, and lockable for security. The height of cover should be at the level of the proposed adjacent grade of the wetland.

20.3 Boulder Stone for Wetland

Contractor shall install boulder stone for wetland aesthetics as directed by project landscape architect (LA). Boulders shall be landscaping variety boulders with a flat sitting surface of the sizes and shapes indicated by LA. Boulders shall have a smooth surface and no sharp or fractured surfaces. Protect boulders during handling to prevent scratching visible surfaces. Shape and size shall be as indicated on the plans, specs or bid tab.

20.4 Foot Bridge and Footings

Work included in this Section is to be completed by the Contractor, and is to include furnishing all labor, materials, and equipment and performing all operations necessary to complete the installation of concrete footings and posts for construction of the foot bridge.

Contractor shall construct concrete footings and posts for installation of the proposed foot bridge, shown on the construction drawings. Contractor shall determine required post spacing and footing size and depth in accordance with all applicable building codes. Construct and install wooden footbridge with wooden railings per the plans and details and as directed in the field.

20.5 Pedestrian Paths

Pedestrian paths to be constructed of granite fines, 2" depth on 4" compacted ABC; Completed surface to be ADA accessible. Metal edging is to be Corten 14GA, 6" X 120" or equivalent.

21.0 SUGGESTED SEQUENCE OF CONSTRUCTION ACTIVITIES

21.1 Scope

Work included in this Section is to be completed by the Contractor, and is to include furnishing all labor, materials, and equipment and performing all operations necessary to complete the construction of the project in accordance with the suggested sequence of construction activities.

21.2 Construction Sequence

- 1) Perform construction stake out.
- 2) Install temporary gravel construction entrances.
- 3) Clear site within limits of disturbance (LOD), excluding trees on or near boundary of LOD, but do not grub.
- 4) Install erosion and sediment control measures.
- 5) Grub site and remove invasive plant species.
- 6) Commence demolition and removal of asphalt pavement.
- 7) Haul and dispose of pavement to approved recycling location.
- 8) Commence excavation and rough grading of the site.
- 9) Stockpile suitable top soil material for reuse as backfill.
- 10) Haul unusable soil material offsite for disposal.
- 11) Complete rough grading of the site.
- 12) Install flow splitter during dry period, (without baffle or flashboards) to allow full drainage through site.
- 13) Construct infiltration basins (Cells 1 and 2), spillways and connecting channels.
- 14) Construct stormwater wetland, over excavating to depth for installation of geosynthetic clay liner (GCL).
- 15) Install GCL with approved onsite GCL inspector from manufacturer or geotechnical engineer.
- 16) Back fill stormwater wetland to achieve design grades.
- 17) Fine grade site. Achieving finished elevations in accordance with the plans is critical for plant survival.
- 18) Install Agri-drain outlet water level controller, footing, and connect to existing RCP storm sewer with proper penetration and sealing through GCL.
- 19) Install pedestrian paths and other landscape structures.
- 20) Install poured concrete wall.
- 21) Install concrete footings and foot bridge.
- 22) Scarify, seed, fertilize, mulch, and/or plant all disturbed areas.
- 23) After disturbed areas are stabilized with vegetation, Contractor shall return to the site to install the baffle riser, flash boards, full-draining orifice, grate cover, and remove all temporary erosion control measures.

ATTACHMENT A

Buncombe County General Conditions of the Contract

GENERAL CONDITIONS OF THE CONTRACT

STANDARD FORM FOR SINGLE PRIME CONSTRUCTION PROJECTS

**NORTH CAROLINA
COUNTY OF BUNCOMBE**

GENERAL CONDITIONS OF THE CONTRACT

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ARTICLE 1 - DEFINITIONS

- a. The **contract documents** consist of the Request for Proposal (RFP); General Contractor's formal response to the RFP; General Conditions of the Contract; special conditions if applicable; the drawing and specifications, including all bulletins, addenda or other modifications of the drawings and specifications incorporated into the documents prior to their execution; the contract; the performance bond; the payment bond; insurance certificates. All of these items together form the contract.
- b. The **Owner** is Buncombe County Government.
- c. The **designer** or **project designer** means the firm or firms of architects or engineers or both (and their consultants) which have undertaken to design the project pursuant to a contract with the Owner, (hereinafter, the "design contract").
- d. Intentionally left blank for sequential numbering purposes.
- e. A **subcontractor**, as the term is used herein, shall be a trade contractor, a general, mechanical, electrical, plumbing, specialty contractor, or a trade contractor, who has entered into a direct contract with a GC, and includes one who furnishes materials worked to a special design in accordance with plans and specifications covered by the contract, but does not include one who only sells or furnishes materials not requiring work so described or detailed.
- f. **Written notice** shall be defined as notice in writing delivered in person to the contractor, or to a partner of the firm in the case of a partnership, or to a member of the contracting organization, or to an officer of the organization in the case of a corporation, or sent to the last known business address of the contracting organization by registered mail.
- g. **Work**, as used herein as a noun, is intended to include materials, labor, and workmanship of the appropriate contractor as supervised by the GC.
- h. The **project** is the total construction work to be performed under the contract documents.
- i. Intentionally left blank for sequential numbering purposes.
- j. **Change order**, as used herein, shall mean a written order to the GC subsequent to the signing of the contract authorizing a change in the contract. The change order shall be signed by the GC, designer and the Owner, in that order (Article 19).
- k. **Field Order**, as used herein, shall mean a written approval for the GC to proceed with the work requested by Owner prior to issuance of a formal Change Order. The field order shall be signed by the GC, designer, and Owner.
- l. **Field Change**, as used herein shall mean a written approval from the Owner for the GC to proceed with work requested by the Owner.

- m. **Time of Completion**, as stated in the contract documents, is to be interpreted as consecutive calendar days measured from the date established in the written Notice to Proceed, or such other date as may be established herein (Article 23).
- n. **Liquidated damages**, as stated in the contract documents, is an amount reasonably estimated in advance to cover the consequential damages associated with the Owner's economic loss in not being able to use the Project for its intended purposes at the end of the contract's completion date as amended by change order, if any, by reason of failure of the GC to complete the work within the time specified. Liquidated damages does not include the Owner's extended contract administration costs (including but not limited to additional fees for architectural and engineering services, testing services, inspection services, commissioning services, etc.), such other damages directly resulting from delays caused solely by the GC, or consequential damages that the Owner identified in the bid documents that may be impacted by any delay caused solely by the GC (e.g., if a multi-phased project-subsequent phases, delays in start of other projects that are dependent on the completion of this Project, extension of leases and/or maintenance agreements for other facilities).
- o. **Surety**, as used herein, shall mean the bonding company or corporate body which is bound with and for the GC, and which engages to be responsible for the GC and his acceptable performance of the work.
- p. **Routine written communications between the Designer and the General Contractor** are any communication other than a "request for information" provided in letter, memo, or transmittal format, sent by mail, courier, electronic mail, or facsimile. Such communications cannot be identified as "request for information".
- q. **Clarification or Request for information (RFI)** is a request from the GC seeking an interpretation or clarification by the Designer relative to the contract documents. The RFI, which shall be labeled (RFI), shall clearly and concisely set forth the issue or item requiring clarification or interpretation and why the response is needed. The RFI must set forth the GC's interpretation or understanding of the contract documents requirements in question, along with reasons for such an understanding.
- r. **Approval** means written or imprinted acknowledgement that materials, equipment or methods of construction are acceptable for use in the work.
- s. **Inspection** shall mean examination or observation of work completed or in progress to determine its compliance with contract documents.
- t. **"Equal to" or "approved equal"** shall mean materials, products, equipment, assemblies, or installation methods considered equal by the bidder in all characteristics (physical, functional, and aesthetic) to those specified in the contract documents. Acceptance of equal is subject to approval of the designer and owner.
- u. **"Substitution" or "substitute"** shall mean materials, products, equipment, assemblies, or installation methods deviating in at least one characteristic (physical, functional, or aesthetic) from those specified, but which in the opinion of the bidder would improve

competition and/or enhance the finished installation. Acceptance of substitution is subject to the approval of the designer and owner.

- v. **Provide** shall mean furnish and install complete in place, new, clean, operational, and ready for use.
- w. **Indicated and shown** shall mean provide as detailed, or called for, and reasonably implied in the contract documents.
- x. **Special inspector** is one who inspects materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with the approved construction documents and referenced standards.
- y. **Commissioning** is a quality assurance process that verifies and documents that building components and systems operate in accordance to the owner's project requirements and the project design documents.
- z. **Designer Final Inspection** is the inspection performed by the design team to determine the completeness of the project in accordance with approved plans and specifications. This inspection occurs prior to final inspection.
- aa. left blank for numbering purposes
- bb. **Beneficial Occupancy** is requested by the owner and is occupancy or partial occupancy of the building after all life safety items have been completed as determined by the local Authority Having Jurisdiction (AHJ). Life safety items include but not limited to fire alarm, sprinkler, egress and exit lighting, fire rated walls, egress paths and security.
- cc. **Final Acceptance** is the date in which the Owner accepts the construction as totally complete. This includes the local AHJ and certification by the designer that all punch lists are completed.

ARTICLE 2 - INTENT AND EXECUTION OF DOCUMENTS

- a. The drawings and specifications are complementary, one to the other. That which is shown on the drawings or called for in the specifications shall be as binding as if it were both called for and shown. The intent of the drawings and specifications is to establish the scope of all labor, materials, transportation, equipment, and any and all other things necessary to provide a complete job. In case of discrepancy or disagreement in the contract documents, the order of precedence shall be: Form of Contract, specifications, large-scale detail drawings, small- scale drawings.
- b. The wording of the specifications shall be interpreted in accordance with common usage of the language except that words having a commonly used technical or trade meaning shall be so interpreted in preference to other meanings.
- c. The GC shall execute each copy of the response to RFP, contract, performance bond and payment bond as follows:

- 1 If the documents are executed by a sole Owner, that fact shall be evidenced by the word "Owner" appearing after the name of the person executing them.
- 2 If the documents are executed by a partnership, that fact shall be evidenced by the word "Co-Partner" appearing after the name of the partner executing them.
- 3 If the documents are executed on the part of a corporation, they shall be executed by either the president or the vice president and attested by the secretary or assistant secretary in either case, and the title of the office of such persons shall appear after their signatures. The seal of the corporation shall be impressed on each signature page of the documents.
- 4 If the documents are made by a joint venture, they shall be executed by each member of the joint venture in the above form for sole Owner, partnership or corporation, whichever form is applicable to each particular member.
- 5 All signatures shall be properly witnessed.
- 6 If the General Contractor's license is held by a person other than an Owner, partner or officer of a firm, then the licensee shall also sign and be a party to the contract. The title "Licensee" shall appear under his/her signature.
- 7 The bonds shall be executed by an attorney-in-fact. There shall be attached to each copy of the bond a certified copy of power of attorney properly executed and dated.
- 8 Each copy of the bonds shall be countersigned by an authorized individual agent of the bonding company licensed to do business in North Carolina. The title "Licensed Resident Agent" shall appear after the signature.
- 9 The seal of the bonding company shall be impressed on each signature page of the bonds.
- 10 The GC's signature on the performance bond and the payment bond shall correspond with that on the contract.

ARTICLE 3 - CLARIFICATIONS AND DETAIL DRAWINGS

- a. In such cases where the nature of the work requires clarification by the designer, such clarification shall be furnished by the designer with reasonable promptness by means of written instructions or detail drawings, or both. Clarifications and drawings shall be consistent with the intent of contract documents, and shall become a part thereof.
- b. The GC and the Designer shall prepare, if deemed necessary, a schedule fixing dates upon which foreseeable clarifications will be required. The schedule will be subject to addition or change in accordance with progress of the work. The Designer shall furnish drawings or clarifications in accordance with that schedule. The GC shall not proceed with the work without such detail drawings and/or written clarifications.

ARTICLE 4 - COPIES OF DRAWINGS AND SPECIFICATIONS

The Designer or owner shall furnish free of charge to the GC electronic copies of plans and specifications. If requested by the GC, up to 3 paper copies of plans and specifications will be provided free of charge, plus a clean set of black line prints on white paper of all appropriate drawings, upon which the GC shall clearly and legibly record all work-in-place that is at variance with the contract documents. Additional sets shall be furnished at cost, including mailing, to the GC at the request of the GC.

ARTICLE 5 - SHOP DRAWINGS, SUBMITTALS, SAMPLES, DATA

- a. Within fifteen (15) consecutive calendar days of the notice to proceed, a schedule for anticipated submission of all shop drawings, product data, samples, and similar submittals shall be prepared by the GC and provided to the designer. This schedule shall indicate the items, relevant specification sections, other related submittal data, and the date when these items will be furnished to the designer.
- b. The GC shall review, approve and submit to the Designer all Shop Drawings, Coordination Drawings, Product Data, Samples, Color Charts, and similar submittal data required or reasonably implied by the Contract Documents. Required Submittals shall bear the GC's stamp of approval, any exceptions to the Contract Documents shall be noted on the submittals, and copies of all submittals shall be of sufficient quantity for the Designer to retain up to three (3) copies of each submittal for his own use plus additional copies as may be required by the GC. Submittals shall be presented to the Designer in accordance with the schedule submitted in paragraph (a) so as to cause no delay in the activities of the Owner.
- c. The Designer shall review required submittals promptly, noting desired corrections if any, and retaining three (3) copies (1 for the Designer, 1 for the owner) for his use. The remaining copies of each submittal shall be returned to the GC not later than twenty (20) days from the date of receipt by the Designer, for the GC's use or for corrections and resubmittal as noted by the Designer. When resubmittals are required, the submittal procedure shall be the same as for the original submittals.
- d. Approval of shop drawings by the designer shall not be construed as relieving the GC from responsibility for compliance with the design or terms of the contract documents nor from responsibility of errors of any sort in the shop drawings, unless such error has been called to the attention of the designer in writing by the GC.

ARTICLE 6 - WORKING DRAWINGS AND SPECIFICATIONS AT THE JOB SITE

- a. The GC shall maintain, in readable condition at his job office, one complete set of working drawings and specifications for his work including all shop drawings. Such drawings and specifications shall be available for use by the Designer or his authorized representative, and the owner.

- b. The GC shall maintain at the job office, a day-to-day record of work-in-place that is at variance with the contract documents. Such variations shall be fully noted on project drawings by the GC and submitted to the designer upon project completion and no later than thirty (30) days after acceptance of the project.
- c. The contractor shall maintain at the job office a record of all required tests that have been performed, clearly indicating the scope of work inspected and the date of approval or rejection.

ARTICLE 7 - OWNERSHIP OF DRAWINGS AND SPECIFICATIONS

All drawings and specifications are instruments of service and remain the property of the Owner. The use of these instruments on work other than this contract without permission of the Owner is prohibited. All copies of drawings and specifications other than contract copies shall be returned to the Owner upon request after completion of the work.

ARTICLE 8 - MATERIALS, EQUIPMENT, EMPLOYEES

- a. The GC shall, unless otherwise specified, supply and pay for all labor, transportation, materials, tools, apparatus, scaffolding and incidentals necessary for the completion of his work, and to install, maintain and remove all equipment of the construction, other utensils or things, and be responsible for the safe, proper and lawful construction, maintenance and use of same. The GC shall construct in the best and most workmanlike manner, a complete job and everything incidental thereto, as shown on the plans, stated in the specifications, or reasonably implied there from, all in accordance with the contract documents.
- b. All materials shall be new and of quality specified, except where reclaimed material is authorized herein and approved for use. Workmanship shall at all times be of a grade accepted as the best practice of the particular trade involved, and as stipulated in written standards of recognized organizations or institutes of the respective trades except as exceeded or qualified by the specifications.
- c. Upon notice, the GC shall furnish evidence as to quality of materials.
- d. Products are generally specified by ASTM or other reference standard and/or by manufacturer's name and model number or trade name. When specified only by reference standard, the GC may select any product meeting this standard, by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the GC has the option of using any product and manufacturer combination listed. However, the GC shall be aware that the cited examples are used only to denote the quality standard of product desired and that they do not restrict bidders to a specific brand, make, manufacturer or specific name; that they are used only to set forth and convey to bidders the general style, type, character and quality of product desired; and that equivalent products will be acceptable. The GC shall be responsible for reviewing all substitution requests from their subcontractors prior to submission to the Project Designer and Owner and shall track & monitor all such requests. Requests for substitution of materials, items, or equipment shall be submitted to the Project Designer for approval or disapproval; such approval or disapproval shall be made by the designer prior to the opening of bids. Alternate materials

may be requested after award if it can clearly be demonstrated that it is an added benefit to the owner and the designer and the owner approves.

- e. The GC shall obtain written approval from the designer for the use of products, materials, equipment, assemblies or installation methods claimed as equal to those specified. Such approvals must be obtained as soon after contract awards as possible and before any materials are ordered.
- f. The Designer is the judge of equality for proposed substitution of products, materials or equipment.
- g. If at any time during the construction and completion of the work covered by these contract documents, the conduct of any workman of the various crafts be adjudged a nuisance to the Owner or Designer, or if any workman be considered detrimental to the work, the GC shall order such parties removed immediately from grounds.

ARTICLE 9 - ROYALTIES, LICENSES AND PATENTS

It is the intention of the contract documents that the work covered herein will not constitute in any way infringement of any patent whatsoever unless the fact of such patent is clearly evidenced herein. The GC shall protect and save harmless the Owner against suit on account of alleged or actual infringement. The GC shall pay all royalties and/or license fees required on account of patented articles or processes, whether the patent rights are evidenced hereinafter.

ARTICLE 10 - PERMITS, INSPECTIONS, FEES, REGULATIONS

- a. The GC shall give all notices and comply with all laws, ordinances, codes, rules and regulations bearing on the conduct of the work under this contract. If the GC observes that the drawings and specifications are at variance therewith, he shall promptly notify the Designer in writing. Any necessary changes required after contract award shall be made by change order in accordance with Article 19. If the GC performs any work or authorizes any work to be performed knowing it to be contrary to such laws, ordinances, codes, rules and regulations, and without such notice to the designer, he shall bear all cost arising there from. Additional requirements implemented after bidding will be subject to equitable negotiations.
- b. All work under this contract shall conform to the North Carolina State Building Code and other State, local and national codes as are applicable. The cost of all required inspections and permits shall be the responsibility of the GC unless otherwise specified.
- c. Projects constructed by Buncombe County or a subdivision thereof are subject to inspection by appropriate county or municipal authorities and building codes. The GC shall cooperate with the county and/or municipal authorities by obtaining building permits. Permits shall be obtained at GC's cost.
- d. Projects involving local funding (Community Colleges) are also subject to county and municipal building codes and inspection by local authorities. The GC shall pay the cost of these permits and inspections unless otherwise specified.

ARTICLE 11 - PROTECTION OF WORK, PROPERTY AND THE PUBLIC

- a. The GC shall be responsible for the entire site and the building or construction of the same and provide all the necessary protections, as required by the Owner or designer, and by laws or ordinances governing such conditions. The GC shall be responsible for any damage to the Owner's property or of that of others on the job, by them, their personnel, or their subcontractors, and shall make good such damages. The GC shall be responsible for and pay for any damages caused to the Owner. The GC shall have access to the project at all times.
- b. The GC shall be responsible to cover and protect all portions of the structure when the work is not in progress, provide and set all temporary roofs, covers for doorways, sash and windows, and all other materials necessary to protect all the work on the building. Any work damaged through the lack of proper protection or from any other cause, shall be repaired or replaced without extra cost to the Owner.
- c. No fires of any kind will be allowed inside or around the operations during the course of construction without special permission from the Designer.
- d. The GC shall ensure that all trees and shrubs designated to remain in the vicinity of the construction operations are protected in accordance with the requirements of the plans and specifications. All walks, roads, etc., shall be barricaded as directed by the designer to keep the public away from the construction. All trenches, excavations or other hazards in the vicinity of the work shall be well barricaded and properly lighted at night.
- e. The GC shall develop and implement a project safety plan that provides all necessary safety measures for the protection of all persons on the job, including the requirements of the *A.G.C. Accident Prevention Manual in Construction*, as amended, and shall fully comply with all state laws or regulations and North Carolina State Building Code requirements to prevent accident or injury to persons on or about the location of the work. The GC shall clearly mark or post signs warning of hazards existing, and shall barricade excavations, elevator shafts, stairwells and similar hazards. The GC shall insure that protection is provided against damage or injury resulting from falling materials and that all protective devices and signs be maintained throughout the progress of the work.
- f. The GC shall adhere to the rules, regulations and interpretations of the North Carolina Department of Labor relating to Occupational Safety and Health Standards for the Construction Industry (Title 29, Code of Federal Regulations, Part 1926, published in Volume 39, Number 122, Part II, June 24, 1974, *Federal Register*), and revisions thereto as adopted by N.C.G.S. 95-126 through 155.
- g. The GC shall designate a responsible person of his organization as safety officer/inspector to inspect the project site for unsafe health and safety hazards, to report these hazards to the contractor for correction, and whose duties also include accident prevention on the project, and to provide other safety and health measures on the project site as required by the terms and conditions of the contract. The name of the safety inspector shall be made

known to the designer and owner at the time of the preconstruction conference and in all cases prior to any work starting on the project.

- h. In the event of an emergency affecting the safety of life, the protection of work, or the safety of adjoining properties, the GC is hereby authorized to act at his own discretion, without further authorization from anyone, to prevent such threatened injury or damage. Any compensation claimed by the GC on account of such action shall be determined as provided for under Article 19(b).
- i. Any and all costs associated with correcting damage caused to adjacent properties of the construction site or staging area shall be borne by the contractor. These costs shall include but not be limited to flooding, mud, sand, stone, debris, and discharging of waste products.

ARTICLE 12 - SEDIMENTATION POLLUTION CONTROL ACT OF 1973

- a. Any land-disturbing activity performed by the GC in connection with the project shall comply with all erosion control measures set forth in the contract documents and any additional measures which may be required in order to ensure that the project is in full compliance with the Sedimentation Pollution Control Act of 1973, as implemented by Title 15, North Carolina Administrative Code, Chapter 4, Sedimentation Control, Subchapters 4A, 4B and 4C, as amended (15 N.C.A.C. 4A, 4B and 4C).
- b. Upon receipt of notice that a land-disturbing activity is in violation of said act, the GC shall be responsible for ensuring that all steps or actions necessary to bring the project in compliance with said act are promptly taken.
- c. The GC shall be responsible for defending any legal actions instituted pursuant to N.C.G.S. 113A-64 against any party or persons described in this article.
- d. To the fullest extent permitted by law, the GC shall indemnify and hold harmless the Owner, the designer and the agents, consultants and employees of the Owner and designer, from and against all claims, damages, civil penalties, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance of work or failure of performance of work, provided that any such claim, damage, civil penalty, loss or expense is attributable to a violation of the Sedimentation Pollution Control Act. Such obligation shall not be construed to negate, abridge or otherwise reduced any other right or obligation of indemnity which would otherwise exist as to any party or persons described in this article.

ARTICLE 13 - INSPECTION OF THE WORK

- a. It is a condition of this contract that the work shall be subject to inspection during normal working hours by the designer, designated official representatives of the Owner and those persons required by state law to test special work for official approval. The GC shall therefore provide safe access to the work at all times for such inspections.

- b. All instructions to the GC will be made only by or through the designer or his designated project representative. Observations made by official representatives of the Owner shall be conveyed to the designer for review and coordination prior to issuance to the GC.
- c. The GC shall perform quality control inspections on the work of Principal Trade and Specialty Contractors to guard the Owner against defects and deficiencies in the work and shall coordinate this activity with the on-site duties of the Project Designer. The GC shall advise the Project Designer of any apparent variation and/or deviation from the intent of the Contract Documents and shall take the necessary action to correct such variations and deviations.
- d. All work shall be inspected by designer, special inspector prior to being covered by the contractor. The GC shall give a minimum of two week notice unless otherwise agreed to by all parties. If inspection fails, after the first re-inspection all costs associated with additional re-inspections shall be borne by the GC.
- e. Where special inspection or testing is required by virtue of any state laws, instructions of the designer, specifications or codes, the GC shall give adequate notice to the Project Designer of the time set for such inspection or test, if the inspection or test will be conducted by a party other than the Project Designer. Such special tests or inspections will be made in the presence of the Project Designer, or his authorized representative, and it shall be the GC's responsibility to serve ample notice of such tests.
- f. All laboratory tests shall be paid by the Owner unless provided otherwise in the contract documents except the GC shall pay for laboratory tests to establish design mix for concrete and for additional tests to prove compliance with contract documents where materials have tested deficient except when the testing laboratory did not follow the appropriate ASTM testing procedures.
- g. Should any work be covered up or concealed prior to inspection and approval by the Project Designer such work shall be uncovered or exposed for inspection, if so requested by the Project Designer in writing. Inspection of the work will be made promptly upon notice from the GC. All cost involved in uncovering, repairing, replacing, recovering and restoring to design condition, the work that has been covered or concealed will be paid by the GC.

ARTICLE 14 - CONSTRUCTION SUPERVISION AND SCHEDULE

- a. On-site representatives of the GC shall manage the work and coordinate the work with the activities of the Owner and Project Designer to complete the project with the Owner's objectives of cost, time and quality. Throughout the progress of the work, the GC shall maintain a competent and adequate full-time staff approved by the Owner and Project Designer. It is understood that the designated and approved on-site representative of the GC will remain on the job and in responsible charge as long as those persons remain employed by the GC unless otherwise requested or agreed to by the Owner. The GC shall establish an on-site organization with appropriate lines of authority to act on behalf of the GC. Instructions, directions or notices given to the designated on-site authority shall be as

binding as if given to the GC. However, directions, instructions, and notices shall be confirmed in writing.

- b. The GC shall examine and study the drawings and specifications and fully understand the project design, and shall provide constant and efficient supervision to the work. Should he discover any discrepancies of any sort in the drawings or specifications, he shall report them to the designer without delay. He will not be held responsible for discrepancies in the drawings and/or specifications, but shall be held responsible to report them should they become known to him.
- c. The GC shall call and preside over monthly job site progress conferences. The GC shall require attendance from other subcontractors and material suppliers who can contribute toward maintaining required job progress. It shall be the principal purpose of these meetings, or conferences, to effect coordination, cooperation and assistance in every practical way toward the end of maintaining progress of the project on schedule and to complete the project within the specified contract time. The GC shall be prepared to assess progress of the work and to recommend remedial measures for correction of progress as may be appropriate. The GC with assistance from the Designer shall be the coordinator of the conferences and shall preside as chairman. The GC shall turn over a copy of his daily reports to the Designer and Owner at the job site progress conference. Owner will determine daily report format.
- d. The GC, if necessary, shall employ an engineer or a land surveyor licensed in the State of North Carolina to lay out the work and to establish a bench mark nearby in a location where same will not be disturbed and where direct instruments sights may be taken.
- e. Intentionally left blank for sequential numbering purposes.
- f. The CPM schedule shall be a complete computer generated network analysis showing the complete sequence of construction activities, identifying the work of separate stages and other logically grouped activities, indicating early and late start and early and late finish dates, float duration and a complete logic. Monthly updates will show the estimated completion of each activity.
- g. Intentionally left blank for sequential numbering purposes.
- h. The GC shall maintain the project CPM schedule, making monthly adjustments, updates, corrections, etc., which are necessary to finish the project within the time allotted by the contract. In doing so, the GC shall keep the designer fully informed as to all changes and updates to the schedule. The GC shall submit to the Project Designer a monthly report of the status of all work activities. The monthly status report shall show the actual work completed to date in comparison with the original amount of work scheduled. If the work is behind schedule, the GC must indicate in writing what measures are being taken to bring the work back on schedule and ensure that the contract completion date is not exceeded. If the work is greater than thirty (30) days behind schedule and no legitimate requests for time extensions are in process, then the GC shall prepare and submit to the Project Designer a recovery schedule for review and approval. Failure of the GC to abide by the directives

in this paragraph will give the Owner cause to exercise the remedies set forth in Article 29 of the General Conditions and pursue any other legal remedies allowed it by law.

ARTICLE 15 – {NOT USED}

ARTICLE 16 – {NOT USED}

ARTICLE 17 – {NOT USED}

ARTICLE 18 - DESIGNER'S STATUS

- a. The Project Designer shall provide liaison and necessary inspection of the work to ensure compliance with plans and specifications. He is the agent of the Owner only for the purpose of constructing this work and to the extent stipulated in the contract documents. He has authority to stop work or to order work removed, or to order corrections of faulty work where such action may be necessary to assure successful completion of the work.
- b. The Project Designer is the impartial interpreter of the contract documents, and, as such, he shall exercise his powers under the contract to enforce faithful performance by both the Owner and the GC, taking sides with neither.
- c. Should the Project Designer cease to be employed on the work for any reason whatsoever, then the Owner shall employ a competent replacement who shall assume the status of the former Project Designer.
- d. The Project Designer will make periodic inspections of the project at intervals appropriate to the stage of construction. He will inspect the progress, the quality and the quantity of the work.
- e. The Project Designer and the Owner shall have access to the work whenever it is in preparation and progress during normal working hours. The GC shall provide facilities for such access so the Designer may perform his functions under the contract documents.
- f. Based on the Project Designer's inspections and evaluations of the project, the Project Designer shall issue interpretations, directives and decisions as may be necessary to assist the GC in the administration of the project. His decisions relating to artistic effect and technical matters shall be final, provided such decisions are within the limitations of the contract. The GC's decisions, however, relating to means and methods, and administration of the contracts the GC holds are final.

ARTICLE 19 - CHANGES IN THE WORK

- a. The Owner may have changes made in the work covered by the contract. These changes will not invalidate and will not relieve or release the GC from any guarantee given by him pertinent to the contract provisions. These changes will not affect the validity of the guarantee bond and will not relieve the surety or sureties of said bond. All extra work shall be executed under conditions of the original contract.

- b. Except in an emergency endangering life or property, no change shall be made by the contractor except upon receipt of approved change order or written field order from the designer, countersigned by the owner authorizing such change. No claim for adjustments of the contract price shall be valid unless this procedure is followed.

A field order, transmitted by email, fax, or hand delivered, may be used where the change involved impacts the critical path of the work. A formal change order shall be issued as expeditiously as possible.

In the event of emergency endangering life or property, the County may direct the GC to proceed on a time and material basis whereupon the GC shall proceed and keep accurately on such form as may be required, a correct account of costs together with all proper invoices, payrolls and supporting data. Upon completion of the work the change order will be prepared as outlined under either Method "c(1)" or Method "c(2)" or both.

- c. In determining the values of changes, either additive or deductive, the GC is restricted to the use of the following methods:

- 1 Where the extra work involved is covered by unit prices quoted in the proposal, the value of the change shall be computed by application of unit prices based on quantities estimated or actual as agreed of the items involved, except in such cases where a quantity exceeds the estimated quantity allowance in the contract by one hundred percent (100%) or more. In such cases, either party may elect to proceed under subparagraph c2 herein. If neither party elects to proceed under c2, then unit prices shall apply.
- 2 The contracting parties shall negotiate and agree upon the equitable value of the change prior to issuance of the change order, and the change order shall stipulate the corresponding lump sum adjustment to the contract price.

- d. Under Paragraph "b" and Methods "c(2)" above, the allowances for overhead and profit combined for a Principal Trade or Specialty Contractor and all multi-tier subcontractors shall not exceed fifteen percent (15%) of **net cost** of the work. In the case of deductible change orders, under Method "c(2)" and Paragraph (b) above, the contractor shall include no less than five percent (5%) profit, but no allowances for overhead.

- e. The term "net cost" as used herein shall mean the difference between all proper cost additions and deductions. The "cost" as used herein shall be limited to the following:

- 1 The actual costs of materials and supplies incorporated or consumed as part of the project;
- 2 The actual costs of labor expended on the project site;
- 3 The actual costs of labor burden, limited to the costs of social security (FICA) and Medicare/Medicaid taxes; unemployment insurance costs; health/dental/vision insurance premiums; paid employee leave for holidays, vacation, sick leave, and/or petty leave, not to exceed a total of 30 days per year; retirement contributions;

worker's compensation insurance premiums; and the costs of general liability insurance when premiums are computed based on payroll amounts; the total of which shall not exceed thirty percent (30%) of the actual costs of labor;

- 4 The actual costs of rental for tools, excluding hand tools; equipment; machinery; and temporary facilities required for the project;
 - 5 The actual costs of premiums for bonds, insurance, permit fees and sales or use taxes related to the project. Overtime and extra pay for holidays and weekends shall not be incurred by the Owner as a cost item or otherwise.
- f. Should concealed conditions be encountered in the performance of the work below grade, or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the contract documents, the contract sum and time for completion may be equitably adjusted by change order upon claim by either party made within thirty (30) days after the condition has been identified. The cost of such change shall be arrived at by one of the foregoing methods. All change orders shall be supported by a breakdown showing method of arriving at net cost as defined above.
- g. In all change orders, the procedure will be for the Project Designer to request proposals for the change order work in writing. The Project Designer shall verify correctness. Within fourteen (14) days after receipt of the GC's proposal, the Project Designer shall prepare the change order and forward to the GC for his signature or otherwise respond, in writing, to the GC's proposal. Within seven (7) days after receipt of the change order executed by the GC, the Project Designer shall, certify the change order by his signature, and forward the change order and all supporting data to the Owner for the Owner's signature. The Owner shall execute the change order for final approval, within seven (7) days of receipt. Copies will be sent to the Project Designer for distribution to the GC and the surety. In case of emergency or extenuating circumstances, approval of changes may be obtained verbally by telephone or field orders approved by all parties, then shall be substantiated in writing as outlined under normal procedure.
- h. At the time of signing a change order, the GC shall be required to certify as follows:
- "I certify that my bonding company will be notified forthwith that my contract has been changed by the amount of this change order, and that a copy of the approved change order will be mailed upon receipt by me to my surety."
- i. A change order, when issued, shall be full compensation, or credit, for the work included, omitted or substituted. It shall show on its face the adjustment in time for completion of the project as a result of the change in the work.
- j. If, during the progress of the work, the Owner requests a change order and the GC's terms are unacceptable, the Owner, may require the GC to perform such work on a time and material basis in accordance with paragraph "b" above. Without prejudice, nothing in this paragraph shall preclude the Owner from performing or to have performed that portion of the work requested in the change order.

ARTICLE 20 - CLAIMS FOR EXTRA COST AND DISPUTE RESOLUTION

- a. Should the GC consider that as a result of any instructions given in any form by the designer, he is entitled to extra cost above that stated in the contract, he shall give written notice thereof to the designer within seven (7) days without delay. The written notice shall clearly state that a claim for extra cost is being made and shall provide a detailed justification for the extra cost. The GC shall not proceed with the work affected until further advised, except in emergency involving the safety of life or property, which condition is covered in Article 19(b) and Article 11(h). No claims for extra compensation will be considered unless the claim is so made. The Designer shall render a written decision within seven (7) days of receipt of claim.
- b. The GC shall not act on instructions received by him from persons other than the Project Designer, and any claims for extra compensation or extension of time on account of such instruction will not be honored. The Project Designer will not be responsible for misunderstandings claimed by the GC of verbal instructions which have not been confirmed in writing, and in no case shall instructions be interpreted as permitting a departure from the contract documents unless such instruction is confirmed in writing and supported by a properly authorized change order.
- c. To prevent disputes and litigation, it is agreed by the parties that any claim or dispute between the Owner and the Design Consultant, that any claim, dispute, or other matter in question arising out of or related to this Agreement shall be subject to voluntary non-binding mediation as a condition precedent to the institution of legal or equitable proceedings by either party. If the parties are unable to agree upon a certified mediator to hear their dispute, the President of the Buncombe County Bar Association shall name a mediator to hear the matter. During the pendency of any dispute and after a determination thereof, the parties to the dispute shall act in good faith to mitigate any potential damages including utilization of construction schedule changes and alternate means of construction. The costs of the process shall be divided equally between the parties to the dispute.
- d. The mediation session shall be private and shall be held in Buncombe County, North Carolina or in another North Carolina County agreed upon by both parties. Mediation under this Article 11 shall not be the cause for a delay of the Project which is the focus of the dispute.
- e. If, as a result of mediation, a voluntary settlement is reached and the parties to the dispute agree that such settlement shall be reduced to writing, the Mediator shall be deemed appointed and constituted an arbitrator for the sole purpose of signing the mediated settlement agreement. Such agreement shall be, and shall have the same force and effect as an arbitration award, and judgment may be entered upon it in accordance with applicable law in any court of competent jurisdiction.
- f. If the disputed issue cannot be resolved in mediation or either party disagrees with the results of the mediation, the parties may seek resolution in the General Court of Justice in the County of Buncombe and the State of North Carolina. If a party fails to comply in strict accordance with the requirements of this Article, the non-complying party specifically

waives all of its rights provided hereunder, including its rights and remedies under State law.

ARTICLE 21 - MINOR CHANGES IN THE WORK

The Project Designer will have the authority to order minor changes in the work not involving an adjustment in the contract sum or time for completion, and not inconsistent with the intent of the contract documents. Such changes shall be effected by written order, and shall be binding on the Owner and the GC.

ARTICLE 22 - UNCORRECTED FAULTY WORK

Should the correction of faulty or damaged work be considered inadvisable or inexpedient by the Owner and the Project Designer, the Owner shall be reimbursed by the GC. A change order will be issued to reflect a reduction in the contract sum.

ARTICLE 23 - TIME OF COMPLETION, DELAYS, EXTENSION OF TIME

- a. The final completion date will be as determined by the Owner, Designer and GC during the pre-construction phase of the project and will be incorporated into the contract for construction services between the Owner and the GC.
- b. The GC shall commence work to be performed under this agreement on a date to be specified in a written Notice to Proceed from the Project Designer and shall fully complete all work hereunder within the time of completion specified. For each day in excess of the above number of days, the GC shall pay the Owner the sum stated as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the Owner by reason of failure of the GC to complete the work within the time specified, such time being in the essence of this contract and a material consideration thereof.
- c. If the GC is delayed at any time in the progress of his work by any act or negligence of the Owner or the Project Designer, or by any employee of either; by changes ordered in the work; by labor disputes at the project site; by abnormal weather conditions not reasonably anticipated for the locality where the work is performed; by unavoidable casualties; by any causes beyond the contractor's control; or by any other causes which the designer and Owner determine may justify the delay, then the contract time may be extended by change order for the time which the designer and Owner may determine is reasonable.

Time extensions will not be granted for rain, wind, snow or other natural phenomena of normal intensity for the locality where work is performed. For purpose of determining extent of delay attributable to unusual weather phenomena, a determination shall be made by comparing the weather for the contract period involved with the average of the preceding five (5) year climatic range during the same time interval based on the National Oceanic and Atmospheric Administration National Weather Service statistics for the locality where work is performed and on daily weather logs kept on the job site by the GC reflecting the effect of the weather on progress of the work and initialed by the designer's representative. No weather delays shall be considered after the building is dried in unless work claimed to be delayed is on the critical path of the baseline schedule or approved

updated schedule. Time extensions for weather delays, acts of God, labor disputes, fire, delays in transportation, unavoidable casualties or other delays which are beyond the control of the Owner do not entitle the Contractor to compensable damages for delays. Any contractor claim for compensable damages for delays is limited to delays caused solely by the owner or its agents. Contractor caused delays shall be accounted for before owner or designer caused delays in the case of concurrent delays.

- d. Request for extension of time shall be made in writing to the designer, copies to the owner, within twenty (20) days following cause of delay. In case of continuing cause for delay, the GC shall notify the designer copies to the owner, of the delay within twenty (20) days of the beginning of the delay and only one claim is necessary.
- e. The GC shall notify his surety in writing of extension of time granted.
- f. No claim shall be allowed on account of failure of the Project Designer to furnish drawings or instructions until twenty (20) days after demand for such drawings and/or instructions. See Article 5c. Demand must be in written form clearly stating the potential for delay unless the drawings or instructions are provided. Any delay granted will begin after the twenty (20) day demand period is concluded.

ARTICLE 24 - PARTIAL UTILIZATION/BENEFICIAL OCCUPANCY

- a. The Owner may desire to occupy or utilize all or a portion of the project when the work is substantially complete.
- b. Should the owner request a utilization of a building or portion thereof, the designer shall perform a designer final inspection of area after being notified by the contractor that the area is ready for such. After the contractor has completed designer final inspection punch list and the designer has verified, then the designer shall schedule a beneficial occupancy inspection at a time and date acceptable to the owner and contractor(s). If beneficial occupancy is granted, in such areas the following will be established:
 - 1. The beginning of guarantees and warranties period for the equipment necessary to support in the area.
 - 2. The owner assumes all responsibilities for utility costs for entire building.
 - 3. Contractor will obtain consent of surety.
 - 4. Contractor will obtain endorsement from insurance company permitting beneficial occupancy.
 - 5. The Owner shall have the right to exclude the GC from any part of the project which the Project Designer has so certified to be substantially complete, but the Owner will allow the GC reasonable access to complete or correct work to bring it into compliance with the contract.

6. Occupancy by the Owner under this article will in no way relieve the GC from his contractual requirement to complete the project within the specified time. The contractor will not be relieved of liquidated damages because of beneficial occupancy. The designer may prorate liquidated damages based on the percentage of project occupied.

ARTICLE 25 - FINAL INSPECTION, ACCEPTANCE, AND PROJECT CLOSEOUT

- a. Upon notification from the GC that the project is complete and ready for inspection, the Project Designer shall make a designer final inspection to verify that the project is complete and ready for final inspection. Prior to final inspection, the GC shall ensure that all items requiring corrective measures noted at the designer final inspection are complete. The Project Designer shall schedule a final inspection at a time and date acceptable to the Owner and the GC.
- b. At the final inspection, the designer and his consultants shall, if job conditions warrant, record a list of items that are found to be incomplete or not in accordance with the contract documents. At the conclusion of the final inspection, the designer and Owners' representative shall make the following determinations:
 1. That the project is completed and accepted.
 2. That the project is accepted subject to the correction of the list of discrepancies (punch list). All punch list items must be completed within thirty (30) days of final inspection or the Owner may invoke Article 28, Owner's Right to Do Work.
 3. That the project is not complete and another date for a final inspection will be established.
- c. Within fourteen (14) days of acceptance per Paragraph b1 or within fourteen (14) days after completion of punch list per Paragraph b2 above, the Project Designer shall certify the work and issue applicable certificate(s) of compliance.
- d. Any discrepancies listed or discovered after the date of final inspection and acceptance under Paragraphs b1 or b2 above shall be handled in accordance with Article 42.
- e. The date of acceptance will establish the following:
 1. The beginning of guarantees and warranties period.
 2. The date on which the GC's insurance coverage for public liability, property damage and builder's risk may be terminated.
 3. That no liquidated damages (if applicable) shall be assessed after this date.
 4. The termination date of utility cost to the GC (if applicable).

- f. **Prior to issuance of final acceptance date, the contractor shall have his authorized representatives visit the project and give full instructions to the designated personnel regarding operating, maintenance, care, and adjustment of all equipment and special construction elements. In addition, the contractor shall provide to the owner a complete instructional video (media format acceptable to the owner) on the operation, maintenance, care and adjustment of all equipment and special construction elements.**

ARTICLE 26 - CORRECTION OF WORK BEFORE FINAL PAYMENT

- a. Any work, materials, fabricated items or other parts of the work which have been condemned or declared not in accordance with the contract by the designer shall be promptly removed from the work site by the GC, and shall be immediately replaced by new work in accordance with the contract at no additional cost to the Owner. Work or property of the Owner, damaged or destroyed by virtue of such faulty work, shall be made good at the expense of the GC.
- b. Correction of condemned work described above shall commence within twenty-four (24) hours after receipt of notice from the Project Designer, and shall make satisfactory progress until completed.
- c. Should the GC fail to proceed with the required corrections, then the Owner may complete the work in accordance with the provisions of Article 28.

ARTICLE 27 - CORRECTION OF WORK AFTER FINAL PAYMENT

See Article 35, Performance Bond and Payment Bond, and Article 42, Guarantee. Neither the final certificate, final payment, occupancy of the premises by the Owner, nor any provision of the contract, nor any other act or instrument of the Owner, nor the Project Designer, shall relieve the GC from responsibility for negligence, or faulty material or workmanship, or failure to comply with the drawings and specifications. The GC shall correct or make good any defects due thereto and repair any damage resulting therefrom, which may appear during the guarantee period following final acceptance of the work except as stated otherwise under Article 42, Guarantee. The Owner will report any defects as they may appear to the GC and establish a time limit for completion of corrections by the GC. The Owner will be the judge as to the responsibility for correction of defects.

ARTICLE 28 - OWNER'S RIGHT TO DO WORK

If, during the progress of the work or during the period of guarantee, the GC fails to prosecute the work properly or to perform any provision of the contract, the Owner, after seven (7) days written notice sent by certified mail, return receipt requested, to the GC from the designer, may perform or have performed that portion of the work. The cost of the work may be deducted from any amounts due or to become due to the GC, such action and cost of same having been first approved by the Project Designer. Should the cost of such action of the Owner exceed the amount due or to become due the GC, then the GC or his surety, or both, shall be liable for and shall pay to the Owner the amount of said excess.

ARTICLE 29 - ANNULMENT OF CONTRACT

If the GC fails to begin the work under the contract within the time specified, or the progress of the work is not maintained on schedule, or the work is not completed within the time above specified, or fails to perform the work with sufficient workmen and equipment or with sufficient materials to ensure the prompt completion of said work, or shall perform the work unsuitably or shall discontinue the prosecution of the work, or if the GC shall become insolvent or be declared bankrupt or commit any act of bankruptcy or insolvency, or allow any final judgment to stand against him unsatisfied for a period of forty-eight (48) hours, or shall make an assignment for the benefit of creditors, or for any other cause whatsoever shall not carry on the work in an acceptable manner, the Owner may give notice in writing, sent by certified mail, return receipt requested, to the GC and his surety of such delay, neglect or default, specifying the same, and if the GC within a period of seven(7) days after such notice shall not proceed in accordance therewith, then the Owner shall, declare this contract in default, and, thereupon, the surety shall promptly take over the work and complete the performance of this contract in the manner and within the time frame specified. In the event the surety shall fail to take over the work to be done under this contract within seven(7) days after being so notified and notify the Owner in writing, sent by certified mail, return receipt requested, that he is taking the same over and stating that he will diligently pursue and complete the same, the Owner shall have full power and authority, without violating the contract, to take the prosecution of the work out of the hands of said GC, to appropriate or use any or all contract materials and equipment on the grounds as may be suitable and acceptable and may enter into an agreement, either by public letting or negotiation, for the completion of said contract according to the terms and provisions thereof or use such other methods as in his opinion shall be required for the completion of said contract in an acceptable manner. All costs and charges incurred by the Owner, together with the costs of completing the work under contract, shall be deducted from any monies due or which may become due said GC and surety. In case the expense so incurred by the Owner shall be less than the sum which would have been payable under the contract, if it had been completed by said GC, then the said GC and surety shall be entitled to receive the difference, but in case such expense shall exceed the sum which would have been payable under the contract, then the GC and the surety shall be liable and shall pay to the Owner the amount of said excess.

ARTICLE 30 – GENERAL CONTRACTOR’S RIGHT TO STOP WORK OR TERMINATE THE CONTRACT

- a. Should the work be stopped by order of a court having jurisdiction, or by order of any other public authority for a period of three months, due to cause beyond the fault or control of the GC, or if the Owner should fail or refuse to make payment on account of a certificate issued by the designer within forty-five (45) days after receipt of same, then the GC, after fifteen (15) days' written notice sent by certified mail, return receipt requested, to the Owner and the designer, may suspend operations on the work or terminate the contract.
- b. The Owner shall be liable to the GC for the cost of all materials delivered and work performed on this contract plus ten (10) percent overhead and profit and shall make such payment. The designer shall be the judge as to the correctness of such payment.

ARTICLE 31 - REQUEST FOR PAYMENT

- a. Not later than the fifth day of the month, the GC shall submit to the designer a request for payment for work done during the previous month. The request shall be in the form agreed upon between the GC and the designer, but shall show substantially the value of work done and materials delivered to the site during the period since the last payment, and shall sum up the financial status of the contract with the following information:
 1. Total of contract including change orders.
 2. Value of work completed to date.
 3. Less five percent (5%) retainage, provided however, that after fifty percent (50%) of the GC's work has been satisfactorily completed on schedule, with approval of the owner and written consent of the surety, further requirements for retainage will be waived only so long as work continues to be completed satisfactorily and on schedule.
 4. Less previous payments.
 5. Current amount due.
- b. Prior to submitting the first payment request, the GC shall prepare a schedule showing a breakdown of the contract price. This schedule of values will be submitted to & approved by the designer and Owner within 30 days of the Notice to Proceed. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the designer and Owner may require.
- c. Applications for payment shall be in a form agreed upon by the GC, designer and Owner and shall be prepared and supported by such data to substantiate the accuracy of the request as the designer may require.
- d. Intentionally left blank for sequential numbering purposes.
- e. Intentionally left blank for sequential numbering purposes.
- f. When payment is made on account of stored materials and equipment, such materials must be stored on the owner's property, and the requests for payments shall be accompanied by invoices or bills of sale or other evidence to establish the owner's title to such materials and equipment. Such payments will be made only for materials that have been customized or fabricated specifically for this project. Raw materials or commodity products including but not limited to piping, conduit, CMU, metal studs and gypsum board may not be submitted. Responsibility for such stored materials and equipment shall remain with the GC regardless of ownership title. Such stored materials and equipment shall not be removed from the owner's property. Should the space for storage on-site be limited, the GC, at his option, shall be permitted to store such materials and/or equipment in a suitable space off-site. Should the GC desire to include any such materials or equipment in his application for payment, they must be stored in the name of the owner in an independent, licensed, bonded warehouse approved by the designer and owner and located as close to the site as possible. The warehouse selected must be approved by the GC's bonding and

insurance companies; the material to be paid for shall be assigned to the owner and shall be inspected by the designer. Upon approval by the designer and owner of the storage facilities and materials and equipment, payment therefore will be certified. Responsibility for such stored materials and equipment shall remain with the GC. Such stored materials and equipment shall not be moved except for transportation to the project site. Under certain conditions, the designer may approve storage of materials at the point of manufacture, which conditions shall be approved by the designer and the owner prior to approval for the storage and shall include an agreement by the storing party which unconditionally gives the County absolute right to possession of the materials at any time. Bond, security and insurance protection shall continue to be the responsibility of the GC.

- g. In the event of beneficial occupancy, retainage of funds due the GC may be reduced with the approval of the Owner to an equitable amount to cover the list of items to be completed or corrected. Retainage may not be reduced to less than two and one-half (2 1/2) times the estimated value of the work to be completed or corrected. Reduction of retainage must be with the consent and approval of the GC's bonding company.

ARTICLE 32 - CERTIFICATES OF PAYMENT AND FINAL PAYMENT

- a. Within five (5) days from receipt of request for payment from the GC, the designer shall issue and forward to the Owner a certificate for payment. This certificate shall indicate the amount requested or as approved by the designer. If the certificate is not approved by the designer, he shall state in writing to the GC and the Owner his reasons for withholding payment.
- b. No certificate issued or payment made shall constitute an acceptance of the work or any part thereof. The making and acceptance of final payment shall constitute a waiver of all claims by the Owner except:
 - 1. Claims arising from unsettled liens or claims against the GC.
 - 2. Faulty work or materials appearing after final payment.
 - 3. Failure of the contractor to perform the work in accordance with drawings and specifications, such failure appearing after payment.
 - 4. As conditioned in the performance bond and payment bond.
- c. The making and acceptance of final payment shall constitute a waiver of all claims by the GC except those claims previously made and remaining unsettled (Article 20(c)).
- d. Prior to submitting request for final payment to the designer for approval, the GC shall fully comply with all requirements specified in the "project closeout" section of the specifications. These requirements include but not limited to the following:
 - 1. Submittal of Product and Operating Manuals, Warranties and Bonds, Guarantees, Maintenance Agreements, As-Built Drawings, Certificates of Inspection or

Approval from agencies having jurisdiction. (The designer must approve the Manuals prior to delivery to the Owner).

2. Transfer of required attic stock material and all keys in an organized manner.
 3. Record of Owner's training.
 4. Resolution of any final inspection discrepancies.
 5. Granting access to Contractor's records, if Owner's internal auditors have made a request for such access pursuant to Article 52.
- e. The GC shall forward to the designer, the final application for payment along with the following documents:
1. List of minority business subcontractors and material suppliers showing breakdown of contracts amounts and total actual payments to subcontractors and material suppliers.
 2. Affidavit of Release of Liens.
 3. Affidavit from GC of payment to material suppliers and subcontractors. (See Article 36).
 4. Consent of Surety to Final Payment.
 5. Certificates of state agencies required by state law.
- f. The designer will not authorize final payment until the work under contract has been certified by Project Designer, certificates of compliance issued, and the GC has complied with the closeout requirements. The designer shall forward the GC's final application for payment to the Owner along with respective certificate(s) of compliance required by law.

ARTICLE 33 - PAYMENTS WITHHELD

- a. The designer may withhold payment for the following reasons:
1. Faulty work not corrected.
 2. The unpaid balance on the contract is insufficient to complete the work in the judgment of the designer.
 3. To provide for sufficient contract balance to cover liquidated damages that will be assessed against the GC.
- b. The Owner may authorize the withholding of payment for the following reasons:
1. Claims filed against the GC or evidence that a claim will be filed.

2. Evidence that subcontractors have not been paid.
- c. Intentionally left blank for sequential numbering purposes.
- d. When grounds for withholding payments have been removed, payment will be released. Delay of payment due the GC without cause will make owner liable for payment of interest to the GC in accordance with G.S. 143-134.1. As provided in G.S.143-134.1(e) the owner shall not be liable for interest on payments withheld by the owner for unsatisfactory job progress, defective construction not remedied, disputed work, or third-party claims filed against the owner or reasonable evidence that a third-party claim will be filed.

ARTICLE 34 - MINIMUM INSURANCE REQUIREMENTS

GC agrees their insurance policies shall be endorsed evidencing the minimum insurance coverage and limits set forth below prior to the County's signing of this Agreement. The insurance coverage and limits set forth below shall be deemed minimum coverage limits and shall not be construed in any way as a limitation on GC's duty to carry adequate insurance. All policies of insurance shall be on a primary basis, non-contributory with any other insurance coverages and/or self-insurance carried by the County. The minimum insurance coverage which the GC shall procure and maintain at its sole cost and expense during the term of the Agreement is as follows:

Worker's Compensation. Coverage at the statutory limits in compliance with applicable State and Federal laws. GC shall ensure that any subcontractors also have workers compensation coverage at the statutory limits.

Employer's Liability. Coverage with minimum limits of \$1,000,000 each employee accident and \$1,000,000 each employee disease.

Commercial General Liability. Insurance covering all operations performed by the GC with a minimum limit of \$5,000,000 per occurrence with a \$10,000,000 aggregate. Coverage shall not contain any endorsement(s) excluding nor limiting Product/Completed Operations or Contractual Liability. Buncombe County shall be named as an additional insured under the policy.

Commercial general liability coverage shall not restrict coverage under such policy with respect to the escape or release of pollutants at or from a site owned or occupied by or rented or loaned to County. This policy shall not limit the scope of coverage for liability arising from pollution, explosion, collapse, underground property damage or damage to the work.

Professional Liability. Insurance covering GC for acts, errors, or omissions in performance of the Agreement with a minimum limit of \$1,000,000 per claim with a \$2,000,000 aggregate. Policy is to be on a primary basis if other professional liability is carried. This policy shall remain in effect three (3) years after project completion.

Contractor's Pollution Liability. If GC's commercial general liability policy referenced above does not include an endorsement including the Limited Pollution Liability Extension, GC will be required to purchase a Pollution Liability policy with limits of \$1,000,000 per loss and \$1,000,000 aggregate. GC shall keep this policy in effect 3 years after completion of the project. Buncombe

County shall be named as an additional insured with respect to liability and defense of suits arising out of the activities performed by, or on behalf of GC, including completed operations.

Business Automobile Liability. Insurance covering all owned, non-owned, and hired vehicles used in performance of this Agreement. The minimum combined single limit per occurrence shall be \$1,000,000 and shall include uninsured/underinsured motorist coverage per N.C. Gen. Stat. § 20-279.21.

Umbrella/Excess Liability. If the underlying liability policy limits are less than those required, GC may provide an excess or umbrella policy to meet the required limits of insurance. The excess or umbrella policy shall extend coverage over the underlying general liability policy. Any additional insured under any policy of the underlying insurance will automatically be an additional insured under this insurance.

Builder's Risk. GC shall purchase and maintain property insurance (Builder's Risk) in the amount of the initial contract plus values of subsequent modification, change orders, and loss of materials supplied or installed by others comprising the value of the entire project at the site on a replacement cost basis (subject to such deductible amounts as may be required by laws and regulations). Such builder's risk insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed to in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made or until no person or entity other than Buncombe County has insurable interest in the property to be covered, whichever is earlier. This insurance shall include the interests of the Owner, Contractor, Subcontractors, Owner's Representatives and Owner's Representative's Consultants in the Work.

The Builders' Risk Coverage shall be written on a Special Covered Cause of Loss form and shall include theft, vandalism, malicious mischief, collapse, false-work, temporary buildings, transit, debris removal including demolition, increased cost of construction, architect's fees and expenses, soft costs, flood (including water damage), earthquake, and if applicable, all below and above ground structures, piping, foundations including underground water and sewer mains, piling including the ground on which the structure rests and excavation, backfilling, filling, and grading. Insured property shall include portions of the work located away from the site but intended for use at the site, and shall also cover portions of the work in transit. The policy shall cover the cost of removing debris, including demolition as may be made legally necessary by the operation of any law, ordinance or regulation.

Contractors engaged in modifications of existing structures are required to secure a Beneficial Occupancy Endorsement to enable the County to occupy the facility during construction.

Additional Insurance Provisions.

If GC maintains higher limits than the minimums shown above, the County requires and shall be entitled to coverage for the higher limits maintained by GC. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the County.

GC shall provide the County with certificates of insurance listing County as the certificate holder and evidencing the above amounts. Buncombe County shall be named as additional insured under the commercial general liability policy and if applicable, GC's Pollution Liability policy. Before

commencing work and for any subsequent renewals, GC shall furnish the County with certificates of insurance on an approved form.

Each insurance policy required above shall state that coverage shall not be canceled, except with written notice to the County, delivered in accordance with the policy provisions. All insurance shall be procured from reputable insurers authorized and qualified to do business in North Carolina with a rating of A- or better as determined by A. M. Best Company and shall be in a form acceptable to the County.

GC shall require and verify that all subcontractors maintain insurance meeting all the requirements stated herein, and GC shall ensure that Buncombe County is an additional insured on insurance required from subcontractors.

Waiver of Subrogation: GC hereby grants to County a waiver of any right to subrogation which any insurer of said Contractor may acquire against the County by virtue of payment of any loss under such insurance. GC agrees to obtain any endorsement that may be necessary to affect this waiver of subrogation.

Providing and maintaining adequate insurance coverage is a material obligation of GC and is of the essence of this contract. GC may meet its requirements of maintaining specified coverage and limits by demonstrating to the County that there is in force insurance with equivalent coverage and limits that will offer at least the same protection to the County. GC shall at all times comply with the terms of such insurance policies, and all requirements of the insurer under any such insurance policies, except as they may conflict with existing North Carolina laws or this contract. The limits of coverage under each insurance policy maintained by GC shall not be interpreted as limiting the contractor's liability and obligations under the contract.

Nothing in this section is intended to affect or abrogate Buncombe County's governmental immunity.

ARTICLE 35 - PERFORMANCE BOND AND PAYMENT BOND

- a. The GC shall furnish a performance bond and payment bond executed by a surety company authorized to do business in North Carolina. The bonds shall be in the full contract amount, for the entire project. Bonds shall be executed in the form bound with the specifications.
- b. All bonds shall be countersigned by an authorized agent of the bonding company who is licensed to do business in North Carolina.

ARTICLE 36 - CONTRACTOR'S AFFIDAVIT

The final payment of retained amount due the GC on account of the contract shall not become due until the GC has furnished to the Owner through the designer an affidavit signed, sworn and notarized to the effect that all payments for materials, services or subcontracted work in connection with his contract have been satisfied, and that no claims or liens exist against the GC in connection with this contract.

ARTICLE 37 - ASSIGNMENTS

The GC shall not assign any portion of this contract nor subcontract in its entirety. Except as may be required under terms of the performance bond or payment bond, no funds or sums of money due or become due the GC under the contract may be assigned.

ARTICLE 38 - USE OF PREMISES

- a. The GC shall confine his apparatus, the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the designer and shall not exceed those established limits in his operations.
- b. The GC shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.
- c. The GC shall enforce the designer's and owner's instructions regarding signs, advertisements, fires and smoking.
- d. No firearms, any type of alcoholic beverages or drugs (other than those prescribed by a physician) will be permitted at the job site.

ARTICLE 39 - CUTTING, PATCHING AND DIGGING

- a. The GC shall ensure that all cutting, fitting or patching that may be required to make the work come together properly and fit it to receive or be received by work of other contractors shown upon or reasonably implied by the drawings and specifications for the completed structure, as the designer may direct.
- b. Any cost brought about by defective or ill-timed work shall be borne by the party responsible therefor.
- c. No subcontractor shall endanger any work of another such contractor by cutting, digging or other means, nor shall he cut or alter the work of any other such contractor without the consent of the designer and the affected contractor(s).

ARTICLE 40 - UTILITIES, STRUCTURES, SIGNS

- a. The GC shall provide necessary and adequate facilities for water, electricity, gas, oil, sewer, and other utility services, which may be necessary and required for completion of the project. If the Owner specifies that the GC is to pay all utilities, any permanent meters installed shall be listed in the GC's name until his work is fully accepted by the Owner. The Owner may: (1) pay utilities cost directly, (2) require the GC to pay all utilities cost, (3) or reimburse the GC for the actual cost of utilities. The Owner or GC, as applicable, may recover actual costs of metered utilities from the responsible party should delays occur

in project completion. Coordination of the work of the utility companies during construction is the sole responsibility of the GC.

- b. If applicable Meters shall be relisted in the Owner's name on the day following completion and acceptance of the GC's work, and the Owner shall pay for services used after that date.
- c. Prior to the operation of permanent systems, the GC will provide temporary power, lighting, water, and heat to maintain space temperature above freezing, as required for construction operations.
- d. The GC shall ensure that the permanent building systems are in sufficient readiness for furnishing temporary climatic control at the time a building is enclosed and secured. The HVAC systems shall maintain climatic control throughout the enclosed portion of the building sufficient to allow completion of the interior finishes of the building. A building shall be considered enclosed and secured when windows, doorways (exterior, mechanical, and electrical equipment rooms), and hardware are installed; and other openings have protection, which will provide reasonable climatic control. The appropriate time to start the mechanical systems and climatic condition shall be jointly determined by the GC and the designer. Use of the equipment in this manner shall in no way affect the warranty requirements of the GC.
- e. The GC shall coordinate the work so that the building's permanent power wiring distribution system shall be in sufficient readiness to provide power as required by the HVAC contractor for temporary climatic control.
- f. The GC shall coordinate the work so that the building's permanent lighting system shall be ready at the time interior painting and finishing begins and shall provide adequate lighting in those areas where interior painting and finishing is being performed.
- g. The GC shall be responsible for his permanently fixed service facilities and systems in use during progress of the work. The following procedures shall be strictly adhered to:
 - 1. Prior to acceptance of work by the Designer and Owner, the GC shall coordinate the removal and replacement of any parts of the permanent building systems damaged through use during construction.
 - 2. Temporary filters as recommended by the equipment manufacturer in order to keep the equipment and ductwork clean and free of dust and debris shall be installed in each of the heating and air conditioning units and at each return grille during construction. New filters shall be installed in each unit prior to the Owner's acceptance of the work.
 - 3. Extra effort shall be maintained to keep the building and the site adjacent to the building clean and under no circumstances shall air systems be operated if finishing and site work operations are creating dust in excess of what would be considered normal if the building were occupied.

4. It shall be understood that any warranty on equipment presented to the Owner shall extend from the day of final acceptance by the Owner. The cost of warranting the equipment during operation in the finishing stages of construction shall be borne by the contractor whose system is utilized.
5. The GC shall ensure that all lamps are in proper working condition at the time of final project acceptance.
- h. The GC shall provide, if required and where directed, a shed for toilet facilities and shall furnish and install in this shed all water closets required for a complete and adequate sanitary arrangement. These facilities will be available to other subcontractors on the job and shall be kept in a neat and sanitary condition at all times. Chemical toilets are acceptable.
- i. The GC shall, if required by Owner and where directed, erect a temporary field office, complete with lights, telephone, heat and air conditioning. A portion of this office shall be partitioned off, of sufficient size, for the use of a resident inspector, should the designer so direct.
- j. On multi-story construction projects, the GC shall either provide or ensure that temporary elevators, lifts, or other necessary special equipment is available for the general use of all contractors. The cost for such elevators, lifts or other special equipment and the operation thereof shall be included in the GC bid.
- k. The GC will erect one sign on the project if required. The sign shall be of sound construction, and shall be neatly lettered with black letters on white background. The sign shall bear the name of the project, and the GC's name, and the name of the designer and consultants. Directional signs may be erected on the Owner's property subject to approval of the Owner with respect to size, style and location of such directional signs. Such signs may bear the name of the contractor and a directional symbol. No other signs will be permitted except by permission of the Owner.

ARTICLE 41 - CLEANING UP

- a. The GC shall ensure that the building and surrounding area is reasonably free from rubbish at all times, and shall remove debris from the site on a timely basis or when directed to do so by the designer. The GC shall provide an on-site refuse container(s) for the use of all subcontractors. The GC shall ensure that each subcontractor removes their rubbish and debris from the building on a daily basis. The GC shall ensure that the building is broom cleaned as required to minimize dust and dirt accumulation.
- b. The GC shall provide and maintain suitable all-weather access to the building.
- c. Before final inspection and acceptance of the building, the GC shall ensure that all portions of the work are clean, including glass, hardware, fixtures, masonry, tile and marble (using no acid), clean and wax all floors as specified, and completely prepare the building for use by the Owner, with no cleaning required by the Owner.

ARTICLE 42 - GUARANTEE

- a. The GC shall unconditionally guarantee materials and workmanship against patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve (12) months following the date of final acceptance of the work or beneficial occupancy and shall replace such defective materials or workmanship without cost to the Owner.
- b. Where items of equipment or material carry a manufacturer's warranty for any period in excess of twelve (12) months, then the manufacturer's warranty shall apply for that particular piece of equipment or material. The GC shall replace such defective equipment or materials, without cost to the Owner, within the manufacturer's warranty period.
- c. Additionally, the Owner may bring an action for latent defects caused by the negligence of the GC, which is hidden or not readily apparent to the Owner at the time of beneficial occupancy or final acceptance, whichever occurred first, in accordance with applicable law.
- d. Guarantees for roof, equipment, materials, and supplies shall be stipulated in the specifications sections governing such roof, equipment, materials, or supplies.

ARTICLE 43 - CODES AND STANDARDS

Wherever reference is given to codes, standard specifications or other data published by regulating agencies including, but not limited to, national electrical codes, North Carolina State Building Codes, federal specifications, ASTM specifications, various institute specifications, etc., it shall be understood that such reference is to the latest edition including addenda published prior to the date of the contract documents.

ARTICLE 44 - INDEMNIFICATION

To the fullest extent permitted by law, the GC shall indemnify and hold harmless the Owner, the designer and the agents, consultants and employees of the Owner and designer, from and against all claims, damages, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance or failure of performance of the work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission of the GC, the GC's subcontractor, or the agents of either the GC or the GC's subcontractor. Such obligation shall not be construed to negate, abridge or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this article.

ARTICLE 45 - TAXES

- a. Federal excise taxes do not apply to materials entering into local government work.

- b. Federal transportation taxes do not apply to materials entering into local government work (Internal Revenue Code, Section 3475(b) as amended).
- c. North Carolina sales tax and use tax, as required by law, do apply to materials entering into local government work and such costs shall be included in the bid proposal and contract sum.
- d. Local option sales and use taxes, as required by law, do apply to materials entering into local government work as applicable and such costs shall be included in the bid proposal and contract sum.
- e. Accounting Procedures for Refund of County Sales & Use Tax Amount of county sales and use tax paid per GC's statements:

GC's performing contracts for local government agencies shall ensure that they and all subcontractors will provide information to give the local government agency for whose project the materials, supplies, fixtures and/or equipment was purchased a signed statement containing the information listed in N.C.G.S. 105-164.14(e).

The Department of Revenue has agreed that in lieu of obtaining copies of sales receipts from contractors, an agency may obtain a certified statement from the contractors setting forth the date, the type of property and the cost of the property purchased from each vendor, the county in which the vendor made the sale and the amount of local sales and use taxes paid thereon. If the property was purchased out-of-state, the county in which the property was delivered should be listed. The contractor should also be notified that the certified statement may be subject to audit.

In the event the contractors make several purchases from the same vendor, such certified statement must indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices, the counties, and the county sales and use taxes paid thereon.

Name of taxing county: The position of a sale is the retailer's place of business located within a taxing county where the vendor becomes contractually obligated to make the sale. Therefore, it is important that the county tax be reported for the county of sale rather than the county of use.

When property is purchased from out-of-state vendors and the county tax is charged, the county should be identified where delivery is made when reporting the county tax.

Such statement must also include the cost of any tangible personal property withdrawn from the contractor's warehouse stock and the amount of county sales or use tax paid thereon by the GC.

Contractors are not to include any tax paid on supplies, tools and equipment which they use to perform their contracts and should include only those building materials,

supplies, fixtures and equipment which actually become a part of or annexed to the building or structure.

ARTICLE 46 - EQUAL OPPORTUNITY CLAUSE

The non-discrimination clause contained in Section 202 (Federal) Executive Order 11246, as amended by Executive Order 11375, relative to equal employment opportunity for all persons without regard to race, color, religion, sex or national origin, and the implementing rules and regulations prescribed by the Secretary of Labor, are incorporated herein.

ARTICLE 47 - EMPLOYMENT OF INDIVIDUALS WITH DISABILITIES

The GC agrees not to discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant is qualified. The GC agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices.

ARTICLE 48 - ASBESTOS-CONTAINING MATERIALS (ACM)

The State of North Carolina has attempted to address all asbestos-containing materials that are to be disturbed in the project. However, there may be other asbestos-containing materials in the work areas that are not to be disturbed and do not create an exposure hazard. General Contractors are reminded of the requirements of instructions under General Conditions of the Contract, titled Examination of Conditions. Statute 130A, Article 19, amended August 3, 1989, established the Asbestos Hazard Management Program that controls asbestos abatement in North Carolina.

ARTICLE 49 - MINORITY BUSINESS PARTICIPATION

N.C.G.S. 143-128.2 establishes a ten percent (10%) goal for participation by minority businesses in total value of work for each State building project and requires documentation of good faith efforts for meeting that goal. The document, *Guidelines for Recruitment and Selection of Minority Businesses for Participation in State Construction Contracts* including Affidavits and Appendix F are hereby incorporated into and made a part of this contract.

ARTICLE 50 – CONTRACTOR EVALUATION

The GC's overall work performance on the project shall be fairly evaluated in accordance with the State Building Commission policy and procedures, for determining qualifications to compete for future capital improvement projects for institutions and agencies of the State of North Carolina. In addition to final evaluation, interim evaluation may be prepared during the progress of project. The document, General Contractor Evaluation Procedures, is hereby incorporated and made a part of this contract. The Owner may request the GC's comments to evaluate the designer.

ARTICLE 51 – GIFTS

Pursuant to N.C. Gen. Stat. § 133-32, it is unlawful for any vendor or contractor (i.e. architect, bidder, contractor, General Contractor, design professional, engineer, subcontractor, supplier,

vendor, etc.), to make gifts or to give favors to any County employee. This prohibition covers those vendors and contractors who: (1) have a contract with a governmental agency; or (2) have performed under such a contract within the past year; or (3) anticipate bidding on such a contract in the future. For additional information regarding the specific requirements and exemptions, vendors and contractors are encouraged to review G.S. Sec. 133-32.

During the construction of the Project, the Contractor is prohibited from making gifts to any of the Owner's employees, Owner's project representatives (architect, engineers, General Contractor and their employees), employees of the County that may have any involvement, influence, responsibilities, oversight, management and/or duties that pertain to and/or relate to the contract administration, financial administration and/or disposition of claims arising from and/or relating to the Contract and/or Project.

ARTICLE 52 – AUDITING-ACCESS TO PERSONS AND RECORDS

In accordance with N.C. General Statute 147-64.7, the State Auditor shall have access to Contractor's officers, employees, agents and/or other persons in control of and/or responsible for the Contractor's records that relate to this Contracts for purposes of conducting audits under the referenced statute. The Owner's internal auditors shall also have the right to access and copy the Contractor's records relating to the Contract and Project during the term of the Contract and within two years following the completion of the Project/close-out of the Contract to verify accounts, accuracy, information, calculations and/or data affecting and/or relating to Contractor's requests for payment, requests for change orders, change orders, claims for extra work, requests for time extensions, and related claims for delay/extended general conditions costs, claims for lost productivity, claims for loss efficiency, claims for idle equipment or labor, claims for price/cost escalation, pass-through claims of subcontractors and/or suppliers, and/or any other type of claim for payment or damages from Owner and/or its project representatives.

ARTICLE 53 – LEFT BLANK FOR NUMBERING PURPOSES

ARTICLE 54 – TERMINATION FOR CONVENIENCE

- a. Owner may at any time and for any reason terminate GC's services and work at Owner's convenience. Upon receipt of such notice, GC shall, unless the notice directs otherwise, immediately discontinue the work and placing of orders for materials, facilities and supplies in connection with the performance of this Agreement.
- b. Upon such termination, GC shall be entitled to payment only as follows: (1) the actual cost of the work completed in conformity with this Agreement; plus, (2) such other costs actually incurred by GC as are permitted by the prime contract and approved by Owner; (3) plus ten percent (10%) of the cost of the work referred to in subparagraph (1) above for overhead and profit. There shall be deducted from such sums as provided in this subparagraph the amount of any payments made to GC prior to the date of the termination of this Agreement. GC shall not be entitled to any claim or claim of lien against Owner for any additional compensation or damages in the event of such termination and payment.

ATTACHMENT B

HUB Certified/Minority Business Participation

State of North Carolina AFFIDAVIT A – Listing of Good Faith Efforts

County of _____

(Name of Bidder)

Affidavit of _____

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

Bidders must earn at least 50 points from the good faith efforts listed for their bid to be considered responsive. (1 NC Administrative Code 30 I.0101)

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

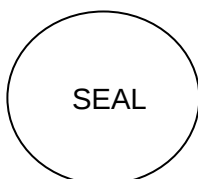
The undersigned, if apparent low bidder, will enter into a formal agreement with the firms listed in the Identification of Minority Business Participation schedule conditional upon scope of contract to be executed with the Owner. Substitution of contractors must be in accordance with GS143-128.2(d) Failure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

The undersigned hereby certifies that he or she has read the terms of the minority business commitment and is authorized to bind the bidder to the commitment herein set forth.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of _____, County of _____

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

Notary Public _____

My commission expires _____

State of North Carolina --AFFIDAVIT B-- Intent to Perform Contract with Own Workforce.

County of _____

Affidavit of _____
(Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the _____
_____ A-B Tech Parking Lot Stormwater Retrofit Project _____ contract.
(Name of Project)

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform all elements of the work on this project with his/her own current work forces; and

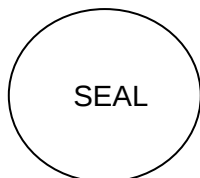
The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement. The Bidder agrees to make a Good Faith Effort to utilize minority suppliers where possible.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of _____, County of _____

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

Notary Public _____

My commission expires _____

State of North Carolina - AFFIDAVIT C - Portion of the Work to be Performed by HUB Certified/Minority Businesses

County of _____

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

If the portion of the work to be executed by HUB certified/minority businesses as defined in GS143-128.2(g) and 128.4(a),(b),(e) is equal to or greater than 10% of the bidders total contract price, then the bidder must complete this affidavit.

This affidavit shall be provided by the apparent lowest responsible, responsive bidder within **72 hours** after notification of being low bidder.

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

A-B Tech Parking Lot Stormwater Retrofit Project

(Project Name)

Project ID# _____ Amount of Bid \$ _____

I will expend a minimum of _____ % of the total dollar amount of the contract with minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below.

Attach additional sheets if required

Name and Phone Number	*Minority Category	**HUB Certified Y/N	Work Description	Dollar Value

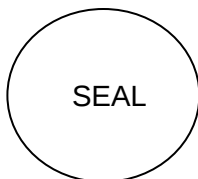
*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

**** HUB Certification with the state HUB Office required to be counted toward state participation goals.**

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

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date: _____ Name of Authorized Officer: _____



Signature: _____

Title: _____

State of _____, County of _____

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

Notary Public _____

My commission expires _____

State of North Carolina AFFIDAVIT D – Good Faith Efforts

County of _____

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

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

Affidavit of _____ I do hereby certify that on the _____

(Name of Bidder)

A-B Tech Parking Lot Stormwater Retrofit Project

(Project Name)

Project ID# _____ Amount of Bid \$ _____

I will expend a minimum of _____% of the total dollar amount of the contract with HUB certified/ minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. (Attach additional sheets if required)

Name and Phone Number	*Minority Category	**HUB Certified Y/N	Work Description	Dollar Value

*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

**** HUB Certification with the state HUB Office required to be counted toward state participation goals.**

Examples of documentation that may be required to demonstrate the Bidder's good faith efforts to meet the goals set forth in these provisions include, but are not necessarily limited to, the following:

- Copies of solicitations for quotes to at least three (3) minority business firms from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.
- Copies of quotes or responses received from each firm responding to the solicitation.
- A telephone log of follow-up calls to each firm sent a solicitation.
- For subcontracts where a minority business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.
- Documentation of any contacts or correspondence to minority business, community, or contractor organizations in an attempt to meet the goal.
- Copy of pre-bid roster
- Letter documenting efforts to provide assistance in obtaining required bonding or insurance for minority business.
- Letter detailing reasons for rejection of minority business due to lack of qualification.
- Letter documenting proposed assistance offered to minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to the next lowest responsible and responsive bidder.

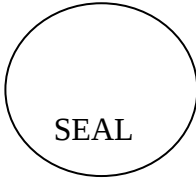
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of _____, County of _____

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

Notary Public _____

My commission expires _____

ATTACHMENT C

Construction Plans A-B Tech Parking Lot Stormwater Retrofit Project

ATTACHMENT D

City of Asheville Grading Permit

ATTACHMENT E

Limited Geotechnical Exploration Report



Limited Geotechnical Exploration Report

AB Tech Stormwater Project
Asheville, North Carolina
S&ME Project No. 23410116

PREPARED FOR:

**Asheville Buncombe Technical Community College
340 Victoria Road
Asheville, North Carolina 28801**

PREPARED BY:

**S&ME, Inc.
44 Buck Shoals Road, Suite C-3
Arden, North Carolina 28704**

November 17, 2023



November 17, 2023

Asheville Buncombe Technical Community College
340 Victoria Road
Asheville, North Carolina 28801

Attention: Mr. Lee Pack

Reference: **Limited Geotechnical Exploration Report**
AB Tech Stormwater Project
Asheville, North Carolina
S&ME Project No. 23410116
NC PE Firm License No. F-0176

Dear Mr. Pack:

S&ME, Inc. (S&ME) is pleased to submit this Limited Geotechnical Exploration Report for the referenced project. The exploration was made in accordance with our Proposal No. 23410116 and our Agreement for Services dated October 3, 2023 and authorized by submitting purchase order P0054784 dated October 19, 2023. The purpose of the exploration was to evaluate general subsurface conditions with respect to earthwork impacts for the proposed stormwater ponds and pavements as well as the existing slope. This report presents a brief confirmation of our understanding of the project, the exploration results, and our geotechnical conclusions and recommendations. Additional services for evaluation of the seasonal high-water table and hydraulic conductivity was also authorized as part of this proposal and has been submitted as a separate report.

We appreciate the opportunity to provide the geotechnical engineering services for this project. Please contact us if you have any questions regarding the information in this report, or when further services are needed.

Sincerely,

S&ME, Inc.

Christopher Fujita-Mentch, PE
Associate Project Manager

Matthew H. McCurdy, PE
Principal Engineer



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- Appendix I – Hand Auger and Test Pit Location Plan
- Appendix II – Hand Auger Boring Field Logs, Test Pit Field Logs, Photograph Log
- Appendix III – Important Information

1.0 Project Information

Our understanding of the project is based on a site visit by Mr. Tim Ormond with BlueEarth and Messrs. Joe Laps and Christopher Fujita-Mentch with S&ME on September 18, 2023, and an email conversation between Mr. Lee Pack with AB Tech, Mr. Ormon, and Mr. Laps between September 12 and 18, 2023. Included in this conversation was a copy of the AB Tech Stormwater Conceptual Design prepared by BlueEarth and dated August 23, 2023.

We understand a new series of stormwater management basins are planned for the area west of the intersection of Fernihurst Drive and Facilities Way at the AB Tech campus in Asheville, North Carolina. A series of 3 basins, landscaping, and new parking and drive areas are proposed for the area. Mr. Ormond indicated the purpose of this stormwater project was to provide attenuation during rainstorms and reduce erosion due to large surges of stormwater in the existing drainage ditch and other downstream facilities and that the basins are anticipated to be infiltration basins. The proposed basins are to be "dry" ponds with drawdown times of less than 24 hours for large storms. The excavations for the basins are planned to be on the order of 4 to 5 feet below the existing grades.

2.0 Field Exploration

The field exploration included observing the excavation of six test pits, labelled TP-1 to TP-6. Five of these test pits (TP-1 to TP-5) were excavated near the crest of the existing slope and the remaining test pit (TP-6) was excavated near the entrance to the existing parking area. Test pits were excavated using a John Deere 4600 tractor with a backhoe attachment that was provided by AB Tech. Each of the test pits except for TP-1 and TP-6 were excavated to a depth of 6 feet, which the operator indicated was the limits of the machine. Test pits TP-1 and TP-5 encountered a large boulder in the excavation at a depth of 5 feet and were terminated at this depth.

Additionally, the field exploration also included the excavation of six hand auger borings (labelled HA-1 to HA-6) along the more steeply sloped area northwest of the proposed development. The hand auger borings were extended to depths of 1 to 4 feet, with each boring except HA-2 and HA-3 encountering refusal at 1 to 1.5 feet. The hand auger borings were made by twisting a hand-operated steel auger into the ground. At regular intervals, the auger was withdrawn, and dynamic cone penetrometer (DCP) testing was performed. The conical point of the DCP was first seated about 1-3/4 inches to penetrate any loose cuttings in the boring, then driven about two additional 1-3/4-inch increments by a 15-pound hammer falling 20 inches. The number of hammer blows required to achieve this penetration was recorded as the "Blows Per Increment" also referred to as the "n"-value. When properly evaluated, the penetration resistance provides qualitative information relative to the in-situ consistency and relative density of the material encountered. During the hand augering process, the auger cuttings were observed to estimate the distribution of grain sizes, plasticity, organic content, moisture condition, color, presence of lenses and seams, and apparent geologic origin.

Our project engineer was on site during the work and classified the materials removed from the test pits and hand auger borings in general accordance with the Unified Soil Classification System (USCS). The information is provided on the test pit and hand auger boring field logs in the Appendix. Because the soils were primarily non-plastic and not moist to the touch, laboratory testing was not performed. The test pit and hand auger boring locations were recorded by our engineer using a handheld GPS unit. The approximate test pit locations are

depicted on Figures 1 and 2 in the Appendix. Additionally, elevations shown on the test pit and hand auger boring field logs were interpolated from the provided drawing. Both the locations and elevations should be considered approximate.

3.0 Site Conditions

3.1 Surface Features

The site consists of a relatively level parking area, with an outdoor pavilion in the northeast, a drainage ditch in the west, and an approximately 40-foot-tall existing slope with an inclination of approximately 2H:1V at the north and west ends. Based on Google Earth historical imagery, the existing slope has been in this general configuration since prior to 1994. The majority of the existing slope did not exhibit any obvious signs of sloughing or erosion; however, erosion was observed along the drainage ditch. Groundcover consisted of grass, concrete, and asphalt in the relatively flat area and tall grass and bushes in the steeply sloped area. Several bricks and cobbles were observed along the surface of the slope. The drainage ditch area along the slope consisted of some bare soil and rock pieces and was surrounded by trees. The ground surface generally falls gently to the northwest across the site.

3.2 Area Geology

The project site is in the Blue Ridge Physiographic Province of North Carolina. The topography and relief of the Blue Ridge have developed from differential weathering of the igneous and metamorphic rock. Because of the continued chemical and physical weathering, the rocks in the Blue Ridge are now generally covered with a mantle of soil that has weathered in place from the parent bedrock. These soils have variable thicknesses and are referred to as residuum or residual soils. The residuum is typically finer grained and has higher clay content near the surface because of the advanced weathering. Similarly, the soils typically become coarser grained with increasing depth because of decreased weathering. As the degree of weathering decreases, the residual soils generally retain the overall appearance, texture, gradation and foliations of the parent rock.

The boundary between the residual soil and the underlying bedrock is not sharply defined. Generally, a transition zone consisting of very hard soil and soft rock appropriately classified as "partially weathered rock" is found. Partially weathered rock is defined, for engineering purposes, as residual material with standard penetration resistance values of at least 50 blows per 6 inches. Weathering is facilitated by fractures, joints, and the presence of less resistant rock types. Consequently, the profile of the partially weathered rock (as well as hard rock) is quite irregular and erratic, even over relatively short horizontal distances. Also, it is not unusual to find lenses and boulders of hard rock and zones of partially weathered rock within the soil mantle, well above the general bedrock level.

The natural geological profile of the site has been modified by apparent fill placement. Existing fill can vary in composition and consistency, and the engineering characteristics of such soils can be difficult to predict. The engineering properties of fill depend primarily on its composition, density, and moisture content. S&ME did not receive documentation (i.e., in-place density tests, engineering monitoring reports, etc.) of the fill placement at this site and we do not expect any exists.

3.3 Subsurface Conditions

The following is a brief and general description of subsurface conditions encountered at the site. More detailed information is provided on the individual Hand Auger Boring Field Logs and Test Pit Field Logs included in the Appendix. Similar soils were grouped into strata on the logs. The strata contact lines represent approximate boundaries between soil types; the actual transition between soil types in the field could be gradual in both the horizontal and vertical directions.

3.3.1 Surface Materials

A surface layer of organic-laden topsoil about 4 to 8 inches thick is noted on the logs; however, topsoil stripping depths are often deeper to remove the grass, large roots, and root mat. Surface material thickness and composition will vary throughout other areas of the site.

3.3.2 Existing Fill

Beneath the surface materials, existing fill soils were encountered in each of the test pits and hand auger borings HA-4 to HA-6 to the termination depths of 1 to 6 feet. The existing fill was described as sandy silt (USCS group symbol ML) and silty sand (SM). The sampled materials included varying quantities of debris including topsoil, roots, lumber, asphalt pieces, concrete pieces, brick pieces, gravel, and boulders. DCP "n"-values in the fill were greater than 20 blows per 1¾-inch increment (bpi) indicating a medium dense relative density. Please note, the DCP "n"-values could be elevated by the rocky material in the existing fill. Based on the composition of the existing fill, we anticipate it was not placed or compacted in a controlled fashion nor was it tested for compaction during placement. Test pits TP-1 and TP-5 encountered a large boulder in the fill that was too large for the equipment to remove from the pit at a depth of 5 feet, and the pits were terminated at this depth. Similarly, hand auger borings HA-4 to HA-6 encountered refusal at a depth of 1 to 1.5 feet below the ground surface in the existing fill. Several offset borings were attempted but were unable to penetrate the fill layer.

3.3.3 Residual Soils

Residual soils (residuum) of the type common to the Blue Ridge area were encountered below the topsoil in hand auger borings HA-1 to HA-3, which were along the lower and eastern portion of the existing tall slope. The residuum generally consisted of sandy lean clay (CL), sandy silt (ML) and silty sand (SM). DCP "n"-values ranged from 8 to greater than 20 bpi, indicating a stiff consistency in the fine-grained soils and a medium dense relative density in the sands. Hand auger boring HA-1 encountered auger refusal at a depth of 1.5 feet in the residuum and hand auger borings HA-2 and HA-3 were terminated at a depth of 3 and 4 feet, respectively, in the residuum.

3.3.4 Subsurface Water

Subsurface water was not encountered in the hand auger borings or test pits. Please note that subsurface water levels will fluctuate during the year, due to such things as seasonal variations, precipitation and construction activity in the area. Also, subsurface water can sometimes be perched or temporarily present in particular soil zones, existing fill, or on top of rock and PWR layers well above the general subsurface water levels, particularly following heavy rainfall.

4.0 Conclusions and Recommendations

The conclusions and recommendations presented herein are based on information and assumptions concerning expected existing and final site grades, our understanding of the proposed fill placement, findings of the limited subsurface exploration, geotechnical engineering evaluations of encountered subsurface conditions, and experience with similar projects. When reviewing this information, please keep in mind subsurface conditions vary erratically in this geologic area, particularly with respect to the previously placed fill, subsurface water levels, partially weathered rock, and rock.

4.1 General Discussion

The site is generally underlain by poor quality, debris-laden fill with some residual soils in the lower, eastern portion of the existing slope. The test pits and hand auger borings were generally not able to penetrate through the fill into residual soils due to limitations of the equipment (6 feet was the maximum depth the operator could excavate the pits) or debris/rocky material in the existing fill. When placing structural fill for the pond slopes and pavement subgrades, debris or pockets of poor quality soils will likely need to be removed from suitable fill material. New pavements can typically be supported on existing fill with a low risk, provided subgrades are stable during engineering evaluations during construction. We anticipate that some unstable areas are likely to be encountered and some undercutting and/or repair with crushed stone should be accounted for in the project budget.

Obvious signs of slope instability were not observed during our site work, although the rocky material and brick pieces could have been placed to reduce erosion of the slope. In our opinion, the main geotechnical concerns for this project are the following:

- The impact of the low quality fill, debris, and possible underground voids on the proposed new stormwater ponds.
- Impacts of the proposed stormwater ponds on stability of the existing slope.
- Possible lining of the proposed stormwater ponds.
- Managing large influxes of water so they do not overtop the existing slope during large rain events.
- Through evaluation and repair of pavement subgrades.
- Removal of debris and poor quality soil as needed when placing structural fill for pavements and ponds.

4.2 Earthwork Recommendations

4.2.1 *Site Preparation and Subgrade Evaluation*

To prepare the site for construction, all surface vegetation, pavements, topsoil, roots and any other unsuitable surface materials should be stripped to at least 5 feet beyond the proposed new pavements and ponds and proposed new fill areas.

After stripping, the exposed subgrades should be evaluated by a representative of the Geotechnical Engineer. During this evaluation, the exposed subgrade should be methodically proofrolled with a tandem-axle dump truck or similar piece of rubber-tired equipment loaded at the engineer's discretion. Areas that deflect excessively

Limited Geotechnical Exploration Report

AB Tech Stormwater Project

Asheville, North Carolina

S&ME Project No. 23410116

during proofrolling should be undercut or stabilized in place as recommended by the Geotechnical Engineer before placing fill or constructing pavements. We anticipate some fill areas will not be practical to proofroll such as the existing drainage ditch. These areas may be more practical to evaluate with a "T" handled steel probe rod, hand auger borings supplemented with dynamic cone penetrometer testing, and/or observing test pits. Unstable areas should also be evaluated further by the Geotechnical Engineer or his representative using these methods. Stabilization is often achieved by scarifying and recompaction, undercutting to firm soil, or placing 1 to 2 feet of crushed stone with or without a geotextile fabric or geogrid (as needed).

Our experience on previously graded sites is that unexpected conditions could be encountered. This could include areas with uncompacted fill, wet soils, organics, or buried debris. If this occurs recommendations can be provided in the field to handle the unsuitable material.

4.2.2 *Structural Fill Placement and Compaction*

After excavation and undercutting, areas requiring fill placement should be raised to their design subgrade configuration with soil free of deleterious materials, including rock fragments greater than 4 to 6 inches in diameter. The fill should be uniformly spread in 6- to 8-inch thick loose lifts and be compacted to at least 95 percent of the soil's maximum dry density, as determined by a laboratory standard Proctor compaction test (ASTM D698). The upper 2 feet of pavement subgrades should be compacted to a slightly higher degree (98%) since the pavement support characteristics improve with higher density. The moisture content should be controlled at plus to minus 3 percent of optimum; however, a slight increase in optimum moisture could be allowed if the minimum compacted density is achieved and subgrade is stable. Closer moisture control could be needed with the silty soils.

Fill placement should be monitored by a qualified Materials Technician working under the general direction of the Geotechnical Engineer. In addition to this visual evaluation, the Technician should perform in-place field density tests to confirm that the required degree of compaction is being attained.

4.2.2.1 Use of Excavated Soils as Fill

We anticipate much of the existing on-site soils will be challenging to reuse as structural fill due to debris and organic contents. Some relatively "clean" existing fill soils were encountered, and these soils would be suitable for re-use as structural fill. We expect diligent effort by the contractor will be needed to separate the debris and pockets of organics from the otherwise suitable fill material.

The moisture content of the soils will fluctuate with prevailing weather conditions prior to and at the time of grading. Some drying or wetting of the soils is often required on earthwork projects such as this and the contractor should be prepared to moisture condition the soil.

If any suitable soils are stockpiled for later reuse, they should be protected from precipitation as much as practical. Unsuitable soils will most likely need to be wasted offsite (hauled off) or placed in non-structural "green" areas (areas designated for landscaping).

4.2.2.2 Fill Placement Over Existing Slopes

Where the existing ground is steeper than 4:1 (horizontal to vertical), the new fill should be tied into the existing ground to help prevent slippage at the fill/natural ground surface interface. This can be accomplished by benching or stepping into the natural ground. The height of each bench should not exceed 2 feet. All fill should be properly compacted on a level plane starting at the toe of the sloped area. New fill should not be placed over loose/uncompacted existing fill or other unstable soils in steeply sloping areas. If present, these materials should be stripped from steeply sloping areas until firm soil is reached prior to benching and new fill placement.

4.2.3 *Excavated Slopes and Fill Embankments*

The existing site consists of a an approximately 40-foot tall slope with an inclination of 2 horizontal to 1 vertical (2H:1V). It appears portions of the slope are cut to grade, and some portions consist of fill. Some new cut and fill slopes for the proposed new stormwater ponds and site grading include slopes with inclinations of about 2.5H:1V and 2H:1V, respectively. Moderate height slopes with inclinations of 2H:1V are typically stable, but are more prone to shallow sloughs and advanced erosion than flatter slopes. Additionally, global stability could become a concern if the slopes were to become saturated. To help reduce erosion, maintenance and repair, and allow more convenient access for landscaping equipment, we suggest the new slopes be constructed no steeper than 2.5H:1V to 3H:1V, where practical.

Fill placed in embankments should be compacted as recommended in Section 4.2.2. Since it is difficult to compact soils near the embankment face, we suggest constructing the embankments outside their design limits and then cutting them back, leaving the exposed face well compacted. Our experience indicates fill embankments are often not given the proper consideration during grading and should be closely evaluated and tested during construction.

We advise the face of slopes and embankments be protected by establishing vegetation with the use of permanent turf reinforcement mats (such as the VMax C350 by North American Green or similar) as soon as practical after grading. Also, rainwater runoff should be diverted away from the crest of slopes. In general, utilities should be routed away from fill embankments. Any utilities that must be located near the face or the crests of the fill embankments should be designed with extra precautions to ensure they do not leak or rupture. All utility line backfill should be compacted to project specifications. It is very important all factors associated with slopes be constructed in accordance with plans and specifications.

4.2.4 *Excavation Conditions*

The test pit data (which extended only to 5 or 6 feet below the surface) indicates excavation to shallow depths beneath existing grades will encounter low to moderate consistency fill with some large boulders and debris, underlain by moderate consistency residual soils in some areas. We expect the soils can be excavated by front-end loaders and/or tracked excavators, but some large boulders in the fill could require use of pneumatic tools to break down in manageable pieces, depending on the size of the materials. Be aware that rock in a boulder, weathered and massive form varies erratically in location and depth in this geologic region. Therefore, these materials can exist at shallower depths between the test pits and in unexplored areas. If encountered, rock (and sometimes partially weathered rock) will require removal by blasting or use of pneumatic tools.

All excavations should be sloped or shored in accordance with local, state, and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. The Contractor is solely responsible for site safety. This information is provided only as a service and under no circumstances should S&ME be assumed to be responsible for construction site safety.

4.3 Stormwater Pond Considerations

Based on the provided drawings, the stormwater management pond Cell #3 is planned to be set back approximately 15 feet from the crest of the existing 2H:1V slope and Cells #1 and #2 are set back further (about 90 feet and 150 feet, respectively). Based on the existing fill and debris observed, we anticipate voids caused by debris or pockets of very soft soils could be underlying the proposed ponds, which could allow an avenue for water to migrate towards the slope face and cause internal erosion or slope instability. Therefore, we recommend a pond liner be considered for Cell #3 (on at least the side adjacent to the existing slope and the bottom of pond) to reduce infiltration into the subgrade soils and possible saturation or internal erosion of the existing slope. Cells #1 and #2 are further away from the slope and we do not anticipate they will require a pond liner to reduce impacts on the slope, although it may be desirable depending on the design. Based on our in-situ permeability tests (details submitted in a separate Stormwater Soil Evaluation Report dated November 7, 2023), the measured K_{sat} varied from 0.07 to 0.43 inches per hour across the site, which indicates the high variability likely in the existing fill.

Care should be taken to direct stormwater away from the slope face and ensure it does not overtop the existing slope in an uncontrolled fashion during large rain events. The existing slope area should not be used as a spillway without a properly designed channel or protection from erosion. Excessive erosion, sloughing or, in extreme cases, an embankment failure could occur if these issues are not taken into consideration.

5.0 Limitations of Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty either express or implied, is made.

We relied on project information given to us to develop our conclusions and recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information if necessary.

Our conclusions and recommendations are based on limited data from a field exploration program. Subsurface conditions can vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.

Unless specifically noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants or presence of any biological materials (mold, fungi, bacteria).

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If there is a concern about these items, other studies should be performed. S&ME can provide a proposal and perform these services if requested.

S&ME should be retained to review the final plans and specifications to confirm that earthwork, foundation, and other recommendations are properly interpreted and implemented. The recommendations in this report are contingent on S&ME's review of final plans and specifications followed by our observation and monitoring of earthwork and foundation construction activities.

Appendices

Appendix I – Hand Auger and Test Pit Location Plan

Drawing path: T:\Asheville-141\Projects\2023\23410116_Asheville Buncombe Tech Comm. Coll_AB Tech - Stormwater Project_Asheville NC\GEO\CAD\ABTech OneMap Aerial BLP - NC State Plans.dwg



REFERENCE:
2019 AERIAL IMAGERY WAS OBTAINED FROM NC ONE MAP.

-  APPROX. HAND AUGER BORING LOCATION
-  APPROX. TEST PIT LOCATION

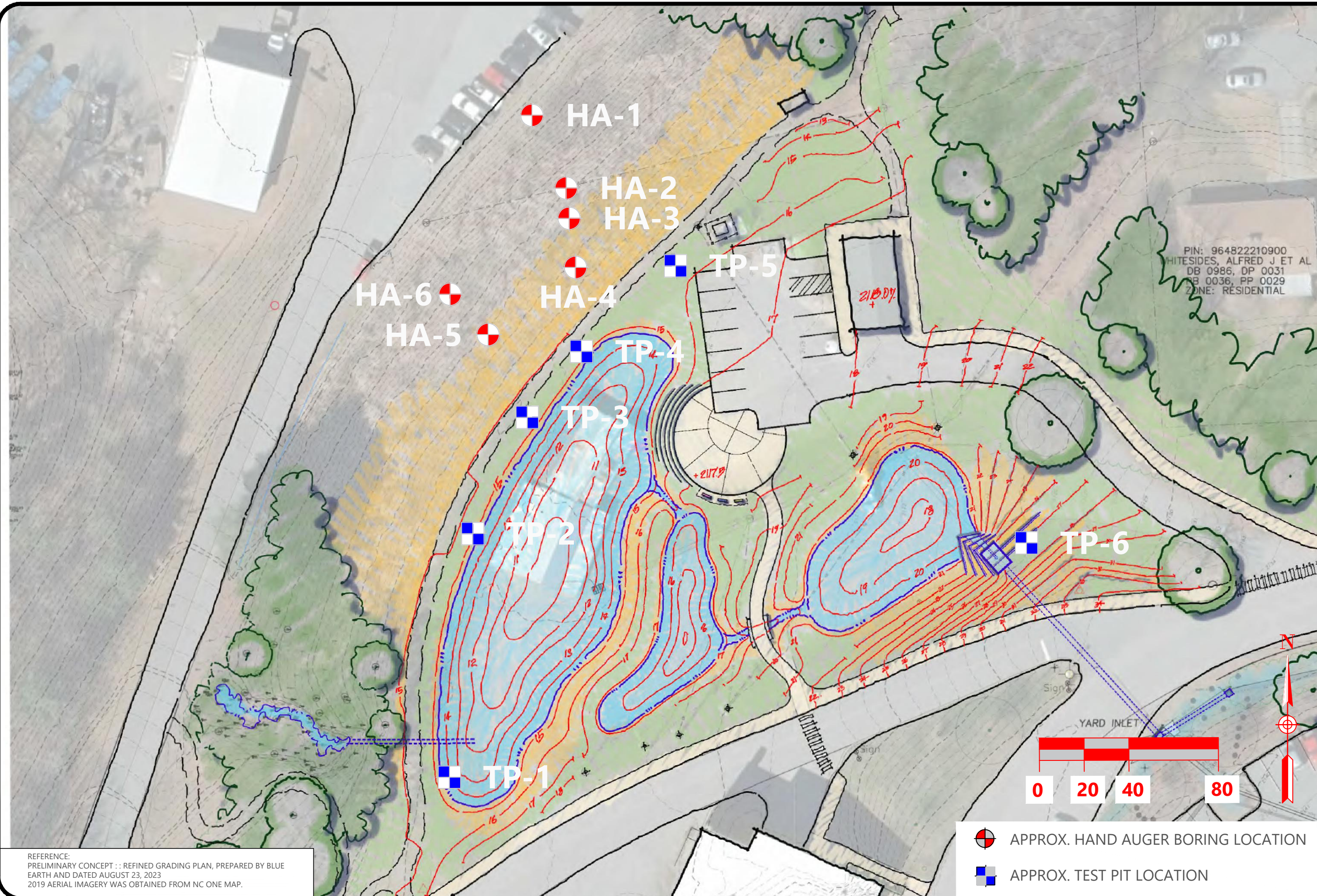


HAND AUGER AND TEST PIT LOCATION PLAN WITH AERIAL IMAGERY

AB TECH STORMWATER PROJECT
FERNIHURST DRIVE AND FACILITIES WAY
ASHEVILLE, NORTH CAROLINA

SCALE:
1" = 40'
DATE:
NOVEMBER 2023
PROJECT NUMBER
23410116
FIGURE NO.

Drawing path: T:\Asheville-14\0\Projects\2023\23410116_Ashville Buncombe Tech Comm. Coll_AB Tech - Stormwater Project_Ashville NCGEO\CAD\ABTech OneMap Aerial BLP - NC State Plans.dwg



REFERENCE:
PRELIMINARY CONCEPT :: REFINED GRADING PLAN, PREPARED BY BLUE
EARTH AND DATED AUGUST 23, 2023
2019 AERIAL IMAGERY WAS OBTAINED FROM NC ONE MAP.

-  APPROX. HAND AUGER BORING LOCATION
-  APPROX. TEST PIT LOCATION



HAND AUGER AND TEST PIT LOCATION PLAN WITH GRADING PLAN

AB TECH STORMWATER PROJECT
FERNIHURST DRIVE AND FACILITIES WAY
ASHEVILLE, NORTH CAROLINA

SCALE:

1" = 40'

DATE:

NOVEMBER 2023

PROJECT NUMBER

23410116

FIGURE NO.

02

**Appendix II – Hand Auger Boring Field Logs, Test Pit Field Logs,
Photograph Log**

HAND AUGER BORING FIELD LOG

		AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			HA - 1
		DATE: 10/31/2023	S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH		
HAND AUGER BORING DEPTH: 1.5 FEET		WATER LEVEL: NA		ELEVATION: 2077 FT	
DEPTH:		SOIL DESCRIPTION		DCP RESULTS	
FROM	TO			DEPTH (ft)	BLOWS PER INCREMENT (n)
0	0.7	TOPSOIL, 8 inches	1	15, 20+	
0.7	1.5	RESIDUUM: SILTY SAND (SM), medium dense, tan brown white, fine to coarse			
NOTES: Hand auger boring encountered refusal at 1.5 feet. One offset was attempted and encountered refusal at a similar depth.					
NOTE: All depths were measured from the ground surface at the time of the test pit excavation.					

HAND AUGER BORING FIELD LOG

		AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			HA - 2	
		DATE: 10/31/2023		S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH		
HAND AUGER BORING DEPTH: 3 FEET			WATER LEVEL: NA		ELEVATION: 2094 FT	
DEPTH:		SOIL DESCRIPTION			DCP RESULTS	
FROM	TO				DEPTH (ft)	BLOWS PER INCREMENT (n)
0	0.3	TOPSOIL, 4 inches	1	8, 12, 20+		
			2	20+		
			3	20+		
0.3	3	RESIDUUM: SILTY SAND (SM), medium dense, tan pink white, fine to coarse				

NOTES: Hand auger boring encountered refusal at 3 feet.

NOTE: All depths were measured from the ground surface at the time of the test pit excavation.

HAND AUGER BORING FIELD LOG

		AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			HA - 3	
		DATE: 10/31/2023		S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH		
HAND AUGER BORING DEPTH: 4 FEET			WATER LEVEL: NA		ELEVATION: 2099 FT	
DEPTH:		SOIL DESCRIPTION			DCP RESULTS	
FROM	TO				DEPTH (ft)	BLOWS PER INCREMENT (n)
0	0.3	TOPSOIL, 4 inches	1	4, 8, 9		
			2.5	6, 10, 12		
			3	14, 15, 18		
0.3	3	RESIDUUM: SANDY LEAN CLAY (CL), stiff, red brown, fine				
3	4	SANDY SILT (ML), stiff, pink brown tan, fine, micaceous				
NOTES: Hand auger boring terminated at at 4 feet.						
NOTE: All depths were measured from the ground surface at the time of the test pit excavation.						

HAND AUGER BORING FIELD LOG

		AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			HA - 4
		DATE: 10/31/2023	S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH		
HAND AUGER BORING DEPTH: 1.5 FEET		WATER LEVEL: NA		ELEVATION: 2106 FT	
DEPTH:		SOIL DESCRIPTION		DCP RESULTS	
FROM	TO			DEPTH (ft)	BLOWS PER INCREMENT (n)
0	0.3	TOPSOIL, 4 inches	1	20+	
0.3	1.5	FILL: SILTY SAND (SM), medium dense, tan brown, fine to coarse, some rounded and crushed gravel, some brick pieces, DCP n-value is likely amplified by rocky material			
NOTES: Hand auger boring encountered refusal at 1.5 feet. Four offsets were attempted and encountered refusal at a similar depth. Some cobbles (about 4 to 6 inches in diameter) observed on the surface near the hand auger boring.					
NOTE: All depths were measured from the ground surface at the time of the test pit excavation.					

HAND AUGER BORING FIELD LOG

		AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			HA - 5
		DATE: 10/31/2023	S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH		
HAND AUGER BORING DEPTH: 1.5 FEET		WATER LEVEL: NA		ELEVATION: 2090 FT	
DEPTH:		SOIL DESCRIPTION		DCP RESULTS	
FROM	TO			DEPTH (ft)	BLOWS PER INCREMENT (n)
0	0.3	TOPSOIL, 4 inches	1	20+	
0.3	1	FILL: SILTY SAND (SM), medium dense, tan brown, fine to coarse, some rounded and crushed gravel, some brick pieces, DCP n-value is likely amplified by rocky material			
NOTES: Hand auger boring encountered refusal at 1 foot. Three offsets were attempted and encountered refusal at a similar depth. Some cobbles (4 to 6 inches in diameter) and brick pieces observed on the surface near the hand auger boring.					
NOTE: All depths were measured from the ground surface at the time of the test pit excavation.					

HAND AUGER BORING FIELD LOG

		AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			HA - 6
		DATE: 10/31/2023	S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH		
HAND AUGER BORING DEPTH: 1.5 FEET		WATER LEVEL: NA		ELEVATION: 2106 FT	
DEPTH:		SOIL DESCRIPTION		DCP RESULTS	
FROM	TO			DEPTH (ft)	BLOWS PER INCREMENT (n)
0	0.5	TOPSOIL, 6 inches	1	20+	
0.5	1	FILL: SILTY SAND (SM), medium dense, tan brown, fine to coarse, some rounded and crushed gravel, some brick pieces, DCP n-value is likely amplified by rocky material			
NOTES: Hand auger boring encountered refusal at 1 foot. Some cobbles (about 4 to 6 inches in diameter) and brick pieces observed on the surface near the hand auger boring.					
NOTE: All depths were measured from the ground surface at the time of the test pit excavation.					

TEST PIT FIELD LOG

	AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			TP - 1
	DATE: 10/30/2023	S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH		
TEST PIT DEPTH: 5 FEET	WATER LEVEL: NA	ELEVATION: 2115 FT	EQUIPMENT: JOHN DEERE 4600 TRACTOR/BACKHOE	
DEPTH:		SOIL DESCRIPTION		
FROM	TO			
0	0.5	TOPSOIL, 6 inches		
0.5	3	FILL: SILTY SAND (SM), red brown, fine to coarse		
3	5	FILL: SILTY SAND (SM), brown black, coarse, some clay, topsoil, and wood (old roots) debris, large boulder (larger than the extent of the test pit and too large for the equipment to move from the confined excavation) at 5 feet		
NOTES: TEST PIT TERMINATED DUE TO REFUSAL ON A LARGE BOULDER IN THE EXCAVATION				
NOTE: All depths were measured from the ground surface at the time of the test pit excavation.				

TEST PIT FIELD LOG

		AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			TP - 2
		DATE: 10/30/2023	S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH		
TEST PIT DEPTH: 6 FEET		WATER LEVEL: NA	ELEVATION: 2115 FT	EQUIPMENT: JOHN DEERE 4600 TRACTOR/BACKHOE	
DEPTH:		SOIL DESCRIPTION			
FROM	TO				
0	0.7	TOPSOIL, 8 inches			
0.7	5.5	FILL: SILTY SAND (SM), tan brown, fine to medium, some approximately 3- to 6-inch diameter rock pieces and approximately 1 inch diameter roots, an approximately 12-inch long section of concrete curb near 3 feet in depth			
5.5	6	TOPSOIL and ROCK FRAGMENTS			
NOTES: TEST PIT TERMINATED BASED ON THE OPERATOR INDICATING 6 FEET WAS THE LIMITS OF THE MACHINE					
NOTE: All depths were measured from the ground surface at the time of the test pit excavation.					

TEST PIT FIELD LOG

	AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			TP - 3	
	DATE: 10/30/2023	S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH			
TEST PIT DEPTH: 6 FEET		WATER LEVEL: NA	ELEVATION: 2115 FT	EQUIPMENT: JOHN DEERE 4600 TRACTOR/BACKHOE	
DEPTH:		SOIL DESCRIPTION			
FROM	TO				
0	0.3	TOPSOIL, 4 inches			
0.3	3	FILL: SILTY SAND (SM), red brown, fine to medium, micaceous, trace of small (<1/8-inch) roots			
3	6	FILL: SANDY SILT (ML), red brown, fine, large boulder near 3 feet (too large for the equipment to move, test pit was extended a few feet southwest to excavate around the boulder), some pockets of clay from 3 to 4 feet, some crushed gravel and sand from 4 to 5 feet			
NOTES: TEST PIT TERMINATED BASED ON THE OPERATOR INDICATING 6 FEET WAS THE LIMITS OF THE MACHINE					
NOTE: All depths were measured from the ground surface at the time of the test pit excavation.					

TEST PIT FIELD LOG

	AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			TP - 4	
	DATE: 10/30/2023	S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH			
TEST PIT DEPTH: 6 FEET		WATER LEVEL: NA	ELEVATION: 2115 FT	EQUIPMENT: JOHN DEERE 4600 TRACTOR/BACKHOE	
DEPTH:		SOIL DESCRIPTION			
FROM	TO				
0	0.3	TOPSOIL, 4 inches			
0.3	4	FILL: SILTY SAND (SM), red brown, fine to coarse, trace of small (<1/8-inch) roots			
4	6	FILL: SANDY SILT (ML), red brown gray, fine, trace of mica, trace of small (<1/8-inch) roots, some rounded gravel, rock fragments and bricks near 6 feet			
NOTES: TEST PIT TERMINATED BASED ON THE OPERATOR INDICATING 6 FEET WAS THE LIMITS OF THE MACHINE					
NOTE: All depths were measured from the ground surface at the time of the test pit excavation.					

TEST PIT FIELD LOG

	AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			TP - 5	
	DATE: 10/30/2023	S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH			
TEST PIT DEPTH: 6 FEET		WATER LEVEL: NA	ELEVATION: 2116 FT	EQUIPMENT: JOHN DEERE 4600 TRACTOR/BACKHOE	
DEPTH:		SOIL DESCRIPTION			
FROM	TO				
0	0.3	TOPSOIL, 4 inches			
0.3	6	FILL: SANDY SILT (ML), red brown, fine to coarse, trace of mica, trace of small (<1/8-inch) roots, piece of wire near 6 feet			
NOTES: TEST PIT TERMINATED BASED ON THE OPERATOR INDICATING 6 FEET WAS THE LIMITS OF THE MACHINE					
NOTE: All depths were measured from the ground surface at the time of the test pit excavation.					

TEST PIT FIELD LOG

	AB TECH STORMWATER PROJECT S&ME PROJECT NO. 23410116			TP - 6
	DATE: 10/30/2023	S&ME PERSONNEL: CHRISTOPHER FUJITA-MENTCH		
TEST PIT DEPTH: 5 FEET		WATER LEVEL: NA	ELEVATION: 2127 FT	EQUIPMENT: JOHN DEERE 4600 TRACTOR/BACKHOE
DEPTH:		SOIL DESCRIPTION		
FROM	TO			
0	0.5	TOPSOIL, 6 inches		
0.5	4	FILL: SILTY SAND (SM), red brown, coarse, some rock and concrete pieces, asphalt slab near 1 foot, wood (lumber) debris near 2 feet		
4	5	TOPSOIL, large boulder (larger than the extent of the test pit and too large for the equipment to move from the confined excavation) at 5 feet		
NOTES: TEST PIT TERMINATED DUE TO REFUSAL ON A LARGE BOULDER IN THE EXCAVATION.				
NOTE: All depths were measured from the ground surface at the time of the test pit excavation.				



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		Date: 10/30/2023
		Photographer: C. Fujita-Mentch
1	Location	Test Pit TP-1
	Remarks	Layer of topsoil in fill

		Date: 10/30/2023
		Photographer: C. Fujita-Mentch
2	Location	Test Pit TP-4
	Remarks	Some bricks in the fill



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		Date: 10/30/2023
		Photographer: C. Fujita-Mentch
3	Location	Test Pit TP-6
	Remarks	Asphalt slab in fill

		Date: 10/31/2023
		Photographer: C. Fujita-Mentch
4	Location	West of Hand Auger Boring HA-5
	Remarks	Some cobbles and brick pieces at surface

Appendix III – Important Information



Important Information About Your Geotechnical Engineering Report

Variations in subsurface conditions can be a principal cause of construction delays, cost overruns and claims. The following information is provided to assist you in understanding and managing the risk of these variations.

Geotechnical Findings Are Professional Opinions

Geotechnical engineers cannot specify material properties as other design engineers do. Geotechnical material properties have a far broader range on a given site than any manufactured construction material, and some geotechnical material properties may change over time because of exposure to air and water, or human activity.

Site exploration identifies subsurface conditions at the time of exploration and only at the points where subsurface tests are performed or samples obtained. Geotechnical engineers review field and laboratory data and then apply their judgment to render professional opinions about site subsurface conditions. Their recommendations rely upon these professional opinions. Variations in the vertical and lateral extent of subsurface materials may be encountered during construction that significantly impact construction schedules, methods and material volumes. While higher levels of subsurface exploration can mitigate the risk of encountering unanticipated subsurface conditions, no level of subsurface exploration can eliminate this risk.

Scope of Geotechnical Services

Professional geotechnical engineering judgment is required to develop a geotechnical exploration scope to obtain information necessary to support design and construction. A number of unique project factors are considered in developing the scope of geotechnical services, such as the exploration objective; the location, type, size and weight of the proposed structure; proposed site grades and improvements; the construction schedule and sequence; and the site geology.

Geotechnical engineers apply their experience with construction methods, subsurface conditions and exploration methods to develop the exploration scope. The scope of each exploration is unique based on available project and site information. Incomplete project information or constraints on the scope of exploration increases the risk of variations in subsurface conditions not being identified and addressed in the geotechnical report.

Services Are Performed for Specific Projects

Because the scope of each geotechnical exploration is unique, each geotechnical report is unique. Subsurface conditions are explored and recommendations are made for a specific project. Subsurface information and recommendations may not be adequate for other uses. Changes in a proposed structure location, foundation loads, grades, schedule, etc. may require additional geotechnical exploration, analyses, and consultation. The geotechnical engineer should be consulted to determine if additional services are required in response to changes in proposed construction, location, loads, grades, schedule, etc.

Geo-Environmental Issues

The equipment, techniques, and personnel used to perform a geo-environmental study differ significantly from those used for a geotechnical exploration. Indications of environmental contamination may be encountered incidental to performance of a geotechnical exploration but go unrecognized. Determination of the presence, type or extent of environmental contamination is beyond the scope of a geotechnical exploration.

Geotechnical Recommendations Are Not Final

Recommendations are developed based on the geotechnical engineer's understanding of the proposed construction and professional opinion of site subsurface conditions. Observations and tests must be performed during construction to confirm subsurface conditions exposed by construction excavations are consistent with those assumed in development of recommendations. It is advisable to retain the geotechnical engineer that performed the exploration and developed the geotechnical recommendations to conduct tests and observations during construction. This may reduce the risk that variations in subsurface conditions will not be addressed as recommended in the geotechnical report.