CITY OF ASHEVILLE

CONTRACT PROPOSAL

PROJECT NUMBER: 298 PR-16-17-001

COUNTY: BUNCOMBE

DESCRIPTION: BEAUCATCHER MOUNTAIN GREENWAY TRAIL

DATE OF ADVERTISEMENT: OCTOBER 19, 2016

PRE-BID MEETING: 10AM, NOVEMBER 3, 2016, AT ASHEVILLE CITY HALL BUILDING, 70 COURT PLAZA, PURCHASING CONFERENCE ROOM, ASHEVILLE, NC 28802

BID OPENING: 2PM, NOVEMBER 17, 2016, AT CITY OF ASHEVILLE 161 SOUTH CHARLOTTE STREET, CONFERENCE ROOM A-109, ASHEVILLE, NC 28802

***** NOTICE *****

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. FOR CONTRACTS $30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD, BIDDERS ARE REQUIRESD TO BECOME LICENSED BY THE NC LICENSING BOARD. BIDDERS SHALL HAVE A VALID LICENSE AT THE TIME OF BIDDING. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA.

_____

NAME OF BIDDER

_____

ADDRESS OF BIDDER

RETURN BIDS TO: CITY OF ASHEVILLE
Attention: PETE WALL
Person's Title: PROJECT MANAGER
Physical Address: CITY OF ASHEVILLE, CITY HALL BUILDING, 70 COURT PLAZA, ASHEVILLE, NC 28801

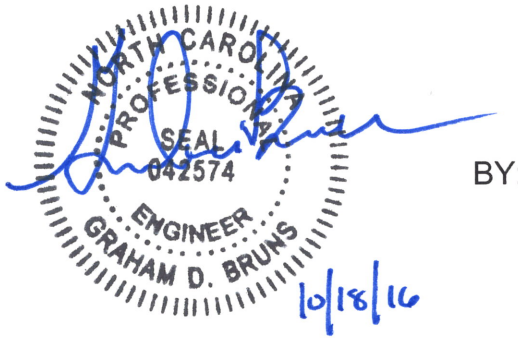
ALL BIDS MUST BE RECEIVED PRIOR TO THE DATE AND TIME LISTED ABOVE.

Project Name BEAUCATCHER MOUNTAIN GREENWAY
Project No. 298 PR-16-17-001

CERTIFICATION

I HEREBY CERTIFY THAT THE SPECIFICATIONS CONTAINED HEREIN AND THE ACCOMPANYING PLANS AND SPECIFICATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION.

SIGNED, SEALED, AND DATED THIS 18th DAY OF OCTOBER, 2016.



BY: Graham Bruns, PE

Stewart, Inc.
421 Fayetteville Street
Suite 400
Raleigh, NC 27601
License C-1051

BEAUCATCHER MOUNTAIN GREENWAY
298 PR-16-17-001
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TECHNICAL SPECIFICATIONS

GENERAL CONSTRUCTION

ADVERTISEMENT FOR BIDS

Pursuant to N. C. Gen. Stat. sec. 143-129, sealed bids will be received by the City of Asheville, Post Office Box 7148, Asheville, North Carolina, 28802, in the office of Pete Wall, Parks and Recreation Department on the 4th floor of the City Hall Building, Asheville, North Carolina, up to 2:00, p.m., on November 16th, 2016. Any bid not received by 2pm on the 16th at the above address shall be hand delivered to Conference Room A-109, 161 South Charlotte Street, Asheville, NC 28802 up to 2:00, p.m. on November 17th, 2016 and shall be immediately opened publicly and read aloud for the project described as follows:

City of Asheville

BEAUCATCHER MOUNTAIN GREENWAY TRAIL

Project Number: 298 PR-16-17-001

The project generally includes approximately 2.26 miles of trail construction, consisting of new 10-foot wide trail construction (10-foot wide asphalt with 1-foot shoulders) and other sections of variable width trail, associated clearing, drainage, erosion control, signage, and construction of eight (8) trailheads.

Complete plans, specifications and contract documents may be examined at the following locations:

City of Asheville Parks and Recreation Department, 4th Floor, 70 Court Plaza, Asheville, NC 28801
Henco Printing, 54 Broadway St. Asheville, NC 28801
Stewart, 200 S College St # 720, Charlotte, NC 28202

Copies of the Contract Documents may be obtained at Henco Printing (phone 828-253-0449 / address 54 Broadway St. Asheville, NC 28801) or using their online plan room. The Non-Refundable Purchase of the entire bid set includes all plans and specifications, including addenda. The cost of the Bid Documents is Non-Refundable.

Or can be viewed or downloaded for reproduction for free from the City of Asheville's bid page:
http://www.ashevillenc.gov/Departments/Purchasing/RequestsforBidsProposals.aspx

Neither the owner nor the Engineer will be responsible for full or partial sets of Contract Documents including and addendum obtained from any other source.

A pre-bid conference will be held on November 3rd, 2016, at 10:00 a.m. in the Purchasing conference room, Asheville City Hall Building, 70 Court Plaza, Asheville, North Carolina. Attendance at the pre-bid conference is not mandatory for submitting a bid proposal. The project, the City's Minority Business Plan and the City's Drug-Free Workplace Policy will be explained.

Bidders are notified that the City of Asheville has adopted a Minority Business Plan which established guidelines and verifiable percentage goals for participation by minority businesses in the awarding of construction contracts. Minority businesses are invited to participate.
Questions regarding this should be directed to Brenda Mills, Economic Development Specialist, in the Office of Economic Development at 828.259.8050 or bmills@ashevillenc.gov

Bidders are notified that the City of Asheville has adopted a Drug-Free Workplace Policy requiring successful bidders to insure that a drug-free workplace is provided in the performance of any City of Asheville construction contracts. The requirements of that policy are able to be viewed or printed from the link provided below. Bidders are required to sign the certification provided in the bid documents indicating their agreement to fulfill the requirements of the policy.
http://www.ashevillenc.gov/Departments/Purchasing/DrugFreeWorkPolicy.aspx

Bidders are notified that by submitting this bid proposal, the Contractor certifies that, as of the date of submission, it is not on the Final Divestment List as created by the State Treasurer pursuant to N.C.G.S. § 147-86.58. In compliance with the requirements of the Iran Divestment Act and N.C. G. S. § 147-86.59, Contractor shall not utilize in the performance of the contract any subcontractor that is identified on the Final Divestment List.

All bidders must have current North Carolina licenses for all work for the project. The contractor must have a General Contractors License for North Carolina with Highway Classification at the time of the bid.

All bids must be submitted on the form of bid proposal provided. All bids must be enclosed in a sealed envelope and properly labeled.

Bid proposals shall include the cost of required insurance and bonds and payment of any applicable local, State and Federal taxes. The City Council of the City of Asheville has adopted a policy that the City of Asheville will not enter into contracts with bidders who are delinquent in the payment of ad valorem taxes owed to the City of Asheville.

Each bid shall be accompanied by a deposit with the City of Asheville of cash, or a cashier's check, or a certified check on some bank or trust company insured by the Federal Deposit Insurance Corporation in an amount equal to not less than five percent (5%) of the bid amount. In lieu of making the cash deposit as above provided, the bidder may file a bid bond executed by a corporate surety licensed under the laws of North Carolina to execute such bonds, conditioned that the surety will upon demand forthwith make payment to the obligee upon said bond if the bidder fails to execute the contract in accordance with the bid bond. This deposit shall be retained if the successful bidder fails to execute the contract within ten (10) days after the award of bid or fails to give satisfactory surety as required in N. C. Gen. Stat. sec. 143-129.

The successful bidder will be required to furnish a performance bond and a payment bond in the amount of one hundred percent (100%) of the contract amount. Those bonds shall meet the requirements of N. C. Gen. Stat. sec. 143-129 and of Article 3 of Chapter 44A of the North Carolina General Statutes.

No bid may be withdrawn after bids have been opened, except as provided in N. C. Gen. Stat. sec. 143-129.1.

The City of Asheville reserves the right to reject any or all bids and to waive informalities.

CITY OF ASHEVILLE

By: _____

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

1. PREPARATION OF BIDS:

1. The Bid Proposal form furnished by the City 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 price for every item in the Bid form unless specific directions in the Invitation for Bids allow for partial Bids. The unit prices bid for the various Contract Items shall be written figures.

4. A Total Bid shall be entered in the Bid form for every item on which a unit price has been submitted. The total Bid for each item shall be determined by multiplying each unit price bid by the quantity for that item, and shall be written in figures in the "Total Bid" column in the Bid form. In case of a discrepancy between the unit price bid for a Contract Item and the Total Bid for that item, the unit price bid shall govern

5. The Total Contract Bid Price shall be written in figures in the proper place in the Bid form. The Total Contract Bid Price shall be determined by adding the Total Bid for each item.

6. 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 shall initial the change in ink.

7. The Bid shall be properly executed. In order to constitute proper execution; the Bid 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, the President or Vice-president of the Corporation shall execute it in the name of the Corporation. The Secretary or Assistant Secretary shall attest the signature(s). 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, one of the general partners shall execute it in the name of the Partnership, by the address shown for the Partnership.

d. If the Bid is a joint venture, it shall be executed by each of the joint ventures in the appropriate manner set out above. The address for the joint venture shall be shown.

8. The Bid shall not contain any unauthorized additions, deletions or conditional bids.

9. The Bidder shall not add any provisions reserving the right to accept or reject an award, or to enter into a Contract pursuant to an award.

10. The Bid shall not contain irregularities of any kind, which make the Bid incomplete, indefinite, or ambiguous as to its meaning.

11. 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 numbered Alternate Item.

12. All attachments, certifications or acknowledgments attached to the Bid shall be executed in the same manner as the Bid.

13. For projects bid in the single-prime alternative, the names and license numbers of major subcontractors shall be listed on the proposal form.

14. Unit prices quoted in the proposal shall include overhead and profit and shall be the full compensation for the contractor's cost involved in the work.

2. EXAMINATION OF CONDITIONS:

It is understood and mutually agreed that by submitting a bid the bidder acknowledges that he has carefully examined all documents pertaining to the work, the location, accessibility and general character of the site of the work and all existing buildings and structures within and adjacent to the site, and has satisfied himself as to the nature of the work, the condition of existing buildings and structures, the conformation of the ground, the character, quality and quantity of the material to be encountered, the character of the equipment, machinery, plant and any other facilities needed preliminary to and during prosecution of the work, the general and local conditions, the construction hazards, and all other matters, including, but not limited to, the labor situation which can in any way affect the work under the contract, and including all safety measures required by the Occupational Safety and Health Act of 1970 and all rules and regulations issued pursuant thereto.

It is further mutually agreed that by submitting a proposal the bidder acknowledges that he has satisfied himself as to the feasibility and meaning of the plans, drawings, specifications and other contract documents for the

construction of the work and that he accepts all the terms, conditions and stipulations contained therein; and that he is prepared to work in cooperation with other contractors performing work on the site.

The failure or omission of any Bidder to thoroughly examine and familiarize himself with the Contract Documents or to receive or examine any form, instrument or document or visit the site and acquaint himself with the conditions there existing shall in no way relieve any Bidder from any obligation in respect to his bid.

No verbal agreement or conversation with any officer, agent or employee of the Owner, either before or after the execution of the Contract, shall affect or modify any of the terms or obligations in the Contract Document's.

If applicable, reference is made in the contract documents for the identification of surveys and investigation reports of subsurface or latent physical conditions at the site or otherwise affecting performance of the work which have been relied upon by the designer in preparing the documents.

Any reasonable request for access to the site will be honored by the owner.

3. RECEIPT AND OPENING OF BIDS:

Each Bid package must be submitted in an opaque sealed envelope, plainly marked on the outside, addressed and delivered as shown below.

The Bid Bond must be clearly labeled in a separately sealed envelope from the Bid in the sealed Bid package. The Bid must also be clearly labeled in a separately sealed envelope from the Bid Bond in the sealed Bid package.

If forwarded by mail, the sealed envelope containing the separately sealed Bid and separately sealed Bid Bond must be enclosed in another envelope addressed to the City of Asheville, Parks and Recreation Department, City Hall Building – 4th Floor, 70 Court Plaza, Asheville, North Carolina 28802. The envelope-containing the Bid shall be marked as follows:

Upper left hand corner -	Lower left hand corner -
Bidder's Name	NC General Contractor's License No.
Bidder's Address	Classification
	Expiration Date

Bid For: Beaucatcher Mountain Greenway Trail
To: Pete Wall

Pete Wall	
City of Asheville, Parks and Recreation Department	
Physical Address (FedEx, UPS):	Mailing Address (USPS):
City Hall Building – 4th Floor	
70 Court Plaza	PO Box 7148
Asheville, NC 28801	Asheville, NC 28802
(828) 259-5955	

Bids received prior to the advertised hour of opening will be securely kept sealed. The officer whose duty it is to open them will decide when the specified time has arrived, and no Bid received thereafter will be considered. A mailed Bid will be treated in every respect as though filed in person and will be subject to the same requirements.

The location and time of the Opening of and reading of Bids shall be held on **November 17th, 2016, at 2:00 p.m**. in Room A-109, 161 S. Charlotte Street, Asheville, North Carolina 28801. *It shall be the specific responsibility of the bidder to deliver his bid to the proper official at the selected place and prior to the announced time for the opening of bids. Later delivery of a bid for any reason, including delivery by any delivery service, shall disqualify the bid.*

Bids received subsequent to the advertised hour of opening will be returned to the Bidder unopened. At the time and place fixed for the opening of Bids, the Owner will cause to be opened and publicly read aloud every Bid received within the time set for receiving Bids, irrespective of any irregularities therein. Bidders and other persons properly interested may be present in person or by representative.

4. WITHDRAWAL OR REVISION OF BIDS:

A Bidder may, without prejudice to himself, withdraw a Bid after it has been delivered to the Owner provided the request for such withdrawal is made either in writing or by telegram to the project manager/engineer, presiding over the public opening of Bids before the date and time set for the opening of Bids. The bidder may then submit a revised Bid provided it is received prior to the time set for opening of Bids. Any withdrawal of a bid after the opening of Bids shall be in accordance with N.C. General Statute Section 143-129.1.

Only those persons authorized to sign Bids shall be recognized as being qualified to withdraw a Bid.

5. ADDENDA AND INTERPRETATIONS:

No interpretations of the meaning of the Plans, Specifications or other portions of the Contract Documents will be made orally. All questions and communication should be directed in writing to: Graham Bruns, Stewart Inc., gbruns@stewartinc.com

Every request for such interpretation must be addressed to the Project Engineer. To be given consideration, such requests must be received at the above address at least 3:00 P.M. prevailing local time five (5) days prior to the date fixed for the opening of Bids. Any and all such interpretations and any supplemental instructions will be in the form of written Addenda. All addenda will be posted on the City of Asheville's bid page no later than 3 P.M. prevailing local time two (2) days prior to the advertised bid date. The Asheville bid page may be found at link below.

http://www.ashevillenc.gov/Departments/Purchasing/RequestsforBidsProposals.aspx

It is the responsibility of the bidder to ensure that they have accounted for all issued addenda. Failure of any Bidder to receive any such Addenda shall not relieve said Bidder from any obligation under his Bid as submitted. All Addenda so issued shall become part of the Contract Documents.

6. DISCREPANCY IN BIDS:

In the event there is a discrepancy in any Bid between the unit prices and the extended totals, the unit prices shall govern. Bids, which do not contain a price for every numbered item contained in the applicable Bid form, will not be accepted, unless otherwise specified.

The City of Asheville reserves the right to reject any Bid in which the prices appear, in the judgment of the City, to constitute an unbalanced Bid. Unbalanced prices shall be interpreted to mean that the unit price for any item is such that it is unreasonable for that particular item when considered in connection with the Bid submitted, or any other item or items.

7. QUALIFICATIONS OF BIDDERS:

It is the intention of the Owner to award the Contract(s) to a Bidder competent to perform and complete the work described in a satisfactory manner. Before awarding the contract, the owner may require the apparent low bidder to qualify himself to be a responsible bidder by furnishing any or all of the following data within 5 days following the Bid Opening:

(1) Evidence of Bidder's Certification and license to perform the work and services.

(2) Evidence of Bidder's experience to perform the work and financial statements reasonably available for 3 years immediately preceding the date of the Bid Opening.

(3) Bidder's financial resources, adequacy of plant and equipment, organization and prior experience (including a list setting forth twenty of the Successful Bidder's most recent projects and the name and address and telephone number of the owner of each such project). Financial information shall be certified by a Certified Public Accountant, and will be submitted on the Associated General Contractors of America Form "Standard Questionnaires and Financial Statement for Bidders" available from AGC, 1975 "E", NW, Washington, DC 20006; "Questionnaire" form Section 00430 (Included in Contract Document Specifications).

The Owner may make such other investigation as it deems necessary to determine the qualifications of the Bidder to perform the work and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may reasonably request. The Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder (1) Fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Contract, and to complete the work contemplated therein in a reasonable manner and time; or (2) Fails to satisfy the Owner that such Bidder has maintained a satisfactory safety record over the past 5 years. Conditional Bids will not be accepted.

Bidders shall comply with all applicable laws regulating the practice of General Contracting as contained in Chapter 87 of the General Statutes of North Carolina.

All Bidders must be General Contractors with Highway classification licensed in the State of North Carolina to perform work of a nature as required by the Contract Documents.

8. BID SECURITY:

Each bid must be accompanied by a Bid Bond, cash, cashier’s check or a certified check of the Bidder made payable to the Owner in an amount not less than five percent (5%) of the amount of the Base Bid. Bid Bonds shall be issued by a corporate surety licensed under the laws of North Carolina to execute such bonds.

The Bid Security shall be submitted in a separate sealed envelope from the Bid Proposal.

When the Bidder elects to submit a certified check or cashier’s check as his Bid Bond, the check shall be drawn on a bank or trust company insured by the Federal Deposit Insurance Corporation.

Where alternate items are included in the Bid, the amount of bid security shall be not less than five percent (5%) of the alternate, or combination of alternates, that result in the highest Bid.

Revised Bids submitted before the opening of Bids, if representing an increase of the original Bid, must have the Bid security adjusted accordingly, otherwise the Bid will not be considered.

The security of the Bidders will be released upon the earlier to occur of (a) the expiration of five days after the Contract has been signed by the accepted Bidder and the Owner; or (b) the expiration of sixty (60) days after the day the bids are opened, upon demand of any such bidders whose bid has not been accepted prior to such demand.

In the event that all Bids are rejected, the security of all Bidders whose security has not been previously returned will be returned at the time of such rejection.

9. COLLUSIVE AGREEMENTS:

Each Bidder submitting a Bid to the Owner for any portion of the work contemplated by the documents on which bidding is based, shall execute and attach thereto an affidavit substantially in the form herein provided, to the effect that he has not entered into a collusive agreement with any person, firm or corporation in regard to any Bid submitted.

Before executing any Sub-contract, the successful Bidder shall submit the name of any proposed Sub- contractor for prior approval and an affidavit substantially as above.

10. TAXES

The Contractor shall include in his Bid the cost of all sales and use taxes and furnish to the Owner with each progress pay application, a statement setting forth all such taxes paid. This statement shall indicate the amount paid to each firm and be adequate for audit by the State Department of Revenue.

11. SUBSTITUTIONS

In accordance with the provisions of G.S. 133-3, material, product, or equipment substitutions proposed by the bidders to those specified herein can only be considered during the bidding phase until ten (10) days prior to the receipt of bids when submitted to the Designer with sufficient data to confirm material, product, or equipment equality. Proposed substitutions submitted after this time will be considered only as potential change order.

Submittals for proposed substitutions shall include the following information:

a) Name, address, and telephone number of manufacturer and supplier as appropriate.

b) Trade name, model or catalog designation.

c) Product data including performance and test data, reference standards, and technical descriptions of material, product, or equipment. Include color samples and samples of available finishes as appropriate.

d) Detailed comparison with specified products including performance capabilities, warranties, and test results.

e) Other pertinent data including data requested by the Designer to confirm product equality. If a proposed material, product, or equipment substitution is deemed equal by the Designer to those specified, all bidders of record will be notified by Addendum.

12. COMPARISON OF BIDS:

Bids will be compared on the basis of the totals of the approximated quantities comprising all items, at the unit prices bid for these items. The resulting total Contract Bid Price will be compared which will include and cover the furnishing of all materials, and the performance of all labor requisite or proper, and completing of all the work called for under the accompanying Contract, and in the manner set forth and described in the Contract Documents.

The lowest Bidder under each Contract will be that Bidder whose Bid totals the lowest number of dollars as determined above.

When numbered Alternate bid items are required, the lowest Bidder is the Bidder whose bid for the Alternate or combination of Alternates, selected by the Owner is the lowest. The Owner reserves the right to select any Alternate or combinations of Alternates.

Where estimated quantities are included in certain items of the Bid, they are for the purpose of comparing bids. While they are believed to be close approximations, they are not guaranteed, and settlement will be made from such items upon the basis of work as actually executed at the unit prices in the Bid as accepted.

13. OPENING OF BIDS:

Upon opening, all bids shall be read aloud. Once bidding is closed, there shall not be any withdrawal of bids by any bidder and no bids may be returned by the

designer to any bidder. After the opening of bids, no bid may be withdrawn, except under the provisions of General Statute 143-129.1, for a period of thirty days unless otherwise specified. Should the successful bidder default and fail to execute a contract, the contract may be awarded to the next lowest and responsible bidder. The owner reserves the unqualified right to reject any and all bids.

14. AWARD OF CONTRACT:

The award of the Contract will be made to the lowest responsible, responsive bidder, who, in the opinion of the Owner, is qualified to perform the work required and is responsible and reliable. When Alternate Bid items are required in the Bid, the Contract will be awarded to that responsible Bidder who's Bid for the Alternate or combination of Alternates, selected by the Owner, is the lowest.

These Bids are asked for in good faith, and awards will be made as soon as practicable, provided satisfactory Bids are received.

The Owner may consider informal and reject any Bid not prepared and submitted in accordance with the provisions hereof.

The right is reserved to waive informalities in bidding, to reject any or all Bids, or to accept a Bid other than the lowest submitted if such action is deemed to be in the best interest of the Owner.

15. BONDS AND INSURANCE

The successful bidder, upon award of contract, shall furnish payment and performance bonds in an amount equal to 100% of the contract price. Each contractor 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. Bonds shall be executed in the form bound with these specifications. All bonds shall be countersigned by an authorized agent of the bonding company who is licensed to do business in North Carolina.

The successful bidder, upon award of contract, shall furnish evidence of insurance in the amounts of:

Worker's Compensation	
Bodily Injury, each accident	$1,000,000
Bodily Injury by Disease, each employee	$1,000,000
Bodily Injury/Disease Aggregate	$1,000,000
Commercial General Liability	
General Aggregate	$2,000,000
Products- Completed Operations Aggregate	$2,000,000
Personal Injury	$1,000,000

Each Occurrence (Bodily Injury and Property Damage)	$1,000,000
Automobile Liability	
Combined Single Limit	$1,000,000
Umbrella Liability	
Per Occurrence	$2,000,000
General Aggregate	$2,000,000

The City of Asheville shall be designated as a Co-Insured.

16. COMMENCEMENT OF WORK:

Upon execution and delivery of the Contract and the delivery of the required performance and payment bonds and insurance certificates and policies, the Contractor will be notified to proceed with the work of the Contract. The work of the Contract shall be commenced within ten (l0) days following such notification or as otherwise specified in the Notice to Proceed.

The Contractor shall notify the Capital Projects Project Manager in writing, of his intention to enter upon the site of the work at least five (5) days in advance of such entrance.

17. DAMAGES FOR FAILURE TO EXECUTE CONTRACT:

If an accepted Bidder shall fail or refuse to sign and deliver this Contract and the required surety bonds and insurance documentation within ten (10) days after he has received Notice of Award of his Bid, the Owner shall retain, as partial damages for such failure or refusal, the Bid security of such defaulting Bidder. In addition to such damages, the Owner reserves whatever other rights and remedies it may have against such defaulting Bidder.

Execution of the Contract shall include submission of a complete original Certificate of Insurance with proof of coverage as required and of the form required by the General and/or Supplementary Conditions of the Contract Documents, and shall include the execution of Performance and Payment Bonds in the full amount of the Contract.

18. EQUAL EMPLOYMENT OPPORTUNITY

Attention of Bidders is particularly called to the requirements for insuring that employees and applicants for employment are not discriminated against because of their race, color, religion, sex, or national origin.

19. PROGRESS SCHEDULE/TIME OF COMPLETION

The number of days for completion of the work, i.e., the Contract Time, is set forth in the Contract. The Contractor shall commence work on the date specified in the Notice to Proceed, and he shall complete the work within the stipulated Contract time.

20. Minimum Number of Bids for Public Contracts

No contract to which G.S. 143-129 applies for construction or repairs shall be awarded by the owner, unless at least three competitive bids have been received from reputable and qualified contractors regularly engaged in their respective lines of endeavor; however, this section shall not apply to contracts which are negotiated as provided for in North Carolina General Statute ("G.S.") 143-129.

Provided that if after advertisement for bids as required by G.S. 143-129, less than three competitive bids have been received from reputable and qualified contractors regularly engaged in their respective lines of endeavor, the Owner shall again advertise for bids; and if as a result of such second advertisement, less than three competitive bids from reputable and qualified contractors are received, the Owner may then let the contract to the lowest responsible bidder submitting a bid for the Project, even though only one bid is received.

21. IRAN DIVESTMENT ACT

By submitting this bid proposal, the Contractor certifies that, as of the date of submission, it is not on the Final Divestment List as created by the State Treasurer pursuant to N.C.G.S. § 147-86.58. In compliance with the requirements of the Iran Divestment Act and N.C. G. S. § 147-86.59, Contractor shall not utilize in the performance of the contract, any subcontractor that is identified on the Final Divestment List.

END

SECTION 00301

PROPOSAL

TO: **THE MAYOR AND CITY COUNCIL**
OF THE CITY OF ASHEVILLE, NORTH CAROLINA

FROM: **BIDDER**_____

ADDRESS_____

_____

DATE OF BID:_____, 2016

The undersigned hereby signifies that it is ____ (his/their) intention and purpose to enter into a formal Contract with the City of Asheville, N.C. to furnish all labor, materials, tools, equipment, apparatus, supplies, etc., required and to do all the work necessary for and because of the construction, erection, and/or installation of the proposed

BEAUCATCHER MOUNTAIN- GREENWAY TRAIL
CONTRACT NO. 1, PROJECT NO. 298 PR-16-17-001

for the City of Asheville, N.C. in accordance with the Consulting Engineers' Specifications; the terms of the **Advertisement for Bids** (copy of which is bound herein); the foregoing Instructions to Bidders, General Conditions and Specifications; this Proposal; the following forms of Contract and Bonds; and the Plans and/or Drawings, including Addenda Nos. *_____; and pursuant with the requirements of the Notice and Instructions to Bidders. There is deposited, herewith, cash, a certified check or cashier's check in the amount of: _____

_____Dollars ($_____),
or a Bid Bond in the amount of five percent of the total aggregate amount of this Bid (base bid plus alternates) made payable to the City of Asheville, the same to be refunded to the undersigned under the conditions of and in accordance with the terms of this Proposal which are as follows:

THAT: The undersigned has carefully examined the Plans and Specifications and all other Contract Documents and fully understands them.

THAT: The undersigned has carefully examined the site of the Project and is familiar with the conditions under which the work, or any part thereof, is to be performed and the conditions which must be fulfilled in furnishing and/or installing, erecting or constructing any or all items of the Project.

THAT: The undersigned will provide all necessary tools, machinery, equipment, apparatus, and all other means necessary to do all the work and will furnish all labor, materials and all else required to complete such Contract as may be entered into, in the manner prescribed in and in accordance with the terms of the Specifications and Contract and in accordance with the true intent and meaning thereof, and in accordance with the Plans and/or Drawings and the requirements of the Engineer under them, in a first class manner.

* Fill in appropriate Addenda number.

THAT: It is the intention of the City of Asheville to let Contracts on a basis of the Bids received in accordance with GS 143-129 and in such manner as they may deem to be for the best interests of the Owner.

THAT: The Owner reserves the right to reject any or all Proposals.

THAT: The project includes 4 alternative. The Owner may decide to implement any or all Alternatives if it is determined to be in the Owner's best interest. The lowest bid shall be determined by including the base bid and those alternate(s) selected by the owner.

THAT: On being awarded the Contract, the undersigned will execute a Performance Bond and a Payment Bond, on the forms included herein, each equal to one hundred percent of the Contract price, as security for the faithful performance of the Contract.

THAT: The undersigned shall submit, in the blank spaces provided, all data efficiencies, guarantees, and other information called for.

THAT: The undersigned shall submit, herewith, Drawings or Cuts and Specifications showing and describing in detail the equipment, material, and/or apparatus which the undersigned proposes to furnish.

THAT: This Proposal shall be signed and submitted in the manner prescribed in the Instructions to Bidders.

THAT: Should this Proposal not be accepted by the Mayor and City Council of City, the certified check or cashier's check, in the amount of_____Dollars ($_____) or the five percent Bid Bond, deposited herewith will be returned to the undersigned.

THAT: Should the Owner accept this Proposal and the undersigned fail or neglect to execute the Contract and furnish the required Bonds within ten days after receiving notifications of the acceptance of the Proposal and/or receipt of the formal Contract and Bond forms, the cash or certified check or cashier's check, in the amount of _____
_____Dollars ($_____)
or the Bid Bond deposited herewith shall be retained by the Owner as liquidated damages, it being understood that the Owner reserves the right to extend the time allowed for executing the Contract and/or furnishing the Bond.

THAT: The undersigned will complete such Contract as may be entered into within the number of consecutive calendar days specified in the Contract from the date specified in the Notice to Proceed.

THAT: It is the intent of these Contract Documents to obtain a Contract based on Unit Prices applied to the various portions of the work, except where Lump Sum Bid Prices are specifically requested. In the event of errors in the arithmetical extension of unit prices to total prices, the unit price bid shall govern, and the Award of the Contract shall be based on the recomputed total prices. If a Bidder submits a Bid showing a unit price for a particular item and omits an extended total for that item, or a Bidder submits a Bid showing an extended total for a particular item and omits a unit price for that item, the omitted numbers shall be computed using the following equation:

Estimated Quantity x Unit Price = Total Price

so that the omission shall render the Bid neither non-responsive nor incomplete. If the Bidder leaves blank any lines or spaces indicated for the dollar amount of any item in the Bid, that omission shall be understood and treated as if the Bidder had written in $0.00 for that particular item in the Bid. Before applying the preceding two sentences of this paragraph, the following rule shall apply in the special case that it describes: In places where it is indicated that a Bid should show both words and numerals for a particular dollar amount, and the Bid shows the dollar amount in numerals but omits to show any dollar amount in words (or vice versa), the Bid shall be treated as if it had shown the indicated dollar amount in both numerals and words.

THAT: The undersigned proposes to enter into a Contract in accordance with this Proposal and the Contract Documents included herein, for the price, or prices, shown on the following pages. Bidder acknowledges that the following quantities are approximate only and are given as the basis for comparison of Bids. The Owner may increase or decrease the quantity of any item or portion of the work as may be deemed necessary or expedient. An increase or decrease in the quantity of any item will not be regarded as sufficient grounds for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided for in the General and Supplemental Conditions.

THAT: The undersigned understands that there is a public art allowance attached as part of this contract. The amount of the allowance shall be 1% of the base bid minus $975,000 and 1% of any or all bid alternates that the Owner chooses to build. The bidder shall compute the base bid and produce a subtotal for the base bid, the bidder shall then compute the public art allowance based on the following equation:

(Sub-Total amount - $975,000) x 1% = Public Art Allowance Lump Sum

The bidder shall then compute the Total base bid based on the following equation:

Sub-Total + Public Art Allowance = Total Base Bid

The bidder shall compute the bid alternates and produce a subtotal for the bid alternates, the bidder shall then compute the public art allowance based on the following equation:

(Sub-Total amount of each bid alternate) x 1% = Public Art Allowance Lump Sum

The bidder shall then compute the Total bid alternate based on the following equation:

Sub-Total + Public Art Allowance = Total Bid for Bid Alternate #__

BASE PROPOSAL

BEAUCATCHER MOUNTAIN GREENWAY TRAIL

(BID FORM)

NOTE TO CONTRACTORS: DO NOT REMOVE THIS ITEMIZED PROPOSAL FROM THE SPECIFICATIONS

BID FOR UNIT PRICE CONTRACT

BEAUCATCHER MOUNTAIN
GREENWAY TRAIL
CONTRACT NO. 1, PROJECT NO. 298 PR-16-17-001

Bidder agrees to perform all of the greenway trail work described in the specifications and shown on the Contract Drawings for the unit prices listed below.

BEAUCATCHER MOUNTAIN - GREENWAY TRAIL BASE BID – L3 REV, L8REV3, L9, and L10					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Total Price
01010-1	Mobilization	LS	1		
01010-2	Construction Permits Allowance	LS	1		
01010-3	Construction Staking	LS	1		
02100-1	Clearing and Grubbing	AC	2.13		
02200-1	Grading	LS	1		
02200-2	Rock Excavation	CY	300		
02200-3	Undercut Excavation (replace with select fill material)	CY	210		
02200-4	Undercut Excavation (replace with aggregate base course)	CY	210		
02207-1	Aggregate Base Course	TN	1594		
02260-1	Shoulder Construction & Shaping	LF	2640		
02274-1	Geogrid	SY	210		
02274-2	Geotextile Separator Fabric	SY	3404		
02275-1	Permanent Soil Reinforcement Matting (PSRM)	SY	363		
02276-1	Silt Fence	LF	3446		
02276-2	Tree Protection Fence	LF	3034		
02276-3	Silt Fence Outlets	EA	24		
02276-4	Check Dam	EA	66		
02276-5	Sediment Control Stone (#57 Stone)	TN	0		
02276-6	Plain Rip Rap, Class A (Construction Entrance)	TN	955		
02276-7	Plain Rip Rap, Class B	TN	235		
02276-8	Plain Rip Rap, Class I	TN	67		

02276-9	Plain Rip Rap, Class II	TN	58		
02276-10	Filter Fabric	SY	20		
02276-11	Sediment Removal	CY	300		
02276-12	Site Inspections	DAYS	70		
02276-13	Excelsior Matting	SY	493		
02276-14	River Jacks (3/4"-1")	TN	0		
02276-15	River Jacks (5"-8")	TN	0		
02276-16	River Stones (8"-12")	TN	0		
02510-1	Asphalt Concrete Surface Course, Type S9.5B	TN	421		
02510-2	Asphalt Concrete Base Course, Type B25.0B	TN	10		
02510-3	Asphalt Binder for Plant Mix, Grade PG64-22	TN	282		
02510-4	Milling	SY	0		
02510-5	#67 Stone	TN	0		
02630-1	15-inch HDPE Pipe Culvert	LF	0		
02630-2	18-inch HDPE Pipe Culvert	LF	166		
02630-3	18-inch RCP CL IV Pipe Culvert	LF	616		
02630-4	24-inch RCP CL IV Pipe Culvert	LF	20		
02630-5	Catch Basin	EA	4		
02630-6	Headwalls	EA	18		
02630-7	Drop Inlet with Box and Grates	EA	8		
02630-8	Junction Box with Manhole	EA	5		
02831-1	Chain Link Fence, 6 ft.	LF	1		
02834-1	Precast Block Gravity Retaining Walls	SF	8759		
02844-1	Mechanically Stabilized Earth (MSE) Retaining Walls	SF	0		
02910-1	Temporary Seed and Mulch	AC	0.79		
02910-2	Permanent Seed and Mulch	AC	1.75		
02950-1	Trees	EA	5		
02950-2	Shrubs	EA	0		
02950-3	Ornamental Grasses (Liner 36 per tray)	Tray	174		
02950-4	Shredded Hardwood Mulch	CY	27.5		
02950-5	Additional Landscaping Allowance	LS	1	$ 11,447.79	$ 11,447.79
03300-1	Concrete Stairs with Cheek Wall (Sheet 2K)	CY	20		
03300-2	4.5” Concrete Sidewalk with 6” Curb	SY	259		
03300-3	4.5” Concrete Sidewalk	SY	494.37		
03300-4	6” Concrete Driveway	SY	119		
03300-5	Concrete Curb Ramps	EA	0		
03300-6	Surface Mounted monolithic concrete island	SY	0		
03300-7	Single Face Concrete Barrier	LF	0		
03300-8	1'-6" Concrete Curb and Gutter	LF	159		
03300-9	Concrete Paved Ditch	SY	86		
03300-10	Flowable Fill	CY	0		
03300-11	Concrete Washout Structure	EA	1		
03300-12	Concrete Paver System (Stone Base and Sand Setting Bed)	SF	0		
03300-13	Detectable Warning Mat (2'X4')	EA	2		

03300-14	Concrete SS Pipe Encasement (Sheet 2F)	CY	0		
05521-1	Safety Rail - Type 1(Sheet 2H)	LF	1382		
05521-2	Steel Backed Timber Guardrail (Sheet 2K1)	LF	0		
05521-3	Guardrail	LF	0		
05521-4	Guardrail Anchor Unit, Type AT-1	EA	0		
05521-5	Guardrail Anchor Unit, Type SBT-FAT (Sheet 2K2)	EA	0		
05521-6	Separator Rail (Sheet 2K)	LF	0		
05521-7	Safety Rail - Type 2 (Sheet 2H)	LF	0		
09900-1	Paint Stripe - Double Yellow Line - 4"	LF	0		
09900-2	Paint Stripe - Solid Yellow Line - 4"	LF	0		
09900-3	Paint - Parking Area	LF	228		
09900-4	Paint - 2" white Mini-Skips	LF	0		
09900-5	Paint - 2" white line	LF	0		
09910-1	Pavement Marking – Sharrows	EA	30		
09910-2	Pavement Marking – High Visibility Crosswalk	LF	0		
09910-3	Pavement Marking – Arrows	EA	0		
09910-4	Pavement Marking - Handicap Symbol	EA	0		
09910-5	Tubular Delineator (Sheet 2H)	EA	0		
09910-6	Pavement Marking - Custom Multi-Use Lane Symbol (Sheet 2G)	EA	0		
10431-1	Monument Sign (6/D1.4)	EA	1		
10500-1A	Kiosk (2/D1.1)	EA	1		
10500-1B	Interpretive sign (4/D1.1)	EA	1		
10500-1C	Regulations Sign (4/D1.2)	EA	2		
10500-1D	Directional Sign (1/D1.1)	EA	6		
10500-1E	Wayfinding Post (3/D1.1)	EA	0		
10500-1F	Mile Marker (5/D1.2)	EA	4		
10500-2A	Signs Type A (Trailhead Identification)	EA	1		
10500-2B	Signs Type B (18" x 18" R1-1 STOP Sign)	EA	1		
10500-2C	Signs Type C (12"x18" R9-6 Yield to Peds)	EA	2		
10500-2D	Signs Type D (18" x 18" W7-5 Steep Hill)	EA	3		
10500-2E	Signs Type E (12" x 18" Custom "Caution Steps Ahead" Signs)	EA	1		
10500-2F	Signs Type F (30"x30" W11-1 Bike Sign)	EA	0		
10500-2G	Signs Type G (18"x24" W16-1p Share the Road Sign)	EA	0		
10500-2H	Signs Type H (30"x30" W5-1 Road Narrows Sign)	EA	0		
10500-2I	Signs Type I (24"x12" W16-9p Ahead Sign)	EA	0		
10500-2J	Signs Type J (30"x30" W11-15 Bike and Peds Sign)	EA	0		
10500-2K	Signs Type K (18" x 12" Custom "Please Stay on the Greenway" Sign) (Sheet 2H)	EA	0		
10500-2L	Signs Type L (18"x24" R2-1 Speed Limit 20MPH Sign)	EA	0		
10500-2M	Signs Type M (24"x30" R6-6 Begin One Way Sign)	EA	0		
10500-2N	Signs Type N (30"x30" R5-1 Do Not Enter Sign)	EA	0		
10500-2O	Signs Type O (36"x24" R5-1a Wrong Way Sign)	EA	0		
10500-2P	Signs Type P (24"x30" R6-7 End One Way Sign)	EA	0		

10500-3	Accessible Parking Signs (1/D1.3)	EA	2		
10500-4	Relocate Sign Assembly	LS	0		
10900-1	Hinged Barrier Bollard (4/D1.0)	EA	2		
10900-2	Helen's Bridge Rail (3/D1.5)	LF	0		
10900-3	Black Steel Double Swing Gates (20LF)	EA	0		
10900-4	24LF Corten Steel Single Arm Swing Gate	EA	0		
10900-5	Emergency Call Box (6/D1.0)	EA	0		
10900-6	9"x7"x5' Timber Wheelstop (7/D1.3)	EA	0		
10900-7	Bench (2/D1.0)	EA	5		
10900-8	Trash Receptacles (1/D1.0)	EA	6		
10900-9	Bike Rack (5/D1.0)	EA	3		
10900-10	Pet Waste Station (3/D1.2)	EA	3		
10900-11	Natural Stone Column (6/D1.2)	EA	0		
10900-12	Natural Stone Seat Wall (1/D1.2)	SF	308		
10900-13	Place Boulders At Trailhead	LS	2		
10900-14	Split Rail Fence (3/D1.0)	LF	0		
10900-15	Remove Existing Gate and footings	LS	1		
10900-16	Remove Existing Bollards and footings	LS	1		
10900-17	Relocate Existing Mailboxes	LS	0		
16000-1	2” Sch 80 Elec. Conduit (HDPE)	LF	0		
16000-2	Electrical Junction Boxes	EA	3		
16000-3	40mm Triduct Communication Conduit (HDPE)	LF	3387		
16000-4	Relocate Existing Electrical Outlets	EA	0		
				Sub Total	_____

17000-1	Public Art Allowance	LS	1		
				TOTAL	_____

Contractor_____
(Print)

Note: Proposal signature required on Page 00301-27.

BID FOR ALTERNATIVE 1

White Faun Reservoir Spur

BEAUCATCHER MOUNTAIN
GREENWAY TRAIL

CONTRACT NO. 1, PROJECT NO. 298 PR-16-17-001

Bidder agrees to perform all of the greenway trail work described in the specifications and shown on the Contract Drawings for the unit prices listed below.

BEAUCATCHER MOUNTAIN - GREENWAY TRAIL - ALTERNATE 1 – L1_MOD, L1REV, L2, and L2A					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Total Price
	White Faun Spur				
01010-1	Mobilization	LS	1		
01010-2	Construction Permits Allowance	LS	1		
01010-3	Construction Staking	LS	1		
02100-1	Clearing and Grubbing	AC	3.04		
02200-1	Grading	LS	1		
02200-2	Rock Excavation	CY	200		
02200-3	Undercut Excavation (replace with select fill material)	CY	200		
02200-4	Undercut Excavation (replace with aggregate base course)	CY	200		
02207-1	Aggregate Base Course	TN	2002		
02260-1	Shoulder Construction & Shaping	LF	4127		
02274-1	Geogrid	SY	200		
02274-2	Geotextile Separator Fabric	SY	3748		
02275-1	Permanent Soil Reinforcement Matting (PSRM)	SY	64		
02276-1	Silt Fence	LF	2725		
02276-2	Tree Protection Fence	LF	1850		
02276-3	Silt Fence Outlets	EA	27		
02276-4	Check Dam	EA	59		
02276-5	Sediment Control Stone (#57 Stone)	TN	30		
02276-6	Plain Rip Rap, Class A (Construction Entrance)	TN	40		
02276-7	Plain Rip Rap, Class B	TN	15		
02276-8	Plain Rip Rap, Class I	TN	35		
02276-9	Plain Rip Rap, Class II	TN	0		
02276-10	Filter Fabric	SY	111		
02276-11	Sediment Removal	CY	120		
02276-12	Site Inspections	DAYS	45		
02276-13	Excelsior Matting	SY	115		
02276-14	River Jacks (3/4"-1")	TN	0		

02276-15	River Jacks (5"-8")	TN	0		
02276-16	River Stones (8"-12")	TN	0		
02510-1	Asphalt Concrete Surface Course, Type S9.5B	TN	450		
02510-2	Asphalt Concrete Base Course, Type B25.0B	TN	384		
02510-3	Asphalt Binder for Plant Mix, Grade PG64-22	TN	44		
02510-4	Milling	SY	0		
02510-5	#67 Stone	TN	76		
02630-1	15-inch HDPE Pipe Culvert	LF	0		
02630-2	18-inch HDPE Pipe Culvert	LF	0		
02630-3	18-inch RCP CL IV Pipe Culvert	LF	46		
02630-4	24-inch RCP CL IV Pipe Culvert	LF	0		
02630-5	Catch Basin	EA	0		
02630-6	Headwalls	EA	2		
02630-7	Drop Inlet with Box and Grates	EA	2		
02630-8	Junction Box with Manhole	EA	0		
02831-1	Chain Link Fence, 6 ft.	LF	0		
02834-1	Precast Block Gravity Retaining Walls	SF	4925		
02844-1	Mechanically Stabilized Earth (MSE) Retaining Walls	SF	0		
02910-1	Temporary Seed and Mulch	AC	0.75		
02910-2	Permanent Seed and Mulch	AC	2.25		
02950-1	Trees	EA	5		
02950-2	Shrubs	EA	10		
02950-3	Ornamental Grasses (Liner 36 per tray)	Tray	19		
02950-4	Shredded Hardwood Mulch	CY	4		
02950-5	Additional Landscaping Allowance	LS	1	$ 11,592.77	$ 11,592.77
03300-1	Concrete Stairs with Cheek Wall (Sheet 2K)	CY	52		
03300-2	4.5” Concrete Sidewalk with 6” Curb	SY	0		
03300-3	4.5” Concrete Sidewalk	SY	49		
03300-4	6” Concrete Driveway	SY	0		
03300-5	Concrete Curb Ramps	EA	0		
03300-6	Surface Mounted monolithic concrete island	SY	0		
03300-7	Single Face Concrete Barrier	LF	330		
03300-8	1'-6" Concrete Curb and Gutter	LF	0		
03300-9	Concrete Paved Ditch	SY	0		
03300-10	Flowable Fill	CY	1		
03300-11	Concrete Washout Structure	EA	1		
03300-12	Concrete Paver System (Stone Base and Sand Setting Bed)	SF	0		
03300-13	Detectable Warning Mat (2'X4')	EA	0		
03300-14	Concrete SS Pipe Encasement (Sheet 2F)	CY	0		
05521-1	Safety Rail - Type 1(Sheet 2H)	LF	2069		
05521-2	Steel Backed Timber Guardrail (Sheet 2K1)	LF	236		
05521-3	Guardrail	LF	346		
05521-4	Guardrail Anchor Unit, Type AT-1	EA	2		
05521-5	Guardrail Anchor Unit, Type SBT-FAT (Sheet 2K2)	EA	0		

05521-6	Separator Rail (Sheet 2K)	LF	0		
05521-7	Safety Rail - Type 2 (Sheet 2H)	LF	0		
09900-1	Paint Stripe - Double Yellow Line - 4"	LF	0		
09900-2	Paint Stripe - Solid Yellow Line - 4"	LF	0		
09900-3	Paint - Parking Area	LF	0		
09900-4	Paint - 2" white Mini-Skips	LF	0		
09900-5	Paint - 2" white line	LF	65		
09910-1	Pavement Marking – Sharrows	EA	0		
09910-2	Pavement Marking – High Visibility Crosswalk	LF	0		
09910-3	Pavement Marking – Arrows	EA	0		
09910-4	Pavement Marking - Handicap Symbol	EA	1		
09910-5	Tubular Delineator (Sheet 2H)	EA	0		
09910-6	Pavement Marking - Custom Multi-Use Lane Symbol (Sheet 2G)	EA	0		
10431-1	Monument Sign (6/D1.4)	EA	0		
10500-1A	Kiosk (2/D1.1)	EA	1		
10500-1B	Interpretive sign (4/D1.1)	EA	1		
10500-1C	Regulations Sign (4/D1.2)	EA	0		
10500-1D	Directional Sign (1/D1.1)	EA	0		
10500-1E	Wayfinding Post (3/D1.1)	EA	1		
10500-1F	Mile Marker (5/D1.2)	EA	0		
10500-2A	Signs Type A (Trailhead Identification)	EA	0		
10500-2B	Signs Type B (18" x 18" R1-1 STOP Sign)	EA	4		
10500-2C	Signs Type C (12"x18" R9-6 Yield to Peds)	EA	0		
10500-2D	Signs Type D (18" x 18" W7-5 Steep Hill)	EA	6		
10500-2E	Signs Type E (12" x 18" Custom "Caution Steps Ahead" Signs)	EA	0		
10500-2F	Signs Type F (30"x30" W11-1 Bike Sign)	EA	0		
10500-2G	Signs Type G (18"x24" W16-1p Share the Road Sign)	EA	0		
10500-2H	Signs Type H (30"x30" W5-1 Road Narrows Sign)	EA	0		
10500-2I	Signs Type I (24"x12" W16-9p Ahead Sign)	EA	0		
10500-2J	Signs Type J (30"x30" W11-15 Bike and Peds Sign)	EA	0		
10500-2K	Signs Type K (18" x 12" Custom "Please Stay on the Greenway" Sign) (Sheet 2H)	EA	0		
10500-2L	Signs Type L (18"x24" R2-1 Speed Limit 20MPH Sign)	EA	0		
10500-2M	Signs Type M (24"x30" R6-6 Begin One Way Sign)	EA	0		
10500-2N	Signs Type N (30"x30" R5-1 Do Not Enter Sign)	EA	0		
10500-2O	Signs Type O (36"x24" R5-1a Wrong Way Sign)	EA	0		
10500-2P	Signs Type P (24"x30" R6-7 End One Way Sign)	EA	0		
10500-3	Accessible Parking Signs (1/D1.3)	EA	2		
10500-4	Relocate Sign Assembly	LS	0		
10900-1	Hinged Barrier Bollard (4/D1.0)	EA	2		
10900-2	Helen's Bridge Rail (3/D1.5)	LF	0		
10900-3	Black Steel Double Swing Gates (20LF)	EA	0		
10900-4	24LF Corten Steel Single Arm Swing Gate	EA	1		

10900-5	Emergency Call Box (6/D1.0)	EA	1		
10900-6	9"x7"x5' Timber Wheelstop (7/D1.3)	EA	12		
10900-7	Bench (2/D1.0)	EA	0		
10900-8	Trash Receptacles (1/D1.0)	EA	1		
10900-9	Bike Rack (5/D1.0)	EA	0		
10900-10	Pet Waste Station (3/D1.2)	EA	1		
10900-11	Natural Stone Column (6/D1.2)	EA	0		
10900-12	Natural Stone Seat Wall (1/D1.2)	SF	0		
10900-13	Place Boulders At Trailhead	LS	0		
10900-14	Split Rail Fence (3/D1.0)	LF	228		
10900-15	Remove Existing Gate and footings	LS	0		
10900-16	Remove Existing Bollards and footings	LS	0		
10900-17	Relocate Existing Mailboxes	LS	0		
16000-1	2” Sch 80 Elec. Conduit (HDPE)	LF	0		
16000-2	Electrical Junction Boxes	EA	0		
16000-3	40mm Triduct Communication Conduit (HDPE)	LF	2451		
16000-4	Relocate Existing Electrical Outlets	EA	0		

Sub Total _____

17000-1	Public Art Allowance	LS	1		

Total Alternate 1 Add _____

Contractor_____
(Print)

Note: Proposal signature required on Page 00301-27.

BID FOR ALTERNATIVE 2

Helen's Bridge Upper Trailhead

BEAUCATCHER MOUNTAIN
GREENWAY TRAIL

CONTRACT NO. 1, PROJECT NO. 298 PR-16-17-001

Bidder agrees to perform all of the greenway trail work described in the specifications and shown on the Contract Drawings for the unit prices listed below.

BEAUCATCHER MOUNTAIN - GREENWAY TRAIL - ALTERNATE 2 –HELEN'S BRIDGE UPPER					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Total Price
	Hellen's Bridge Trailheads				
01010-1	Mobilization	LS	1		
01010-2	Construction Permits Allowance	LS	1		
01010-3	Construction Staking	LS	1		
02100-1	Clearing and Grubbing	AC	0.082		
02200-1	Grading	LS	1		
02200-2	Rock Excavation	CY	100		
02200-3	Undercut Excavation (replace with select fill material)	CY	10		
02200-4	Undercut Excavation (replace with aggregate base course)	CY	10		
02207-1	Aggregate Base Course	TN	145		
02260-1	Shoulder Construction & Shaping	LF	0		
02274-1	Geogrid	SY	10		
02274-2	Geotextile Separator Fabric	SY	0		
02275-1	Permanent Soil Reinforcement Matting (PSRM)	SY	0		
02276-1	Silt Fence	LF	142		
02276-2	Tree Protection Fence	LF	0		
02276-3	Silt Fence Outlets	EA	0		
02276-4	Check Dam	EA	0		
02276-5	Sediment Control Stone (#57 Stone)	TN	0		
02276-6	Plain Rip Rap, Class A (Construction Entrance)	TN	0		
02276-7	Plain Rip Rap, Class B	TN	0		
02276-8	Plain Rip Rap, Class I	TN	0		
02276-9	Plain Rip Rap, Class II	TN	0		
02276-10	Filter Fabric	SY	0		
02276-11	Sediment Removal	CY	50		
02276-12	Site Inspections	DAYS	10		
02276-13	Excelsior Matting	SY	0		
02276-14	River Jacks (3/4"-1")	TN	0		

02276-15	River Jacks (5"-8")	TN	0		
02276-16	River Stones (8"-12")	TN	0		
02510-1	Asphalt Concrete Surface Course, Type S9.5B	TN	0		
02510-2	Asphalt Concrete Base Course, Type B25.0B	TN	0		
02510-3	Asphalt Binder for Plant Mix, Grade PG64-22	TN	0		
02510-4	Milling	SY	0		
02510-5	#67 Stone	TN	0		
02630-1	15-inch HDPE Pipe Culvert	LF	0		
02630-2	18-inch HDPE Pipe Culvert	LF	0		
02630-3	18-inch RCP CL IV Pipe Culvert	LF	0		
02630-4	24-inch RCP CL IV Pipe Culvert	LF	0		
02630-5	Catch Basin	EA	0		
02630-6	Headwalls	EA	0		
02630-7	Drop Inlet with Box and Grates	EA	0		
02630-8	Junction Box with Manhole	EA	0		
02831-1	Chain Link Fence, 6 ft.	LF	30		
02834-1	Precast Block Gravity Retaining Walls	SF	599		
02844-1	Mechanically Stabilized Earth (MSE) Retaining Walls	SF	0		
02910-1	Temporary Seed and Mulch	AC	0		
02910-2	Permanent Seed and Mulch	AC	0		
02950-1	Trees	EA	2		
02950-2	Shrubs	EA	0		
02950-3	Ornamental Grasses (Liner 36 per tray)	Tray	25		
02950-4	Shredded Hardwood Mulch	CY	3.5		
02950-5	Additional Landscaping Allowance	LS	0	$0.00	$0.00
03300-1	Concrete Stairs with Cheek Wall (Sheet 2K)	CY	0		
03300-2	4.5” Concrete Sidewalk with 6” Curb	SY	0		
03300-3	4.5” Concrete Sidewalk	SY	119		
03300-4	6” Concrete Driveway	SY	93		
03300-5	Concrete Curb Ramps	EA	0		
03300-6	Surface Mounted monolithic concrete island	SY	0		
03300-7	Single Face Concrete Barrier	LF	0		
03300-8	1'-6" Concrete Curb and Gutter	LF	0		
03300-9	Concrete Paved Ditch	SY	0		
03300-10	Flowable Fill	CY	0		
03300-11	Concrete Washout Structure	EA	0		
03300-12	Concrete Paver System (Stone Base and Sand Setting Bed)	SF	838		
03300-13	Detectable Warning Mat (2'X4')	EA	0		
03300-14	Concrete SS Pipe Encasement (Sheet 2F)	CY	0		
05521-1	Safety Rail - Type 1(Sheet 2H)	LF	0		
05521-2	Steel Backed Timber Guardrail (Sheet 2K1)	LF	0		
05521-3	Guardrail	LF	81		
05521-4	Guardrail Anchor Unit, Type AT-1	EA	0		
05521-5	Guardrail Anchor Unit, Type SBT-FAT (Sheet 2K2)	EA	0		

05521-6	Separator Rail (Sheet 2K)	LF	0		
05521-7	Safety Rail - Type 2 (Sheet 2H)	LF	0		
09900-1	Paint Stripe - Double Yellow Line - 4"	LF	0		
09900-2	Paint Stripe - Solid Yellow Line - 4"	LF	0		
09900-3	Paint - Parking Area	LF	66		
09900-4	Paint - 2" white Mini-Skips	LF	0		
09900-5	Paint - 2" white line	LF	0		
09910-1	Pavement Marking – Sharrows	EA	0		
09910-2	Pavement Marking – High Visibility Crosswalk	LF	0		
09910-3	Pavement Marking – Arrows	EA	0		
09910-4	Pavement Marking - Handicap Symbol	EA	0		
09910-5	Tubular Delineator (Sheet 2H)	EA	0		
09910-6	Pavement Marking - Custom Multi-Use Lane Symbol (Sheet 2G)	EA	0		
10431-1	Monument Sign (6/D1.4)	EA	0		
10500-1A	Kiosk (2/D1.1)	EA	0		
10500-1B	Interpretive sign (4/D1.1)	EA	1		
10500-1C	Regulations Sign (4/D1.2)	EA	0		
10500-1D	Directional Sign (1/D1.1)	EA	0		
10500-1E	Wayfinding Post (3/D1.1)	EA	0		
10500-1F	Mile Marker (5/D1.2)	EA	0		
10500-2A	Signs Type A (Trailhead Identification)	EA	0		
10500-2B	Signs Type B (18" x 18" R1-1 STOP Sign)	EA	0		
10500-2C	Signs Type C (12"x18" R9-6 Yield to Peds)	EA	0		
10500-2D	Signs Type D (18" x 18" W7-5 Steep Hill)	EA	0		
10500-2E	Signs Type E (12" x 18" Custom "Caution Steps Ahead" Signs)	EA	0		
10500-2F	Signs Type F (30"x30" W11-1 Bike Sign)	EA	0		
10500-2G	Signs Type G (18"x24" W16-1p Share the Road Sign)	EA	0		
10500-2H	Signs Type H (30"x30" W5-1 Road Narrows Sign)	EA	0		
10500-2I	Signs Type I (24"x12" W16-9p Ahead Sign)	EA	0		
10500-2J	Signs Type J (30"x30" W11-15 Bike and Peds Sign)	EA	0		
10500-2K	Signs Type K (18" x 12" Custom "Please Stay on the Greenway" Sign) (Sheet 2H)	EA	0		
10500-2L	Signs Type L (18"x24" R2-1 Speed Limit 20MPH Sign)	EA	0		
10500-2M	Signs Type M (24"x30" R6-6 Begin One Way Sign)	EA	0		
10500-2N	Signs Type N (30"x30" R5-1 Do Not Enter Sign)	EA	0		
10500-2O	Signs Type O (36"x24" R5-1a Wrong Way Sign)	EA	0		
10500-2P	Signs Type P (24"x30" R6-7 End One Way Sign)	EA	0		
10500-3	Accessible Parking Signs (1/D1.3)	EA	2		
10500-4	Relocate Sign Assembly	LS	0		
10900-1	Hinged Barrier Bollard (4/D1.0)	EA	0		
10900-2	Helen's Bridge Rail (3/D1.5)	LF	25		
10900-3	Black Steel Double Swing Gates (20LF)	EA	0		
10900-4	24LF Corten Steel Single Arm Swing Gate	EA	1		

10900-5	Emergency Call Box (6/D1.0)	EA	1		
10900-6	9"x7"x5' Timber Wheelstop (7/D1.3)	EA	1		
10900-7	Bench (2/D1.0)	EA	0		
10900-8	Trash Receptacles (1/D1.0)	EA	0		
10900-9	Bike Rack (5/D1.0)	EA	0		
10900-10	Pet Waste Station (3/D1.2)	EA	0		
10900-11	Natural Stone Column (6/D1.2)	EA	2		
10900-12	Natural Stone Seat Wall (1/D1.2)	SF	207		
10900-13	Place Boulders At Trailhead	LS	0		
10900-14	Split Rail Fence (3/D1.0)	LF	20		
10900-15	Remove Existing Gate and footings	LS	0		
10900-16	Remove Existing Bollards and footings	LS	0		
10900-17	Relocate Existing Mailboxes	LS	0		
16000-1	2” Sch 80 Elec. Conduit (HDPE)	LF	0		
16000-2	Electrical Junction Boxes	EA	0		
16000-3	40mm Triduct Communication Conduit (HDPE)	LF	0		
16000-4	Relocate Existing Electrical Outlets	EA	0		

Sub Total _____

17000-1	Public Art Allowance	LS	1		

Total Alternate 2 Add _____

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Note: Proposal signature required on Page 00301-27.

BID FOR ALTERNATIVE 3

Ardmion Park Road to South Beaumont Street

BEAUCATCHER MOUNTAIN
GREENWAY TRAIL

CONTRACT NO. 1, PROJECT NO. 298 PR-16-17-001

Bidder agrees to perform all of the greenway trail work described in the specifications and shown on the Contract Drawings for the unit prices listed below.

BEAUCATCHER MOUNTAIN - GREENWAY TRAIL - ALTERNATE 3 –L4 ALT2, L5REV, and L6					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Total Price
	Hellen's Bridge Trailheads				
01010-1	Mobilization	LS	1		
01010-2	Construction Permits Allowance	LS	1		
01010-3	Construction Staking	LS	1		
02100-1	Clearing and Grubbing	AC	1.44		
02200-1	Grading	LS	1		
02200-2	Rock Excavation	CY	120		
02200-3	Undercut Excavation (replace with select fill material)	CY	120		
02200-4	Undercut Excavation (replace with aggregate base course)	CY	120		
02207-1	Aggregate Base Course	TN	1242		
02260-1	Shoulder Construction & Shaping	LF	3710		
02274-1	Geogrid	SY	120		
02274-2	Geotextile Separator Fabric	SY	2411		
02275-1	Permanent Soil Reinforcement Matting (PSRM)	SY	17		
02276-1	Silt Fence	LF	2343		
02276-2	Tree Protection Fence	LF	3354		
02276-3	Silt Fence Outlets	EA	22		
02276-4	Check Dam	EA	38		
02276-5	Sediment Control Stone (#57 Stone)	TN	880		
02276-6	Plain Rip Rap, Class A (Construction Entrance)	TN	15		
02276-7	Plain Rip Rap, Class B	TN	65		
02276-8	Plain Rip Rap, Class I	TN	224		
02276-9	Plain Rip Rap, Class II	TN	0		
02276-10	Filter Fabric	SY	221		
02276-11	Sediment Removal	CY	60		
02276-12	Site Inspections	DAYS	30		
02276-13	Excelsior Matting	SY	0		
02276-14	River Jacks (3/4"-1")	TN	0		

02276-15	River Jacks (5"-8")	TN	0		
02276-16	River Stones (8"-12")	TN	0		
02510-1	Asphalt Concrete Surface Course, Type S9.5B	TN	335		
02510-2	Asphalt Concrete Base Course, Type B25.0B	TN	62		
02510-3	Asphalt Binder for Plant Mix, Grade PG64-22	TN	24		
02510-4	Milling	SY	0		
02510-5	#67 Stone	TN	0		
02630-1	15-inch HDPE Pipe Culvert	LF	5		
02630-2	18-inch HDPE Pipe Culvert	LF	0		
02630-3	18-inch RCP CL IV Pipe Culvert	LF	25		
02630-4	24-inch RCP CL IV Pipe Culvert	LF	32		
02630-5	Catch Basin	EA	0		
02630-6	Headwalls	EA	3		
02630-7	Drop Inlet with Box and Grates	EA	1		
02630-8	Junction Box with Manhole	EA	1		
02831-1	Chain Link Fence, 6 ft.	LF	0		
02834-1	Precast Block Gravity Retaining Walls	SF	7447		
02844-1	Mechanically Stabilized Earth (MSE) Retaining Walls	SF	0		
02910-1	Temporary Seed and Mulch	AC	0.5		
02910-2	Permanent Seed and Mulch	AC	1.27		
02950-1	Trees	EA	1		
02950-2	Shrubs	EA	0		
02950-3	Ornamental Grasses (Liner 36 per tray)	Tray	37		
02950-4	Shredded Hardwood Mulch	CY	8.5		
02950-5	Additional Landscaping Allowance	LS	1	$ 7,459.44	$ 7,459.44
03300-1	Concrete Stairs with Cheek Wall (Sheet 2K)	CY	0		
03300-2	4.5” Concrete Sidewalk with 6” Curb	SY	616		
03300-3	4.5” Concrete Sidewalk	SY	557		
03300-4	6” Concrete Driveway	SY	83		
03300-5	Concrete Curb Ramps	EA	6		
03300-6	Surface Mounted monolithic concrete island	SY	0		
03300-7	Single Face Concrete Barrier	LF	0		
03300-8	1'-6" Concrete Curb and Gutter	LF	127		
03300-9	Concrete Paved Ditch	SY	117		
03300-10	Flowable Fill	CY	3		
03300-11	Concrete Washout Structure	EA	1		
03300-12	Concrete Paver System (Stone Base and Sand Setting Bed)	SF	0		
03300-13	Detectable Warning Mat (2'X4')	EA	0		
03300-14	Concrete SS Pipe Encasement (Sheet 2F)	CY	3.5		
05521-1	Safety Rail - Type 1(Sheet 2H)	LF	20		
05521-2	Steel Backed Timber Guardrail (Sheet 2K1)	LF	0		
05521-3	Guardrail	LF	0		
05521-4	Guardrail Anchor Unit, Type AT-1	EA	0		
05521-5	Guardrail Anchor Unit, Type SBT-FAT (Sheet 2K2)	EA	0		

05521-6	Separator Rail (Sheet 2K)	LF	428		
05521-7	Safety Rail - Type 2 (Sheet 2H)	LF	558		
09900-1	Paint Stripe - Double Yellow Line - 4"	LF	0		
09900-2	Paint Stripe - Solid Yellow Line - 4"	LF	73		
09900-3	Paint - Parking Area	LF	27		
09900-4	Paint - 2" white Mini-Skips	LF	0		
09900-5	Paint - 2" white line	LF	0		
09910-1	Pavement Marking – Sharrows	EA	12		
09910-2	Pavement Marking – High Visibility Crosswalk	LF	146		
09910-3	Pavement Marking – Arrows	EA	0		
09910-4	Pavement Marking - Handicap Symbol	EA	0		
09910-5	Tubular Delineator (Sheet 2H)	EA	3		
09910-6	Pavement Marking - Custom Multi-Use Lane Symbol (Sheet 2G)	EA	3		
10431-1	Monument Sign (6/D1.4)	EA	0		
10500-1A	Kiosk (2/D1.1)	EA	0		
10500-1B	Interpretive sign (4/D1.1)	EA	1		
10500-1C	Regulations Sign (4/D1.2)	EA	0		
10500-1D	Directional Sign (1/D1.1)	EA	0		
10500-1E	Wayfinding Post (3/D1.1)	EA	2		
10500-1F	Mile Marker (5/D1.2)	EA	2		
10500-2A	Signs Type A (Trailhead Identification)	EA	0		
10500-2B	Signs Type B (18" x 18" R1-1 STOP Sign)	EA	1		
10500-2C	Signs Type C (12"x18" R9-6 Yield to Peds)	EA	2		
10500-2D	Signs Type D (18" x 18" W7-5 Steep Hill)	EA	1		
10500-2E	Signs Type E (12" x 18" Custom "Caution Steps Ahead" Signs)	EA	0		
10500-2F	Signs Type F (30"x30" W11-1 Bike Sign)	EA	2		
10500-2G	Signs Type G (18"x24" W16-1p Share the Road Sign)	EA	3		
10500-2H	Signs Type H (30"x30" W5-1 Road Narrows Sign)	EA	2		
10500-2I	Signs Type I (24"x12" W16-9p Ahead Sign)	EA	2		
10500-2J	Signs Type J (30"x30" W11-15 Bike and Peds Sign)	EA	2		
10500-2K	Signs Type K (18" x 12" Custom "Please Stay on the Greenway" Sign) (Sheet 2H)	EA	6		
10500-2L	Signs Type L (18"x24" R2-1 Speed Limit 20MPH Sign)	EA	2		
10500-2M	Signs Type M (24"x30" R6-6 Begin One Way Sign)	EA	0		
10500-2N	Signs Type N (30"x30" R5-1 Do Not Enter Sign)	EA	0		
10500-2O	Signs Type O (36"x24" R5-1a Wrong Way Sign)	EA	0		
10500-2P	Signs Type P (24"x30" R6-7 End One Way Sign)	EA	0		
10500-3	Accessible Parking Signs (1/D1.3)	EA	0		
10500-4	Relocate Sign Assembly	LS	1		
10900-1	Hinged Barrier Bollard (4/D1.0)	EA	4		
10900-2	Helen's Bridge Rail (3/D1.5)	LF	0		
10900-3	Black Steel Double Swing Gates (20LF)	EA	0		
10900-4	24LF Corten Steel Single Arm Swing Gate	EA	0		

10900-5	Emergency Call Box (6/D1.0)	EA	1		
10900-6	9"x7"x5' Timber Wheelstop (7/D1.3)	EA	0		
10900-7	Bench (2/D1.0)	EA	2		
10900-8	Trash Receptacles (1/D1.0)	EA	2		
10900-9	Bike Rack (5/D1.0)	EA	0		
10900-10	Pet Waste Station (3/D1.2)	EA	1		
10900-11	Natural Stone Column (6/D1.2)	EA	0		
10900-12	Natural Stone Seat Wall (1/D1.2)	SF	0		
10900-13	Place Boulders At Trailhead	LS	1		
10900-14	Split Rail Fence (3/D1.0)	LF	635		
10900-15	Remove Existing Gate and footings	LS	0		
10900-16	Remove Existing Bollards and footings	LS	0		
10900-17	Relocate Existing Mailboxes	LS	1		
16000-1	2” Sch 80 Elec. Conduit (HDPE)	LF	560		
16000-2	Electrical Junction Boxes	EA	16		
16000-3	40mm Triduct Communication Conduit (HDPE)	LF	2390		
16000-4	Relocate Existing Electrical Outlets	EA	5		
				Sub Total	_____

17000-1	Public Art Allowance	LS	1		
				Total Alternate 3 Add	_____

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Note: Proposal signature required on Page 00301-27.

BID FOR ALTERNATIVE 4

South Beaumont Street to Helen's Bridge Lower Trailhead

BEAUCATCHER MOUNTAIN
GREENWAY TRAIL

CONTRACT NO. 1, PROJECT NO. 298 PR-16-17-001

Bidder agrees to perform all of the greenway trail work described in the specifications and shown on the Contract Drawings for the unit prices listed below.

BEAUCATCHER MOUNTAIN - GREENWAY TRAIL - ALTERNATE 4 –L7A, L7C, and HELEN'S BRIDGE LOWER					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Total Price
	Hellen's Bridge Trailheads				
01010-1	Mobilization	LS	1		
01010-2	Construction Permits Allowance	LS	1		
01010-3	Construction Staking	LS	1		
02100-1	Clearing and Grubbing	AC	0.5		
02200-1	Grading	LS	1		
02200-2	Rock Excavation	CY	200		
02200-3	Undercut Excavation (replace with select fill material)	CY	110		
02200-4	Undercut Excavation (replace with aggregate base course)	CY	110		
02207-1	Aggregate Base Course	TN	158		
02260-1	Shoulder Construction & Shaping	LF	0		
02274-1	Geogrid	SY	110		
02274-2	Geotextile Separator Fabric	SY	0		
02275-1	Permanent Soil Reinforcement Matting (PSRM)	SY	17		
02276-1	Silt Fence	LF	526		
02276-2	Tree Protection Fence	LF	526		
02276-3	Silt Fence Outlets	EA	2		
02276-4	Check Dam	EA	3		
02276-5	Sediment Control Stone (#57 Stone)	TN	25		
02276-6	Plain Rip Rap, Class A (Construction Entrance)	TN	0		
02276-7	Plain Rip Rap, Class B	TN	25		
02276-8	Plain Rip Rap, Class I	TN	8		
02276-9	Plain Rip Rap, Class II	TN	0		
02276-10	Filter Fabric	SY	139		
02276-11	Sediment Removal	CY	150		
02276-12	Site Inspections	DAYS	40		
02276-13	Excelsior Matting	SY	0		
02276-14	River Jacks (3/4"-1")	TN	1		

02276-15	River Jacks (5"-8")	TN	1		
02276-16	River Stones (8"-12")	TN	1		
02510-1	Asphalt Concrete Surface Course, Type S9.5B	TN	38		
02510-2	Asphalt Concrete Base Course, Type B25.0B	TN	88		
02510-3	Asphalt Binder for Plant Mix, Grade PG64-22	TN	6		
02510-4	Milling	SY	695		
02510-5	#67 Stone	TN	52		
02630-1	15-inch HDPE Pipe Culvert	LF	0		
02630-2	18-inch HDPE Pipe Culvert	LF	0		
02630-3	18-inch RCP CL IV Pipe Culvert	LF	57		
02630-4	24-inch RCP CL IV Pipe Culvert	LF	0		
02630-5	Catch Basin	EA	0		
02630-6	Headwalls	EA	1		
02630-7	Drop Inlet with Box and Grates	EA	2		
02630-8	Junction Box with Manhole	EA	0		
02831-1	Chain Link Fence, 6 ft.	LF	0		
02834-1	Precast Block Gravity Retaining Walls	SF	2471		
02844-1	Mechanically Stabilized Earth (MSE) Retaining Walls	SF	0		
02910-1	Temporary Seed and Mulch	AC	0		
02910-2	Permanent Seed and Mulch	AC	0.1		
02950-1	Trees	EA	2		
02950-2	Shrubs	EA	0		
02950-3	Ornamental Grasses (Liner 36 per tray)	Tray	32		
02950-4	Shredded Hardwood Mulch	CY	6.5		
02950-5	Additional Landscaping Allowance	LS	0		
03300-1	Concrete Stairs with Cheek Wall (Sheet 2K)	CY	20	$0.00	$0.00
03300-2	4.5” Concrete Sidewalk with 6” Curb	SY	553		
03300-3	4.5” Concrete Sidewalk	SY	88		
03300-4	6” Concrete Driveway	SY	55		
03300-5	Concrete Curb Ramps	EA	2		
03300-6	Surface Mounted monolithic concrete island	SY	24		
03300-7	Single Face Concrete Barrier	LF	0		
03300-8	1'-6" Concrete Curb and Gutter	LF	0		
03300-9	Concrete Paved Ditch	SY	0		
03300-10	Flowable Fill	CY	0		
03300-11	Concrete Washout Structure	EA	1		
03300-12	Concrete Paver System (Stone Base and Sand Setting Bed)	SF	0		
03300-13	Detectable Warning Mat (2'X4')	EA	0		
03300-14	Concrete SS Pipe Encasement (Sheet 2F)	CY	6.5		
05521-1	Safety Rail - Type 1(Sheet 2H)	LF	252		
05521-2	Steel Backed Timber Guardrail (Sheet 2K1)	LF	0		
05521-3	Guardrail	LF	238		
05521-4	Guardrail Anchor Unit, Type AT-1	EA	0		
05521-5	Guardrail Anchor Unit, Type SBT-FAT (Sheet 2K2)	EA	2		

05521-6	Separator Rail (Sheet 2K)	LF	0		
05521-7	Safety Rail - Type 2 (Sheet 2H)	LF	0		
09900-1	Paint Stripe - Double Yellow Line - 4"	LF	66		
09900-2	Paint Stripe - Solid Yellow Line - 4"	LF	0		
09900-3	Paint - Parking Area	LF	100		
09900-4	Paint - 2" white Mini-Skips	LF	50		
09900-5	Paint - 2" white line	LF	51		
09910-1	Pavement Marking – Sharrows	EA	4		
09910-2	Pavement Marking – High Visibility Crosswalk	LF	40		
09910-3	Pavement Marking – Arrows	EA	2		
09910-4	Pavement Marking - Handicap Symbol	EA	0		
09910-5	Tubular Delineator (Sheet 2H)	EA	0		
09910-6	Pavement Marking - Custom Multi-Use Lane Symbol (Sheet 2G)	EA	0		
10431-1	Monument Sign (6/D1.4)	EA	1		
10500-1A	Kiosk (2/D1.1)	EA	1		
10500-1B	Interpretive sign (4/D1.1)	EA	0		
10500-1C	Regulations Sign (4/D1.2)	EA	0		
10500-1D	Directional Sign (1/D1.1)	EA	0		
10500-1E	Wayfinding Post (3/D1.1)	EA	0		
10500-1F	Mile Marker (5/D1.2)	EA	2		
10500-2A	Signs Type A (Trailhead Identification)	EA	1		
10500-2B	Signs Type B (18" x 18" R1-1 STOP Sign)	EA	0		
10500-2C	Signs Type C (12"x18" R9-6 Yield to Peds)	EA	0		
10500-2D	Signs Type D (18" x 18" W7-5 Steep Hill)	EA	0		
10500-2E	Signs Type E (12" x 18" Custom "Caution Steps Ahead" Signs)	EA	0		
10500-2F	Signs Type F (30"x30" W11-1 Bike Sign)	EA	1		
10500-2G	Signs Type G (18"x24" W16-1p Share the Road Sign)	EA	1		
10500-2H	Signs Type H (30"x30" W5-1 Road Narrows Sign)	EA	0		
10500-2I	Signs Type I (24"x12" W16-9p Ahead Sign)	EA	0		
10500-2J	Signs Type J (30"x30" W11-15 Bike and Peds Sign)	EA	0		
10500-2K	Signs Type K (18" x 12" Custom "Please Stay on the Greenway" Sign) (Sheet 2H)	EA	0		
10500-2L	Signs Type L (18"x24" R2-1 Speed Limit 20MPH Sign)	EA	0		
10500-2M	Signs Type M (24"x30" R6-6 Begin One Way Sign)	EA	2		
10500-2N	Signs Type N (30"x30" R5-1 Do Not Enter Sign)	EA	2		
10500-2O	Signs Type O (36"x24" R5-1a Wrong Way Sign)	EA	2		
10500-2P	Signs Type P (24"x30" R6-7 End One Way Sign)	EA	2		
10500-3	Accessible Parking Signs (1/D1.3)	EA	2		
10500-4	Relocate Sign Assembly	LS	0		
10900-1	Hinged Barrier Bollard (4/D1.0)	EA	0		
10900-2	Helen's Bridge Rail (3/D1.5)	LF	0		
10900-3	Black Steel Double Swing Gates (20LF)	EA	1		
10900-4	24LF Corten Steel Single Arm Swing Gate	EA	1		

10900-5	Emergency Call Box (6/D1.0)	EA	1		
10900-6	9"x7"x5' Timber Wheelstop (7/D1.3)	EA	4		
10900-7	Bench (2/D1.0)	EA	1		
10900-8	Trash Receptacles (1/D1.0)	EA	2		
10900-9	Bike Rack (5/D1.0)	EA	4		
10900-10	Pet Waste Station (3/D1.2)	EA	1		
10900-11	Natural Stone Column (6/D1.2)	EA	1		
10900-12	Natural Stone Seat Wall (1/D1.2)	SF	0		
10900-13	Place Boulders At Trailhead	LS	0		
10900-14	Split Rail Fence (3/D1.0)	LF	20		
10900-15	Remove Existing Gate and footings	LS	0		
10900-16	Remove Existing Bollards and footings	LS	0		
10900-17	Relocate Existing Mailboxes	LS	0		
16000-1	2” Sch 80 Elec. Conduit (HDPE)	LF	0		
16000-2	Electrical Junction Boxes	EA	0		
16000-3	40mm Triduct Communication Conduit (HDPE)	LF	780		
16000-4	Relocate Existing Electrical Outlets	EA	0		
				Sub Total	_____

17000-1	Public Art Allowance	LS	1		
				Total Alternate 4 Add	_____

Contractor_____
(Print)

Note: Proposal signature required on Page 00301-27.

CERTIFIED LIST OF MATERIAL MANUFACTURERS

The Bidder, _____, as part of the procedure for the submission of Bids on this project known as BEAUCATCHER MOUNTAIN, submits the following list of Material Manufacturers to be used in the performance of work to be done on said Project. The list of Manufacturers and all materials furnished shall be based on requirements of the Contract Documents. Changes to this list after the Bid opening shall only be as approved by the Owner upon request by the Contractor or as required by the Owner based upon review of Contractor's submittals:

MATERIALS		MANUFACTURER/SUPPLIER
Treated Timber		
Retaining Wall System		
Asphalt		
Concrete		
Standard Safety Rail		
Standard Safety Rail with Vertical Pickets		
Aggregate and Stone		

It is understood and agreed that, if awarded a Contract, the Contractor will not make any additions, deletions or substitutions to this Certified list without the consent of the Owner.

CERTIFICATION AFFIDAVIT

THE PRIOR INFORMATION IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF. I FURTHER UNDERSTAND AND AGREE THAT, IF AWARDED A CONTRACT, THIS CERTIFICATION SHALL BE ATTACHED THERETO AND BECOME A PART THEREOF.

NAME OF SIGNER: _____
(Please Print or Type)

TITLE OF SIGNER: _____
(Please Print or Type)

SIGNATURE: _____

DATE: _____

BID SECURITY:

Accompanying this Proposal is a (a)_____ in the amount

of (b) $_____.

NOTE: (a) Insert the words "bank draft", "certified check", "cashier's check", or "bid bond" as the case may be.

(b) Amount must be equal to at least five percent of the Total Bid (base bid plus alternates).

CONTRACTOR'S LICENSE:

The undersigned certifies that (he/they)_____ (is/are) licensed as a Contractor under the specific State law regulating _____(his/their) particular trade and that the number of _____(his/their) license, under which (he/they)_____(is/are) now operating is_____.

PROPOSAL SIGNATURE: (Signature required on Page 00301-28)

CORPORATION:

The Bidder is a corporation organized and existing under the laws of the State of _____, which operates under the legal name of:

_____

and the full names of its officers are as follows:

President _____

Secretary/Treasurer _____

Manager _____

and it does have a corporate seal. The President is authorized to sign construction proposals and contracts for the company by action of its Board of Directors taken _____, a certified copy of which is hereto attached. (Strike out this last sentence if not applicable.)

PARTNERSHIP:

The Bidder is a partnership consisting of individual partners whose full names are as follows:

The partnership does business under the legal name of:

_____

INDIVIDUAL:

The Bidder is an individual whose full name is:_____

and if operating under a trade name, said trade name is as follows: _____

(Sign Below)

Dated _____, 2016.

_____
Legal Entity

(Sign Here) By: _____

_____
(Printed Name)

SEAL - if Corporation

Telephone No. (_____)_____

Subscribed and sworn to before me this _____ day of _____, 2016.

_____
Notary Public

My Commission Expires:

_____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, THAT WE, THE UNDERSIGNED, _____ as Principal, and _____ _____ as Surety, are hereby held and firmly bound unto the City of Asheville as Owner in the penal sum of _____ _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns, this the _____ day of _____, _____.

The condition of the above obligation is such that whereas the Principal has submitted to the City of Asheville a certain BID which is attached hereto and hereby made a part hereof, to enter into a contract in writing for:

City of Asheville

BEAUCATCHER MOUNTAIN GREENWAY

NOW, THEREFORE,

(a) If said BID shall be rejected, or

(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said Contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect, it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Attest to:

_____
Contractor

_____ By: _____
Secretary
(Corporate Seal)

Attest to:

_____
Surety

_____ By: _____
Secretary
(Corporate Seal)

Countersigned:

_____

N.C. Licensed Resident Agent

_____

_____

Name and Address – Surety Agency

_____

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

IMPORTANT – Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

STATE OF _____
COUNTY OF _____

_____, of _____, being
(Name) (Bidder)
duly sworn, deposes and says that:

1. He is _____
(owner, partner, officer, representative, agent)
of _____, the Bidder that has submitted the attached Bid Proposal;

2. He is fully informed respecting the preparation and contents of the attached Bid Proposal and of all pertinent circumstances respecting such Bid Proposal;

3. Such Bid Proposal is genuine and is not a collusive or sham Bid Proposal;

4. Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid Proposal in connection with the Contract for which the attached Bid Proposal has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid Proposal or of any other Bidder, or to fix the overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the City of Asheville, or any person interested in the proposed Contract; and

5. The price or prices quoted in the attached Bid Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owner, employees, or parties of interest including this affiant.

(Signed) _____

_____
Title

SWORN TO AND SUBSCRIBED before me this ____ day of _____, 20___.

_____
Notary Public
My Commission Expires: _____

City of Asheville - Minority Business Requirements
Non-Building Construction Only

The **annual verifiable goals for the** City of Asheville in minority business participation are listed below:

CONSTRUCTION
African Americans 3%
Hispanic, Asian & Native Americans 1%
Women 8%

PROCUREMENT
African Americans 5%
Hispanic, Asian & Native Americans 2%
Women 18%

PROFESSIONAL
African Americans 7%
Hispanic, Asian & Native Americans 7%
Women 37%

The City is committed to providing minority businesses equal opportunity to participate in all City contracting opportunities. As such, the successful Bidder must provide documented proof in the form of MB (Minority Business) Form 1 (MB Utilization Commitment) or MB Form 2 (Letter of Intent to Perform Work without Subcontracting) that goals have been met or exceeded within 72-hours following the bid opening. If despite good faith efforts, the bidder was unable to provide subcontracting opportunities to minority subcontractors, the Bidder must submit MB form 1A along with the Good Faith Checklist within 72-hours following the bid opening. All three forms along with the Good Faith Checklist are attached hereto and incorporated herein by reference.

For more information regarding the City's Minority Business Program, please contact Brenda Mills, Economic Development Specialists, Community & Economic Development, P. O. Box 7148, Asheville, NC 28802-7148; (828) 259-8050 phone, (828) 350-0072 Fax, email at bmills@ashevillenc.gov.

CHECKLIST FOR REVIEW OF GOOD FAITH EFFORTS

(This form, MB Form 1A along with good faith efforts documentation due within 72 business hours of bid opening)

1. Have you attended the pre-bid conference(s) scheduled?
   ( ) Yes ( ) No (Meeting attendance is documented by the local government agency)

2. Have you advertised at least seven (7) days in a general circulation, trade association, construction or Minority/women-focused media **within the contracting area** regarding subcontracting opportunities with your firm prior to the bid opening date? ( ) Yes ( ) No (Attach documentation)

3. Have you utilized the services of the City's Minority Business Program, available minority community organizations, minority contractors' group, local minority business assistance offices and other local organizations that provide assistance in the recruitment and placement of minorities and women to solicit bids for this project? Access to the website for the most current information in the Directory of Certified Businesses for each local government is on the State North Carolina's VendorLink site at www.ips.state.nc.us/ips/vendor/searchvendor.aspx?t=h **(HUB Vendor Search).** ( ) Yes ( ) No (Attach documentation)

4. Have you provided interested minority & women owned businesses (MB's) with ***adequate and equal access*** to information about the plans, specifications and requirements of the contract, insurance and licenses? ( ) Yes ( ) No

5. Did you provide written notice to all appropriate certified minority & women-owned businesses within the identified subcontracting / supplier / service categories that their interest in the contract was being solicited and in sufficient time to allow these certified minority & women-owned businesses to participate? Additionally, did the solicitation contain a description and location of the project, the work for which the subcontractors' bids are being solicited, date, time and location where the subcontractors' bids are to be submitted, locations where bidding documents could be reviewed? ( ) Yes ( ) No

6. Have you selected portions of the work to be performed by certified minority & women-owned businesses in order to increase the likelihood of meeting outreach goals including breaking it into economically feasible units where appropriate? ( ) Yes ( ) No

7. Have you designated someone in your firm to be the single contact for MB's that may have questions or need assistance? ( ) Yes ( ) No (Please indicate name of person and title)

   Name: _____ Title: _____

8. Have you worked with the Minority Business Program in developing and administrating areas of technical assistance for MBs, i.e. bonding, lines of credit or insurance? ( ) Yes ( ) No

9. Did you follow up initial solicitations of interest by contacting MB's to determine with certainty whether they are interested in bidding? ( ) Yes ( ) No

10. Did you negotiate in good faith with interested MB's; not rejecting MB's as unqualified without sound reasons based on a thorough investigation of their capabilities? ( ) Yes ( ) No

_____ _____

Signature Title

MB FORM 1
MB UTILIZATION COMMITMENT

(This form must be submitted 72 business hours following the bid if subcontracting along with The Good Faith Efforts Checklist, MB Form 1A & documentation)

We, _____, do certify that on the _____
(Project Name)

_____, _____
(Project Number) (Dollar Amount of Bid)

We will expend a minimum of _____% of the total dollar amount of the contract with certified minority business (MB) enterprises. MB's will be employed as vendors, suppliers or providers of professional services.

Such work will be subcontracted to the following firms listed below. If the Bidder intends to subcontract, this form must be completed and submitted with the bid and documentation of good faith efforts regardless of the amount or lack of participation attained.

Name and Phone Number of Firm	Indicate MB Category	Description of Work	Dollar Value

The undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that s/he has read the terms of this commitment and is authorized to bind the Bidder to the commitment herein set forth.

Date: _____ Name of Bidder/Company: _____

By: _____

Title: _____

MB FORM 1A
CERTIFICATE OF MB UNAVAILABILITY
SUBCONTRACTING / SUPPLIES / SERVICES

(This form is due 72 business hours following the bid opening if your company is subcontracting on the project)

Name of Contractor: _____ **Project:** _____

Work/Service/Goods Needed	Name of MB & Phone	Date of Contact	Contact Person	Reason for Unavailability

Pursuant to the City of Asheville's "Minority Business Plan Minimum Compliance Requirements," the undersigned certifies that the above Minority Business(es) were contacted in good faith and that said MB(s) were unable to submit a bid for reasons indicated.

Date: _____ Signature: _____

Title: _____

MB FORM 2

STATEMENT OF INTENT TO PERFORM WORK WITHOUT SUBCONTRACTING

(This form due 72 hours after bid opening - No Other MB Forms need to accompany this form)

We, _____, hereby certify that it is our intent to

perform ***100% of the work required*** for the _____ 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 work forces; and

The bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement.

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

Date: _____ Name of Bidder/Company: _____

Signature: _____

Title: _____

MB FORM 5

DOCUMENTATION OF CONTRACT PAYMENTS

Payments on subcontracts made to minority firms needs to be provided per project. Please provide this information to the owner's representative or directly to the Office of Economic Development (see contact information below).

The following is a list of payments made to minority and women owned firms on this project

between the dates of _____ and _____.

Project Name: _____

Company Name: _____

Company Contact (Name, phone and email): _____

_____

ON THE ABOVE REFERENCE PROJECT, PLEASE INDICATE THE FOLLOWING:

MINORITY FIRM NAME	BLACK, HISPANIC ASIAN, INDIAN OR WOMAN	AMOUNT & DATE OF PAYMENTS

PLEASE CHECK ONE:

_____ Payment amounts represent the final total to be paid for this project.

_____ Payment amounts DO NOT represent the final total to be paid for this project.

_____
Signature and Title of Certifying Agent

Any questions regarding this information can be directed to Brenda Mills, Economic Development Specialist, Community & Economic Development at (828) 259-8050 or bmills@ashevillenc.gov.

City of Asheville, North Carolina
Contractors Sales and Use Detail Tax Report (must accompany each payment application)

Contractor: _____ Payment Application No.: _____

Project: _____ For Period: _____

Invoice Date	Vendor Name	Invoice Number	Invoice Total including Tax	State Tax Paid	County Tax Paid	Total Paid	County of Sale
						$ -	Buncombe
						$ -	
						$ -	
						$ -	
						$ -	
						$ -	
						$ -	
						$ -	
						$ -	
						$ -	
						$ -	
						$ -	
						$ -	
						$ -	
		Grand Total	$ -	$ -	$ -	$ -	

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

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

This the _____ day of _____

_____ Notary Public

My Commission Expires: _____

Seal

_____ Signed

Owner or Officer
Print or Type Signed Name of Above

NOTE: This certified statement may be subject to audit.

BEAUCATCHER MOUNTAIN GREENWAY TRAIL

00301E-1

Project No. 298 PR-16-17-001

Instructions for Completing
Contractors Sales and Use Detail Tax Report

The City of Asheville is eligible for a refund of NC sales and/or use taxes paid in North Carolina by the City's contractors ("contractors" hereinafter also refers to sub-contractors) on purchases of building materials, supplies, fixtures and equipment which become a part of or are annexed to any building or structure being erected, altered or repaired under contract with the City. Contractors shall include and must pay all taxes imposed by governmental authorities which are applicable to the contract work. Examples of property on which sales and use tax has been paid by the contractor for which the contractor shall not include on this schedule are scaffolding, forms for concrete, fuel for the operation of machinery and equipment, tools, equipment repair parts and equipment rentals, blueprints, etc, or any other items which do not become a part of or are not annexed to the building or structure being erected, altered, or repaired.

The general contractor is responsible for obtaining the Contractors Sales and Use Detail Tax Report from its subcontractors. Each payment application must be accompanied with a certified Contractors Sales and Use Detail Tax Report. If no purchases of building materials, supplies, fixtures and equipment occurred in which sales and use tax was paid for a period covering a payment application, the contractor shall file a negative report indicating **"No State or County Sales Tax Paid".**

Contractor: The name of your company.
Project: The name of the project, or the City Contract Number.
Payment Application No.: The numerical sequence associated with the pay application (i.e. 1, 2, 3, etc.)
For Period: The beginning and ending period stated as month/day/year
Invoice Date: The date the materials were purchased.
Vendor Name: The vendor's name.
Invoice Number: The vendor's invoice number.
Invoice Total: The sum of the invoice to include State Tax and County Tax.
State Tax Paid: The North Carolina State tax, currently 5.75% of the item cost.
County Tax Paid: The County tax, currently 2.00 to 2.25% of the item cost (Buncombe currently 2.00%).
Total Tax Paid: The sum of State Tax and County Tax
County Name: County where material was purchased and sales tax paid, e.g., Buncombe, Haywood, Mecklenburg, etc.

The owner or an officer of the company must certify that the statement is correct. The signature should also be notarized.

NOTICE OF AWARD

To: _____

_____

_____

_____

PROJECT Description: CITY OF ASHEVILLE

BEAUCATCHER MOUNTAIN GREENWAY TRAIL

The Owner has considered the Bid Proposal submitted by you for the above-described Project in response to its receipt of Bids on _____, 20__, and the Instructions to Bidders.

You are hereby notified that your Bid Proposal has been accepted in the amount of $_____.

You are required by the Instructions to Bidders to execute the Contract and furnish the required Performance Bond, Payment Bond and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Contract and to furnish said Bonds within ten (10) days from the date of this Notice, said Owner will be notified to consider all your rights arising out of the Owner's acceptance of your Bid Proposal as abandoned and as a forfeiture of your Bid Proposal. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner.

Dated this _____ day of _____, _____.

CITY OF ASHEVILLE

By: _____
Department Director

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

AGREEMENT

BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

Prepared by

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Endorsed by

CSI

NUCA
REPRESENTING UTILITY & EXCAVATION CONTRACTORS

Issued and Published Jointly by

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NOTE: EJCDC publications may be purchased at www.ejcdc.org, or from any of the sponsoring organizations above.

INTRODUCTION

This Agreement between Owner and Contractor for Construction Contract (Stipulated Price) ("Agreement") has been prepared for use with the Suggested Instructions to Bidders for Construction Contracts ("Instructions to Bidders") (EJCDC® C-200, 2013 Edition); the Suggested Bid Form for Construction Contracts ("Bid Form") (EJCDC® C 410, 2013 Edition); and the Standard General Conditions of the Construction Contract ("General Conditions") (EJCDC® C-700, 2013 Edition). Their provisions are interrelated, and a change in one may necessitate a change in the others. See also the Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition), and the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

In construction contracting, as a general matter the "agreement" is the legal instrument executed (signed) by the project owner and the construction contractor, binding the parties to the terms of the contract. See CSI Project Delivery Practice Guide (2011), Section 11.1.2, p. 210, and CSI Construction Specification Practice Guide (2011), Section 5.1, p. 75. This EJCDC Agreement form serves that basic function, by identifying the parties and Contract Documents, and establishing the Contract Price and Contract Times. This Agreement form is specifically intended for stipulated price (fixed price) contracts—that is, contracts in which Owner and Contractor identify specific lump sums and unit prices as Contractor's compensation for performing the Work. For construction contracts in which the Contract Price is primarily based on costs incurred during construction, users should select EJCDC® C-525, Agreement between Owner and Contractor for Construction Contract (Cost-Plus).

This Agreement form is drafted to be flexible enough to be used on projects that are competitively bid, and for public and private contracts that are negotiated or awarded through a proposal process or otherwise. On competitively bid projects, the following documentary information would typically be made available to bidders:

- Bidding Requirements, which include the Advertisement or invitation to bid, the Instructions to Bidders, and the Bid Form that is suggested or prescribed, all of which provide information and guidance for all Bidders, and Bid Form supplements (if any) such as Bid Bond and Qualifications Statement.

- Contract Documents, which include the Agreement, performance and payment bonds, the General Conditions, the Supplementary Conditions, the Drawings, and the Specifications.

- Documents referred to in the Supplementary Conditions or elsewhere as being of interest to bidders for reference purposes, but which are not Contract Documents.

Together, the Bidding Requirements and the Contract Documents are referred to as the Bidding Documents. (The terms "Bidding Documents," "Bidding Requirements," and "Contract Documents" are defined in Article 1 of the General Conditions.) The Bidding Requirements are not Contract Documents because much of their substance pertains to the relationships prior to the award of the Contract and has little effect or impact thereafter. Many contracts are awarded without even going through a bidding process, and thus have no Bidding Requirements, illustrating that the bidding items are typically superfluous to the formation of a binding and comprehensive construction contract. In some cases, however, a bid or proposal will contain numerous line items and their prices; in such case the actual bid or proposal document may be attached as an exhibit to the Agreement to avoid extensive rekeying.

Suggested provisions are accompanied by "Notes to User" and bracketed notes and prompts to assist in preparing the Agreement. The provisions have been coordinated with the other forms produced by EJCDC. Much of the language should be usable on most projects, but modifications and additional provisions will often be necessary. When modifying the suggested language or writing additional provisions, the user must check the other documents thoroughly for conflicts and coordination of terms, and make appropriate revisions in all affected documents.

All parties involved in construction projects benefit significantly from a standardized approach in the location of subject matter throughout the documents. Experience confirms the danger of addressing the same subject matter in more than one location; doing so frequently leads to confusion and unanticipated legal consequences. When preparing documents for a construction project, careful attention should be given to the guidance provided in EJCDC® N-122/AIA® A521, Uniform Location of Subject Matter (2012 Edition), available at no charge from the EJCDC website, www.ejcdc.org, and from the websites of EJCDC's sponsoring organizations.

CSI MasterFormat™ (50-Division format) designates Document "00 52 XX" for various forms of the owner-contractor agreement. If this format is used, the first page of the Agreement would be numbered 00 52 13-1 (or other appropriate third pair of numbers, in accordance with MasterFormat™).

Instructions and restrictions regarding the use of this document are set out in the License Agreement that accompanied the document at the time of purchase. To prepare the Agreement for inclusion in a Project Manual or for use in a specific contractual engagement, (1) remove the cover pages and this Introduction, (2) fill in Project-specific information and make revisions to the Agreement, following the guidance in the Notes to Users and bracketed notes and prompts, and the advice of legal counsel, and (3) delete the Notes to Users and bracketed notes and prompts.

AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT

THIS AGREEMENT is by and between _____ ("Owner") and _____ ("Contractor").

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

ARTICLE 2 – THE PROJECT

The Project, of which the Work under the Contract Documents is a part, is generally described as follows:

BEAUCATCHER MOUNTAIN

GREENWAY TRAIL
Project No. 298 PR-16-17-001

2.01 The BEAUCATCHER MOUNTAIN – **Greenway Trail** section involves the construction of approximately 2.26miles of new greenway consisting of primarily a 10-foot wide paved trail (10-foot wide asphalt with 1-foot shoulders), variable width greenway in selected areas, eight (8) parking areas, retaining walls, drainage, signing, bollards, erosion and sedimentation control with inspections, and all associated appurtenances as described in the specifications or shown on the Contract Drawings. _____

ARTICLE 3 – ENGINEER

3.01 The part of the Project that pertains to the Work has been designed by _____.

3.02 The Owner has retained _____ ("Engineer") to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

NOTE(S) TO USER:

If an entity or individual other than the design engineer will serve as Owner's representative during construction, then make appropriate revisions and additions to this Agreement, the General Conditions, the Supplementary Conditions, and other Contract Documents regarding the construction-phase roles and duties of the design engineer and such other entity or individual.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

NOTE(S) TO USER:

1. *Select one of the two alternative Paragraphs 4.02 below, and delete the other. The first uses dates for the time of completion; the second uses number of days.*

2. *If Owner elects to predetermine fixed dates or fixed number of days for completion of the Work, such dates or number of days should be inserted in the appropriate Paragraph 4.02 below prior to the bidding or other contractor selection process. If the time for completion will be determined through negotiation or a bidding process that allows bidders to specify the time for completion, then leave the blanks below open until the Contract is finalized (e.g., until after the Successful Bidder has been determined and its proposed completion time accepted).*

4.02 *Contract Times: Days*

A. The Work will be substantially completed within _____ calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within _____ days after the date when the Contract Times commence to run.

NOTE(S) TO USER:

If the Contract includes Milestones, add the following Paragraph 4.02.B to the selected version of Paragraph 4.02.A:

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Contractor shall pay Owner $_____ for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.

2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as

duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner $_____ for each day that expires after such time until the Work is completed and ready for final payment.

3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

NOTE(S) TO USER:

1. *At Substantial Completion, the Owner is able to use the Work for its intended purpose, by definition. See General Conditions, Paragraph 1.01.A. Achieving Substantial Completion is typically a critical deadline, and the associated damages for missing this deadline are typically significant. The subsequent failure to complete the punch list tasks and bring the Work to a complete close by the final completion date may also result in some degree of damages to Owner—though typically these damages are significantly less than the daily damages for not achieving Substantial Completion on time. Some users may choose to establish liquidated damages only for the failure to achieve Substantial Completion. If that is the case, delete paragraphs 4.03.A.2 and .3 above.*

2. *If failure to achieve a Milestone on time is of such consequence that the assessment of liquidated damages is warranted for the failure to reach the Milestone on time, then retain and complete Paragraph 4.03.A.4; if not, delete it. Add additional similar paragraphs for any additional Milestones subject to a liquidated damages assessment. Liquidated damages for Milestones might, in some cases, be additive to liquidated damages for failing to timely attain Substantial Completion; if so this should be specifically noted.*

NOTE(S) TO USER:

If early completion would be a benefit to Owner, then consider retaining and completing the bonus clause above as 4.03.B. The daily bonus for early completion need not be exactly the same as the daily post-Substantial Completion liquidated damages amounts, but presumably the two amounts will be reasonably compatible. If no bonus will be offered, then delete 4.03.B.

NOTE(S) TO USER:

EJCDC recommends developing daily liquidated damages amounts that comprehensively account for the full range of Owner's damages, including costs of additional engineering, construction observation, inspection, and administrative services, and potential fines or penalties. Some Owners, however, prefer to charge a Contractor that has not completed the Work on schedule for Owner's additional hard-dollar costs for fines and penalties, and for extended engineering, construction observation, inspection, and administrative services; these charges are levied on top of the daily liquidated damages amount. It is very important if this practice is followed to be certain that the liquidated

damages amount does not already include or rely in part on the potential for incurring these very same hard-dollar costs; if it does, then the separate charge for actual costs may be regarded as "double dipping" and the entire framework of liquidated damages for late completion may be called into question.

Those users that choose the "liquidated damages plus actual hard dollar costs" approach may use the preceding "Special Damages" provisions, together with the liquidated damages provisions in Paragraph 4.03, Liquidated Damages, above. ***Those users that follow the more conventional path of relying on comprehensive daily liquidated damages to cover the full scope of damage done by late Contractor completion should delete the "Special Damages" provisions—Paragraph 4.04—and rely solely on Paragraph 4.03, Liquidated Damages, above.***

Finally, note that Paragraph 4.04.B above does not refer to fines or penalties. In the typical case, fines and penalties are linked to Substantial Completion, and are not applicable to delays in final completion of the Work.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

B. For all Unit Price Work, an amount based on the actual quantities of the various items that are completed and accepted in accordance with the terms of the contract. The total amount shall be based on the unit price amounts established in Contractor's Bid, multiplied by the actual quantity installed, as determined by the Engineer. This amount shall not to exceed $xxxxx, unless said amount is amended in accordance with the terms of the contract.

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

NOTE(S) TO USER:

1. *If adjustment prices for variations from stipulated Base Bid or other baseline quantities have been agreed to, insert appropriate provisions.*
2. *Depending upon the particular project's pricing structure, use 5.01.A alone; 5.01.A, 5.01.B, and 5.01.C together; 5.01.B alone; or 5.01.D alone, deleting those not used and renumbering accordingly. If 5.01.D is used, Contractor's Bid is attached as an exhibit and listed as a Contract Document in Article 9 below.*

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the _____ day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract

a. 5 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

b. 5 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to _____ percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less _____ percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

OR

A. Progress payments will be based upon progress estimates prepared by the Engineer once each month on the date established by the Engineer. Progress payments will be approximate only and will be subject to correction in the final estimate and payment.

Where lump sum items are included in the contract and the applicable section of the Specifications require that fixed percentages of the total amount bid be included in partial pay estimates, the Engineer will determine amounts due on partial pay estimate in accordance with the applicable sections of the Specifications.

NOTE(S) TO USER:

Typical values used in Paragraph 6.02.B are 100 percent and 200 percent respectively, subject to Laws and Regulations specific to the Project.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

6.04 *Prompt Payments*

A. Contractors at all levels, prime, subcontractor, or second tier subcontractor, shall within 7 calendar days of receipt of monies, resulting from the satisfactory completion of work performed, pay subcontractors, second tier subcontractors, or material suppliers. This seven-day period begins upon knowledgeable receipt by the contracting firm obligated to make a subsequent periodic or final payment. This prompt payment requirement will be met if each firm mails the payment to the next level firm by evidence of postmark within the seven-day period. For the purposes of this section, the satisfactory completion of work performed shall exist when a subcontractor, second tier subcontractor or material supplier completes tasks called for in the subcontract and are in conformance with the terms of the Contract as required by the Owner. This specification for prompt payment shall be incorporated into each subcontract or second tier subcontract issued for work performed on the project or for services provided.

The Contractor shall not withhold any payments to a subcontractor, second tier subcontractor or material supplier for any claim or action arising outside the current contract with the Owner. Notwithstanding the provisions of this section, the Contractor may withhold retainage if any subcontractor does not obtain a payment and performance bond for their portion of the work. If any retainage is held on subcontractors, all retainage shall be released within seven calendar days of satisfactory completion of all work. For release of retainage, satisfactory completion is defined as completion of all physical elements and corresponding documentation as defined in the subcontract, as well as agreement between the parties as to the final quantities for all work performed in the subcontract.

1. Failure of any entity to make prompt payment as defined herein may result in the Owner:

    a. Withholding money from the Contractor due for work performed by that entity in the next partial payment until the necessary assurances are made consistent with this specification.

ARTICLE 7 – INTEREST

7.01 All amounts not paid in accordance with N.C.G.S. 143-134.1 shall bear interest as required by North Carolina State law.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

NOTE(S) TO USER:

Modify the above paragraph if there are no such reports or drawings.

E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

NOTE(S) TO USER:

If the Contract Documents do not identify any Site-related reports and drawings, modify this paragraph accordingly.

F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

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

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

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement (pages 1 to ___, inclusive).
2. Performance bond (pages ___ to ___, inclusive).
3. Payment bond (pages ___ to ___, inclusive).
4. Other bonds.
   a. ___ (pages ___ to ___, inclusive).

NOTE(S) TO USER:

Such other bonds might include maintenance or warranty bonds intended to manage risk after completion of the Work.

5. General Conditions (pages ___ to ___, inclusive).
6. Supplementary Conditions (pages ___ to ___, inclusive).
7. Specifications as listed in the table of contents of the Project Manual.
8. Drawings (not attached but incorporated by reference) consisting the Drawings listed on the attached sheet index.
9. Addenda (numbers ___ to ___, inclusive).
10. Exhibits to this Agreement (enumerated as follows):
    a. Contractor's Bid (pages _00301-1__ to _00301-19_, inclusive).
    b. Minority Business Forms
    c. Certificate of Insurance
    d. E-Verify Form

NOTE(S) TO USER:

1. As noted in the introduction to this Agreement, in the typical case bidding-related documents such as the Instructions to Bidders and Bid are not included as Contract Documents. Include Contractor's Bid as a Contract Document here only as a matter of necessity, for example if the Bid contains numerous line items and their prices, and rekeying such information would be burdensome and susceptible to error.

2. *List other required attachments (if any), such as documentation submitted by Contractor prior to Notice of Award and documents required by funding or lending agencies.*

3. *If a Geotechnical Baseline Report or a Geotechnical Data Report is used, include them as lettered Items under Paragraph 9.01.A.10.a. For a further discussion of GBRs and GDRs see EJCDC C-001, Commentary on the 2013 EJCDC Construction Documents.*

11. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:

    a. Notice to Proceed.

    b. Work Change Directives.

    c. Change Orders.

    d. Field Orders.

NOTE(S) TO USER:

If any of the items listed are not to be included as Contract Documents, remove such item from the list and renumber the remaining items.

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

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

10.03 *Successors and Assigns*

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

10.04 *Severability*

A. If any provision of the Contract for Construction, or the application thereof, is determined to be invalid or unenforceable, the remainder of that provision and all other provisions shall remain valid and enforceable.

10.05 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

B. Iran Divestment Act Certification:

By executing this contract, the Contractor certifies that, as of the date of execution, it is not on the Final Divestment List as created by the State Treasurer pursuant to N.C.G.S. § 147-86.58. In compliance with the requirements of the Iran Divestment Act and N.C. G. S. § 147-86.59, Contractor shall not utilize in the performance of the contract any subcontractor that is identified on the Final Divestment List.

C. E-Verify

By executing this contract, the Contractor and their subcontractors with 25 or more employees as defined in Article 2 of Chapter 64 of the NC General Statutes, certify they shall comply with E-Verify requirements to contract with governmental units. E-Verify is a Federal program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law. E-verify can be accessed via this link: http://www.uscis.gov/e-verify/employers

D. Drug Free Work Place:

The City is a drug-free workplace employer. By executing this contract, the Contractor certifies that they and their subcontractors shall comply with the City's Drug Free Workplace policy. This policy may be viewed at the following: http://www.ashevillenc.gov/Departments/Purchasing/DrugFreeWorkPolicy.aspx

10.06 *Other Provisions*

A. Owner stipulates that if the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

NOTE(S) TO USER:

1. *Delete Paragraph 10.06.A if inapplicable.*
2. *Insert other provisions here if applicable.*
3. *When the Contractor is required in this Contract to accept assignment of a procurement contract, previously entered into by the Owner (as "Buyer") with a manufacturer or distributor (as "Seller") for the direct purchase of goods (most commonly equipment) and related special services, insert at this location in the Agreement language regarding the assignment. For model language, refer to EJCDC® P-200 (Suggested Instructions to Bidders for Procurement Contracts), Notes to User at Article 23. For additional information on assigning a procurement contract, refer to EJCDC® P-001, Commentary on the EJCDC Procurement Documents.*
4. *Performance Requirements and Damages. In some cases the construction contract will contain performance requirements that must be met by the equipment, systems, or facilities constructed or furnished by Contractor. The Owner's remedies for Contractor's failure to meet the performance requirements may include rejection of the items in question; correction remedies; exercise of warranty rights; and acceptance of the underperforming items coupled with a reduction in Contract Price or imposition of damages to compensate Owner for not receiving its full contractual entitlement. Typical damages might be for reduced production or treatment, or for the costs of increased electricity or chemical consumption over the life of the equipment. On some projects the Owner and Contractor may contractually stipulate specific damages that will be owed in the event of specific levels of underperformance. It is important when drafting such provisions to clarify whether the availability of underperformance damages is meant to close off other potential remedies. Most commonly performance provisions (and any stipulated damages amounts) will be located in the Specifications. It may be useful to provide a cross-reference to such provisions here in the Agreement, or in some cases to state the stipulated damages amounts here because of their importance to the pricing of the Contract, which is one of the primary subjects of the Agreement.*

Certificate of Insurance

(Attach)

Contract Signature Page

Contract # _____
Council Resolution #_____ (if applicable)

IN WITNESS WHEREOF, each party has caused this agreement to be executed by it's duly authorized official as of the day and year written above.

The Department Director by Written Approval conveys that this contract has been reviewed and presented for approval by the City of Asheville.

_____DATE_____
Department Director

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

_____DATE_____
Chief Financial Officer

City Manager's signature, if required
Attest to: **CITY OF ASHEVILLE**

_____ BY: _____ DATE_____
City Clerk **City Manager**
(Corporate Seal)

STATE OF NORTH CAROLINA
COUNTY OF BUNCOMBE

I, Notary Public of the County and State aforesaid, certify that _____, personally came before me this day and acknowledged that she is the City Clerk of the City of Asheville, a municipal corporation, and that by authority duly given and as the act of the corporation the foregoing instrument was signed in its name by its City Manager and attested by herself as its City Clerk.

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

Notary Public
Printed Name:_____
My Commission Expires: _____

Remove this Statement and insert one of the following signature paragraphs plus notary witness on this Contract Signature page, depending on the type of business you are contracting with. ONLY USE ONE OF THE FOLLOWING SIGNATURE STATEMENTS ON THIS CONTRACT AGREEMENT FORM!

Individual Person / Sole Proprietorship
or
Partnership
or
Corporation
or
Limited Liability Corporation

City of Asheville Contract Number_____

****

INDIVIDUAL PERSON / SOLE PROPRIETORSHIP SIGNATURE FORM

****

Signature: _____
Owner

STATE OF _____
COUNTY OF _____

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

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

Notary Public
Printed Name:_____
My Commission Expires: _____

City of Asheville Contract Number_____

****

PARTNERSHIP SIGNATURE FORM

****

Signature: _____
General Partner

_____
Name of Partnership

STATE OF _____
COUNTY OF _____

I, _____, a Notary Public for said County and State, do hereby certify that _____, General Partner of _____ Partnership, personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

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

Notary Public
Printed Name:_____
My Commission Expires: _____

City of Asheville Contract Number_____

****

CORPORATION SIGNATURE FORM

****

IN WITNESS WHEREFORE, the parties hereto have made and executed this Agreement as of the day and year first above written.

_____

(**Insert Name of Corporation**)

By: _____

(**Insert signature and title of officer**)

STATE OF _____

COUNTY OF _____

I, _____, Notary Public of the aforesaid County and State,

certify that _____ personally came before me this day and
(Insert Name of Person Signing)
acknowledged that he/she is _____ of_____
(Insert Title of Office) **(Insert Name of Corporation)**
corporation, and that he/she, as _____, being authorized to do so,
(Insert Title of Person Signing)
executed the foregoing on behalf of the said corporation.

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

Notary Public
Printed Name:_____
My Commission Expires: _____

City of Asheville Contract Number_____

****

LIMITED LIABILITY CORPORATION (LLC) FORM

****

BY: _____
Name of Limited Liability Corporation

Signature: _____
Member/Manager

STATE OF _____
COUNTY OF _____

I, _____, a Notary Public for said County and State do hereby certify that _____, Member/Manager of _____, a limited liability company, personally appeared before me this day and acknowledged the due execution of the foregoing instrument on behalf of the company.

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

Notary Public
Printed Name:_____
My Commission Expires: _____

PAYMENT BOND

Date of Execution: _____

Name of Principal: (Contractor) _____

Name of Surety: _____

Name of Contracting Body: _____

Amount of Bond: _____

Project: _____

KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL and SURETY above named, are held and firmly bound unto the above named Contracting Body, (hereinafter referred to as “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 promptly make payment to all persons supplying labor and material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications 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.

Attest to:

_____
Secretary
(Corporate Seal)

Attest to:

_____
Secretary
(Corporate Seal)

Countersigned:

_____
N.C. Licensed Resident Agent

_____

_____
Contractor

By: _____

_____
Surety

By: _____

_____
Name and Address – Surety Agency

_____

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

PERFORMANCE BOND

Date of Execution: _____

Name of Principal: (Contractor) _____

Name of Surety: _____

Name of Contracting Body: _____

Amount of Bond: _____

Project: _____

KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL and SURETY above named, are held and firmly bound unto the above named Contracting Body, (hereinafter referred to as "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.

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

1) Complete a bid or bids for completing the contract in accordance with its terms and conditions; or

2) Obtain a bid or bids for completing the contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or, if the Contracting Body elects, upon determination by the Contracting Body and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Contracting Body, and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the

balance of the contract price, but not exceeding, including other costs and damages for which the Surety may be of liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price", as used in this paragraph shall mean the total amount payable by Contracting Body to Principal under the Contract and any amendments thereto, less the amount properly paid by Contracting Body to Contractor.

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.

Attest to:

_____
Secretary
(Corporate Seal)

_____
Contractor

By: _____

Attest to:

_____
Secretary
(Corporate Seal)

_____
Surety

By: _____

Countersigned:

_____
N.C. Licensed Resident Agent

_____

_____
Name and Address – Surety Agency

_____

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

NOTICE TO PROCEED

TO: _____
_____
_____

DATE: _____

PROJECT: _CITY OF ASHEVILLE_____
BEAUCATCHER MOUNTAIN GREENWAY
TRAIL

You are hereby notified to commence WORK in accordance with the Contract dated ____ _____, 20___, on or before _____, 20___, and you are to complete the WORK within _____ consecutive calendar days thereafter. The date of completion of all Work is therefore _____, 20____.

CITY OF ASHEVILLE

By: _____
Department Director

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____ this the _____ day of _____, 20___.

_____
Contractor

By: _____

Title: _____

CONTRACTOR/VENDOR FINAL RELEASE AND LIEN WAIVER

The undersigned represents and warrants that it has been paid and has received (or that it will be paid and will receive via proceeds from this pay application) $_____ as full and final settlement under the contract/agreement dated _____ (including any amendments or modifications thereto) (the "**Contract**") between the undersigned and _____ ("**Contractor/Vendor**") for the _____ Project owned by the City of Asheville ("**Owner**")

In consideration for this final payment, and other good and valuable consideration, receipt of which is acknowledged, the undersigned makes the following representations and warranties:

1. The undersigned and Owner have fully settled all terms and conditions of the Contract (including any amendments or modifications thereto), as well as any other written or oral commitments, agreements, and/or understandings in connection with the Project.

2. The undersigned has been paid in full (or it will be paid in full via proceeds from this pay application) for the labor, services, and materials in connection with the Contract, including all work performed or any materials provided by its subcontractors, vendors, suppliers, materialmen, laborers, or other persons or entities.

3. The undersigned has paid in full (or it will pay in full via proceeds from this pay application) all its subcontractors, vendors, suppliers, materialmen, laborers, and other person or entity providing services, labor, or materials to the Project; there are no outstanding claims, demands, or rights to liens against the undersigned, the Project, or the Owner in connection with the Contract on the part of any person or entity; and no claims, demands, or liens have been filed against the undersigned, the Project, or the Owner relating to the Contract.

4. The undersigned releases and discharges Owner from all claims, demands, or causes of action (including all lien claims and rights) that the undersigned has, or might have, under any present or future law, against Owner in connection with the Contract. The undersigned hereby specifically waives and releases any lien or claim or right to lien in connection with the Contract against Owner, Owner's property, and the Project, and also specifically waives, to the extent allowed by law, all liens, claims, or rights of lien in connection with the Contract by
the undersigned's subcontractors, materialmen, laborers, and all other persons or entities furnishing services, labor, or materials in connection with the Contract.

5. The undersigned shall indemnify, defend, and hold harmless Owner from any action, proceeding, arbitration, claim, demand, lien, or right to lien relating to the Contract, and shall pay any costs, expenses, and/or attorneys' fees incurred by Owner in connection therewith.

The undersigned makes the foregoing representations and warranties with full knowledge that Owner shall be entitled to rely upon the truth and accuracy thereof.

DATED:_____ **(CONTRACTOR/VENDOR COMPANY NAME)**

By:_____
Title:

STATE OF
COUNTY OF

I, a Notary Public for the above County and State, certify that _____ personally came before me this day and acknowledged that he/she is _____ [title] of _____ [company name], and that he/she, as _____ [title], being authorized to do so, executed the foregoing on behalf of _____ [company name].

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

Notary Public
Printed Name:_____
My Commission Expires: _____

NOTICE: THIS DOCUMENT WAIVES RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID.

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

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

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These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC's Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition). The full EJCDC Construction series of documents is discussed in the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a

demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Engineer*—The individual or entity named as such in the Agreement.

21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and

the requirements of the Contract, does not establish a Hazardous Environmental Condition.

23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.

26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.

33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.

35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.

38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.

42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.

45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any

encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

46. *Unit Price Work*—Work to be paid for on the basis of unit prices.

47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*:

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*:

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

D. *Defective*:

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents; or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

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

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

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

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Contractor's Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.

C. *Not used.*~~*Evidence of Owner's Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.~~

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract; the initially accepted schedule shall be the baseline schedule for comparison to actual conditions throughout the Contract duration. The baseline schedule must provide for an orderly progression of the designated portion of the Work to completion within any specified Milestones and Contract Times.

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance

will not impose on Engineer responsibility for ~~the Progress Schedule,~~ for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

B. Neither the acceptance nor the approval of any of the submittals required above, will constitute either the adoption, affirmation, or direction of the Contractor's means and methods. Acceptance of the Progress Schedule by Engineer will neither impose on Engineer responsibility or liability for the sequencing, scheduling or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility for such Work.

~~B.~~C. Contractor shall obtain approval from the Engineer on the Progress Schedule before the first progress payment will be made to Contractor.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*:

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

B. Engineer will, in a timely manner as not to delay the project, ~~with reasonable promptness,~~ render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

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

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

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

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

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

4.02 *Starting the Work*

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

B. The Contractor will be required to prosecute the Work in a continuous and uninterrupted manner from the time he receives the Notice to Proceed until completion and final acceptance of the project. The Contractor will not be permitted to suspend his operations except for reasons beyond his control, except where the Engineer has authorized a suspension of the Contractor's operations in writing.

1. In the event that the Contractor's operations are suspended in violation of the above paragraph, the sum established as Liquidated Damages, if applicable, will be charged the Contractor for each and every calendar day that such suspension takes place. Liquidated damages chargeable due to suspension of the Work will be additional to any liquidated damages that may become chargeable due to failure to complete the Work on time.

~~A.~~2. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as Owner and Contractor may otherwise agree in writing.

4.03 *Reference Points*

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

responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer, in a form acceptable to the Owner, for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. abnormal weather conditions;

3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and

4. acts of war or terrorism.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within ~~30~~10 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to

Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
2. is of such a nature as to require a change in the Drawings or Specifications; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or

rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or

b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice as required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

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

1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

    a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

    b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;

    c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

    d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

C. *Engineer's Review*: Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference,

causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;

b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and

d. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

2. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.

H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees

and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.

E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

C.1. The Contractor agrees to keep and maintain for the duration of this Agreement including but not limited to the lines of insurance coverage with at least the minimum limits stipulated in the Supplementary Conditions. The Contractor shall furnish the Owner with certificates of insurance for each type of insurance described herein, with the Owner listed as Certificate Holder and as an additional insured on the Contractor's general liability policy and provide a waiver of subrogation on the Contractor's general liability and workers' compensation policy. In the event of bodily injury, property damage, or financial loss caused by the Contractor's negligent acts or omissions in connection with Contractor's services performed under this Agreement, the Contractor's Liability insurance shall be primary with respect to any other insurance which may be available to the Owner, regardless of how the "Other Insurance"

provisions may read. In the event of cancellation, substantial changes or nonrenewal, the Contractor and Contractor's insurance carrier shall give the Owner at least thirty (30) days prior written notice. No work shall be performed until the Contractor has furnished to the Owner the above referenced certificates of insurance and associated endorsements, in a form suitable to the Owner.

D. ~~Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.~~Not used.

E. Failure of Owner ~~or Contractor~~ to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner ~~or Contractor~~ to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

F. ~~If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.~~Not used.

G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.

H. ~~Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.~~Not used.

I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.

J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.

2. ~~United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).~~Not used.

3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. ~~Foreign voluntary worker compensation (if applicable).~~Not used.

B. *Commercial General Liability—Claims Covered*: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:

1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.

2. claims for damages insured by reasonably available personal injury liability coverage.

3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

C. *Commercial General Liability—Form and Content*: Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage:

a. Such insurance shall be maintained for three years after final payment.

b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.

3. Broad form property damage coverage.

4. Severability of interest.

5. Underground, explosion, and collapse coverage.

6. Personal injury coverage.

7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.

8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

E. *Umbrella or excess liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

F. ~~*Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.~~Not used.

G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.

H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:

1. include at least the specific coverages provided in this Article.

2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.

3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.

4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.

5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

A. ~~In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.~~Not used.

B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

~~A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:~~

~~1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."~~

~~2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.~~

3. ~~cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.~~

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

5. ~~extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).~~

6. ~~extend to cover damage or loss to insured property while in transit.~~

7. ~~allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.~~

8. ~~allow for the waiver of the insurer's subrogation rights, as set forth below.~~

9. ~~provide primary coverage for all losses and damages caused by the perils or causes of loss covered.~~

10. ~~not include a co-insurance clause.~~

11. ~~include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.~~

12. ~~include performance/hot testing and start-up.~~

~~13.~~1. ~~be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.~~ Not Used

B. *Notice of Cancellation or Change*: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will

provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.

F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. ~~Owner and~~ Contractor waive<u>s</u> all rights against~~ each other and~~ the <u>Owner, </u>respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; ~~and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them,~~ under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by ~~Owner or~~ Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

<u>B. The Contactor shall indemnify, defend and hold harmless the Owner and its subsidiaries, divisions, officers, directors and employees from all liability, loss, costs, claims, damages, expenses, attorney fees, judgments and awards arising or claimed to have arisen, from any injury caused by, or allegedly caused by, either in whole or in part, any act or omission of the Contractor or any employee, agent or assign of the Contractor. This provision is not applicable to any claim arising out of or related to any active or primary negligence of or by Owner, its officers or employees. Nothing herein shall be construed as a waiver on the part of the Owner to any defense of any claim, including, but not limited to the defense of governmental immunity.</u>

~~B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:~~

~~1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and~~

~~2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.~~

C. ~~Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.~~Not used.

D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 *"Or Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. Contractor 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; The cited examples are used only to denote the quality standard of product desired and that they do not impose restriction 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. Request for substitution of materials, items, or equipment shall be submitted to the Engineer for approval or disapproval; such approval or disapproval shall be made by the Engineer prior to the opening of bids. Alternate materials may be requested after the award if it can clearly be demonstrated that it is an added benefit to the owner and the Engineer and Owner approves. ~~The specification or description of such an item is intended to establish the type, function, appearance, and quality required.~~ Unless the specification or description contains or is followed by words reading that *no like, equivalent, or "or equal"* item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

    a. in the exercise of reasonable judgment Engineer determines that:

        1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

        2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

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

        4) it is not objectionable to Owner.

    b. Contractor certifies that, if approved and incorporated into the Work:

        1) there will be no increase in cost to the Owner or increase in Contract Times; and

        2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

~~B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.~~

~~C.~~B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be

evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

~~D.~~C. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

~~E.~~D. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

a. shall certify that the proposed substitute item will:

1) perform adequately the functions and achieve the results called for by the general design,

2) be similar in substance to that specified, and

3) be suited to the same use as that specified.

b. will state:

1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,

2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

c. will identify:

1) all variations of the proposed substitute item from that specified, and

2) available engineering, sales, maintenance, repair, and replacement services.

d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.

B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.

F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.

J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.

L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Contractor agrees to take such action as may be necessary to bind each Subcontractor to these terms. The Contractor further agrees to conform to the Code of Ethical Conduct as adopted by the Associated General Contractors of America, Inc., with respect to contractor-subcontractor relationships, and that payments to Subcontractors shall be made in accordance with the provisions of G.S. 143-134.1 titled Interest on final payments due to prime contractors: payments to subcontractors.

N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. Not used.~~To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.~~

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners,

employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 *Taxes*

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

B. The Owner is eligible for a refund of NC sales and/or use taxes paid in North Carolina by the Owner's contractors ("contractors" hereinafter also refers to sub-contractors) on purchases of building materials, supplies, fixtures and equipment which become a part of or are annexed to any building or structure being erected, altered or repaired under contract with the City. Contractors shall include and must pay all taxes imposed by governmental authorities which are applicable to the contract work. The Contractor is responsible for obtaining the Contractors Sales and Use Detail Tax Report from its subcontractors. Each payment application must be accompanied with a certified Contractors Sales and Use Detail Tax Report. If no purchases of building materials, supplies, fixtures and equipment occurred in which sales and use tax was paid for a period covering a payment application, the contractor shall file a negative report indicating **"No State or County Sales Tax Paid".**

7.10 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that

the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

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

~~A.~~B. Contractor shall maintain and provide access to all fiscal records relating to this Contract in accordance with Generally Accepted Accounting Principles, and shall maintain any other records pertinent to this Contract in a manner so as to clearly document Contractor's performance. The Owner shall have a right to access the fiscal and other records of Contractor that are pertinent to this Contract to perform examinations and audits. Contractor shall retain and keep accessible all the fiscal and other records for a minimum of six (6) years following final payment and termination of this Contract, or until the conclusion of any audit or controversy related to this Contract, whichever is later.

7.12 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

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

7.14 *Hazard Communication Programs*

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

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements*:

1. Before submitting a Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

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

c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

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

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings*:

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples*:

   a. Contractor shall submit the number of Samples required in the Specifications.

   b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals*: Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review*:

1. Engineer will provide a review in a timely manner, as not to delay the Work, ~~review~~ of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.

5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances,

change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures*:

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

2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.

1. The Contractor 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.

2. 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 Contractor shall replace such defective equipment or materials, without cost to the owner, within the manufacturer's warranty period.

3. Additionally, the owner may bring an action for latent defects caused by the negligence of the Contractor 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.

~~1.~~4. Guarantees for roof, equipment, materials, and supplies shall be stipulated in the specifications sections governing such roof, equipment, materials, or supplies.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal;

6. the issuance of a notice of acceptability by Engineer;

7. any inspection, test, or approval by others; or

8. any correction of defective Work by Owner.

D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

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

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the

survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.

B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. an itemization of the specific matters to be covered by such authority and responsibility; and

3. the extent of such authority and responsibilities.

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

8.03 *Legal Relationships*

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of

them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

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

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Not used.~~Insurance~~*

~~Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.~~

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to

comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Not used.~~Evidence of Financial Arrangements~~*

~~Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).~~

9.12 *Safety Programs*

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

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

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

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as ~~Engineer deems~~ necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, ~~for the benefit of Owner,~~ will determine, ~~in general,~~ if the Work is proceeding in accordance with the Contract Documents. Engineer will ~~not be required to~~ make ~~exhaustive or continuous~~ inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a ~~greater degree of~~ confidence that the completed Work will conform ~~generally~~ to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work. ~~and will endeavor to guard Owner against defective Work.~~

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.

B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.

C. Engineer's authority as to Change Orders is set forth in Article 11.

D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

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

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the

safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

1. *Change Orders*:

a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.

2. *Work Change Directives*: A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding

change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any

Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.

B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures*: Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. *Engineer's Action*: Engineer will review each Change Proposal and, in a time frame as not to delay the Work, ~~within 30 days after receipt of the Contractor's supporting data,~~ either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. In such case that the Engineer is deemed to be delaying the work, ~~If Engineer does not take action on the Change Proposal within 30 days,~~ then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3. *Binding Decision*: Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

B. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

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

ARTICLE 12 – CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with

the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*:

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

    c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

    d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

    e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

    f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

    g. The cost of utilities, fuel, and sanitary facilities at the Site.

    h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

    i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

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

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers,

engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities installed and accepted by the Engineer.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

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

E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

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

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*:

1. At least ~~20~~30 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

4. Applications for Payment shall include the following documentation:

   a. sales and use tax form

   b. updated Progress Schedule

C. *Review of Applications*:

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing

Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

    a. the Work has progressed to the point indicated;

    b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

    c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

    a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

    b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

    a. to supervise, direct, or control the Work, or

    b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

    c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

    d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or

    e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

   a. the Work is defective, requiring correction or replacement;

   b. the Contract Price has been reduced by Change Orders;

   c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

   d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

   e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*:

1. ~~Twenty~~Thirty days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

   a. Prompt Payments: Contractors at all levels, prime, subcontractor, or second tier subcontractor, shall within 7 calendar days of receipt of monies, resulting from the satisfactory completion of work performed, pay subcontractors, second tier subcontractors, or material suppliers. This seven-day period begins upon knowledgeable receipt by the contracting firm obligated to make a subsequent periodic or final payment. This prompt payment requirement will be met if each firm mails the payment to the next level firm by evidence of postmark within the seven-day period. For the purposes of this section, the satisfactory completion of work performed shall exist when a subcontractor, second tier subcontractor or material supplier completes tasks called for in the subcontract and are in conformance with the terms of the Contract as required by the Owner. This specification for prompt payment shall be incorporated into each subcontract or second tier subcontract issued for work performed on the project or for services provided.

   The Contractor shall not withhold any payments to a subcontractor, second tier subcontractor or material supplier for any claim or action arising outside the current contract with the Owner. Notwithstanding the provisions of this section, the Contractor may withhold retainage if any subcontractor does not obtain a payment and performance bond for their portion of the work. If any retainage is held on subcontractors, all retainage shall be released within seven calendar days of satisfactory completion of all work. For release of retainage, satisfactory completion is defined as completion of all physical elements and corresponding documentation as defined in the subcontract, as well as agreement between the parties as to the final quantities for all work performed in the subcontract.

b. Failure of any entity to make prompt payment as defined herein may result in the Owner:

1) Withholding money from the Contractor due for work performed by that entity in the next partial payment until the necessary assurances are made consistent with this specification.

E. *Reductions in Payment by Owner*:

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. the Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. the Contract Price has been reduced by Change Orders;

i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;

j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

l. there are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

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

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree

otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.

2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

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

15.06 *Final Payment*

A. *Application for Payment*:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

   d. a list of all disputes that Contractor believes are unsettled; and

   e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

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

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer, in accordance with N.C.G.S. 133-1.1, will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will

return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such other adjacent areas;

2. correct such defective Work;

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not

limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

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

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this Article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and

2. Disputes between any party to the Contract~~Owner and Contractor~~ concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this Article, ~~Owner or Contractor~~ the parties may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to ~~a court of competent jurisdiction.~~ the Buncombe County Court system.

17.02 *Mediation*

A. Should a claim be denied by the Designer or Owner, and cannot be resolved, the Contractor, or any party to the Contract, may request a mediation in connection with GS 143-128(f1) in the dispute resolution rules adopted by the State Building Commission (1 N.C.A.C. 30H .0101 through .1001).

~~C.~~B. Any party to the Contract allowed to use the dispute resolution process adopted by the North Carolina State Building Commission pursuant to G. S. 143-135.26(11) and G. S. 143-128(F1) may participate in mediation pursuant to the dispute resolution process as a precondition to initiating litigation concerning the dispute. The amount of $15,000 or more must be at issue before a party may require other parties to participate in the dispute resolution process. The costs of the dispute resolution process shall be divided between the parties to the dispute.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

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

1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

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

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

A. This Contract is to be governed by the exclusively by the laws of North Carolina~~the state in which the Project is located~~.

18.08 *Headings*

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

18.09 *Minority Business Plan*

A. The City of Asheville has adopted a Minority Business Plan to encourage participation by women and minority businesses in the award of contracts. Contractor is hereby notified that this contract is subject to the provisions of that Plan. It is the policy of the City to (1) provide minorities an equal opportunity to participate in all aspects of its contracting and procurement programs and (2) to prohibit any and all discrimination against persons or businesses in pursuit of these opportunities.

18.10 *Americans with Disabilities Act:*

A. The Contractor shall comply with the provisions of the Americans with Disabilities Act ("ADA") and all rules and regulations promulgated thereunder. The Contractor hereby agrees to indemnify Owner from and against all claims, suits, damages, costs, losses and expenses in any manner arising out of or connected with the failure of the Contractor, its subcontractors, agents, successors, assigns, officers or employees to comply with provisions of the ADA or the rules and regulations promulgated thereunder.

18.11 *Records and Owner's Right to Audit:*

A. Records means all records generated by or on behalf of Contractor and each Subcontractor and Supplier of Contractor, whether paper, electronic, or other media, which are in any way related to performance of or compliance with this Contract, including, without limitation:

1. accounting records;
2. written policies and procedures;
3. subcontract files (including proposals of successful and unsuccessful Bidders, Bid recaps, etc.);
4. original estimates and estimating work sheets;
5. correspondence;

6. Change Order files (including documentation covering negotiated settlements);

7. back charge logs and supporting documentation;

8. general ledger entries detailing cash and trade discounts earned, insurance rebates and dividends;

9. lump sum agreements between Contractor and any Subcontractor or Supplier;

10. records necessary to evaluate: Contract compliance, Change Order pricing, and any Claim submitted by Contractor or any of its payees; and

11. any other Contractor record that may substantiate any charge related to this Contract.

B. Contractor shall allow Owner's agent or its authorized representative to inspect, audit, and/or reproduce, or all three, all Records generated by or on behalf of Contractor and each Subcontractor and Supplier, upon Owner's written request. Further, Contractor shall allow Owner's agent or authorized representative to interview any of Contractor's employees, all Subcontractors and all Suppliers, and all their respective employees.

~~A.~~C. Contractor shall retain all its Records, and require all its Subcontractors and Suppliers to retain their respective Records, during this Contract and for six (6) years after final payment, until all audit and litigation matters that Owner has brought to the attention of Contractor are resolved, or as otherwise required by law, whichever is longer. Owner's right to inspect, audit, or reproduce Records, or interview employees of Contractor or its respective Subcontractors or Suppliers exists during this Contract, and for six (6) years after final payment, until all audit and litigation matters that Owner has brought to Contractor's attention are resolved, or as otherwise required by law, whichever is longer, and at no cost to Owner, either from Contractor or any of its Subcontractors or Suppliers that may furnish Records or make employees available for interviewing.

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

GUIDE TO THE PREPARATION OF SUPPLEMENTARY CONDITIONS

Prepared by

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

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This **Guide to the Preparation of Supplementary Conditions** has been prepared for use with the Standard General Conditions of the Construction Contract (EJCDC® C-700, 2013 Edition). Their provisions are interrelated and a change in one may necessitate a change in the other. The suggested language contained in the **Guide to the Preparation of Instructions to Bidders** (EJCDC® C-200, 2013 Edition) is also carefully integrated with the suggested language of this document. The full EJCDC Construction series of documents is discussed in the **Commentary on the 2013 EJCDC Construction Documents** (EJCDC® C-001, 2013 Edition).

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NOTE: EJCDC publications may be purchased at www.ejcdc.org, or from any of the sponsoring organizations above.

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A. *General*

The Engineers Joint Contract Documents Committee® (EJCDC®) has prepared and publishes standard contract forms for construction contracts, as well as bidding-related documents. The principal forms are listed in Table 1. EJCDC has also prepared other documents that may be useful in preparing construction contract documents. Some of the principal ones are listed in Table 2. For the most recent editions of these forms, guides, and other documents, please refer to EJCDC's website at www.ejcdc.org.

Table 1
Principal EJCDC Standard Forms
and Related Guides for Construction Contracts

Name	Number	Short Title/Abbreviation
Suggested Instructions to Bidders for Construction Contracts	C-200	Instructions/I
Bid Form for Construction Contracts	C-410	Bid Form/BF
Agreement between Owner and Contractor for Construction Contract (Stipulated Price)	C-520	Stipulated Price Agreement/A
Agreement between Owner and Contractor for Construction Contract (Cost-Plus)	C-525	Cost-Plus Agreement/A
Standard General Conditions of the Construction Contract	C-700	General Conditions/GC
Guide to the Preparation of Supplementary Conditions	C-800	Supplementary Conditions/SC

Table 2
Principal EJCDC Documents Relating to
Preparation of Construction Documents

Name	Number	Short Title
Commentary on the 2013 EJCDC Construction Documents	C-001	Commentary
Uniform Location of Subject Matter	N-122	Locator Guide
Bidding Procedures and Construction Contract Documents	C-050	Bidding Procedures
Engineer's Letter to Owner Requesting Instructions Concerning Bonds and Insurance	C-051	Engineer's Letter to Owner Concerning Bonds and Insurance
Owner's Instructions to Engineer Concerning Bonds and Insurance	C-052	Owner's Instructions Concerning Bonds and Insurance

B. *Mandatory Supplementary Conditions*

Several provisions of the General Conditions expressly indicate that essential Project-specific information will be set out in a corresponding Supplementary Condition. For example, Paragraph 6.03.I of the General Conditions indicates that required insurance coverage limits will be specified in the Supplementary Conditions. Every EJCDC-based construction contract should include, at a minimum, the following Supplementary Conditions:

1. One of the suggested Paragraphs SC-5.03, concerning reports and drawings of conditions at the Site, and any Technical Data in the reports and drawings on whose accuracy the Contractor may rely;
2. One of the suggested Paragraphs SC-5.06, concerning reports and drawings regarding Hazardous Environmental Conditions at the Site, and any Technical Data in those reports and drawings on whose accuracy the Contractor may rely;
3. Those portions of SC-6.03 identifying specific insurance coverage requirements; and
4. One of the two alternatives presented in SC-10.03 (either the Engineer will provide Resident Project Representative services on the Project, with specific authority and responsibilities, or Engineer will not provide Resident Project Representative services).

Other suggested Supplementary Conditions are mandatory under specific circumstances: for example, on projects in which the Contractor will be responsible for compliance with Owner's safety program, SC-7.12 would be mandatory.

C. *Relationship of Supplementary Conditions to Other Contract Documents*

Supplementary Conditions are modifications to the General Conditions—additions, deletions, changes. This is as the term is defined by EJCDC and the Construction Specification Institute (CSI). Other organizations use their supplementary conditions to modify a broader range of contract documents, such as agreement forms and standard specifications.

This Guide and the other Construction-related documents prepared and issued by EJCDC assume use of the CSI MasterFormat™ concept, which provides an organizational format for location of all documentary information for a construction project: Bidding Requirements, contract forms (Agreement, Bonds, and certificates), General Conditions, Supplementary Conditions, and Specifications. Under the CSI MasterFormat™, the last grouping, Specifications, is divided into 49 Divisions, the first of which, Division 01, is entitled “General Requirements.”

The standard fundamental provisions affecting the rights and duties of the parties appear in the General Conditions. Language to modify the fundamental relationships between the parties, supplement the framework set forth in the General Conditions, or change the language of the General Conditions, should appear in the Supplementary Conditions. Examples of this are a change in Contractor’s Site responsibilities, and a supplemental clause specifying the details of insurance coverages and limits for the Project.

Price terms, monetary terms such as liquidated damages clauses, and completion dates should all be set forth in the Agreement (EJCDC® C-520–Stipulated Sum or C-525–Cost-Plus), and should not be included in the Supplementary Conditions.

The substance of the General Requirements (Division 01 of the Specifications) falls generally into three categories: (1) administrative requirements, such as summary of work, allowances, coordination, alternatives (materials, equipment, or price), product options, project meetings, and project close-out; (2) work-related provisions, such as temporary facilities, field testing, and start-up; and (3) general provisions applicable to more than one section in Divisions 02 through 49.

D. *Arrangement of Subject Matter*

This Guide is arranged in the same order as the 2013 edition of the General Conditions, and the paragraphs herein bear comparable addresses to those of the General Conditions but with the prefix "SC." A discussion of the purpose and function of these suggested Supplementary Conditions is included in EJCDC® C-001, Commentary on the 2013 EJCDC Construction Documents.

E. *Use of this Guide*

The text presented in bold type in the remainder of this Guide is suggested language for some commonly used Supplementary Conditions. The drafter should bear in mind that most contractual provisions have important legal consequences. Consultation with legal counsel before finalization of any amendment or supplement is recommended.

Many sets of supplementary conditions examined by EJCDC contain typical or "boilerplate" provisions that have accumulated like moss over the years, appear to have no practical significance for the particular project, and may produce unintended and surprising legal consequences. Such provisions are usually there because someone saw similar terms in other contract documents and it "sounded good." Selecting contract terms in that manner is not recommended. Provisions of the Supplementary Conditions should address a particular point in the General Conditions or cover a particular topic. The Supplementary Conditions should not be a repository for general language of vague meaning for which another location cannot be readily found.

This Guide assumes a general familiarity with the other Construction-related (C-series) documents prepared by EJCDC and, when drafting language, specific attention to them is encouraged. Standard documents or prescribed forms issued by governmental bodies and other owners may differ materially from the documents of EJCDC so that careful correlation of any amending or supplementing language is essential. The practice of stating that any provision in one document that is inconsistent with another is superseded, or that one document always takes precedence over another in the event of a conflict in language or requirements, is sometimes necessary, but generally discouraged. The resulting legal consequences of such provisions are frequently difficult to decipher and may be very different from what was anticipated.

The EJCDC General Conditions use carefully chosen language and set forth the basic responsibilities of the parties with respect to fundamental matters and legal consequences. Their provisions should be altered only where mandated by the specific requirements of a given project and the consequences of any modification are thoroughly understood.

Caution should be exercised when making any change in the standard documents. They have been carefully prepared, terms are used uniformly throughout and are consistent with the terms

in other EJCDC documents. Their provisions have been carefully integrated, and are dependent on one another. A change in one document may necessitate a change in another, and a change in one paragraph may necessitate a change in other language of the same document. No change should be made until its full effect on the rest of the General Conditions and other Contract Documents has been considered.

Users must follow the instructions and restrictions regarding the use of this document that are set out in the License Agreement that accompanied the document at the time of purchase or acquisition. To prepare this document for use on a specific project, after reviewing all instructions and explanatory text and notes, (1) remove the cover pages, this Introduction, Part II (Standard Prefatory Language and Traditional Format for Supplementary Conditions) and Part III (Alternative Format for Supplementary Conditions) (2) fill in Project-specific information and make revisions to the document, following the guidance in the explanatory text and notes, and the advice of legal counsel, and (3) delete the explanatory text and notes.

Lastly, remember that an engineer is neither qualified nor licensed to give advice to others on the legal consequences of contracts. All of the Contract Documents have important legal consequences. Owners should be encouraged to seek the advice of an attorney before accepting any modification of the printed forms, before the documents are sent out for bidding, and most assuredly before signing any agreement.

II. STANDARD PREFATORY LANGUAGE AND TRADITIONAL FORMAT FOR SUPPLEMENTARY CONDITIONS

Suggested format and wording conventions for Supplementary Conditions appear below.

A. *Table of Contents*

The inclusion of a table of contents will benefit the user of the Supplementary Conditions, especially if additional articles (beyond the 18 Articles of the General Conditions) are added for the purpose of including mandated or other provisions.

B. *Pagination*

If CSI's MasterFormat™, 2012 Edition, is being used for the Project Manual, consult MasterFormat™ for the appropriate section number and number the pages accordingly.

C. *Format for Complete Paragraph Change*

When completely superseding a paragraph of the General Conditions, the following language may be used:

SC 5.09.B Delete Paragraph 5.09.B in its entirety and insert the following in its place:

_____

_____

_____

D. *Format for Change within a Paragraph*

When changing language within a paragraph of the General Conditions, the following language may be used:

SC 6.21.A Amend the second sentence of Paragraph 6.21.A [to read as follows] *[or]* **[by striking out the following words]:**

_____

_____

_____

E. *Format for Additional Language*

When adding language to an existing paragraph of the General Conditions, the idea may be expressed as follows:

SC 9.03 Add the following language at the end of the second sentence of Paragraph 9.15:

_____

_____

_____

F. *Format for Additional Paragraph*

If it is desired to add a new paragraph to the General Conditions, the thought may be expressed as follows:

SC 8.06 Add the following new paragraph immediately after Paragraph 8.06.B:

_____

_____

_____

III. ALTERNATIVE FORMAT FOR SUPPLEMENTARY CONDITIONS

Electronic files are commonly used for transmittal and storage of the text of standard documents. In fact, EJCDC no longer publishes printed documents. Because it is easy to modify documents electronically, it is increasingly common for practitioners to integrate the text of desired Supplementary Conditions into the text of the General Conditions. Most word processing programs have line-out and underlining features that accurately show deletions, changes, and additions. Users of EJCDC's General Conditions are contractually obligated, through the terms of the purchase of the document, to clearly delineate all changes made to the standard text of the General Conditions to other parties in interest (for example, if Owner makes changes, Owner should show these changes to prospective bidders). It would be misleading to users to imply or represent that the General Conditions are EJCDC's General Conditions if changes are not properly and clearly identified during the contract formation process.

IV. SUGGESTED SUPPLEMENTARY CONDITIONS

A. *Caption and Introductory Statements*

The following is a suggestion for use at the beginning of the Supplementary Conditions for a specific project:

Supplementary Conditions

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2013 Edition). All provisions that are not so amended or supplemented remain in full force and effect.

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

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 Defined Terms

A. If the Contract will include a Geotechnical Baseline Report (see Article 5 below), include the following definitions:

SC-1.01. Add to the list of definitions in Paragraph 1.01.A by inserting the following as numbered items in their proper alphabetical positions:

Geotechnical Baseline Report (GBR) — The interpretive report prepared by or for Owner regarding subsurface conditions at the Site, and containing specific baseline geotechnical conditions that may be anticipated or relied upon for bidding and contract administration purposes, subject to the controlling provisions of the Contract, including the GBR's own terms. The GBR is a Contract Document.

Geotechnical Data Report (GDR) — The factual report that collects and presents data regarding actual subsurface conditions at or adjacent to the Site, including Technical Data and other geotechnical data, prepared by or for Owner in support of the Geotechnical Baseline Report. The GDR's content may include logs of borings, trenches, and other site investigations, recorded measurements of subsurface water levels, the results of field and laboratory testing, and descriptions of the investigative and testing programs. The GDR does not include an interpretation of the data. If opinions, or interpretive or speculative non-factual comments or statements appear in a document that is labeled a GDR, such opinions, comments, or statements are not operative parts of the GDR and do not have contractual standing. Subject to that exception, the GDR is a Contract Document.

ARTICLE 2 – PRELIMINARY MATTERS

~~*SC-2.01 Delivery of Bonds and Evidence of Insurance*~~

~~A. Paragraph 2.01.B of the General Conditions requires that Contractor furnish certificates of insurance. Paragraph 6.02.C states that upon request by Owner or other named or additional insureds, Contractor must provide evidence of insurance such as copies of required policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Parallel provisions apply to Owner and the insurance that Owner is required to provide. Rather than relying on this two-step process (delivery of certificates of insurance at the outset; subsequent requests for additional evidence of insurance), some contract drafters may elect to require from the outset that copies of the insurance policies, rather than certificates of insurance, be delivered to the other party. If exchange of copies of insurance policies is required, the following should be used:~~

~~**SC-2.01 Delete Paragraphs 2.01.B. and C. in their entirety and insert the following in their place:**~~

~~**B. Evidence of Contractor's Insurance: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies of insurance (including all endorsements, and identification of applicable self-insured retentions and deductibles) required to be provided by Contractor in Article 6. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.**~~

~~**C. Evidence of Owner's Insurance: After receipt from Contractor of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner under Article 6 (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.**~~

SC-2.02 Copies of Documents

A. If the number of printed or hard copies of the Drawings and Project Manual to be provided is different than four copies the following may be used:

SC-2.02.A. Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor [____] copies of the Contract Documents (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF).

B. On some projects it may be useful to produce conformed Contract Documents, in which the content of Addenda and negotiated changes are merged into the appropriate Specifications, Drawings, General Conditions, or other Contract Documents. This may be especially true on private construction projects where the terms and scope are negotiated and modified significantly after the initial release of proposed Contract Documents. Conformed documents may be considerably more convenient to use during the performance of the Work and the administration of the Contract.

EJCDC advises that if conformed documents are to be prepared and made available to Contractor, sufficient time and budget must be allocated to ensure the quality and full coordination of the conformed documents, and Owner and Engineer must recognize that Contractor, Subcontractors, and Suppliers will likely rely on the conformed version of the Contract Documents rather than the source components. If conformed documents are prepared without the level of commitment necessary to allow them to be accorded the full status of "Contract Documents," and are merely for reference or convenience, they should be accompanied by clear disclaimers of their content and a warning to consult the actual source Contract Documents.

A Supplementary Condition regarding conformed documents is necessary only if the Owner intends to provide the Contractor with conformed documents that will serve as binding Contract Documents. The following may be used for that purpose:

SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following new paragraph in its place:

A. Owner shall furnish to Contractor [_____] copies of conformed Contract Documents incorporating and integrating all Addenda and any amendments negotiated prior to the Effective Date of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies of the conformed Contract Documents will be furnished upon request at the cost of reproduction.

C. Note: If Owner is not furnishing PDF or other electronic files of the Contract Documents, then draft (1) a Supplementary Condition that deletes the reference in 2.02.A of the General Conditions to providing the PDF files, and (2) a Supplementary Condition that deletes Paragraph 3.01.C in its entirety.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.03 Subsurface and Physical Conditions

A. **This is a mandatory Supplementary Condition.** Paragraph 5.03, Subsurface and Physical Conditions, of the General Conditions requires the identification of all known documents regarding subsurface and physical conditions at or adjacent to the Site (this requirement is broader than merely requiring that Contractor be given access to subsurface reports prepared for the current Project). It also requires the identification of Technical Data (upon whose accuracy Contractor may rely) contained in such documents. Use the first version of SC-5.03, presented immediately below, for the purpose of identifying the known Site condition documents. If no such documents are known, then use the second version of SC-5.03, below. Also note that if the known documents include either a geotechnical report or environmental report prepared for the Project, or both, and the Supplemetary Conditions neglect to expressly identify the Technical Data, upon whose accuracy Contractor may rely, that is contained in such reports, then the default definition of Technical Data in Paragraph 1.01 of the General Conditions will apply.

Note that if Owner elects to furnish a Geotechnical Baseline Report (GBR), use the alternate SC/GBR-5.03 and SC/GBR 5.04 located in the next section of this document, rather than one of the SC-5.03 versions immediately following. If a GBR is used, it remains important to disclose known

reports and tests regarding subsurface conditions; a place for doing so is provided in SC/GBR-5.03. If some Site conditions are outside the scope of the Geotechnical Baseline Report it will continue to be necessary to identify reliable Technical Data contained in such reports and drawings; however, if the Geotechnical Baseline Report or a related Geotechnical Data Report already establish the data that is worthy of reliance, it will not be necessary to make a redundant identification in SC/GBR 5.03.

SC-5.03 ~~**Add the following new paragraphs immediately after Paragraph 5.03.B:**~~

C. ~~**The following reports of explorations and tests of subsurface conditions at or adjacent to the Site are known to Owner:**~~

~~**1. Report dated** *[May 21, 2013, prepared by Aye and Bea, Consulting Engineers, Philadelphia, Pa., entitled: "Results of Investigation of Subsoil Conditions and Professional Recommendations for Foundations of Iron Foundry at South and Front Streets, Pembrig, NJ", consisting of 42 pages.]* **The Technical Data contained in such report upon whose accuracy Contractor may rely are** *[here indicate any such Technical Data, or state "none."] [or]* **[those indicated in the definition of Technical Data in the General Conditions.]**~~

~~**2. Report dated** *[May 2, 2000, prepared by Ecks, Wye and Tszee, Inc., Baltimore, Md., entitled: "Tests of Water Quality in Mixter River at Pembrig, NJ", consisting of 26 pages.]* **The Technical Data contained in such report upon whose accuracy Contractor may rely are** *[here indicate any such Technical Data, or state "none."] [or]* **[as indicated in the definition of Technical Data in the General Conditions.]**~~

~~**D. The following drawings of physical conditions relating to existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities) are known to Owner:**~~

~~**1. Drawings dated** *[March 2, 2000, of Route 24A Overpass Abutment, prepared by Dea & Associates, Inc., Wilmington, Del., entitled: "Record Drawings: Route No. 24A Overpass Abutment", consisting of 12 sheets numbered 001 to 012, inclusive.]*~~

[Use one of the following two subparagraphs:]

a. ~~**All of the information in such drawings constitutes Technical Data on whose accuracy Contractor may rely, except for [redacted] appearing on Drawing No. [redacted] and [redacted] appearing on Drawing No. [redacted].**~~

~~*[or]*~~

~~**a. None of the contents of such drawings is Technical Data on whose accuracy Contractor may rely.**~~

~~**E. Contractor may examine copies of reports and drawings identified in SC 5.03.C and SC 5.03.D that were not included with the Bidding Documents at [redacted]** *[insert location]* **during regular business hours, or may request copies from Engineer.**~~

If there are no known Site-related reports or drawings, use the following version of SC-5.03:

~~SC 5.03 Delete Paragraphs 5.03.A and 5.03.B in their entirety and insert the following:~~

~~A. No reports of explorations or tests of subsurface conditions at or adjacent to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.~~

B. Geotechnical Baseline Reports: Some project owners use a Geotechnical Baseline Report (GBR) for projects (or portions of a project) in which the subsurface conditions will play a significant role. Providing a GBR may result in bids with lower contingencies for subsurface conditions, and simplify the application of the differing site conditions provisions in Article 5 of the General Conditions. Commentary on Geotechnical Baseline Reports is presented in EJCDC® C-001. See also Geotechnical Baseline Reports for Construction—Suggested Guidelines, by Randall J. Essex, P.E., ASCE 2007. In many cases it may be advantageous for Owner, Engineer, or the geotechnical engineer to engage a consultant with GBR experience to assist in preparation of the GBR and related documents.

On projects in which a Geotechnical Baseline Report is used, it is typical to also assemble and provide a Geotechnical Data Report (GDR), as a separate, single source of factual geotechnical information regarding the Site. The content of the GDR is in essence what the EJCDC documents define as "Technical Data"—reliable factual information, such as boring logs and laboratory test results. (See the definition of Technical Data in Article 1 of the General Conditions, and the definition of a GDR in Article 1 of these Supplementary Conditions). Some Owners may elect to issue a GBR without compiling a GDR, but regardless of the format it is essential to identify and make all geotechnical data available. Note that a typical general purpose geotechnical report, usually prepared primarily to assist in the design of the project, often contains not only factual data but also opinions, interpretations, and even speculation regarding the Site's subsurface conditions. **Such a geotechnical report is not suitable to be adopted or identified as a GDR.**

Although it is preferable that a GBR be comprehensive with respect to subsurface conditions, in some cases a GBR will establish baselines for a portion of a project, but will not address all subsurface issues. For example, the GBR may establish baseline subsurface conditions along the route of a pipeline, but be silent with respect to conditions underlying an associated pump building. Also, in some cases a project will involve both subsurface construction as well as building modifications or other tasks unrelated to geotechnical investigations, analysis, or interpretations. The SC/GBR provisions that follow retain certain differing site condition provisions of the General Conditions, in part because these may be needed for situations that are outside the scope of the GBR. As noted previously, these SC/GBR provisions contain locations for (1) identifying known reports and drawings regarding the subsurface conditions (a mandatory obligation), and (2) identifying Technical Data upon whose accuracy Contractor may rely (necessary in some but not all GBR projects, depending on the scope of the GBR and GDR documents).

If a GBR is used, then include the following GBR Supplementary Conditions, and do not use either of the Paragraphs SC-5.03 above:

SC/GBR-5.03 and 5.04. Delete Paragraphs 5.03 and 5.04 of the General Conditions in their entireties and replace with the following provisions:

SC/GBR-5.03 Subsurface and Physical Conditions

A. Reports and Drawings: The Supplementary Conditions hereby identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site (other than any Geotechnical Data Report or Geotechnical Baseline Report), and Technical Data contained in such reports. Such reports are as follows:

a. Report dated *July 21, 2015, prepared by Stewart, entitled "Geotechnical Engineering Report – Beaucatcher Greenway – White Fawn Reservoir to Helen's Bridge Asheville, NC"* ~~*[May 21, 2013, prepared by Aye and Bea, Consulting Engineers, Philadelphia, Pa., entitled: "Results of Investigation of Subsoil Conditions and Professional Recommendations for Foundations of Iron Foundry at South and Front Streets, Pembrig, NJ", consisting of 42 pages.]*~~ **The Technical Data contained in such report upon whose accuracy Contractor may rely** ~~**are** *[here indicate any such Technical Data or state "none."] [or]*~~ **[those indicated in the definition of Technical Data in the General Conditions.]**

b. ~~**Report dated** *[May 2, 2000, prepared by Ecks, Wye and Tszee, Inc., Baltimore, Md., entitled: "Tests of Water Quality in Mixter River at Pembrig, NJ", consisting of 26 pages.]* **The Technical Data contained in such report upon whose accuracy Contractor may rely are** *[here indicate any such Technical Data or state "none."] [or]* **[as indicated in the definition of Technical Data in the General Conditions.]**~~

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), and Technical Data contained in such drawings. Such drawings are as follows:

a. Drawings dated *10/5/16, BEAUCATCHER GREENWAY, White Fawn Reservoir to Helen's Bridge,134 sheets*

[Use one of the following two subparagraphs:]

(1) All of the information in such drawings constitutes Technical Data on whose accuracy Contractor may rely~~**, except for [redacted] appearing on Drawing No. [redacted] and [redacted] appearing on Drawing No. [redacted].**~~

~~*[or]*~~

~~**(2) None of the contents of such drawings is Technical Data on whose accuracy Contractor may rely.**~~

3. **Contractor may examine copies of reports and drawings identified immediately above that were not included with the Bidding Documents at** _____ *[insert location]* **during regular business hours, or may request copies from Engineer, at the cost of reproduction.**

B. Reliance by Contractor on Technical Data Authorized:

Contractor may rely upon the accuracy of the Technical Data contained in such reports and drawings, but such reports and drawings are not Contract Documents. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. **the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or**
2. **other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or**
3. **any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.**

C. Geotechnical Baseline Report:

1. **This Contract contains a Geotechnical Baseline Report ("GBR"), identified as follows:** *July 21, 2015, prepared by Stewart, entitled "Geotechnical Engineering Report – Beaucatcher Greenway – White Fawn Reservoir to Helen's Bridge Asheville, NC" ~~[Geotechnical Baseline Report for Northwest Interceptor, dated February 12, 2013, prepared by ABC Geotechnical Engineers, Inc., Sacramento, California].~~* **This Contract also contains a Geotechnical Data Report (GDR), identified as follows:** *~~[Geotechnical Data Report for Northwest Interceptor, dated June 15, 2012, prepared by ABC Geotechnical Engineers, Inc., Sacramento, California]~~"Appendix to the above noted report.*
2. **The GBR and GDR are incorporated as Contract Documents. The GBR and GDR are to be used in conjunction with other Contract Documents, including the Drawings and Specifications. If there is a conflict between the terms of the GBR and the GDR, the GBR's terms shall prevail.**
3. **The GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations (referred to here in the Supplementary Conditions as "Baseline Conditions"). These may include ground, geological, groundwater, and other subsurface geotechnical conditions, and baselines of anticipated Underground Facilities or subsurface structures.**

4. **The Baseline Conditions shall be used to assist in the administration of the Contract's differing site conditions clause at locations where subsurface conditions have been baselined. If a condition is baselined in the GBR, then only the pertinent Baseline Conditions shall be used to determine whether there is a differing site condition; and no other indication of that condition in the Contract Documents or Technical Data, or of a condition that describes, quantifies, or measures a similar characteristic of the subsurface, shall be used for the differing site condition determination.**

5. **The Baseline Conditions shall not be used to make differing site conditions determinations at locations that have not been baselined in the GBR, or at any location with respect to subsurface conditions that the Baseline Conditions do not address. If Underground Facilities or Hazardous Environmental Conditions are expressly addressed in the Baseline Conditions, then comparison to such Baseline Conditions shall be the primary means of determining (a) whether an Underground Facility was shown or indicated with reasonable accuracy, as provided in Paragraph 5.05 of the General Conditions, or (b) whether a Hazardous Environmental Condition was shown or indicated in the Contract Documents as indicated in Paragraph 5.06.H of the General Conditions. As indicated in Paragraph SC-5.04 below, the GDR shall be the primary resource for differing site conditions determinations in cases in which the GBR is inapplicable.**

6. **The descriptions of subsurface conditions provided in the GBR are based on geotechnical investigations, laboratory tests, interpretation, interpolation, extrapolation, and analyses. Neither Owner, Engineer, nor any geotechnical or other consultant warrants or guarantees that actual subsurface conditions will be as described in the GBR, nor is the GBR intended to warrant or guarantee the use of specific means or methods of construction.**

7. **The behavior of the ground during construction depends substantially upon the Contractor's selected means, methods, techniques, sequences, and procedures of construction. If ground behavior conditions are baselined in the GBR, they are based on stated assumptions regarding construction means and methods.**

8. **The GBR shall not reduce or relieve Contractor of its responsibility for the planning, selection, and implementation of safety precautions and programs incident to Contractor's means, methods, techniques, sequences, and procedures of construction, or to the Work.**

SC/GBR-5.04 Differing Subsurface or Physical Conditions

A. **Notice: If Contractor believes that any subsurface condition that is uncovered or revealed at the Site:**

   1. **differs materially from conditions shown or indicated in the GBR; or**

   2. **differs materially from conditions shown or indicated in the GDR, to the extent the GBR is inapplicable; or**

3. **differs materially from conditions shown or indicated in Contract Documents other than the GBR or GDR, to the extent the GBR and GDR are inapplicable; or**

4. **to the extent the GBR and GDR are inapplicable, is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or**

5. **to the extent the GBR and GDR are inapplicable, is of such a nature as to require a change in the Drawings or Specifications; or**

6. **to the extent the GBR and GDR are inapplicable, is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;**

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. Engineer's Review: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph SC/GBR 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption or continuation of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. Owner's Statement to Contractor Regarding Site Condition:

After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption or continuation of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. Possible Price and Times Adjustments:

1. **Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or**

interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must fall within any one or more of the categories described in Paragraph SC/GBR 5.04.A;

b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03 of the General Conditions; and,

c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or

b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice as required by Paragraph SC/GBR 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

SC-5.06 Hazardous Environmental Conditions

A. **This is a mandatory Supplementary Condition.** Paragraph 5.06 of the General Conditions contemplates that Owner identify all known documents regarding Hazardous Environmental Conditions (HEC) that have been identified at or adjacent to the Site. It also requires the identification of Technical Data (upon whose accuracy Contractor may rely) contained in such documents. Use the first version of SC-5.06, presented immediately below, to identify the known HEC documents. If no HEC documents are known, then use the second version of SC-5.06, below. Also note that if the known documents include either a geotechnical report or environmental

report prepared for the Project, or both, and the Supplementary Conditions neglect to expressly identify the Technical Data, upon whose accuracy Contractor may rely, that is contained in such reports, then the default definition of Technical Data in Paragraph 1.01 of the General Conditions will apply.

~~SC-5.06 Add the following new subparagraphs immediately after Paragraph 5.06.A.2:~~

~~A.3 The following reports regarding Hazardous Environmental Conditions at the Site are known to Owner:~~

~~a. Report dated December 10, 2012, prepared by Eph Environmental Consultants, Princeton, N.J., entitled: "Results of Investigation of Conditions at Iron Foundry at South and Front Streets, Pembrig, NJ", consisting of 27 pages. The Technical Data contained in such report upon whose accuracy Contractor may rely are~~ *~~[here indicate any such Technical Data or state "none."]~~*

~~A.4 The following drawings regarding Hazardous Environmental Conditions at the Site are known to Owner:~~

~~a. Drawings dated November 27, 2002, prepared by Eph Environmental Consultants, Princeton, N.J., entitled: "Iron Foundry Site Conditions", consisting of 5 sheets numbered [redacted] to [redacted], inclusive.~~

~~[Use one of the following two subparagraphs:]~~

~~1) All of the information in such drawings constitutes Technical Data on whose accuracy Contractor may rely, except for [redacted] appearing on Drawing No. [redacted] and [redacted] appearing on Drawing No. [redacted].~~

~~[or]~~

~~1) None of the contents of such drawings is Technical Data on whose accuracy Contractor may rely.~~

B. Use the following SC-5.06 if there are no known HEC reports or drawings:

SC 5.06 Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:

A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.

B. Not Used.

ARTICLE 6 – BONDS AND INSURANCE

~~*SC-6.02 Insurance—General Provisions*~~

~~A. Paragraph 6.02.B of the General Conditions requires that all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better, unless a different standard is indicated in the Supplementary Conditions. The A.M. Best ratings are based on the financial strength and size of the insurance company, with A-VII representing a commonly used standard. SC-6.02 is the location for noting any different standard, whether narrower or broader.~~

~~Note that in some states not all worker's compensation insurers obtain A.M. Best ratings. The Owner may wish to include the following optional exception (modified to meet applicable provisions in the state) to the requirement in 6.02.B:~~

~~**SC 6.02 Add the following paragraph immediately after Paragraph 6.02.B:**~~

~~**1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.**~~

SC-6.03 Contractor's Insurance

A. **This is a mandatory Supplementary Condition**, because it is the location for specifying the limits of the coverages for the insurance required in Paragraph 6.03 of the General Conditions. The information set forth in this Supplementary Condition (and in all other contractual provisions regarding bonds and insurance) should be provided by Owner, either directly or through written instructions given to Engineer (see EJCDC® C-051, Engineer's Letter to Owner Requesting Instructions Concerning Bonds and Insurance, and EJCDC® C-052, Owner's Instructions to Engineer Concerning Bonds and Insurance).

SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.J:

K. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation, and related coverages under Paragraphs 6.03.A.1 and A.2 of the General Conditions:

State:		**Statutory**
Federal, if applicable (e.g., Longshoreman's):		**Statutory**
Jones Act coverage, if applicable:		
Bodily injury by accident, each accident	**$**	**n/a**
Bodily injury by disease, aggregate	**$**	**n/a**
Employer's Liability:		
Bodily injury, each accident	**$**	**1,000,000.00**
Bodily injury by disease, each employee	**$**	**1,000,000.00**
Bodily injury/disease aggregate	**$**	**1,000,000.00**
For work performed in monopolistic states, stop-gap liability coverage shall be endorsed to either the worker's compensation or commercial	**$**	**n/a**

general liability policy with a minimum limit of: _____

Foreign voluntary worker compensation **Statutory**

2. **Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions:**

General Aggregate	**$ 2,000,000.00**
Products - Completed Operations Aggregate	**$ 2,000,000.00**
Personal and Advertising Injury	**$ 1,000,000.00**
Each Occurrence (Bodily Injury and Property Damage)	**$ 1,000,000.00**

3. **Automobile Liability under Paragraph 6.03.D. of the General Conditions:**

~~**Bodily Injury:**~~

~~**- Each person**~~ ~~**$**~~ _____

~~**- Each accident**~~ ~~**$**~~ _____

~~**Property Damage:**~~

~~**- Each accident**~~ ~~**$**~~ _____

~~*[or]*~~

Combined Single Limit of **$ 1,000,000.00**

4. **Excess or Umbrella Liability:**

Per Occurrence	**$ 2,000,000.00**
General Aggregate	**$ 2,000,000.00**

[BE1]

~~*[See Paragraph 6.03.E of the General Conditions.]*~~

~~*[If Owner revises the standard terms by deleting the requirement that Contractor provide Excess or Umbrella liability insurance, then Owner should consider requiring (in SC-6.03.K.2) that "The aggregate limits under SC-6.03.K.2 (Commercial General Liability) be maintained fully available for this Contract by obtaining and maintaining a Designated Construction Project General Aggregate Limit endorsement, or equivalent."]*~~

5. **Contractor's Pollution Liability:**

Each Occurrence	**$ n/a**
General Aggregate	**$ n/a**

☒ **If box is checked, Contractor is not required to provide Contractor's Pollution Liability insurance under this Contract**

~~*[See Paragraph 6.03.F of the General Conditions.]*~~

~~*[On some projects, the Owner may conclude that it is not cost effective to require the Contractor to carry Contractor's Pollution Liability insurance, based on the type of work to be performed or knowledge of conditions at the Site. In such cases, check the box above and either delete the "Each Occurrence" and "General Aggregate" line items, or indicate "N.A." or "Not applicable" in the blanks.]*~~

6. **Additional Insureds: In addition to Owner and Engineer, include as additional insureds the following:** *[Here list by name (not category, role, or classification) other persons or entities to be included on the commercial general liability, automobile liability, umbrella or excess, and pollution liability policies as additional insureds.]*[BE2]

~~**7. Contractor's Professional Liability:**~~

~~**Each Claim**~~	~~**$**~~ _____
~~**Annual Aggregate**~~	~~**$**~~ _____

~~*[See Paragraph 6.03.H of the General Conditions.]*~~

~~*[Contractor's pollution liability and contractor's professional liability policies are sometimes sold as a hybrid or combined policy. If after receiving the advice of its risk managers the Owner concludes that it is an acceptable alternative for Contractor to provide such a combination policy, this should be stated here, together with the required policy limits for a combination policy.]*~~

~~**8.** *[Here list additional types and amounts of insurance that may be required by Owner.]*~~

SC-6.05 Property Insurance

~~A. Builder's Risk Deductible: Paragraph 6.05.A of the General Conditions requires builder's risk insurance on a completed value basis, subject to such deductible amounts as are provided by the Supplementary Conditions. In many cases, the Owner (as the party directing or specifying the content of the insurance-related Supplementary Conditions) will choose not to specify any deductibles, leaving establishment of the deductible amounts to the discretion of the purchasing party, which is responsible for payment of the deductibles. Even when a deductible is stipulated, it~~

is typically a maximum amount; the purchaser may choose to purchase a policy with a lower deductible. Note that it is common for builder's risk policies to feature several different deductibles, typically including a primary deductible and specific deductibles applicable to specific types of loss. The following Supplementary Condition provides a means of identifying a primary deductible; other specific deductibles may also be added.

If a primary deductible is to be stipulated, use the following to establish the maximum amount of the deductible:

SC-6.05. Add the following to the list of requirements in Paragraph 6.05.A, as a numbered item:

14. be subject to a deductible amount of no more than [$_____] for direct physical loss in any one occurrence.

B. Builder's Risk—Supplemental Insureds: Paragraph 6.05.A.1 of the General Conditions refers to other individuals or entities (in addition to the Owner, Contractor, and all Subcontractors) that are to be identified in the Supplementary Conditions as being entitled to protection as insureds under the builder's risk insurance on the Work. In such cases use the following:

SC-6.05.A.1 Add the following new subparagraph after subparagraph 6.05.A.1:

a. In addition to Owner, Contractor, and all Subcontractors, include as insureds the following:

[Here list by name (not category, role, or classification) other persons or entities to be included on the builder's risk policy as insureds.]

C. Builder's Risk—Supplemental Requirements: Paragraph 6.05.A of the General Conditions lists several items that are to be included in the builder's risk insurance. Consider adding one or more of the following items to the list as appropriate to the specific project:

SC-6.05.A. Add the following to the list of items in Paragraph 6.05.A, as numbered items:

15. include for the benefit of Owner loss of profits and soft cost coverage including, without limitation, fixed expenses and debt service for a minimum of 12 months with a maximum deductible of 30 days, plus attorneys fees and engineering or other consultants' fees, if not otherwise covered;

16. include, in addition to the Contract Price amount, the value of the following equipment and materials to be installed by the Contractor but furnished by the Owner or third parties:

a. *[here list specific items of equipment and purchase value]*

b. *[here list items of material and purchase value]*

17. include by express endorsement coverage of damage to Contractor's equipment.

D. Installation Floater: An installation floater is insurance carried by the Contractor, covering the materials and equipment to be incorporated in the Work. It typically does not insure against losses that occur after installation. In most cases, builder's risk insurance offers broader coverage and is the preferred risk management instrument. On some projects, an installation floater may be an acceptable alternative to a builder's risk policy. See EJCDC® C-001, Commentary on the 2013 EJCDC

~~Construction Documents. (In other instances, Contractor may choose to purchase an installation floater to supplement property insurance provided by Owner.) If, after consultation with its risk managers, Owner elects to require purchase of an installation floater rather than a builder's risk policy, the following requirements may be included as a Supplementary Condition:~~

SC-6.05.A. Delete Paragraph 6.05.A of the General Conditions and substitute the following in its place:

Contractor shall provide and maintain Builders Risk / installation floater insurance for property under the care, custody, or control of Contractor. The installation floater insurance shall be a broad form or "all risk" policy providing coverage for all materials, supplies, machinery, fixtures, and equipment that will be incorporated into the Work. Coverage under the Contractor's installation floater will include:

1. **any loss to property while in transit,**
2. **any loss at the Site, and**
3. **any loss while in storage, both on-site and off-site.**
4. **include for the benefit of Owner loss of profits and soft cost coverage including, without limitation, fixed expenses and debt service for a minimum of 12 months with a maximum deductible of 30 days, plus attorney's fees and engineering or other consultants' fees, if not otherwise covered;**

Coverage cannot be contingent on an external cause or risk, or limited to property for which the Contractor is legally liable. The Contractor will be solely responsible for any deductible carried under this coverage and claims on materials, supplies, machinery, fixture, and equipment that will be incorporated into the Work while in transit or in storage. This policy will include a waiver of subrogation applicable to Owner, Contractor, Engineer, all Subcontractors, and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them.

~~E. Builder's Risk—Owner Purchase: In the event that the Owner, rather than the Contractor, will purchase the Builder's Risk insurance, use the following SC-6.05.A:~~

~~**SC-6.05.A. Delete the first sentence of Paragraph 6.05.A and insert the following sentence in its place:**~~

~~**Owner shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations).**~~

SC-6.06 Waiver of Rights

SC-6.06.B Delete Paragraphs 6.06.B in its entirety~~, B.1, B.2~~ and insert the following in its place:

The Contactor shall indemnify, defend and hold harmless the City and its subsidiaries, divisions, officers, directors and employees from all liability, loss, costs, claims, damages, expenses, attorney fees, judgments and awards arising or claimed to have

arisen, from any injury caused by, or allegedly caused by, either in whole or in part, any act or omission of the Contractor or any employee, agent or assign of the Contractor. This provision is not applicable to any claim arising out of or related to any active or primary negligence of or by City, its officers or employees.

Nothing herein shall be construed as a waiver on the part of the City to any defense of any claim, including, but not limited to the defense of governmental immunity.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

SC-7.02 Labor; Working Hours

Paragraph 7.02.B of the General Conditions restricts Contractor to working during "regular hours" Monday through Friday, and no work is permitted on "legal holidays."

A. To provide details regarding the meaning of the terms "regular hours" and "legal holidays," consider specifically defining them by adding the following:

~~**SC-7.02.B. Add the following new subparagraphs immediately after Paragraph 7.02.B:**~~

~~**1. Regular working hours will be** *[here insert schedule of regular working hours]*~~

~~**2. Owner's legal holidays are** *[here insert list of legal holidays]*~~

B. To modify the days of the week that Contractor may work, use the following:

SC-7.02.B. Amend the first and second sentences of Paragraph 7.02.B to state "…all Work at the Site shall be performed during regular working hours, [7 A.M.] through [7 P.M.]~~.~~ No work for this Contract shall be on a Saturday or on a Sunday or on any legal holiday without prior approval by Owner. The Owner shall be notified at least 48 hours in advance of the day that the Contractor is seeking permission to work beyond the above limits.~~**Contractor will not perform Work on a [ ], [ ], or any legal holiday.**~~**"**

C. If the Owner has no objections to the Contractor working multiple shifts, weekends, and legal holidays, use the following:

~~**SC-7.02.B. Delete Paragraph 7.02 B. in its entirety, and insert the following:**~~

~~**B. In the absence of any Laws or Regulations to the contrary, Contractor may perform the Work on holidays, during any or all hours of the day, and on any or all days of the week, at Contractor's sole discretion.**~~

D. If Contractor is permitted to Work outside regular hours and on weekends and holidays, whether by a contractual provision or by Owner's consent during the course of the Project, then it is good practice to address the issue of whether Owner may charge Contractor for engineering expenses associated with the non-regular schedule. Some Owners may prefer to absorb these costs to incentivize (or at least facilitate) an aggressive schedule and timely completion; and in many cases the net additional expense may be modest. Other Owners may prefer to establish and collect a charge for the engineering services. Add the following as SC-7.02.C, making a policy choice regarding responsibility in the beginning of the sentence:

SC-7.02.C. Add the following new paragraph immediately after Paragraph 7.02.B:

[Contractor] [Owner] *[choose one and delete the other]* **shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.**

E. If responsibility for costs in SC-7.02.C will be allocated to Contractor, Owner may wish to provide some specificity regarding the potential costs, through the addition of the following:

SC-7.02.C. Add the following new subparagraph immediately after Paragraph 7.02.C:

1. For purposes of administering the foregoing requirement, additional overtime costs are defined as *[here insert parameters for compensated overtime hours]*

SC-7.09 Taxes

A. If Owner qualifies for a state or local sales or use tax exemption in the purchase of certain materials and equipment, add the following Supplementary Condition, with any revisions necessary to meet the specific applicable exemption rules. (Note: If instructions to bidders or proposers are used, confirm that the provisions here are consistent with the corresponding provisions in such instructions. See Suggested Instructions to Bidders for Construction Contracts, EJCDC® C-200, Article 23.)

SC-7.09 Add a new paragraph immediately after Paragraph 7.09.A:

B. Owner is exempt from payment of sales and compensating use taxes of the State of *[insert name of state where Project is located]* **and of cities and counties thereof on all materials to be incorporated into the Work.**

1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.

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

SC-7.12 Safety and Protection

A. Some Owners have written safety programs with which construction contractors must comply. If such is the case, Paragraph 7.12.C of the General Conditions mandates that the safety program be identified in the Supplementary Conditions (and Paragraph 9.12 requires Owner to provide a copy of such programs to Contractor). The identification of the safety programs may be accomplished as follows:

~~**SC-7.12 Insert the following after the second sentence of Paragraph 7.12.C:**~~

~~**The following Owner safety programs are applicable to the Work:** *[here expressly identify by title and/or date, any such Owner safety programs].*~~

ARTICLE 8 – OTHER WORK AT THE SITE

SC-8.02 Coordination

A. Paragraph 8.02 of the General Conditions requires that if in addition to retaining Contractor, Owner will arrange to have others perform work at the Site, Owner must provide to Contractor specified information regarding coordination of construction activities. (Note that Owner should provide specific information about the other work —nature of the work, scope, schedule, exact location— elsewhere in the Contract Documents or in other documentation.) Use the following in that case:

~~**SC-8.02 Delete Paragraph 8.02.A in its entirety and replace with the following:**~~

~~**A. Owner intends to contract with others for the performance of other work at or adjacent to the Site.**~~

~~**1.** *[Here identify individual or entirety]* **shall have authority and responsibility for coordination of the various contractors and work forces at the Site;**~~

~~**2. The following specific matters are to be covered by such authority and responsibility:** *[here itemize such matters]*;~~

~~**3. The extent of such authority and responsibilities is:** *[here provide the extent]*~~

ARTICLE 9 – OWNER'S RESPONSIBILITIES

SC-9.13 Owner's Site Representative[VL3]

A. Paragraph 10.03 of the General Conditions indicates that the Owner may designate a representative or agent who is not Engineer's consultant, agent, or employee, to represent Owner at the Site ("Owner's Site Representative"). In such case the Owner typically would not have the Engineer furnish a Resident Project Representative, hence the second version of SC-10.03.B below would be used to indicate there is no Engineer's Resident Project Representative.

The following should be used for the identification of the Owner's Site Representative. Note that the following must be supplemented by customized text that explains the responsibilities of the Owner's Site Representative, so far as such are relevant to Contractor. The content of Paragraphs SC-10.03.B and C below may be a helpful starting point in drafting such supplemental text. In addition, if Owner's retention of an Owner's Site Representative will affect other aspects of Engineer's status during construction, other portions of Article 10 and many other parts of the General Conditions will need to be revised. In such cases it is typical for (and Laws and Regulations may require) the design engineer (as engineer of record) to at least retain a role with respect to design-intent reviews of submittals and similar aspects of the Work.

~~**SC-9.13 Add the following new paragraph immediately after Paragraph 9.12 of the General Conditions:**~~

~~**SC-9.13 Owner will furnish an "Owner's Site Representative" to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Owner's Site Representative is not Engineer's consultant, agent, or employee. Owner's Site Representative will be** *[Here identify individual or entirety]***. The authority and responsibilities of Owner's Site Representative follow:** *[Here describe the duties and activities of the Owner's Site Representative]*~~

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

SC-10.03 Project Representative

A. **This is a mandatory Supplementary Condition.** As indicated in Paragraph 10.03 of the General Conditions, in those cases in which the Engineer will provide a Resident Project Representative (RPR) during construction, the authority and responsibilities of the RPR must be specified in the Supplementary Conditions. SC-10.03.B and C, immediately below, provide a mechanism for doing so. In the alternative, in some cases Engineer will not provide RPR services, either because there will not be an RPR, or because a party other than Engineer will provide the site services. When such is the case, the second SC-10.03.B below should be used.

As indicated in Paragraph 10.03 of the General Conditions, the Owner may designate a representative or agent who is not Engineer's consultant, agent, or employee, to represent Owner at the Site. In such case, in addition to using the second version of SC-10.03.B, below, also use SC-9.13 above.

The following suggested language, which parallels the wording of Exhibit D to EJCDC® E-500, the Agreement Between Owner and Engineer for Professional Services, is for use when Engineer will provide RPR services. It should be edited to indicate the RPR authority and responsibilities that apply to this Contract.

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.A:

B. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.

1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.

2. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.

3. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other

Project-related meetings, and prepare and circulate copies of minutes thereof.

4. **Liaison:**

   a. **Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.**

   b. **Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.**

   c. **Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.**

5. **Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.**

6. **Shop Drawings and Samples:**

   a. **Record date of receipt of Samples and Contractor-approved Shop Drawings.**

   b. **Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.**

   c. **Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.**

7. **Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.**

8. **Review of Work and Rejection of Defective Work:**

   a. **Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.**

   b. **Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected**

or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

9. **Inspections, Tests, and System Start-ups:**

   a. **Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.**

   b. **Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.**

10. **Records:**

    a. **Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.**

    b. **Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.**

    c. **Maintain records for use in preparing Project documentation.**

11. **Reports:**

    a. **Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.**

    b. **Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.**

    c. **Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.**

12. **Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.**

13. **Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.**

14. **Completion:**

    a. **Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.**

    b. **Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.**

    c. **Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the work.**

C. The RPR shall not:

1. **Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).**

2. **Exceed limitations of Engineer's authority as set forth in the Contract Documents.**

3. **Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.**

4. **Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work.**

5. **Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.**

6. **Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.**

7. **Accept Shop Drawing or Sample submittals from anyone other than Contractor.**

8. **Authorize Owner to occupy the Project in whole or in part.**

~~*[or]*~~

~~**B. On this Project, by agreement with the Owner, Engineer will not furnish a Resident Project Representative to represent Engineer at the Site or assist Engineer in observing the progress and quality of the Work.** *[See explanatory text at beginning of SC-9.13, and at beginning of SC-10.03, for discussion of this second alternative SC-10.03.B]*~~

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-13.01 Cost of the Work

A. Equipment rental charges, particularly with respect to Contractor-owned equipment, can sometimes lead to disagreements. To reduce the possibility of such disagreements, the following Supplementary Condition may be used. Note that it requires a published reference or method for determining the costs.

~~**SC 13.01.B.5.c Delete Paragraph 13.01.B.5.c in its entirety and insert the following in its place:**~~

~~**c. Construction Equipment and Machinery:**~~

~~**1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.**~~

~~**2) Costs for equipment and machinery owned by Contractor will be paid at a rate shown for such equipment in the** *[cite the rate book appropriate for the Project]***. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs. Costs will include the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, shall cease to accrue when the use thereof is no longer necessary for the changed Work. Equipment or machinery with a value of less than $1,000 will be considered small tools.**~~

SC-13.03 Unit Price Work

A. The following Supplementary Condition is typically called a "variation in estimated quantities (VEQ) clause" and facilitates administrative resolution of situations where actual quantities of unit price items differ materially from estimated quantities. Typically, the clause applies where the extended price (unit price times estimated quantity) of an item of the Unit Price Work is more than 5 percent of the Contract Price (based on estimated quantities), and the actual quantity of the units of work performed or furnished varies by more than a specified percent (typically 15 to 25 percent).

SC 13.03.E Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:

1. if the extended price of a particular item of Unit Price Work amounts to _50__ percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than _50__ percent from the estimated quantity of such item indicated in the Agreement; and

2. if there is no corresponding adjustment with respect to any other item of Work; and

3. if Contractor believes that Contractor has incurred additional expense as a result thereof, Contractor may submit a Change Proposal, or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, Owner may make a Claim, seeking an adjustment in the Contract Price.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

~~*SC-15.03 Substantial Completion*~~

~~A. Paragraph 15.03.A of the General Conditions requires Contractor to give notice that the Work is substantially complete; Paragraph 15.03.B requires an inspection of the Work to determine whether Engineer agrees that the Work is substantially complete. If the Work is not substantially complete, and must be inspected again at a later point, then the following Supplementary Condition, if included in the Contract, would allow Owner to recover the cost of the re-inspection.~~

~~**SC-15.03.B Add the following new subparagraph to Paragraph 15.03.B:**~~

~~**1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.**~~

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

~~B. Paragraph 17.01.B of the General Conditions provides that for any dispute subject to final resolution under Article 17, Owner or Contractor may invoke the dispute resolution procedure called for in the Supplementary Conditions. Paragraph SC-17.02 is the location to identify any such primary dispute resolution procedure. If no procedure is identified here in the Supplementary Conditions, and the parties do not agree to a specific procedure, then the default resolution procedure will be litigation—the pursuit of rights in a court of competent jurisdiction. Note that before reaching the point of final resolution of disputes, in most cases the Owner and Contractor will already have engaged in the Claim process described in Article 12 of the General Conditions. That process allows for mediation of the dispute.~~

As an alternative to litigation, there are many other possible dispute resolution procedures, or combinations of procedures. One of the most common is arbitration; wording for an arbitration clause follows. A discussion of the pros and cons of the arbitration process (and there are many advocates on both sides) is beyond the scope of this Guide. Owner should consult with its legal counsel when considering the inclusion of an arbitration clause, or of any other dispute resolution procedure or combination of procedures.

The arbitration option is as follows:

SC 17.02 Add the following new paragraph immediately after Paragraph 17.01.

SC 17.02 Arbitration

A. All matters subject to final resolution under this Article will be decided by arbitration in accordance with the rules of *[insert name of selected arbitration agency]***, subject to the conditions and limitations of this paragraph. This agreement to arbitrate and any other agreement or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.**

B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in this Article, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations. The demand for arbitration should include specific reference to Paragraph SC-17.02.D below.

C. No arbitration arising out of or relating to the Contract shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and

2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings.

D. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include a concise breakdown of the award, and a written explanation of the award specifically citing the Contract provisions deemed applicable and relied on in making the award.

~~E. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.~~

~~F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor.~~

SC-17.03 Attorneys' Fees

A. In most jurisdictions in the United States, as a general matter each party to a dispute is responsible for its own attorneys' fees, unless an express agreement provides to the contrary. Some legal authorities believe that this general rule encourages claims and disputes, because claimants have little concern that they will be forced to pay for the opposing party's fees if the claim fails. Other authorities take the opposite view—that the enticing prospect of not only prevailing but also of having one's own fees paid by the opponent would encourage overly aggressive pursuit of claims (or overzealous defense against valid claims).

If an exception to the general American rule is preferred for disputes subject to final resolution under Article 17, then add the following express agreement:

SC-17.03 Add the following new paragraph immediately after Paragraph 17.02. *[Note: If there is no Paragraph 17.02, because neither arbitration nor any other dispute resolution process has been specified here in the Supplementary Conditions, then revise this to state "Add the following new paragraph immediately after Paragraph 17.01" and revise the numbering accordingly.]*

SC-17.03 Attorneys' Fees: For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

SECTION 01010

SUMMARY OF WORK

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Work to be done under this Contract and in accordance with these Specifications consists of furnishing all equipment, superintendence, labor, skill, material and all other items necessary for the construction of the BEAUCATCHER MOUNTAIN, Greenway Trail Section.

1. The Contractor shall perform all work required for such construction in accordance with the Contract Documents and subject to the terms and conditions of the Contract, complete and ready for use.

2.

B. The principal features of the Work to be performed under this Contract include:

BEAUCATCHER MOUNTAIN
GREENWAY TRAIL
Project No. 298 PR-16-17-001

The BEAUCATCHER MOUNTAIN – **Greenway Trail** section involves the construction of approximately 2.26 miles of new greenway consisting of primarily a 10-foot wide paved trail (10-foot wide asphalt with 1-foot shoulders), variable width greenway in selected areas, six (6) parking areas, retaining walls, drainage, signing, bollards, erosion and sedimentation control with inspections, and all associated appurtenances as described in the specifications or shown on the Contract Drawings.

C. The foregoing description shall not be construed as a complete description of all work required.

1.02 CONTRACT DOCUMENTS

A. The Work to be done is shown on the set of Drawings titled *BEAUCATCHER MOUNTAIN Greenway Trail* and dated October 5, 2016 (signed and sealed October 5, 2016).

1. A Drawing index appears on the Title Sheet, Sheet 1.

2. All drawings so listed shall be considered an integral part of the Contract Documents as defined herein.

B. Certain Document Sections refer to Divisions of the Contract Specifications.

1. Sections are each individually numbered portions of the Specifications such as 08110, 13182, 15206, etc.

2. The term Division is used as a convenience term meaning all Sections within a numerical grouping.

3. Division 01 would thus include Sections 01010 through 01700.

1.03 GENERAL ARRANGEMENT

A. Drawings indicate the extent and general arrangement of the work.

1. If any departure from the Drawings is deemed necessary by the Contractor to accommodate the materials he proposes to furnish, details of such departures and reasons therefore shall be submitted as soon as practicable to the Engineer for approval.

2. No such departures shall be made without the prior written approval of the Engineer.

3. Approved changes shall be made without additional cost to the Owner for this work.

B. The specific material proposed for use by the Contractor on the project may require changes in structures, piping, or other work to provide a complete and satisfactory operating installation.

1. The Contractor shall submit to the Engineer for approval all necessary Drawings and details showing such changes to verify conformance with the overall project structural and architectural requirements and overall project operating performance.

2. The Bid Price shall include all costs in connection with the preparation of new drawings and details and all changes to construction work to accommodate the proposed equipment or material, including increases in the costs of other Contracts.

1.04 CONSTRUCTION PERMITS, EASEMENTS, AND ENCROACHMENTS

A. The Owner shall obtain or cause to be obtained all permanent and temporary construction easements as shown on the Drawings.

1. The Contractor shall verify that these agreements have been obtained and shall comply with the conditions set forth in each agreement.

B. The Contractor shall obtain, keep current, and pay all fees for any necessary construction permits from those authorities, agencies, or municipalities having jurisdiction over land areas, utilities, or structures which are located within the Contract limits and which will be occupied, encountered, used, or temporarily interrupted by the Contractor's operations unless otherwise stated.

1. Record copies of all permits shall be furnished to the Engineer.

C. When construction permits are accompanied by regulations or requirements issued by a particular authority, agency, or municipality, it shall be the Contractor's responsibility to familiarize himself and comply with such regulations or requirements as they apply to his operations on this Project.

1.05 ADDITIONAL ENGINEERING SERVICES

A. In the event that the Engineer is required to provide additional engineering services as a result of duplication of equal materials by the Contractor, substitution of materials which are not "or equal" by the Contractor, or changes by the Contractor in dimension, weight, etc., of the material and accessories furnished, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor for the convenience of the Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the Owner.

B. Structural design shown on the Contract Drawings is based upon manufacturer’s weights for major items of material as indicated on the Contract Drawings and specified herein.

1. If the actual material furnished exceeds the weights of specified material, the Contractor shall assume the responsibility for all costs of redesign and for any construction changes required to accommodate the material furnished, including the Engineer's expenses in connection therewith.

C. In the event that the Engineer is required to provide additional engineering services as a result of Contractor's errors, omissions, or failure to conform to the requirements of the Contract Documents, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the Owner.

D. If the Contractor request the Engineer inspect concrete forms and reinforcing steel prior to pouring concrete and when the Engineer arrives at the site for inspection to find that the forms and steel are not ready for inspection through no fault of the Engineer, then the Engineer’s charges in connection with such additional services shall be charged to the Contractor by the Owner.

1. If the inspection reveals discrepancies and errors by the Contractor requiring remedial action and reinspection, then the Engineer’s charges in connection with such additional services shall be charged to the Contractor by the Owner.

1.06 ADDITIONAL OWNER'S EXPENSES

A. In the event the Work of this Contract is not completed within the time set forth in the Contract or within the time to which such completion may have been extended in accordance with the Contract Documents, the additional engineering and inspection charges incurred by the Owner may be charged to the Contractor and deducted from the monies due him.

1. Extra work or supplemental Contract work added to the original Contract, as well as extenuating circumstances beyond the control of the Contractor, will be given due consideration by the Owner before assessing engineering and inspection charges against the Contractor.

B. Charges assessed to the Contractor for additional engineering and inspection costs will be determined based on actual hours charged to the job by the Engineer.

1. Daily rates will depend on the number and classification of employees involved, but in no case shall such charges exceed $550 per day for field personnel and $650 per day for engineering personnel, based on an eight hour workday.

C. Charges for additional Owner's expenses shall be in addition to any liquidated damages assessed in accordance with the Contract.

1.07 TIME OF WORK

1. No work for this Contract shall be performed between the hours of 7:00 PM and 7:00 AM or on a Saturday or Sunday without prior approval by Owner. The owner shall be notified at least 48 hours in advance of the day that the Contractor is seeking permission to work beyond the above limits.

B. If it shall become imperative to perform work at night, the Owner and Engineer shall be informed a reasonable time in advance of the beginning of such work.

1. Temporary lighting and all other necessary facilities for performing and inspecting the work shall be provided and maintained by the Contractor.

C. Unless otherwise specifically permitted, all work that would be subject to damage shall be stopped during inclement, stormy or freezing weather.

1. Only such work as will not suffer injury to workmanship or materials will be permitted.

2. Contractor shall carefully protect his work against damage or injury from the weather, and when work is permitted during freezing weather, he shall provide and maintain approved facilities for heating the materials and for protecting the finished work.

1.08 SUBSURFACE DATA

A. Subsurface data are offered in good faith solely for placing the Bidder in receipt of all information available to the Owner and the Engineer, and in no event is it to be considered as part of the Contract Documents.

B. The Bidder must interpret such subsurface data according to his own judgment and acknowledge that he is not relying upon the same as accurately describing the subsurface conditions, which may be found to exist.

1. The test boring logs present factual information of the subsurface conditions at the specific test boring location only. The Bidder should not consider, nor conclude, that the subsurface conditions will be consistent between test boring locations.

C. The Bidder further acknowledges that he assumes all risks contingent upon the nature of the sub-surface conditions to be actually encountered by him in performing the work covered by the Contract, even though such actual conditions may result in the Bidder performing more or less work than he originally anticipated.

D. The Bidder is further advised that the Owner has made sub-surface investigations, and a report or reports has been prepared in connection with this project for the Engineer.

1. A copy of such report or reports is appended to the rear of these specifications.

E. In making this data available, the Owner makes no expressed or implied guarantee as to their accuracy or to the accuracy of any interpretation thereof.

F. It shall be the responsibility of the Contractor to call in locates and ensure that any and all underground utilities be located and marked before beginning construction. The underground utilities shown on the plan documents are approximate locations and neither the Owner nor Engineer can make guarantees as to their accuracy or to the accuracy of any interpretation thereof.

1.09 SURVEYS AND LAYOUT

A. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings, specified herein, and as directed by the Engineer.

1. Where provided, the elevation of existing ground and appurtenances is believed to be reasonably correct but is not guaranteed to be absolute and therefore is presented only as an approximation.

2. Any error or apparent discrepancy in the data shown or omissions of data required for accurately accomplishing the stake out survey shall be referred immediately to the Engineer for interpretation or correction.

B. All survey work for construction purposes shall be made by the Contractor at his expense.

1. All survey work shall be performed under the guidance and direction of a Professional Land Surveyor licensed in the State of North Carolina and capable of interpreting the survey data and the control points established on the ground for the purposes of the horizontal and vertical layout of the Work.

2. Prior to commencing the Work, the Contractor shall provide to the Engineer the name of the Professional Land Surveyor.

3. The Engineer shall provide the Contractor with CADD files either on a compact disk or via FTP download site upon request for Contractor’s use in laying out the work.

a. Horizontal grid coordinate reference is NAD 83 (NRS 2011)

b. Vertical reference is NAVD 88.

c. Control monumentation was not established for this project.

1). Surveys were performed in 2009.

2). Horizontal and Vertical control is tied to the existing monuments “Tunnel”, “Ross”, “Kenilworth”, “Myrtle”, “Endoscopy”, and “Nazareth”.

3). A survey baseline was established for this project. Panel points were established for aerial photography, and may or may not exist at this time.

4). Engineer guarantees neither presence of control monumentation nor accuracy of any recovered monumentation.

5). Contractor shall use established horizontal and vertical control network in order to stake project for construction.

C. The Contractor shall make all detail surveys necessary for construction, including the staking of the boundary of easements when such easements are shown in the Contract Documents.

1. Maps of easements for use by the Contractor in staking will be provided by the Owner.

2. Easement boundaries shall be accurately flagged at corners, at all points of intersection, and at intersection with property lines.

D. Contractor shall establish all centerlines, from points of intersection (PI) to PI, of the greenway trail.

1. Based upon the information provided by the Engineer, the Contractor shall develop and make all surveys necessary for construction, including clearing limits, slope stakes, stakes for all working points, lines, and elevations.

2. Provide intermediate stakes at not more than 50-feet intervals between PIs.

3. Where points of curvature (PC) and points of tangent (PT) are shown on the Drawings, Contractor shall establish PC and PT.

E. The Contractor shall provide a clear line of site between all PIs shown on the Drawings, except that no tree 8-inches or greater in diameter measured 4½-feet above the ground shall be cut to provide the line of site.

1. When alternative routes within 10-feet of the centerline are available that will provide a similar line of site between Pis without cutting of trees, cutting of the line of site is not required.

F. Contractor shall have the responsibility to carefully preserve the bench marks, reference points, and stakes.

1. In the case of destruction thereof by the Contractor or resulting from his negligence, the Contractor shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points, and stakes.

G. Following staking of the easement lines and greenway centerline, cutting of the line of site, and staking of intermediate points, the Contractor shall notify the Engineer to schedule a field inspection of the centerline with the Owner and the Contractor.

1. During the field inspection, the Owner or the Engineer will make adjustments in the centerline. The Owner will confirm all adjustments.

2. Adjustments in the centerline will include the addition of curves to smooth the transition between tangents and to significantly eliminate tangents, thus rendering a meandering or winding greenway trail.

a. Centerline adjustments will also be made to minimize removal of trees.

b. Centerline adjustments will also be made to minimize wetland area crossings.

c. Centerline adjustments will also be made to minimize encroachment into riparian buffers.

3. The Contractor shall then construct the greenway trail based upon the revised alignment as field located by the Owner or the Engineer.

4. The Contractor shall in his construction schedule allow up to 30-days between staking of the easement lines and greenway centerline, cutting of the line of site, and staking of intermediate points and the field inspection of the centerline with the Owner and the Contractor.

H. Following field adjusting of the greenway trail centerline by the Owner and the Engineer, the Contractor shall flag the limits of clearing based upon the adjusted centerline.

1. Under no circumstances shall the Contractor commence site clearing operations until the Owner or the Engineer has adjusted and approved the trail centerline.

I. Listing or new control points, property markers, and monuments that will be or are destroyed during the normal course of construction shall be reestablished by the Contractor.

1. All reference ties recorded therefore shall be furnished to the Engineer.

2. All computations necessary to establish the exact position of the work shall be made and preserved by the Contractor.

J. The Engineer or the Owner may check all or any portion of the work.

1. The Contractor shall afford all necessary assistance to the Engineer or the Owner in carrying out such checks.

2. Any necessary corrections to the work shall be immediately made by the Contractor.

3. Such checking by the Engineer or the Owner shall not relieve the Contractor of any responsibilities for the accuracy or completeness of his work.

K. At completion of the work, the Contractor shall furnish Construction Record Drawings indicating the final layout of all structures, roads, existing bench marks, etc.

1. The Construction Record Drawings shall indicate all critical elevations of structures, finish grades, etc.

1.10 FIRE PROTECTION

A. The Contractor shall take all necessary precautions to prevent fires at or adjacent to the work and shall provide adequate facilities for extinguishing fires which do occur.

B. When fire or explosion hazards are created in the vicinity of the work as a result of the locations of fuel tanks or similar hazardous utilities or devices placed there by the Contractor, the Contractor shall immediately alert the local Fire Marshal, the Engineer, and the Owner of such tank or device.

1. The Contractor shall exercise all safety precautions.

2. The Contractor shall comply with all instructions issued by the Fire Marshal.

3. The Contractor shall cooperate with the Owner of the fuel tank or similar hazardous utility or device to prevent the occurrence of fire or explosion.

1.11 CHEMICALS

A. All chemicals used during the project construction or furnished for project operation, whether herbicide, pesticide, or reactant of other classification, must show approval of either the EPA or USDA.

1. Use of all such chemicals and disposal of residues shall be in strict conformance with all applicable rules and regulations.

1.12 FIRST AID FACILITIES AND ACCIDENTS

A. First Aid Facilities

1. The Contractor shall provide at the site such equipment and facilities necessary to supply first aid to any of his personnel who may be injured in connection with the work.

B. Accidents

1. The Contractor shall promptly report, in writing, to the Engineer and Owner all accidents whatsoever out of, or in connection with, the performance of the work, whether on or adjacent to the site, which cause death, personal injury, or property damage, giving full details and statements of witnesses.

2. If death, serious injuries, or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Owner and the Engineer.

3. If any claim is made by anyone against the Contractor or a Subcontractor on account of any accidents, the Contractor shall promptly report the facts, in writing, to the Engineer and Owner, giving full details of the claim.

1.13 BLASTING AND EXPLOSIVES

A. When blasting is utilized at the site of the work, the Contractor shall take all precautions and provide all protective measures to prevent damage to property and structures and injury to persons.

1. Prior to blasting, the Contractor shall secure all permits required for blasting operations and shall provide any additional hazard insurance required by the Owner.

2. The Contractor shall have a fully qualified and experienced blasting foreman in charge of all blasting operations.

3. The Contractor shall undertake the complete drilling and blasting operations, including handling and storing of explosives, in accordance with Federal, State, and Local laws and regulations and in conformance with the recommendations and practices of the Institute of Makers of Explosives.

4. No blasting shall commence without giving prior notification to the Owner, Engineer, and police and fire departments.

5. Blasting shall be covered or otherwise satisfactorily confined.

6. Contractor shall be responsible for and shall bear the expense of any damage of whatever nature caused by blasting or accidental explosions.

7. Contractor shall submit a blasting plan for review and approval. This plan shall be submitted 14 days prior to commencement of blasting.

1.14 LIMITS OF WORK AREA

A. The Contractor shall confine his construction operations within the Contract limits shown on the Drawings and/or property lines and/or fence lines.

1. In general, the limits of construction shall be not more than ten-feet either side of the centerline of the trail.

2. Storage of materials or erection and use of sheds outside of the Contract limits, if such areas are the property of the Owner, shall be used only with the Owner's approval.

a. Property of the Owner designated for use by the Contractor shall be limited to that area shown on the Drawings.

3. Such storage or temporary structures, even within the limits of construction, shall be confined to the Owner's property and shall not be placed on properties designated as easements or rights-of-way unless specifically permitted elsewhere in the Contract Documents.

1.15 WEATHER CONDITIONS

A. No work shall be done when the weather is unsuitable.

1. The Contractor shall take necessary precautions in the event of impending storms to protect all work and materials from damage or deterioration due to floods, driving rain, wind, snow, and other storms.

2. The Owner reserves the right, through the opinion of the Engineer, to order that additional protective measures over and beyond those proposed by the Contractor be taken to safeguard all components of the Project.

3. The Contractor shall not claim any additional compensation for such precautionary measures so ordered nor claim any additional compensation from the Owner for damage to the work from weather elements.

B. The mixing and placing of concrete or pavement courses, the laying of masonry, and other work requiring excavation shall be stopped during rainstorms when so ordered by the Engineer.

1. All freshly placed work shall be protected by canvas or other suitable covering in such manner as to prevent running water from contacting it.

2. Sufficient coverings shall be provided and kept ready at hand for this purpose.

3. The limitations and requirements for mixing and placing concrete or pavement courses in cold weather are described elsewhere in these Specifications.

1.16 PERIODIC CLEANUP AND BASIC SITE RESTORATION

A. During construction, the Contractor shall regularly remove from the site of the work all accumulated debris and surplus materials of any kind which result from his operations.

1. Unused material and tools shall be stored at the Contractor's yard or base of operations for the Project.

B. When the work involves installation of drains, underground structures, or other disturbance of existing features in or across streets, rights-of-way, easements, or private property, the Contractor shall, as the work progresses, promptly backfill, compact, grade, and otherwise restore the disturbed area to the basic condition which will permit resumption of pedestrian or vehicular traffic and any other critical activity or functions consistent with the original use of the land.

1. The requirements for temporary paving of streets, walks, and driveways are specified elsewhere.

2. Unsightly mounds of earth, large stones, boulders, and debris shall be removed so that the site presents a neat appearance.

C. The Contractor shall perform the cleanup work on a regular basis and as frequently as ordered by the Engineer.

1. Basic site restoration in a particular area shall be accomplished immediately following the installation or completion of the required facilities in that area.

2. Furthermore, such work shall also be accomplished when ordered by the Engineer if partially completed facilities must remain incomplete for some time period due to unforeseen circumstances.

D. Upon failure of the Contractor to perform periodic cleanup and basic restoration of the site to the Engineer's satisfaction, the Owner may, upon five days prior written notice to the Contractor, without prejudice to any other rights or remedies of the Owner, cause such work for which the Contractor is responsible to be accomplished to the extent deemed necessary by the Engineer.

1. All associated costs resulting from this work shall be charged to the Contractor and deducted from the amounts of money that may be due him.

1.17 USE OF FACILITIES BEFORE COMPLETION

A. The Owner reserves the right to enter and use any portion of the constructed facilities before final completion of the whole work to be done under this Contract.

1. Only those portions of the facilities which have been completed to the Engineer's satisfaction, as evidenced by the issuing a Certificate of Substantial Completion covering that part of the work, shall be placed in service.

B. It shall be the Contractor's responsibility to prevent premature use of any portion of the installed facilities, but only to the extent practicable, by private or public parties, persons, or groups of persons before the Engineer issues his Certificate of Substantial Completion covering that portion of the work to be placed in service.

C. Consistent with the approved progress schedule, the Contractor shall cooperate with the Owner, his agents, and the Engineer to accelerate completion of those facilities, or portions thereof, which have been designated for early use by the Owner.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 – EXECUTION
(NOT USED)

- END OF SECTION -

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Contract prices submitted by the Contractor in Section 00301 shall be full compensation for all labor, materials, equipment, tools, specialties, and incidentals necessary for the Contractor to fully complete the Work as shown on the Drawings and specified in the Contract Documents to be performed under this Contract.

B. Items listed in paragraph 1.02 of this section refer to and are identical to pay items listed in Section 00301. Individually and collectively, they represent and constitute all the pay items required for the completion of the Work.

1. There shall be neither direct nor separate payment for providing miscellaneous temporary or accessory works, services, field offices, layout surveys, measurement surveys, job signs, traffic control, access roads (both installing and removing), sanitary requirements, testing, safety devices, construction record drawings, water supplies, power, removal of waste material generated by the Work or shown on the Drawings to be removed, watchmen, and all other requirements of the Contract Documents.

2. Compensation for any and all such services, equipment, materials, and labor shall be included in the unit prices stipulated for the various pay items outlined in Section 00301.

3. All Work not specifically set forth as an item for payment shall be considered a subsidiary obligation of the Contractor, and any and all costs associated therewith shall be included in the prices bid by the Contractor.

C. The Owner reserves the right at any time during the Work to make changes in the quantities of items of work as may be necessary in the opinion of the Owner to satisfactorily complete the Work.

1. Such changes in quantities shall neither invalidate the contract nor release the Contractor's surety, and the Contractor shall agree to perform the Work as changed.

D. Restoration is an integral part of the work but is not a separate pay item.

1. All unit and lump sum bid prices shall include the costs associated with restoration necessitated by the work related to that item.

2. Restoration shall include, but shall not be limited to, restoring existing structures and property; paving and stabilizing roads; cleaning of drainage piping and ditches; repairing driveways, lawns, walkways, irrigation systems, and ground

areas to the satisfaction of the respective property owner; and, in general, restoring all areas, structures, properties, etc. which were altered by the Contractor during construction to a state equal to or better than existed prior to construction.

E. Estimated quantities stipulated in Section 00301 or other parts of the Contract Documents are solely for the purpose of comparing the bids received for the Work and determining an initial contract price.

1. The actual quantities of work done and materials furnished can and will differ from the estimated quantities shown in Section 00301.

2. The final contract price will be based upon the final quantities of pay items incorporated into the Work adjusted by these Contract Documents.

F. All Work completed under this contract will be measured by the Owner according to United States standard measures unless otherwise stipulated in the Contract Documents.

1. The method of measurement and computations used in determining the quantity of the various pay items incorporated into the Work will be those methods generally recognized as accepted engineering practice.

G. Certain pay items require the Owner to collect trip tickets in order to determine quantities of these pay items incorporated into the work. The Contractor shall be fully responsible in ensuring that his drivers deliver to the Owner each trip ticket as outlined in this section. The Owner reserves the right to compensate the Contractor only for the quantity of pay items incorporated into the work that can be documented by the trip tickets received by the Owner.

1.02 PAY ITEMS

A. Pay Item 01010-1 Mobilization

1. Measurement

There shall be no measurement for Mobilization.

2. Payment

The unit price bid for mobilization shall be full compensation for preparing for work and associated operations, including but not limited to project bonds and insurance, the necessary movement of personnel, equipment, supplies, and incidentals to or near the project site; for establishing offices and facilities as may be required for the work; and the subsequent removal of personnel, equipment, supplies, and incidentals for the work site at the completion of the work; and all other costs which the Contractor may incur for the work which are excluded from other bid items.

Payment for mobilization shall be in accordance with Spec Section 800 Supplementary Conditions Article 14.01.C. A Lump Sum Payment equal to 1-1/2% of the total Bid Price (to include all bonds, insurance, move-on expenses, etc.) will be allowed for 'mobilization' as a progress payment line item. The actual cost of bonds and insurance (up to the maximum payment of 1-1/2%) will be considered in the initial payment request provided that cost documentation suitable to the Engineer is furnished by the Contractor. Any outstanding balance of the mobilization line item will be payable when the Project work is 10% complete as indicated by the approved progress payments (less cost of mobilization and stored equipment).

B. Pay Item 01010-2 Construction Permits Allowance

1. Measurement

There shall be no direct measurement for Construction Permits Allowance.

2. Payment

The unit price for Construction Permits Allowance shall be the cost associated with obtaining any and all permits required for construction of the project from the City of Asheville. The Engineer shall file plans and specifications with the City of Asheville, and the Contractor shall then obtain the permits. Any cost assessed by the City of Asheville in excess of the price listed under Construction Permits Allowance shall be reimbursed via a change order based upon invoices for the actual cost.

C. Pay Item 01010-3 Construction Staking

1. Measurement

There shall be no measurement for Construction Staking.

2. Payment

The unit price for Construction Staking shall be full compensation for all construction layout, surveying, staking, stakeout, supplemental surveying, and engineering necessary for the proper control of construction operations, as well as final as-built drawings

D. Pay Item 02100-1 Clearing and Grubbing

1. Measurement

The length and width of Clearing and Grubbing will be measured, and the area computed. In general, the area measured will consist of a 20-feet wide strip along the final selected centerline of the greenway trail path and shall include the complete removal of all parts of any tree, either standing or fallen, and associated stump when any part of the stump or root ball of the tree resides inside of or on the limits of clearing. Depth of grubbing shall generally be 6 inches with deeper depths as required to remove tree stumps, roots, and areas of thicker topsoil. Only those areas consisting of forested vegetation will be measured, and areas absent of forested vegetation are considered incidental to the Work with no direct payment for the associated incidental clearing.

2. Payment

The unit price for Clearing and Grubbing shall include full compensation for all labor, equipment, and materials required to perform clearing and grubbing as outlined in Section 02100, including chipping of woody material and stockpiling of the chips and the removal and proper disposal of material removed during grubbing operations. No payment will be made for clearing and grubbing beyond specified limits of construction.

E. Pay Item 02200-1 Grading lump sum specification

1. Measurement and Payment

Grading will be paid at the contract lump sum price. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer. No separate payment will be made for draining borrow sources as such work will be incidental t the work covered by this section.

F. Pay Item 02200-2 Rock Excavation Allowance

1. Measurement

The quantity of Rock Excavation shown in Section 301 is an allowance for rock excavation if needed during construction. Rock Excavation will be the actual volume in cubic yards of rock actually removed, measured in original position, but not to exceed the following:

a. 24 inches outside of concrete forms other than at footings.
b. 12 inches outside of concrete forms at footings.
c. 24 inches beyond edge of asphalt trail.
d. 6 inches outside of minimum required dimensions of concrete cast against grade.
e. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
f. 6 inches beneath bottom of concrete slabs-on-grade
g. 6 inches beneath pipe in trenches, and 24 inches wider than pipe.

Any area suspect of rock excavation shall be inspected and approved by the

geotechnical engineer prior to performing removal operations. The engineer in the presence of the contractor will measure the rock excavation. The actual number of cubic yards of Rock Excavation will be computed by this quantity.

2. Payment

The unit price for Rock Excavation includes replacement with approved materials. The unit price for Rock Excavation shall include full compensation for all labor, equipment, and materials excavated, including the cost of stockpiling or disposing of excavated material and surveying. No payment will be made for excavation performed by the Contractor outside the specified limits unless such excavation has been performed at the request and direction of the Owner.

G. Pay Item 02200-3 Undercut Excavation (replace with select fill material) Allowance

1. Measurement

The quantity of Undercut Excavation (replace with select fill material) will be the actual number of cubic yards of material excavated within the required limits when directed and as determined by the Owner or engineer. Any area suspect of Undercut Excavation (replace with select fill material) shall be inspected and approved by the geotechnical engineer prior to performing removal operations. The engineer in the presence of the contractor will measure the Undercut Excavation (replace with select fill material). The actual number of cubic yards of Undercut Excavation (replace with select fill material) will be computed by this quantity

2. Payment

The unit price for Undercut Excavation (replace with select fill material) shall include full compensation for all labor, equipment, and materials excavated and properly disposed of and replacing undercut excavated material with an identical quantity of select fill material. The select fill material used to replace undercut material is included in the unit price for Undercut Excavation (replace with select fill material) no additional payment is made for select fill material used to replace undercut. No payment will be made for undercut excavation performed by the Contractor outside the specified limits unless such undercut excavation has been performed at the request and direction of the Owner.

No payment shall be made for material below subgrade that has become unsuitable due to the collection of rainwater.

H. Pay Item 02200-4 Undercut Excavation (replace with ABC) Allowance

1. Measurement

The quantity of Undercut Excavation (replace with ABC) will be the actual number of cubic yards of material excavated within the required limits when directed and as determined by the Owner or engineer. Any area suspect of

Undercut Excavation (replace with ABC) shall be inspected and approved by the geotechnical engineer prior to performing removal operations. The engineer in the presence of the contractor will measure the Undercut Excavation (replace with ABC). The actual number of cubic yards of Undercut Excavation (replace with ABC) will be computed by this quantity

2. Payment

The unit price for Undercut Excavation shall include full compensation for all labor, equipment, and materials excavated and properly disposed of and replacing undercut excavated material with an identical quantity of aggregate base course. The aggregate base course material used to replace undercut material is included in the unit price for undercut excavation (no additional payment is made for aggregate base course). No payment will be made for undercut excavation performed by the Contractor outside the specified limits unless such undercut excavation has been performed at the request and direction of the Owner.

No payment shall be made for material below subgrade that has become unsuitable due to the collection of rainwater.

J. Pay Item 02207-1 Aggregate Base Course

1. Measurement

The quantity of Aggregate Base Course to be paid for will be the actual number of tons of aggregate base course incorporated into the Work. The number of tons will be based upon the trip delivery tickets of each and every truck delivering aggregate base course to the Work. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the aggregate base course. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as "**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY."**

2. Payment

The unit price for Aggregate Base Course shall include full compensation for all labor, equipment, and materials, including the cost of proof rolling of the trail subgrade, purchasing, transporting, placing, and compacting the aggregate base course, furnishing water, mixing, spreading materials, compacting, shaping, and applying a sand seal if necessary. No payment will be made for aggregate base course material placed outside the limits of the typical section as shown on the Drawings unless the Owner requested and directed such placement.

K. Pay Item 02260-1 Shoulder Construction & Shaping

1. Measurement

The quantity of shoulder construction to be paid for will be equal to the actual linear feet of shoulder constructed. On Trail sections, the shoulder is defined as the area from the edge of pavement to the shoulder break point. On roadway / parking sections the shoulder is defined as the entire area from edge of pavement to slope tie point.

2. Payment

Shoulder Construction will be paid for at the contract unit price, and shall include full compensation for all labor, equipment, and materials associated with the shoulder construction activity. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer.

M. Pay Item 02274-1 Geogrid

1. Measurement

Geogrid, complete, in place, and accepted, will be measured by the square yard of finished surface.

2. Payment

The unit price for Geogrid shall include full compensation for all labor, equipment, and materials, including the cost of furnishing, storing, and installing geogrid reinforcement fabric in accordance with manufacturers' recommendations at locations as specified by the Engineer.

N. Pay Item 02274-2 Geotextile Separator Fabric

1. Measurement

Separator Fabric, complete, in place, and accepted, will be measured by the square yard of finished surface.

2. Payment

The unit price for Separator Fabric shall include full compensation for all labor, equipment, and materials, including the cost of furnishing, storing, and installing Separator Fabric reinforcement fabric in accordance with manufacturers' recommendations at locations beneath pavement where soil stabilization fabric is not utilized.

O. Pay Item 02275-1 Permanent Soil Reinforcement Matting (PSRM)

1. Measurement

PSRM, complete, in place, and accepted, will be measured by the square yard of finished surface.

2. Payment

The unit price for PSRM shall include full compensation for all labor, equipment, and materials, including the cost of furnishing, storing, and installing PSRM in accordance with manufacturers' recommendations.

P. Pay Item 02276-1 Silt Fence

1. Measurement

The quantity of Silt Fence to be paid for will be the actual linear feet of silt fence installed, measured from corner to corner, and the linear feet computed by addition.

2. Payment

The unit price for Silt Fence shall include full compensation for all labor, equipment, and materials required to install, maintain during the construction period, and remove and dispose of silt fence at the conclusion of construction.

Hardware cloth and additional posts shall be considered incidental to the work, and their cost shall be distributed into the cost of the 02276-1 Silt Fence. The stone associated with sift fence outlets shall be paid for in item 02276-5 Sediment Control Stone (#57 Stone).

Q. Pay Item 02276-2 Tree Protection Fence

1. Measurement

The quantity of Tree Protection Fence will be the actual number of linear feet of fence measured after installation from corner to corner and the linear feet computed by addition. .

2. Payment

The unit price per foot for of Tree Protection Fence shall include full compensation for all labor, equipment, and materials required to install, maintain, and remove warning and barrier fence. No direct measurement will be made for warning signs located along the fencing. The cost of these signs will be included in the unit price.

R. Pay Item 02276-3 Silt Fence Outlets

1. Measurement and Payment

The quantity of Silt Fence Outlets to be paid for will be computed per each. The unit price for Silt Fence Outlets shall include full compensation for all labor, equipment, and materials required to install, maintain during the construction

period, and remove and dispose of Silt Fence Outlets at the conclusion of construction.

The stone associated with sift fence outlets shall #57 Stone and shall be considered incidental to the work. Assume silt fence outlets at 200 ft intervals along 02276-1 Silt Fence.

Hardware cloth and additional posts associated with silt fence outlets shall be considered incidental to the work.

S. Pay Item 02276-4 Check Dam

1. Measurement and Payment

The quantity of Check Dam to be paid for will be computed per each. The unit price for Check Dams shall include full compensation for all labor, equipment, and materials required to install, maintain during the construction period, and remove and dispose of Check Dams at the conclusion of construction.

T. Pay Item 02276-5 Sediment Control Stone (#57 stone)

1. Measurement and Payment

The quantity of Sediment Control Stone (#57 stone) to be paid for will be the actual number of tons of Sediment Control Stone (#57 stone) incorporated into the Work. The number of tons will be based upon the actual tonnage of stone installed relating to silt fence outlets, and check dams. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the stone. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as "**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY."**

U. Pay Item 02276-6 Plain Rip Rap, Class A (Construction Entrances)

1. Measurement

The quantity of Plain Rip Rap, Class A (Construction Entrances) to be paid for will be the actual number of tons of Plain Rip Rap, Class A (Construction Entrances) incorporated into the Work. The number of tons will be based upon the trip delivery tickets of each and every truck delivering Plain Rip Rap, Class A to the Work. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the rip rap. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as "**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY."**

2. Payment

The unit price for Plain Rip Rap, Class A (Construction Entrances) shall include full compensation for all labor, equipment, and materials, including the cost of purchasing, transporting, and placing the riprap and purchasing, transporting, and installing drainage pipes, etc. required to install the temporary construction entrance.

Filter Fabric

V. Pay Item 02276-7 Plain Rip Rap, Class B

3. Measurement

The quantity of Plain Rip Rap, Class B to be paid for will be the actual number of tons of Plain Rip Rap, Class B incorporated into the Work. The number of tons will be based upon the trip delivery tickets of each and every truck delivering Plain Rip Rap, Class B to the Work. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the rip rap. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as "**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY."**

4. Payment

The unit price for Plain Rip Rap, Class B shall include full compensation for all labor, equipment, and materials, including the cost of purchasing, transporting, and placing the riprap.

W. Pay Item 02276-8 Plain Rip Rap, Class I

1. Measurement

The quantity of Plain Rip Rap, Class I to be paid for will be the actual number of tons of Plain Rip Rap, Class I incorporated into the Work. The number of tons will be based upon the trip delivery tickets of each and every truck delivering Plain Rip Rap, Class I to the Work. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the rip rap. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as "**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY."**

2. Payment

The unit price for Plain Rip Rap, Class I shall include full compensation for all labor, equipment, and materials, including the cost of purchasing, transporting, and placing the riprap.

X. Pay Item 02276-9 Plain Rip Rap, Class II

1. Measurement

The quantity of Plain Rip Rap, Class II to be paid for will be the actual number of tons of Plain Rip Rap, Class II incorporated into the Work. The number of tons

will be based upon the trip delivery tickets of each and every truck delivering Plain Rip Rap, Class II to the Work. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the rip rap. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as "**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY."**

2. Payment

The unit price for Plain Rip Rap, Class II shall include full compensation for all labor, equipment, and materials, including the cost of purchasing, transporting, and placing the riprap.

Y. Pay Item 02276-10 Filter Fabric

1. Measurement

Filter Fabric, complete, in place, and accepted, will be measured by the square yard of finished surface.

2. Payment

The unit price for Filter Fabric shall include full compensation for all labor, equipment, and materials, including the cost of furnishing, storing, and installing Filter Fabric in accordance with manufacturers' recommendations at locations beneath rip rap where filter fabric is utilized.

Z. Pay Item 02276-11 Sediment Removal

1. Measurement

The quantity of Sediment Removal to be paid for will be the actual number of cubic yards of sediment trapped in basins or silt barriers measured in place before removed.

2. Payment

The unit price for Sediment Removal shall include full compensation for all labor, equipment, and materials required to remove sediment trapped in basins or silt barriers, transport and deposit sediment at a stockpile location along the greenway corridor, and near the end of construction distribute the sediment along the greenway corridor.

AA. Pay Item 02276-12 Site Inspections

1. Measurement

The quantity of Site Inspections to be paid for will be the actual number of work days when inspections of project erosion and sedimentation control measures and stream observations were conducted and reported by the Contractor in accordance with paragraph 02276-3.01 and following the installation of project erosion and sedimentation control measures.

2. Payment

The unit price for Site Inspections shall include full compensation for all labor, equipment, and materials required to install rain gage or gages, conduct daily inspections, and prepare and submit weekly inspection reports. No payment will be made before submitting weekly reports that will be used to support the number of days claimed for payment.

AB. Pay Item 02276-13 Excelsior Matting

1. Measurement

Excelsior Matting complete, in place, and accepted, will be measured by the square yard of finished surface.

2. Payment

The unit price for Excelsior Matting shall include full compensation for all labor, equipment, and materials, including the cost of furnishing, storing, and installing matting in accordance with manufacturers' recommendations

ABA. Pay Item 02276-14 River Jacks (3/4"-1")

1. Measurement

The quantity of River Jacks (3/4"-1") to be paid for will be the actual number of tons of River Jacks (3/4"-1") incorporated into the Work. The number of tons will be based upon the trip delivery tickets of each and every truck delivering River Jacks (3/4"-1") to the Work. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the River Jacks. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as "**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY."**

2. Payment

The unit price for River Jacks (3/4"-1") shall include full compensation for all labor, equipment, and materials, including the cost of purchasing, transporting, and placing the River Jacks.

ABB. Pay Item 02276-15 River Jacks (5"-8")

1. Measurement

The quantity of River Jacks (5”-8”) to be paid for will be the actual number of tons of River Jacks (5”-8”) incorporated into the Work. The number of tons will be based upon the trip delivery tickets of each and every truck delivering River Jacks (5”-8”) to the Work. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the River Jacks. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as “**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY.”**

2. Payment

The unit price for River Jacks (5”-8”) shall include full compensation for all labor, equipment, and materials, including the cost of purchasing, transporting, and placing the River Jacks.

ABC. Pay Item 02276-16 River Stones (8”-12”)

1. Measurement

The quantity of River Stones (8”-12”) to be paid for will be the actual number of tons of River Stones (8”-12”) incorporated into the Work. The number of tons will be based upon the trip delivery tickets of each and every truck delivering River Stones (8”-12”) to the Work. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the River Stones. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as “**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY.”**

2. Payment

The unit price for River Stones (8”-12”) shall include full compensation for all labor, equipment, and materials, including the cost of purchasing, transporting, and placing the River Stones.

AC. Pay Item 02510-1 Asphalt Concrete Surface Course Type S9.5B

1. Measurement

The quantity of Asphalt Concrete Surface Course Type S9.5B to be paid for will be the actual number of Tons of asphalt concrete surface course incorporated into the Work. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the Asphalt. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as “**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY.”**

2. Payment

The unit price per ton for Asphalt Concrete Surface Course Type S9.5B shall include full compensation for all labor, equipment, and materials, including the cost of purchasing, transporting, placing, and compacting the asphalt concrete surface course. No payment will be made for asphalt concrete surface course

material placed outside the limits of the typical section as shown in the Drawings unless the Owner requested and directed such placement.

AD. Pay Item 02510-2 Asphalt Concrete Base Course Type B25.0B

1. Measurement

The quantity of Asphalt Concrete Base Course Type B25.0B to be paid for will be the actual number of Tons of asphalt concrete surface course incorporated into the Work. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the Asphalt. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as "**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY."**

2. Payment

The unit price per ton for Asphalt Concrete Base Course Type B25.0B shall include full compensation for all labor, equipment, and materials, including the cost of purchasing, transporting, placing, and compacting the asphalt concrete surface course. No payment will be made for asphalt concrete surface course material placed outside the limits of the typical section as shown in the Drawings unless the Owner requested and directed such placement.

AE. Pay Item 02510-3 Asphalt Binder for Plant Mix, Grade PG64-22

1. Measurement

Measurement for Asphalt Binder for Plant Mix, Grade PG64-22 shall be in accordance with Section 620 of the NCDOT Specifications.

2. Payment

Payment for Asphalt Binder for Plant Mix, Grade PG64-22 will be at the unit price per ton in accordance with Section 620 of the NCDOT specifications.

AF. Pay Item 02510-4 Milling

1. Measurement

The length will be the actual length milled measured along the pavement surface. The width will be the width required by the plans or directed, measured along the pavement surface.

2. Payment

Milling to be paid will be the actual number of square yards of pavement surface milled in accordance with specification.

AG. Pay Item 02510-5 #67 Stone

1. Measurement and Payment

The quantity of #67 stone to be paid for will be the actual number of tons of #67 stone incorporated into the Work. The number of tons will be based upon the actual tonnage of stone installed relating to gravel parking lot. The Owner will collect a copy of each trip ticket from the driver of each truck prior to placing the stone. Each ticket shall clearly show the tare weight in tons and be identified by the segment where it will be installed as "**CITY OF ASHEVILLE, BAEUCATCHER GREENWAY."**

AH. Pay Item 02630-x HDPE Pipe, Size

1. Measurement

The quantity of HDPE Pipe to be paid for will be the actual number of linear feet of each size of high density polyethylene pipe incorporated into the Work, measured from end to end.

2. Payment

The unit price for HDPE Pipe shall include full compensation for all labor, equipment, materials, and installation, including excavation, pumping, select fill, pipe bedding material, and joints. Any additional cost of flared end sections (if used) shall be included in the unit price for HPDE pipe for the particular diameter. Note that any pipe constructed in the wet must utilize temporary sedimentation bag details shown on Sheet G-3G. Select backfill material shall be incidental to the pipe

AI. Pay Item 02630-x RCP Class IV Pipe, Size

1. Measurement

The quantity of RCP Class IV Pipe to be paid for will be the actual number of linear feet of each size of high density polyethylene pipe incorporated into the Work, measured from end to end.

2. Payment

The unit price for RCP Class IV Pipe shall include full compensation for all labor, equipment, materials, and installation, including excavation, pumping, select fill, pipe bedding material, and joints. Any additional cost of flared end sections (if used) shall be included in the unit price for RCP Class IV pipe for the particular diameter. Note that any pipe constructed in the wet must utilize temporary sedimentation bag details shown on Sheet G-3G. Select backfill material shall be incidental to the pipe.

AJ. Pay Item 02630-5 Catch Basin

1. Measurement and Payment

Catch basins will be measured and paid in units of each drainage structure that has been acceptably installed. Such price will include, but is not limited to, excavating, hauling, removal of a portion of the existing structures, disposal of materials, furnishing, transporting, placing backfill material, subsurface drainage, concrete, brick masonry, mortar, grout, reinforcing steel, hardware, casting, miscellaneous metal, fabricating, welding and galvanizing.

AK. Pay Item 02630-6 Headwalls

1. Measurement and Payment

Headwalls will be measured and paid per each completed and accepted. Where precast concrete units have been approved and are used instead of cast-in-place units the quantity to be paid will be computed the same as if cast-in-place units were used, as no reduction in pay quantity will be made due to the use of precast instead of cast-in-place headwalls.

AL. Pay Item 02630-7 Drop Inlet and Grates

1. Measurement and Payment

Drop Inlets and Grates will be measured and paid in units of each drainage structure that has been acceptably installed. Such price will include, but is not limited to, excavating, hauling, removal of a portion of the existing structures, disposal of materials, furnishing, transporting, placing backfill material, subsurface drainage, concrete, brick masonry, mortar, grout, reinforcing steel, hardware, casting, miscellaneous metal, fabricating, welding and galvanizing.

AM. Pay Item 02630-8 Junction Box with Manhole

1. Measurement and Payment

Junction Box with Manhole will be measured and paid in units of each drainage structure that has been acceptably installed. Such price will include, but is not limited to, excavating, hauling, removal of a portion of the existing structures, disposal of materials, furnishing, transporting, placing backfill material, subsurface drainage, concrete, brick masonry, mortar, grout, reinforcing steel, hardware, casting, miscellaneous metal, fabricating, welding and galvanizing.

AN. Pay Item 02831-1 Chain Link Fence, 6 ft.

1. Measurement

The quantity of Chain Link Fence, 6 ft. will be the actual linear feet of chain link fencing installed.

2. Payment

The unit price for Chain Link Fence, 6 ft. shall include full compensation for all labor, equipment, and materials used in installing all new fence components, including but not limited to excavation for fence posts, concrete encasement for posts, collection and disposal of soil removed for installation of fence post fence fabric, top rail, bottom rail, barbed wire, center rail, truss rod, turnbuckles, caps, and all other required items of work associated with furnishing and installing the new chain link fence.

The unit price shall also include removal and disposal of the fencing at completion of construction.

AO. Pay Item 02834-1 Precast Block Gravity Retaining Walls

1. Measurement and Payment

Precast Block Gravity Retaining Walls will be measured and paid in square feet. Block walls will be measured as the square feet of wall face area with the pay height equal to the difference between top of wall and top of footing elevations. Define “top of wall” as top of cap blocks.

The contract unit price for *Precast Block Gravity Retaining Walls* will be full compensation for providing designs, if required, submittals, labor, tools, equipment and block wall materials, excavating, backfilling, hauling and removing excavated materials and supplying footings, blocks, No. 57 stone, wall drainage systems, geotextiles, cap blocks, slope protection, coping and any incidentals necessary to construct block walls.

The contract unit price for *Precast Block Gravity Retaining Walls* does not include the cost for ditches, fences, handrails, barrier or guardrail associated with block walls as these items will be paid for elsewhere in the contract.

Where it is necessary to provide backfill material behind No. 57 stone from sources other than excavated areas or borrow sources used in connection with other work in the contract, payment for furnishing and hauling such backfill material will be paid as extra work in accordance with Article 104-7 of the *Standard Specifications*. Placing and compacting such backfill material is not considered extra work but is incidental to the work being performed.

AP. Pay Item 02844-1 MSE Retaining Walls

1. Measurement and Payment

MSE Retaining Wall No. __ will be measured and paid in square feet. MSE walls will be measured as the square feet of wall face area with the pay height equal to the difference between top of wall and top of leveling pad elevations. Define “top of wall” as top of coping or top of panels or SRW units for MSE walls without coping.

The contract unit price for *MSE Retaining Wall No.* __ will be full compensation for providing designs, submittals, labor, tools, equipment and MSE wall materials, excavating, backfilling, hauling and removing excavated materials and supplying site assistance, leveling pads, panels, SRW units, reinforcement, aggregate, wall drainage systems, geotextiles, bearing pads, coping, miscellaneous components and any incidentals necessary to construct MSE walls. The contract unit price for *MSE Retaining Wall No.* __ will also be full compensation for reinforcement connected to and aggregate behind end bent caps in the reinforced zone, if required.

No separate payment will be made for temporary shoring for wall construction. Temporary shoring for wall construction will be incidental to the contract unit price for *MSE Retaining Wall No.* __.

The contract unit price for *MSE Retaining Wall No.* __ does not include the cost for ditches, fences, handrails, barrier or guardrail associated with MSE walls as these items will be paid for elsewhere in the contract.

Where it is necessary to provide backfill material behind the reinforced zone from sources other than excavated areas or borrow sources used in connection with other work in the contract, payment for furnishing and hauling such backfill material will be paid as extra work in accordance with Article 104-7 of the *Standard Specifications*. Placing and compacting such backfill material is not considered extra work but is incidental to the work being performed.

AQ. Pay Item 02910-1 Temporary Seed and Mulch

1. Measurement

Temporary Seed and Mulch will be measured and paid for in acres. Areas to receive seeding are to be approved by the Engineer before proceeding with temporary seeding operations. This quantity shall include all labor, equipment, and materials required to complete the Work. Note that seeding requirements shall be in accordance with Temporary Seeding Charts on Sheet G-3A.

2. Payment

The unit price for Temporary Seed and Mulch shall include full compensation for all labor, equipment, and materials associated with applying the seeding and mulch to disturbed areas, including but not limited to application of lime and fertilizer, scarifying to incorporate lime and fertilizer into the soil, application of seed, application of mulch, application of tack to secure the mulch, and all other required items of work associated with seeding and mulching. At the contractor's option, hydro seeding may be employed, in which case the unit price shall include full compensation for all labor, equipment, and materials associated with applying the seeding and mulch by hydro seeding.

AR. Pay Item 02910-2 Permanent Seeding and Mulching

1. Measurement

The quantity of Permanent Seed and Mulch to be paid for will be the actual number of acres disturbed by construction less the area receiving aggregate base course or asphalt concrete surface course, for the areas to be seeded. Areas to receive seeding are to be approved by Engineer before proceeding with seeding operations. In general, measurement will be made by subtracting from the area agreed to under Pay Item 02100-1 the length of asphalt greenway multiplied by the average width of asphalt and coarse aggregate shoulder. Note that seeding requirements shall be in accordance with Permanent Seeding Charts on Sheet G-3A.

2. Payment

The unit price for Permanent Seed and Mulch shall include full compensation for all labor, equipment, and materials associated with applying the seeding and mulch to disturbed areas, including but not limited to application of lime and fertilizer, scarifying to incorporate lime and fertilizer into the soil, application of seed, application of mulch, application of tack to secure the mulch, and all other required items of work associated with seeding and mulching. At the contractor's option, hydro seeding may be employed, in which case the unit price shall include full compensation for all labor, equipment, and materials associated with applying the seeding and mulch by hydro seeding.

AS. Pay Item 02950-1 Trees

1. Measurement

The quantity of Trees to be paid for will be the actual number of trees incorporated into the Work of the type, size, and at the locations shown on the Drawings.

2. Payment

The unit price for Trees shall include full compensation for all labor, equipment, and materials associated with procuring, delivering, planting, and maintaining the trees in accordance with section 02950 1.9.B, and 02950 1.10. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer.

AT. Pay Item 02950-2 Shrubs

1. Measurement

The quantity of Shrubs to be paid for will be the actual number of shrubs incorporated into the Work of the type, size, and at the locations shown on the Drawings.

2. Payment

The unit price for shrubs shall include full compensation for all labor, equipment, and materials associated with procuring, delivering, planting, and maintaining the shrubs in accordance with section 02950 1.9.B, and 02950 1.10. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer.

AU. Pay Item 02950-3 Ornamental Grasses

1. Measurement

The quantity of Ornamental Grasses to be paid for will be the actual number of trays of thirty six (36) individual plants incorporated into the Work of the type, size, and at the locations shown on the Drawings.

2. Payment

The unit price for Ornamental Grasses shall include full compensation for all labor, equipment, and materials associated with procuring, delivering, planting, and maintaining the Ornamental Grasses in accordance with section 02950 1.9.B, and 02950 1.10. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer.

AV. Pay Item 02950-4 Shredded Hardwood Mulch

1. Measurement

The quantity of Shredded Hardwood Mulch to be paid for will be the actual number of cubic yards of material incorporated into the Work at the locations shown on the Drawings.

2. Payment

The unit price for Shredded Hardwood Mulch shall include full compensation for all labor, equipment, and materials associated with procuring, delivering, and placing the mulch. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer.

AVA. Pay Item 02950-5 Additional Landscaping Allowance

1. Measurement and Payment

The quantity of Additional Landscaping Allowance to be paid as a lump sum for material incorporated into the Work at direction of the Engineer. The lump sum price for Additional Landscaping Allowance shall include full compensation for all labor, equipment, and materials associated with procuring, delivering, planting, and maintaining the additional landscaping in accordance with section 02950 1.9.B, and 02950 1.10. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer.

AW. Pay Item 03300-1 Concrete Stairs with Cheek Wall

1. Measurement and Payment

Concrete for Stairs with Cheek Wall will be measured and paid as the number of cubic yards that is incorporated into the completed and accepted structure except as indicated below. The number of cubic yards of concrete is computed from the dimensions shown in the plans or from revised dimensions authorized by the Engineer. When the foundation material is rock, the number of cubic yards of footing concrete is computed by the average end area method using the lower limits established for foundation excavation. The volume of concrete displaced by piles other than steel piles is not included in the quantity to be paid.

AX. Pay Item 03300-2 4.5” Concrete Sidewalk with 6” Curb

1. Measurement and Payment

4.5” Concrete Sidewalk with 6” Curb will be measured and paid in square yards, measured along the surface of the completed and accepted work. Such price includes, but is not limited to, excavating and backfilling, sawing any existing sidewalk, furnishing and placing concrete, and constructing and sealing joints.

AY. Pay Item 03300-3 4.5” Concrete Sidewalk

1. Measurement and Payment

4.5” Concrete Sidewalk will be measured and paid in square yards, measured along the surface of the completed and accepted work. Such price includes, but is not limited to, excavating and backfilling, sawing any existing sidewalk, furnishing and placing concrete, and constructing and sealing joints.

AZ. Pay Item 03300-4 6” Concrete Driveway

1. Measurement and Payment

6” Concrete Driveway will measured and paid in square yards, measured along the surface of the completed and accepted work. Such price includes, but is not limited to, excavating and backfilling, sawing the existing driveway, furnishing and placing concrete, and constructing and sealing joints.

BA. Pay Item 03300-5 Concrete Curb Ramps

1. Measurement and Payment

Concrete Curb Ramps will be measured and paid in units of each. Such price includes but is not limited to, excavating and backfilling, sawing the existing sidewalk or driveway, furnishing and placing concrete, curb and gutter, constructing and sealing joints and furnishing and installing truncated domes.

BB. Pay Item 03300-6 Surface Mounted Monolithic Concrete Island

1. Measurement and Payment

Surface Mounted Monolithic Concrete Island will be measured and paid in square yards, measured along the surface of the completed and accepted work. Such price includes but is not limited to, excavating and backfilling, sawing the existing roadway, furnishing and placing concrete, constructing and sealing joints.

BC. Pay Item 03300-7 Single Faced Concrete Barrier

1. Measurement and Payment

Single Faced Concrete Barrier will be measured and paid in linear feet, measured along the surface of the completed and accepted work. Such price includes but is not limited to, excavating and backfilling, furnishing and placing concrete, constructing and sealing joints.

BD. Pay Item 03300-8 1'-6" Concrete Curb and Gutter

1. Measurement and Payment

1'-6" Concrete Curb and Gutter will be measured and paid in linear feet, measured along the surface of the completed and accepted work. Such price includes but is not limited to, excavating and backfilling, sawing the existing roadway, furnishing and placing concrete, constructing and sealing joints.

BE. Pay Item 03300-9 Concrete Paved Ditch

1. Measurement and Payment

Concrete Paved Ditch will be measured and paid in square yards, measured along the surface of the completed and accepted work. Such price includes but is not limited to, excavating and backfilling, furnishing and placing concrete, constructing and sealing joints.

BF. Pay Item 03300-10 Flowable Fill

1. Measurement and Payment

Flowable Fill will be measured and paid as the number of cubic yards that is incorporated into the completed and accepted structure except as indicated below. The number of cubic yards of concrete is computed from the dimensions shown in the plans or from revised dimensions authorized by the Engineer.

BG. Pay Item 03300-11 Concrete Washout Structure

1. Measurement and Payment

Concrete Washout Structure will be paid for per each enclosure installed in accordance with the details. If alternate details are approved then those details will also be paid for per each approved and installed device.
No measurement will be made for other items or for over excavation or stockpiling.

BH. Pay Item 03300-12 Concrete Paver System (Stone Base and Sand Setting Bed)

1. Measurement and Payment

Concrete Paver System (Stone Base and Sand Setting Bed) will be paid for per square foot incorporated into the completed and accepted structure in accordance with the details. The unit price for Concrete Paver System shall include full compensation for all labor, equipment, and materials, including excavation, concrete pavers, fabrication, hardware, and Sand setting bed. Stone base shall be paid under Aggregate Base Course item 02200-1.
No measurement will be made for other items or for over excavation or stockpiling.

BI. Pay Item 03300-13 Detectable Warning Mat (2'x4')

1. Measurement and Payment

Detectable Warning Mat will be for per each incorporated into the completed and accepted structure in accordance with the details. The unit price shall include full compensation for all labor, equipment, and materials, including excavation, fabrication, and hardware.

BIA. Pay Item 03300-14 Concrete SS Pipe Encasement

1. Measurement and Payment

Concrete SS Pipe Encasement will be measured and paid as the number of cubic yards that is incorporated into the completed and accepted structure except as indicated below. The number of cubic yards of concrete is computed from the dimensions shown in the plans or from revised dimensions authorized by the Engineer.

BJ. Pay Item 05521-1 Safety Rail – Type 1

1. Measurement

The quantity of Safety Rail – Type 1 to be paid for will be the actual number of linear feet of railing installed. Detail of railing is shown on Sheet 2H. Safety Railing installed adjacent to retaining walls will also be paid for under this pay item.

2. Payment

The unit price for Safety Rail – Type 1 shall include full compensation for all labor, equipment, and materials, including excavation, concrete footing, gravel, fabrication, hardware, connections, and splices.

BK. Pay Item 05521-2 Steel Backed Timber Rail

1. Measurement and Payment

Steel Backed Timber Rail will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted exclusive of that length of guardrail that is within the pay limits of guardrail anchors. Measurement will be made from center to center of the outermost post in the length of guardrail being measured.

BL. Pay Item 05521-3 Guardrail

1. Measurement and Payment

Guardrail will be measured and paid in linear feet of guardrail that has been satisfactorily completed and accepted exclusive of that length of guardrail that is within the pay limits of guardrail anchors. Measurement will be made from center to center of the outermost post in the length of guardrail being measured.

Such price and payment includes, but is not limited to, furnishing and erecting posts, offset blocks, rail, terminal sections, miscellaneous hardware and all other materials; field curving and shop curving of the rail; removing temporary guardrail; excavation; furnishing and installing additional guardrail posts and additional offset blocks; backfilling; fabrication; welding; galvanizing; and furnishing and installing guardrail delineators and end delineation.

BM. Pay Item 05521-4 Guardrail Anchor Unit, Type AT-1

2. Measurement and Payment

Guardrail Anchor Unit, Type AT-1 will be measured and paid in units of each completed and accepted. No separate measurement will be made of any rail, terminal sections, posts, offset blocks, concrete, hardware, or any other components of the completed unit within the pay limits shown on the plans for the units as all such components will be considered to be part of the unit.

BN. Pay Item 05521-5 Guardrail Anchor Unit, Type SBT-FAT

1. Measurement and Payment

Guardrail Anchor Unit, Type SBT-FAT will be measured and paid in units of each completed and accepted. No separate measurement will be made of any rail, terminal sections, posts, offset blocks, concrete, hardware, or any other

components of the completed unit within the pay limits shown on the plans for the units as all such components will be considered to be part of the unit.

BO. Pay Item 05521-6 Separator Rail

1. Measurement and Payment

Separator Rail will be measured and paid in linear feet of rail that has been satisfactorily completed and accepted. Measurement will be made from center to center of the outermost post in the length of rail being measured.

BOA. Pay Item 05521-7 Safety Rail – Type 2

1. Measurement

The quantity of Safety Rail – Type 2 to be paid for will be the actual number of linear feet of railing installed. Detail of railing is shown on Sheet 2H.

2. Payment

The unit price for Safety Rail – Type 2 shall include full compensation for all labor, equipment, and materials, including excavation, concrete footing, gravel, fabrication, hardware, connections, and splices.

BP. Pay Item 09900-1 Paint Stripe - Solid Double Yellow Line – 4”

1. Measurement and Payment

The quantity of Paint Stripe - Solid Double Yellow Line – 4” to be paid for will be the actual number of linear feet of pavement marking lines that have been satisfactorily incorporated into the Work.

BQ. Pay Item 09900-2 Paint Stripe - Solid Yellow Line – 4”

2. Measurement and Payment

The quantity of Paint Stripe - Solid Yellow Line – 4” to be paid for will be the actual number of linear feet of pavement marking lines that have been satisfactorily incorporated into the Work.

BR. Pay Item 09900-3 Paint - Parking

1. Measurement and Payment

The quantity of Paint-Parking to be paid for will be the actual number of linear feet of pavement marking lines that have been satisfactorily incorporated into the Work.

BS. Pay Item 09900-4 Paint – 2” White Mini-Skips

1. Measurement and Payment

The quantity of Paint-2” White Mini-Skips to be paid for will be the actual number of linear feet of pavement marking lines that have been satisfactorily incorporated into the Work.

BT. Pay Item 09900-5 Paint – 2” White Line

1. Measurement and Payment

The quantity of Paint-2” White Line to be paid for will be the actual number of linear feet of pavement marking lines that have been satisfactorily incorporated into the Work.

BU. Pay Item 09910-1 Pavement Marking - Sharrows

1. Measurement and Payment

The quantity of Sharrow to be paid for per each Sharrow that has been satisfactorily incorporated into the Work.

BV. Pay Item 09910-2 Pavement Marking – High Visibility Crosswalk

1. Measurement and Payment

The quantity of Pavement Marking – High Visibility Crosswalk to be paid for will be the actual number of linear feet of pavement marking lines that have been satisfactorily incorporated into the Work.

BW. Pay Item 09910-3 Pavement Marking - Arrows

1. Measurement and Payment

The quantity of Arrows to be paid for per each Arrows that has been satisfactorily incorporated into the Work.

BX. Pay Item 09910-4 Pavement Marking – Handicap Symbol

1. Measurement and Payment

The quantity of Handicap Symbol to be paid for per each Handicap Symbol that has been satisfactorily incorporated into the Work.

BY. Pay Item 09910-5 Tubular Delineators

1. Measurement and Payment

The Tubular Delineators will be measured and paid as the maximum number of tubular markers satisfactorily placed and accepted by the Engineer at any one time during the life of the project.

BYA. Pay Item 09910-6 Pavement Marking – Custom Multi-Use Lane Symbol

1. Measurement and Payment

Each Symbol will include all members as shown in detail on Sheet 2G.

The quantity of Custom Multi-Use Lane Symbol to be paid for per each Symbol that has been satisfactorily incorporated into the Work.

BZ. Pay Item 10431-1 Monument Sign

1. Measurement and Payment

Monument Sign will be paid for on a per each basis, and shall include full compensation for all labor, equipment, fabrication, shop drawings, finishing, and installation of the panel into the column base.

CA. Pay Item 10500-1A Kiosk

1. Measurement and Payment

Kiosk will be paid for on a per each basis, and shall include full compensation for all labor, equipment, fabrication, shop drawings, finishing, and installation of the panel into the column base.

CB. Pay Item 10500-1B Interpretive Sign

1. Measurement and Payment

Interpretive Sign will be paid for on a per each basis, and shall include full compensation for all labor, equipment, fabrication, shop drawings, finishing, and installation of the panel into the column base.

CD. Pay Item 10500-1C Regulations Sign

1. Measurement and Payment

Regulations Sign will be paid for on a per each basis, and shall include full compensation for all labor, equipment, fabrication, shop drawings, finishing, and installation of the panel into the column base.

CE. Pay Item 10500-1D Directional Sign

1. Measurement and Payment

Directional Sign will be paid for on a per each basis, and shall include full compensation for all labor, equipment, fabrication, shop drawings, finishing, and installation of the panel into the column base.

CF. Pay Item 10500-1E Wayfinding Post

1. Measurement and Payment

Wayfinding Post will be paid for on a per each basis, and shall include full compensation for all labor, equipment, fabrication, shop drawings, finishing, and installation of the panel into the column base.

CG. Pay Item 10500-1F Mile Marker

1. Measurement and Payment

Wayfinding Post will be paid for on a per each basis, and shall include full compensation for all labor, equipment, fabrication, shop drawings, finishing, and installation of the panel into the column base.

CH. Pay Item 10500-2 Signage Type x

2. Measurement and Payment

Signage will be paid for at the contract unit price per sign type, and shall include full compensation for all labor, equipment, associated with the signing activity. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer.

CI. Pay Item 10500-3 Accessible Parking Signs

1. Measurement

The quantity of Accessible Parking Signs for Parking Lot to be paid for will be the actual number of handicap signs installed in parking lots. See Detail 1 on Sheet D1.3 for handicap sign detail.

2. Payment

The unit price for Accessible Parking Signs for Parking Lot shall include full compensation for all labor, equipment, and materials to install signs.

CJ. Pay Item 10500-4 Relocate Sign Assembly

1. Measurement and Payment

Relocate Sign Assembly will be paid at the contract lump sum price and shall include full compensation for all labor, equipment, and materials, and testing

required to relocate mailboxes as shown on the plans. Contractor will match existing material, and install per applicable City of Asheville Standards.

CK. Pay Item 10900-1 Hinged Barrier Bollard

2. Measurement

The quantity of Hinged Barrier Bollard to be paid for will be the actual number of Hinged Barrier Bollards incorporated into the Work.

3. Payment

The unit price for Hinged Barrier Bollard shall include full compensation for all labor, equipment, and materials, including excavation and backfill for concrete foundation, concrete foundation, and all other accessories and appurtenances required. See Hinged Barrier Bollard Detail on Sheet 2C, and Sheet 2L (details are identical).

CL. Pay Item 10900-2 Helen's Bridge Rail

1. Measurement

The quantity of Helen's Bridge Rail to be paid for will be the actual number of linear feet of railing installed.

2. Payment

The unit price for Helen's Bridge Rail shall include full compensation for all labor, equipment, and materials, including excavation, concrete footing, gravel, fabrication, hardware, connections, and splices.

CM. Pay Item 10900-3 Black Steel Double Swing Gates (20LF)

1. Measurement

The quantity of Black Steel Double Swing Gates to be paid for will be the actual number of Black Steel Double Swing Gates incorporated into the Work.

2. Payment

The unit price for Black Steel Double Swing Gates shall include full compensation for all labor, equipment, and materials, including excavation and backfill for concrete foundation, concrete foundation, and all other accessories and appurtenances required. See Swing Gates Detail 6 on D1.3

CN. Pay Item 10900-4 24LF Corten Steel Single Arm Swing Gate

1. Measurement

The quantity of Corten Steel Single Arm Swing Gate to be paid for will be the actual number of Corten Steel Single Arm Swing Gate incorporated into the Work.

2. Payment

The unit price for Corten Steel Single Arm Swing Gate shall include full compensation for all labor, equipment, and materials, including excavation and backfill for concrete foundation, concrete foundation, and all other accessories and appurtenances required. See Swing Gates Detail 6 on D1.3

CO. Pay Item 10900-5 Emergency Call Box

1. Measurement

The quantity of Emergency Call Box to be paid for will be the actual number of Emergency Call Box incorporated into the Work.

2. Payment

The unit price for Emergency Call Box shall include full compensation for all labor, equipment, and materials, including excavation and backfill for concrete foundation, concrete foundation, and all other accessories and appurtenances required. See Emergency Call Box Detail 6 on Sheet D1.0.

CP. Pay Item 10900-6 9”x7”x5’ Timber Wheelstop

1. Measurement

The quantity Timber Wheelstop to be paid for will be the actual number of Timber Wheelstop incorporated into the Work.

2. Payment

The unit price for Timber Wheelstop shall include full compensation for all labor, equipment, and materials, required for complete procurement and installation. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer.

CQ. Pay Item 10900-7 Furnish & Install Bench

1. Measurement & Payment

The measurement and payment of Furnish & Install Bench will be at the contract unit price per each, and shall include full compensation for all labor, equipment, and materials required to install benches, including but not limited to assembly of benches, required grading / leveling, concrete footings, etc. required to provide a complete installation.

CR. Pay Item 10900-8 Furnish & Install Litter Receptacle

1. Measurement & Payment

The measurement and payment of Furnish & Install Litter Receptacle will be at the contract unit price per each, and shall include full compensation for all labor, equipment, and materials required to install Litter Receptacles, including but not limited to assembly of Litter Receptacles, required grading / leveling, concrete footings, etc. required to provide a complete installation.

CS. Pay Item 10900-9 Furnish & Install Bike Rack

1. Measurement & Payment

The measurement and payment of Furnish & Install Bike Rack will be at the contract unit price per each, and shall include full compensation for all labor, equipment, and materials required to install Bike Rack, including but not limited to assembly of Bike Rack, required grading / leveling, concrete footings, etc. required to provide a complete installation.

CT. Pay Item 10900-10 Furnish & Install Pet Waste Station

1. Measurement & Payment

The measurement and payment of Furnish & Install Pet Waste Station will be at the contract unit price per each, and shall include full compensation for all labor, equipment, and materials required to install Pet Waste Station, including but not limited to assembly of Pet Waste Station, required grading / leveling, concrete footings, etc. required to provide a complete installation.

CU. Pay Item 10900-11 Furnish & Install Natural Stone Column

1. Measurement & Payment

The measurement and payment of Furnish & Install Natural Stone Column will be at the contract unit price per each, and shall include full compensation for all labor, equipment, and materials required to install Natural Stone Column, including but not limited to assembly of Natural Stone Column, required grading / leveling, concrete footings, etc. required to provide a complete installation.

CV. Pay Item 10900-12 Furnish & Install Natural Stone Seat Wall

1. Measurement & Payment

The measurement and payment of Furnish & Install Natural Stone Seat Wall will be at the contract unit price per square foot, and shall include full compensation for all labor, equipment, and materials required to install Natural Stone Seat Wall, including but not limited to assembly of Natural Stone Seat Wall, required grading / leveling, concrete footings, etc. required to provide a complete installation.

CW. Pay Item 10900-13 Place Boulders at Trailheads

1. Measurement and Payment

Payment for installation of boulders at trailheads shall be paid for at the contract lump sum price. Boulders are supplied by the City of Asheville. Contractor shall transport and place boulders where indicated on the plans. The contractor is responsible for all handling and transportation from storage location at, Asheville NC.

CX. Pay Item 10900-14 Split Rail Fence

1. Measurement

The quantity of Split Rail Fence to be paid for will be the actual number of linear feet of fence installed.

2. Payment

The unit price for Split Rail Fence shall include full compensation for all labor, equipment, and materials, including excavation, concrete footing, gravel, fabrication, hardware, connections, and splices.

CY. Pay Item 10900-15 Remove Existing Gate and footing

1. Measurement & Payment

The measurement and payment of Remove Existing Gate and footing will be at the contract unit price per lump sum, and shall include full compensation for all labor, equipment, and materials required to Remove Existing Gate and footing, including but not limited to removal, storage, transportation and disposal of all existing materials to be removed.

CZ. Pay Item 10900-16 Remove Existing Bollards and footing

1. Measurement & Payment

The measurement and payment of Remove Existing Bollards and footing will be at the contract unit price per lump sum, and shall include full compensation for all labor, equipment, and materials required to Remove Existing Bollards and footing, including but not limited to removal, storage, transportation and disposal of all existing materials to be removed.

DA. Pay Item 10900-17 Relocate Mailboxes

1. Measurement and Payment

Relocate Mailboxes will be paid at the contract lump sum price and shall include full compensation for all labor, equipment, and materials, and testing required to relocate mailboxes as shown on the plans. Contractor will match existing material, and install per applicable City of Asheville Standards.

DB. Pay Item 16000-1 2” Sch 80 Elec. Conduit (HDPE)

1. Measurement

The quantity of 2” Sch 80 Elec. Conduit (HDPE) will be the actual linear feet of new 2” Sch 80 Elec. Conduit (HDPE) installed. No payment differentiation shall be made for chosen installation method.

2. Payment

The unit price for 2” Sch 80 Elec. Conduit (HDPE) shall include full compensation for all labor, equipment, and materials used in installing the conduit. Tracer wire, conduit plugs, pull line, etc. shall be incidental to the conduit.

Materials shall be in accordance with section 1091 of the North Carolina Department of Transportation Standards Specifications for Roads and Structures.

Installation shall be in accordance with section 1715 of the North Carolina Department of Transportation Standards Specifications for Roads and Structures.

DC. Pay Item 16000-2 Electrical Junction Boxes

1. Measurement

The quantity of Electrical Junction Boxes will be measured per each. This measurement shall be based solely on location. Each location where a junction box is required to be installed shall be considered as 1. There shall be no additional payments for stacking of junction boxes to reach finished grade. Grounding electrodes shall be incidental to each box.

2. Payment

Electrical Junction Boxes shall be measured and paid in actual number of junction boxes furnished, installed, and accepted.

No measurement will be made of covers, graded stone and grounding systems as these will be incidental to furnishing and installing junction boxes. Items used for splicing are incidental to the junction boxes.

DD. Pay Item 16000-3 40mm Triduct Communication Conduit (HDPE)

1. Measurement

The quantity of 40mm Triduct Communication Conduit (HDPE) will be the actual linear feet of new 40mm Triduct Communication Conduit (HDPE) installed. No payment differentiation shall be made for chosen installation method.

2. Payment

The unit price for 40mm Triduct Communication Conduit (HDPE) shall include full compensation for all labor, equipment, and materials used in installing the conduit, tracer, conduit plugs, pull boxes, etc. required for a complete installation.

Installation shall be in accordance with section 1715 of the North Carolina Department of Transportation Standards Specifications for Roads and Structures.

DE. Pay Item 16000-4 Relocate Electrical Outlets

1. Measurement and Payment

Relocate Electrical Outlet will be paid for at the contract unit price per each, and shall include full compensation for all labor, equipment, and materials associated with relocating the Electrical Outlet. This shall include but not be limited to removal of existing wiring to outside of greenway easement. Removal of existing Electrical Outlet. Removal of existing electrical boxes above or underground. Installation of new wiring, trenching, conduit, concrete encasement, junction boxes, pull boxes, etc. Installation of concrete base. Installation of Electrical Outlet, or replacement of Electrical Outlet if damaged.

All electrical construction shall be installed by a qualified electrician. All electrical construction shall be in accordance with the most current applicable building standards. Any permitting or inspection cost shall be included in the cost of this activity.

DF. Pay Item 17000-1 Public Art Allowance

1. Measurement and Payment

The measurement and payment of Public Art Allowance will be paid at the contract lump sum price and shall include full compensation for all labor, equipment, and materials, and testing required to install Public Art, including but not limited to assembly of Public Art, required grading / leveling, concrete footings, etc. required to provide a complete installation.

PART 2 -- PRODUCTS
(NOT USED)

PART 3 -- EXECUTION
(NOT USED)

- END OF SECTION -

SECTION 01040

COORDINATION

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall allow the Owner or his agents to enter upon the work for the purposes of constructing, operating, maintaining, removing, repairing, altering, or replacing such pipes, sewers, conduits, manholes, wires, poles, or other structures and appliances which may be required to be installed or repaired at or in the work.

The Contractor shall cooperate with all aforesaid parties and shall allow reasonable provisions for the prosecution of any other work by the Owner, or others, to be done in connection with his work or in connection with normal use of the facilities.

B. The Contractor shall cooperate fully with the Owner and the Engineer to effect proper coordination and progress to complete the project on schedule and in proper sequence. Insofar as possible, decisions of all kinds required from the Engineer shall be anticipated by the Contractor to provide ample time for inspection or the preparation of instructions.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01070

ABBREVIATIONS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The following is a partial list of typical abbreviations which may be used in the Specifications and the organizations to which they refer:

AASHTO	-	American Association of State Highway and Transportation Officials
ACI	-	American Concrete Institute
ACIFS	-	American Cast Iron Flange Standards
AFBMA	-	Anti-Friction Bearing Manufacturer's Association
AGA	-	American Gas Association
AGMA	-	American Gear Manufacturers Association
AIA	-	American Institute of Architects
AISC	-	American Institute of Steel Construction
AISI	-	American Iron and Steel Institute
ANSI	-	American National Standard Institute
API	-	American Petroleum Institute
ASCE	-	American Society of Civil Engineers
ASHRAE	-	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ASME	-	American Society of Mechanical Engineers
ASTM	-	American Society for Testing and Materials
AWS	-	American Welding Society
AWPA	-	American Wood Preservers' Association
AWWA	-	American Water Works Association
CEMA	-	Conveyor Equipment Manufacturer's Association
CRSI	-	Concrete Reinforcing Steel Institute
DIPRA		Ductile Iron Pipe Research Association
Fed Spec	-	Federal Specifications
IEEE	-	Institute of Electrical and Electronic Engineers
IPCEA	-	Insulated Power Cable Engineers Association
ISO	-	Insurance Services Offices
NBS	-	National Bureau of Standards
NCDOT	-	North Carolina Department of Transportation
NEC	-	National Electric Code
NEMA	-	National Electrical Manufacturers Association
OSHA	-	Occupational Safety and Health Act
PCI	-	Precast Concrete Institute
SPIB	-	Southern Pine Inspection Bureau
UL	-	Underwriters Laboratories, Inc.
USGS	-	United States Geological Survey

PART 2 -- PRODUCTS
(NOT USED)
PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01090

REFERENCE STANDARDS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Wherever reference is made to any published standards, codes, or standard specifications, it shall mean the latest standard code, specification, or tentative specification of the technical society, organization, or body referred to, which is in effect at the date of receipt of Bids.

B. All materials, products, and procedures used or incorporated in the work shall be in strict conformance with applicable codes, regulations, specifications, and standards.

C. A partial listing of codes, regulations, specifications, and standards includes the following:

Air Conditioning and Refrigeration Institute (ARI)

Air Diffusion Council (ADC)

Air Moving and Conditioning Association (AMCA)

The Aluminum Association (AA)

American Architectural Manufacturers Association (AAMA)

American Concrete Institute (ACI)

American Gear Manufacturers Association (AGMA)

American Hot Dip Galvanizers Association (AHDGA)

American Institute of Steel Construction, Inc. (AISC)

American Iron and Steel Institute (AISI)

American National Standards Institute (ANSI)

American Society of Civil Engineers (ASCE)

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)

American Society of Mechanical Engineers (ASME)

American Society for Testing and Materials (ASTM)

American Standards Association (ASA)

American Water Works Association (AWWA)

American Welding Society (AWS)

American Wood-Preservers Association (AWPA)

Anti-Friction Bearing Manufacturers Association (AFBMA)

Consumer Product Safety Commission (CPSC)

Factory Mutual (FM)

Federal Specifications

Instrument Society of America (ISA)

Institute of Electrical and Electronics Engineers (IEEE)

National and Local Fire Codes

Lightning Protection Institute (LPI)

National Electrical Code (NEC)

National Electrical Manufacturer's Association (NEMA)

National Electrical Safety Code (NESC)

National Electrical Testing Association (NETA)

National Fire Protection Association (NFiPA)

North Carolina State Building Code

North Carolina Department of Transportation Standard Specifications for Roads and Structures (SSRS)

Regulations and Standards of the Occupational Safety and Health Act (OSHA)

Southern Building Code Congress International, Inc. (SBCCI)

Sheet Metal & Air Conditioning Contractors National Association (SMACCNA)

Standard Mechanical Code

Standard Plumbing Code

Uniform Building Code (UBC)

Underwriters Laboratories Inc. (UL)

D. Contractor shall, when required, furnish evidence satisfactory to the Engineer that materials and methods are in accordance with such standards where so specified.

E. In the event any questions arise as to the application of these standards or codes, copies shall be supplied on-site by the Contractor.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01200

PROJECT MEETINGS

PART 1 -- GENERAL

1.01 PRE-BID MEETING

A. A Pre-bid meeting will be held at the time and place to be designated in the Instructions to Bidders.

B. The Engineer will be available to discuss the project and answer pertinent questions.

1. No oral interpretation will be made as to the meaning of the Documents.

2. Interpretation, if deemed necessary by the Engineer, will be in the form of an Addendum to the Contract Documents.

1.02 PRECONSTRUCTION MEETING

A. A preconstruction meeting will be held after Award of Contract but prior to starting work at the site.

B. Attendance:

1. Owner

2. Engineer

3. Contractor

4. Major subcontractors

5. Safety representative

6. Representatives of governmental or other regulatory agencies.

C. Minimum Agenda:

1. Tentative construction schedule

2. Designation of responsible personnel

3. Processing of Field Decisions and Change Orders

4. Adequacy of distribution of Contract Documents

5. Submittal of Shop Drawings and samples

6. Procedures for maintaining record documents

7. Use of site and Owner's requirements

8. Major material deliveries and priorities

9. Safety and first aid procedures

10. Security procedures

11. Housekeeping procedures

12. Processing of Partial Payment Requests

13. General regard for community relations

1.03 PROGRESS MEETING

A. Progress meetings will be held monthly at minimum, and at a place designated by the Engineer during the performance of the work of this Contract.

1. Additional meetings may be called as progress of the work dictates.

B. The Engineer will preside at meetings and record minutes of proceedings and decisions made.

1. The Engineer will distribute copies of minutes to all meeting participants.

C. Attendance:

1. Engineer

2. Owner

3. Contractor

4. Subcontractors, but with the Engineer's approval or request as may be pertinent to the agenda

D. Minimum Agenda:

1. Review and approve minutes of previous meetings.

2. Review progress of Work since last meeting.

3. Review proposed 30-60 day construction schedule.

4. Note and identify problems which impede planned progress.

5. Develop corrective measures and procedures to regain planned schedule.

6. Revise construction schedule as indicated and plan progress during next work period.

7. Maintaining quality and work standards.

8. Complete other current business.

1. Report on community and governmental relations.

10. Schedule next progress meeting.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01300

SUBMITTALS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Progress Schedule

1. Within thirty days after issuance of the Notice to Proceed, the Contractor shall prepare and submit five copies of his proposed construction progress schedule to the Engineer for review and approval.

2. If so required, the schedule shall be revised until it is approved by the Engineer.

3. The schedule shall be updated monthly, depicting progress to the last day of the month.

   a. Five copies of the updated schedule shall be submitted to the Engineer with the monthly application for progress payment.

4. The Contractor shall create and maintain a Critical Path Method (CPM) Project Schedule showing the sequence of work intended to be completed within the allotted contract time. The project schedule shall employ computerized CPM for the planning, scheduling, and reporting of the work. The CPM schedule shall be prepared using the Precedence Diagram Method (PDM) and shall contain cost loading. The schedule shall be presented in horizontal bar chart format showing in detail the proposed sequence of the work and identify construction activities for each structure and each portion of work.

5. The schedule shall be time scaled, identifying the first day of each week, with the estimated date for starting and completing each stage of the work in order to complete the Project within the Contract time.

6. Cost Loading – Assign resources to each activity to include budget units and budgeted costs calculated as budget units x unit price. Percent complete type shall be Units Percent Complete. Duration type shall be Fixed Duration/Units. Earned value shall be reported from the schedule.

7. The schedule shall contain milestones for long lead item shop drawing submittal, shop drawing review, fabrication, and delivery.

8. Each updated schedule shall show all changes since the previous submittal.

9. All revisions to the schedule must have the prior approval of the Engineer.

10. The construction schedule shall show as a minimum the following work tasks as appropriate for each segment of the greenway trail:

Asphalt paving
Clean up
Construction Staking
Clearing
Culverts and Headwalls
Erosion and Sedimentation Control
Fencing / Safety Railing
Grading and placing stone
Landscaping
Retaining walls
Signs and trail accessories

B. Material Orders Schedule

1. The Contractor shall prepare and submit to the Engineer for review and approval five copies of his schedule of principal items of materials to be purchased.

2. If so required, the schedule shall be revised until approved by the Engineer.

3. The schedule shall be updated monthly.

   a Five copies submitted to the Engineer with the monthly application for progress payment.

4. The updated schedule shall be based on the Progress Schedule developed under the requirements of Paragraph 1.01(A) of this Section.

5. The schedule shall be in tabular form with appropriate spaces to insert the following information for principal items of materials:

   a. Dates on which Shop Drawings are requested and received from the manufacturer.

   b. Dates on which certification is received from the manufacturer and transmitted to the Engineer.

   c. Dates on which Shop Drawings are submitted to the Engineer and returned by the Engineer for revision.

   d. Dates on which Shop Drawings are revised by manufacturer and resubmitted to the Engineer.

   e. Date on which Shop Drawings are returned by Engineer annotated either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED/RESUBMITTAL NOT REQUIRED".

   f. Date on which accepted Shop Drawings are transmitted to manufacturer.

   g. Date of manufacturer's scheduled delivery.

h. Date on which delivery is actually made.

C. Working Drawings

1. Within thirty days after the Notice to Proceed, the Contractor shall prepare and submit five copies of his preliminary schedule of Working Drawing submittals to the Engineer for review and approval.

   a. If so required, the schedule shall be revised until it is approved by the Engineer.

2. Contractor shall prepare and submit six copies of each set of Working Drawings to the Engineer for review and approval. Working Drawings include, but are not limited to, Shop Drawings, layout drawings in plan and elevation, installation drawings, manufacturer's data, etc.

   a. The Contractor shall be responsible for securing all of the information, details, dimensions, Drawings, etc., necessary to prepare the Working Drawings required and necessary under this Contract and to fulfill all other requirements of his Contract.

   b. Contractor shall secure such information, details, Drawings, etc., from all possible sources including the Drawings, Working Drawings prepared by subcontractors, Engineers, suppliers, etc.

3. Working Drawings shall accurately and clearly present the following:

   a. All working and installation dimensions.

   b. Arrangement and sectional views.

   c. Units of equipment or material in the proposed positions for installation, lifting locations, details of required attachments and connections, and dimensioned locations between units and in relation to the structures.

4. In the event that the Engineer is required to provide additional engineering services as a result of a substitution of materials or equipment by the Contractor, the additional services will be provided in accordance with Section 01010 - Summary of Work and will be covered in supplementary or revised Drawings which will be issued to the Contractor.

   a. All changes indicated that are necessary to accommodate the equipment and appurtenances shall be incorporated into the Working Drawings submitted to the Engineer.

5. Working Drawings specifically prepared for this Project shall be on bond or other approved reproducible material sheets of the same size as the Drawings.

a. Working Drawings shall conform to recognized drafting standards, neat, legible, and drawn to a scale of sufficient size to show in detail the required information.

6. The Drawings are used for engineering and general arrangement purposes only and are not to be used for Working Drawings.

7. Shop Drawings

a. Contractor shall submit Shop Drawings for all fabricated work and for all manufactured items required to be furnished by the Contract Documents to the Engineer for review.

b. Structural and all other layout drawings prepared specifically for the Project shall have a plan scale of not less than 3/8 inch = 1 foot.

c. Where manufacturer's publications in the form of catalogs, brochures, illustrations, or other data sheets are submitted in lieu of prepared Shop Drawings, such submittals shall specifically indicate the item for which approval is requested.

1). Identification of items shall be made in ink.

2). Submittals showing only general information are unacceptable.

8. Layout and Installation Drawings

a. The Contractor shall prepare and submit layout and installation drawings for all bridges under this Contract to the Engineer for review.

1). The final dimensions, elevation, location, etc., of bridges may depend upon the dimensions of the bridge to be furnished by the Contractor.

b. Layout and installation drawings shall show connections to structures, etc.

c. Drawings shall show the location and type of all supports, foundations, etc.

9. Contractor Responsibilities

a. All submittals from subcontractors, manufacturers, or suppliers shall be sent directly to the Contractor for checking.

1). Contractor shall thoroughly check all drawings for accuracy and conformance to the intent of the Contract Documents.

2). Inaccurate drawings, or drawings otherwise in error, shall be returned to the subcontractors, manufacturers, or suppliers by the Contractor for correction prior submitting to the Engineer.

b. All submittals shall be bound, dated, properly labeled, and consecutively numbered.

1). Information on the label shall indicate Specification Section; drawing or sheet number; subcontractor's, manufacturer's, or supplier's name; and the name or type of item the submittal covers.

2). Each part of a submittal shall be marked and tabulated.

c. Working Drawings shall be submitted as a single complete package including all associated drawings relating to a complete assembly of the various parts necessary for a complete unit or system.

d. All submittals shall be thoroughly checked by the Contractor for accuracy and conformance to the intent of the Contract Documents before submitting to the Engineer and shall bear the Contractor's stamp of approval certifying that they have been so checked.

1). Submittals sent to the Engineer without the Contractor's stamp of approval will immediately be returned to the Contractor without review by the Engineer.

2). Submittals with more than three review comments will be immediately returned to the Contractor without further review.

e. If the submittals contain any departures from the Contract Documents, specific mention thereof shall be made in the Contractor's letter of transmittal.

1). The review of such submittals shall not constitute approval of the departure.

f. No materials or equipment shall be ordered, fabricated, or shipped or any work performed until the Engineer returns to the Contractor the submittals, herein required, annotated either "**NO EXCEPTIONS TAKEN**" or "**MAKE CORRECTIONS NOTED / RESUBMITTAL NOT REQUIRED**".

g. Where errors, deviations, and/or omissions are discovered at a later date in any of the submittals, the Engineer's prior review of the submittals does not relieve the Contractor of the responsibility for correcting all errors, deviations, and/or omissions.

10. Procedure for Review

a. Submittals shall be transmitted in sufficient time to allow the Engineer at least 20-working days for review and processing.

b. Contractor shall transmit one reproducible transparency and two prints of each submittal for all drawings greater than 11-inches by 17-inches in size and a sufficient number of copies of all other material so as to allow the Engineer to retain three copies and return the remainder to the Contractor following review as outlined hereafter.

c. Submittal shall be accompanied by a letter of transmittal, in duplicate, containing the date, project title, Contractor's name, contract number, number and titles of submittals, notification of departures, and any other pertinent data to facilitate review.

d. Submittals will be annotated by the Engineer in one of the following ways:

"NO EXCEPTIONS TAKEN" - No exceptions are taken.

"MAKE CORRECTIONS NOTED / RESUBMITTAL NOT REQUIRED" - Minor corrections are noted and shall be made.

"REJECTED / SEE REMARKS" - Based on the information submitted, the submission is not in conformance with the Contract Documents. The deviations from the Contract Documents are too numerous to list, and a completely revised submission of the proposed equipment or a submission of other equipment is required.

"MAKE CORRECTIONS NOTED & RESUBMIT" - Major corrections are noted, and a resubmittal is required.

e. If a submittal is satisfactory to the Engineer, the Engineer will annotate the submittal **"NO EXCEPTIONS TAKEN"** or **"MAKE CORRECTIONS NOTED / RESUBMITTAL NOT REQUIRED"**, retain three copies and return remaining copies to the Contractor.

1). If reproducible transparencies are submitted, the Engineer will retain the copies and return the reproducible transparencies to the Contractor.

f. If a resubmittal is required, the Engineer will annotate the submittal **"MAKE CORRECTIONS NOTED & RESUBMIT@**, retain one copy for record, and transmit the remaining copies to the Contractor for appropriate action.

1). If reproducible transparencies are submitted, the Engineer will retain a copy of each and return the reproducible transparencies to the Contractor.

g. Contractor shall revise and resubmit submittals until submittals are acceptable to the Engineer.

1). It is understood by the Contractor that the Owner may charge the Contractor the Engineer's services for review in the event a submittal is not approved, i.e., either **"NO EXCEPTIONS TAKEN"** or **"MAKE CORRECTIONS NOTED / RESUBMITTAL NOT REQUIRED"** after the second submittal for a system or piece of equipment or material.

2). These charges shall be for all costs associated with engineering review, meetings with the Contractor or manufacturer, etc., commencing with the beginning of the third submittal of a system or type of equipment or material submitted for a particular Specification Section.

h. Acceptance of a Working Drawing by the Engineer will constitute acceptance of the subject matter for which the drawing was submitted and not for any other structure, material, equipment or appurtenances indicated or shown.

11. Engineer's Review

a. Engineer's review of the Contractor's submittals shall in no way relieve the Contractor of any of his responsibilities under the Contract.

1). An acceptance of a submittal shall be interpreted to mean that the Engineer has no specific objections to the submitted material, subject to conformance with the Contract Drawings and Specifications.

b. Engineer's review will be confined to general arrangement and compliance with the Contract Drawings and Specifications only and will not be for the purpose of checking dimensions, weights, clearances, fittings, tolerances, interferences, coordination of trades, quantities, orientation, etc., these being the sole responsibility of the Contractor.

12. Record Working Drawings

a. Prior to the Owner making final payment, the Contractor shall furnish the Engineer one complete set of all accepted Working Drawings, including Shop Drawings, for equipment, materials, etc.

b. Manufacturer's publications, submitted in lieu of prepared Shop Drawings, will not be required in reproducible form.

1). Original manufacturer’s literature or publications shall be provided in place of black and white facsimile copies previously approved.

c. Working Drawings furnished shall be corrected to include any departures from previously accepted drawings.

D. Samples

1. Contractor shall furnish for review all samples as required by the Contract Documents or requested by the Engineer.

2. Samples shall be of sufficient size or quantity to clearly illustrate the quality, type, range of color, finish, and texture and shall be properly labeled to show the nature of the material, trade name of manufacturer and location of the work where the material represented by the sample will be used.

3. Samples shall be checked by the Contractor for conformance to the Contract Documents before being submitted to the Engineer and shall bear the Contractor's stamp of approval certifying that they have been so checked.

    a. Transportation charges on samples submitted to the Engineer shall be prepaid by the Contractor.

4. Engineer's review will be for compliance with the Contract Documents and his comments will be transmitted to the Contractor with reasonable promptness.

5. Accepted samples will establish the standards by which the completed work will be judged.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01400

QUALITY CONTROL

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Testing Laboratory Services

1. Laboratory testing and checking required by the Specifications, including the cost of transporting all samples and test specimens, shall be provided and paid for by the Owner except as listed below and unless otherwise stipulated in the Specifications.

a. Any and all costs associated with retests shall be provided and paid for by the Contractor.

b. All Quality Control for Asphalt Pavements shall be in accordance with Section 609 of the NCDOT Specifications, except that testing frequencies of core samples shall be as described below:
   1. Conduct density sampling based on test sections consisting of not more than 1000 linear feet or fraction thereof per day on pavement placed at the proper laydown width. This is a modification to NCDOT Standard Specifications 609-5 (D) (1), third paragraph (2000 feet is reduced to 1000 feet).
   2. Conduct sampling and testing as specified in NCDOT Standard Specifications based on test sections consisting of not more than 1000 linear feet or fraction thereof per day on pavement placed at the paver laydown width. This is a modification to NCDOT Standard Specifications 609-5 (D) (4), fifth paragraph (2000 feet is reduced to 1000 feet).

2. Materials to be tested include, but are not necessarily limited to, the following:

a. Cement

b. Concrete aggregate

c. Bituminous paving materials

d. Structural and reinforcing steel

e. Welding

f. Waterproofing

g. Select backfill

h. Crushed stone or gravel

i. Sand

3. Tests by the Owner shall not relieve the Contractor from the responsibility of supplying test results and certificates from manufacturers or suppliers to demonstrate conformance with the Specifications.

4. Procedure

a. The Contractor shall advise the Engineer when work is at such a stage that testing is appropriate.

b. The Contractor shall plan and conduct his operations to permit taking of field samples and test specimens and to allow adequate time for laboratory tests.

c. The collection, field preparation, and storage of field samples and test specimens shall be as directed by the Engineer with the cooperation of the Contractor.

5. Significance of Tests

a. Test results shall be binding on both the Contractor and the Owner and shall be considered irrefutable evidence of compliance or noncompliance with the Specification requirements, unless supplementary testing proves to the satisfaction of the Owner that the initial samples were not representative of actual conditions.

6. Supplementary and Other Testing

a. Nothing shall restrict the Contractor from conducting tests he may require.

1). Should the Contractor at any time request the Owner to consider such test results, the test reports shall be certified by an independent testing laboratory acceptable to the Owner.

2). Testing of this nature shall be conducted at the Contractor's expense.

1.02 IMPERFECT WORK, EQUIPMENT, OR MATERIALS

A. Any defective or imperfect work, equipment, or materials furnished by the Contractor discovered before the final acceptance of the work as established by the Certificate of Substantial Completion or during the subsequent guarantee period shall be removed immediately even though it may have been overlooked by the Engineer and estimated for payment.

1. Any equipment or materials condemned or rejected by the Engineer shall be tagged as such and shall be immediately removed from the site.

2. Satisfactory work or materials shall be substituted for that rejected.

B. The Engineer may order tests of imperfect or damaged work or materials to determine the required functional capability for possible acceptance if there is no other reason for rejection.

3. The cost of such tests shall be borne by the Contractor.

2. The nature, tester, extent and supervision of the tests will be determined solely by the Engineer.

3. If the results of the tests indicate that the required functional capability of the work or material was not impaired, consistent with the final general appearance of same, the work or materials may be deemed acceptable.

4. If the results of such tests reveal that the required functional capability of the questionable work or materials has been impaired, then such work or materials shall be deemed imperfect and shall be replaced.

a. The Contractor may elect to replace the imperfect work or material in lieu of performing the tests.

1.03 INSPECTION AND TESTS

A. The Contractor shall allow the Owner and the Engineer ample time and opportunity for testing materials to be used in the work.

1. The Contractor shall advise the Engineer promptly upon placing orders for material so that arrangements may be made, if desired, for inspection before shipment.

2. The Contractor shall at all times furnish the Owner, the Engineer and their representatives facilities including labor and allow proper time for inspecting and testing materials and workmanship.

3. The Contractor shall anticipate possible delays which may be caused in the execution of his work due to the necessity of materials being inspected, tested, and accepted for use.

4. The Contractor shall furnish, at his own expense, all samples of materials required by the Engineer for testing and shall make his own arrangements for providing water, electric power, or fuel for the various inspections and tests of structures.

B. The Contractor shall furnish the services of representatives of the manufacturers of certain materials as prescribed in other Sections of the Specifications.

1. The Contractor shall place orders for such materials on the basis that, after the materials have been tested and prior to final acceptance of the work, the

manufacturer will furnish the Owner with certified statements that the materials have been installed properly and are ready to be placed in functional operation.

2. Tests and analyses required of materials shall be paid for by the Contractor unless specified otherwise in the Section which covers a particular material.

C. Where other tests or analyses are specifically required in other Sections of these Specifications, the cost thereof shall be borne by the party (Owner or Contractor) so designated in such Sections.

1. The Owner will bear the cost of all tests, inspections, or investigations undertaken by the order of the Engineer for the purpose of determining conformance with the Contract Documents if such tests, inspection, or investigations are not specifically required by the Contract Documents and if conformance is ascertained thereby.

2. Whenever nonconformance is determined by the Engineer as a result of such tests, inspections, or investigations, the Contractor shall bear the full cost thereof or shall reimburse the Owner for said cost.

a. The cost of any additional tests and investigations which are ordered by the Engineer to ascertain subsequent conformance with the Contract Documents shall be borne by the Contractor.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01510

TEMPORARY UTILITIES

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall provide temporary light and power, heating, water service, and sanitary facilities for his operations pertaining to this Project at the site.

1. The temporary services shall be provided for use throughout the construction period.

B. The Contractor shall coordinate and install all temporary services in accordance with the requirements of the utility companies having jurisdiction and as required by applicable codes and regulations.

C. At the completion of the work, or when the temporary services are no longer required, the facilities shall be restored to their original conditions.

D. All costs in connection with the temporary services, including but not limited to installation, utility company service charges, maintenance, relocation, and removal, shall be borne by the Contractor at no additional cost to the Owner.

E. Temporary Sanitary Service

1. Sanitary conveniences shall be provided in sufficient numbers for the use of all persons employed on the work.

2. Sanitary conveniences shall be properly screened from public observation.

3. Sanitary conveniences shall be maintained at suitable locations by the Contractor as prescribed by State Labor Regulations and local ordinances.

4. The contents of the sanitary conveniences shall be removed and disposed of in a manner consistent with local and state regulations, as the occasion requires.

5. Sanitary facilities shall be removed from the site when no longer required.

F. Temporary Water

1. The Contractor shall provide temporary water service for construction purposes.

2. The Contractor shall make all arrangements for connections to the potable water system of the City of Asheville.

3. The Contractor shall pay all charges associated with the connection and all charges for potable water used under this Contract.

4. All water used from the City of Asheville's water system shall be metered

a. The Contractor shall contact the City of Asheville's Public Utilities Department Meter Division for procuring hydrant meters.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01530

PROTECTION OF EXISTING FACILITIES

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Contractor shall be responsible for the preservation of property adjacent to the work site and protection of same against damage or injury as a result of his operations under this Contract.

1. Any damage or injury occurring on account of any act, omission, or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.

B. Contractor shall comply promptly with such safety regulations as may be prescribed by the Owner or the local authorities having jurisdiction and shall, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of, his employees.

1. In the event of the Contractor's failure to comply, the Owner may take the necessary measures to correct the conditions or practices complained of.

a. All costs thereof will be deducted from any monies due the Contractor.

2. Failure of the Owner or the Engineer to direct the correction of unsafe conditions or practices shall not relieve the Contractor of his responsibility hereunder.

C. In the event of any claims for damage or alleged damage to property as a result of work under this Contract, the Contractor shall be responsible for all costs in connection with the settlement of or defense against such claims.

1. Prior to commencement of work in the vicinity of property adjacent to the work site, the Contractor shall, at his own expense, take such surveys and pictures as may be necessary to establish the existing condition of the property.

2. Before final payment will be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled, sufficient funds to cover such claims have been placed in escrow, or an adequate bond to cover such claims has been obtained.

1.02 PROTECTION OF WORK AND MATERIAL

A. During the progress of the work and up to the Owner’s issuance of final payment, the Contractor shall be solely responsible for the care and protection of all work and materials covered by the Contract, except as provided for in Article 14.10 of the Supplementary Conditions.

B. All work and materials shall be protected against damage, injury, or loss from any cause whatsoever, and the Contractor shall make good any such damage or loss at his own expense.

1. Protection measures shall be subject to the approval of the Engineer.

1.03 BARRICADES, WARNING SIGNS, AND LIGHTS

A. The Contractor shall provide, erect, and maintain as necessary sufficient barricades, danger signs, and warning lights along all roads accessible to the public as required by the authority having jurisdiction to insure safety to the public.

1. All barricades and obstructions along public roads shall be illuminated at night.

a. All lights shall burn from sunset to sunrise.

B. The Contractor shall provide and maintain such other warning signs and barricades in areas of and around his respective work as may be required for the safety of all those employed in the work, the Owner's personnel, or those visiting the site.

1.04 EXISTING UTILITIES AND STRUCTURES

A. The term “existing utilities” shall be deemed to refer to both publicly-owned and privately-owned utilities such as electric power and lighting, telephone, water, gas, storm drains, irrigation intakes, process lines, sanitary sewers, cable television, fiber optic, and their appurtenant structures.

B. Where existing utilities and structures are indicated on the Drawings, it shall be understood that all of the existing utilities and structures affecting the work may not be shown, and that the locations of those shown are approximate only.

1. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures.

2. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.

3. Where the Drawings do not shown underground utilities, it shall not be interpreted by the Contractor as meaning that no underground utilities exist.

C. Prior to beginning any excavation work, the Contractor shall, through field investigations, determine any conflicts or interferences between existing utilities, whether or not shown on the Drawings, and new construction under this project.

1. This determination shall be made prior to excavation and based on the actual locations, elevations, slopes, etc., of the existing utilities as determined by the field investigations and locations, elevation, slope, etc. of new construction as shown on the Drawings.

2. If an interference exists, the Contractor shall immediately bring it to the attention of the Engineer.

    a. If the Engineer agrees that an interference exists, he shall modify the design as required.

    b. Additional costs to the Contractor for this change shall be processed through a Change Order as detailed within these Contract Documents.

3. In the event the Contractor fails to bring a potential conflict or interference to the attention of the Engineer prior to beginning excavation work, any actual conflict or interference which does arise during the Project shall be corrected by the Contractor, as directed by the Engineer, but without additional expense to the Owner.

D. The work shall be carried out in such a manner so as to prevent disruption of existing services and to avoid damage to the existing utilities.

1. Temporary connections shall be provided as required to insure uninterrupted service of existing utilities.

2. Any damage resulting from the work of this Contract shall be promptly repaired by the Contractor at his own expense in a manner approved by the Engineer and further subject to the requirements of any authority having jurisdiction.

    a. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the Contractor shall be responsible for all costs thereof.

E. Where excavations by the Contractor require temporary support or other type protection of any utility line or appurtenant structure during the construction work, such support and protection shall be provided by the Contractor.

1. All such work shall be performed in a manner satisfactory to the Engineer and the respective authority having jurisdiction over such work.

2. In the event the Contractor fails to provide proper support or protection to any existing utility, the Engineer may, at his discretion, have the respective authority provide such support or protection as deemed necessary to insure the safety of such utility.

    a. The costs of such measures shall be paid by the Contractor.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01550

SITE ACCESS AND STORAGE

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Access Roads

1. The Contractor shall construct and maintain all temporary access roads required to perform the work of this Contract.

2. Access roads, where possible, shall be located within the area of the future greenway trail.

a. If the location of the greenway trail is adjacent to streams, the Contractor shall anticipate the need for equipment mats in some areas. No additional compensation shall be made where the use of equipment mats is required in the performance to the work.

3. Access roads shall be located within the property or easement lines of the Owner unless the Contractor independently secures other easements for his use and convenience.

a. Contractor shall submit written documentation to the Engineer for any Contractor secured easements across privately held property.

b. Easement agreement shall specify terms and conditions of use and provisions for site restoration.

c. A written release from the property owner shall be furnished to the Engineer prior to final payment.

1). Such release shall certify that all terms of the easement agreement have been complied with by the Contractor.

4. Existing access roads authorized for use by the Contractor shall be suitably maintained by the Contractor at his expense during construction.

a. The Contractor shall afford Owner, Engineer, and representatives of regulatory agencies access along the same routes.

b. The Owner or the Engineer may direct the Contractor to perform maintenance of existing access roads when the Owner or the Engineer determines that such work is required to insure all weather access.

5. The Contractor shall obtain and pay all cost associated with any bonds required by the N.C. Department of Transportation for the use of State maintained roads.

6. Construction and demolition of access roads shall be considered an ancillary part of the work.

    a. No separate payment shall be made for access roads, regardless of location, length, or type.

B. Parking Areas

1. The Contractor shall construct and maintain suitable parking areas for his construction personnel on the project site where approved by the Engineer and the Owner.

C. Restoration

1. At the completion of the work, the surfaces of land used for access roads and parking areas shall be restored by the Contractor to its original condition and to the satisfaction of the Engineer.

    a. Restoration shall include establishment of a permanent ground cover adequate to restrain erosion of all areas disturbed by the Contractor.

    b. Mulching of an area designated by the Owner or Engineer with wood chips shall serve as restoration.

D. Traffic Regulations

1. Contractor shall obey all traffic laws and comply with all the requirements, rules, and regulations of the City of Asheville, the North Carolina Department of Transportation, and other local authorities having jurisdiction to maintain adequate warning signs, lights, barriers, etc., for the protection of traffic on public roadways.

E. Storage of Equipment and Materials

1. The Contractor may store his equipment and materials at the job site in accordance with the requirements of the General Conditions, the Supplemental Conditions, and as hereinafter specified.

    a. All materials shall be stored in accordance with the respective manufacturer's recommendations and as directed by the Owner or Engineer and in conformity to applicable statutes, ordinances, regulations, and rulings of the public authority having jurisdiction.

    b. The Contractor shall receive approval of Owner or Engineer prior to using any site for storage, and he shall take measures to protect all trees within the area used for storage.

2. Contractor shall enforce the instructions of Owner and Engineer regarding the posting of regulatory signs for loadings on structures, fire safety, and smoking areas.

3. Contractor shall neither store materials nor encroach upon private property without the written consent of the owners of such private property.

4. Contractor shall neither store unnecessary materials nor equipment on the job site.

5. Contractor shall take care to prevent any loading of any structure with a weight which will endanger the security of the structure or the safety of persons.

6. Materials shall not be placed within ten feet of fire hydrants.

7. Gutters, drainage channels, inlets, and outlets shall be kept unobstructed at all times.

8. Contractor shall provide adequate temporary storage buildings/facilities where required to protect materials on the job site.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01560

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Dust Control

1. The Contractor shall take all necessary measures to control dust from his operations and to prevent spillage of excavated materials onto public roads.

2. The Contractor shall remove all spillage of excavated materials, debris, or dust from public roads by methods approved by the Engineer.

3. The Contractor shall sprinkle water at locations, in such quantities and at such frequencies as may be required by the Owner or the Engineer, to control dust and prevent it from becoming a nuisance to the surrounding area.

4. Dust control and cleaning measures shall be provided without additional cost to the Owner.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01590

FIELD OFFICE, PROJECT SIGNS, AND SERVICES

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Contractor's Field Office

1. The Contractor may, at his option, furnish, equip, and maintain a field office in the vicinity of the project site of a size required for his operations.

a. The Contractor is responsible for securing the site for his field office.

b. The Contractor shall provide his own telephone service.

c. The Contractor shall have readily accessible at the field office copies of the Contract Documents, latest approved Shop Drawings, and all field Project related correspondence, Change Order, etc.

1). Should the Contractor not place a field office in the vicinity of the project, copies of the Contract Documents, latest approved Shop Drawings, and all field Project related correspondence, Change Order, etc. shall at all times be in the possession of the Contractor’s project superintendent or foreman and at the project site.

2. Resident Representative's Field Office

1. If the Contractor provides and maintains a field office, he shall provide space within the field office for the exclusive use of the Owner and Engineer.

a. The space shall be available for the Owner’s and Engineer’s use during the entire life of the Project.

b. The space shall not be disturbed, moved, or interrupted without the Owner’s and Engineer's approval.

c. The space shall contain at least 80-square feet of floor area or approximately 8-feet by 10-feet.

d. A set of keys to the appropriate door locks shall be loaned to the Owner and Engineer for their use during the life of the project.

3. A 24-inch by 36-inch plywood sign shall be erected on the outside wall of the field office in a location determined by the Engineer.

a. The sign shall be painted white with green, 3-inch high lettering, neatly arranged as follows:

4. On completion of the project, the field office shall be removed.

C. Project Sign and Sign Panel

1. The Contractor shall erect two signs at the Project site identifying the Project.

   a. The signs shall be erected within 21-days of the Notice to Proceed.

2. Each project sign shall be fabricated, erected, and maintained by the Contractor in accordance with the following requirements:

   a. The sign panel shall be constructed of ¾-inch minimum thickness marine plywood rabetted into a 2-inch x 4-inch treated wood frame.

   b. All fasteners used in the construction of the sign shall be galvanized.

      1). The sign panel shall be securely fastened to the sign supports with at least six galvanized bolts, nuts, and washers.

   c. All supports, trim, and back of the sign panel shall be painted with at least two coats of the same paint used for the sign face.

      1). All paint used shall be an exterior grade paint suitable for use on wood signs.

   d. The supports for the project sign shall be at least two 4 x 4 treated wood posts.

   e. Lettering shall be green on a white background.

   f. Lettering shall be a minimum height of 6-inches.

      1). Provide project name, Owner, and Engineer.

   g. The project sign shall be maintained by the Contractor in good condition, at all times, for the duration of construction.

   h. The removal of the project signs from the construction site by the Contractor shall be at the completion of construction and when ordered by the Engineer.

PART 2 -- PRODUCTS
(NOT USED)

PART 3 -- EXECUTION
(NOT USED)

- END OF SECTION -

SECTION 01600

MATERIALS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish and Install

1. Where the words "furnish", "provide", "supply", "replace", or "install" are used, whether singularly or in combination, they shall mean to furnish and install, unless specifically stated otherwise.

2. In the interest of brevity, the explicit direction "to furnish and install" has sometimes been omitted in specifying materials and/or equipment herein.

a. Unless specifically noted otherwise, it shall be understood that all materials and/or equipment specified or shown on the Drawings shall be furnished and installed under the Contract as designated on the Drawings.

B. Concrete Foundations for Material

1. The Contractor shall provide all concrete foundations shown, specified, or required for all material or equipment furnished under this Contract.

2. The Contractor shall furnish anchor bolts and templates for material or equipment foundations.

3. All concrete foundations for material or equipment shall, where appropriate, be treated with an approved sealer to prevent oil from seeping into the concrete.

1.02 MATERIALS

A. All materials incorporated in this project shall be new and unused, unless indicated otherwise in the Contract Documents.

1. Materials to be incorporated into the work shall be delivered sufficiently in advance of their installation and use to prevent delay in the execution of the work.

2. Materials shall be delivered as nearly as feasible in the order and of such quantity as necessary required for executing the work.

B. The Contractor shall protect all materials from deterioration and damage, including provisions for temporary storage buildings as needed and as specified in Section 01550, Site Access and Storage.

1. Storage of materials shall be in locations completely protected from flooding,

standing water, excessive dust, falling rock, brush fire, etc.

2. Storage areas shall be located sufficiently distant from all construction activities and the movement of construction vehicles to minimize the potential for accidental damage.

3. Any materials of whatever kind that may have become damaged or deteriorated from any cause shall be removed and replaced by good and satisfactory items at the Contractor's expense for both labor and materials.

1.03 INSTALLATION OF MATERIALS

A. Materials shall be installed in accordance with the requirements of the General Conditions, Supplemental Conditions, and the respective Specification Sections.

B. Foundation bolts of ample size and strength shall be provided and properly positioned by means of suitable templates and secured during placement of concrete.

1. Foundations shall be built, and bolts installed, in full accordance with the manufacturer's certified drawings.

C. All blocking and wedging required for the proper supporting and leveling of material during installation shall be furnished by the Contractor.

D. All temporary supports shall be removed, except steel wedges and shims, which may be left in place with the approval of the Engineer.

1.04 SUBSTITUTIONS

A. Requests for substitutions of materials shall conform to the requirements of the General Conditions, Supplemental Conditions, and as hereinafter specified.

1. For each proposed substitution the Contractor shall submit sufficient details, complete descriptive literature, and performance data together with samples of the materials, where feasible, to enable the Owner and Engineer to determine if the proposed substitution is equal.

2. The Contractor shall submit certified tests, where applicable, by an independent laboratory attesting that the proposed substitution is equal.

3. The Contractor shall submit a list of installations, with contacts names and telephone numbers, where the proposed substitution is installed.

4. Requests for substitutions shall include full information concerning differences in cost.

a. Any and all savings in cost resulting from such substitutions shall be passed on to the Owner.

B. Where the approval of a substitution requires revision or redesign of any part of the work, all such revision and redesign, and all new drawings and details therefore, shall be provided by the Contractor at his own cost and expense and shall be subject to the approval of the Owner and Engineer.

C. In the event that the Engineer is required to provide additional engineering services associated with the substitution, then the Engineer's charges for such additional services shall be charged to the Contractor by the Owner in accordance with the requirements of the General Conditions and the Supplemental Conditions.

D. In all cases the Owner and Engineer shall be the judge as to whether a proposed substitution is acceptable.

   1. The Contractor shall abide by their decision when proposed substitute items are judged to be unacceptable and shall in such instances furnish the item specified or indicated.

   2. No substitute items shall be used in the work without written approval of the Owner and Engineer.

E. The Contractor shall have nor make any claim for an extension of time or for damages by reason of the time taken by the Engineer in considering a substitution proposed by the Contractor or by reason of the failure of the Engineer to approve a substitution proposed by the Contractor.

F. Acceptance of any proposed substitution shall in no way release the Contractor from any of the provisions of the Contract Documents.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01700

PROJECT CLOSEOUT

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Final Cleaning

1. At the completion of the work, the Contractor shall remove all rubbish, temporary structures, construction signs, tools, scaffolding, materials, supplies, and equipment that he or any of his Subcontractors may have used in the performance of the work from and about the site of the work.

a. The Contractor shall broom clean paved surfaces and rake clean other surfaces of grounds and wood chips.

2. The Contractor shall thoroughly clean all materials and structures.

a. All marred surfaces shall be touched up to match adjacent surfaces.

3. The Contractor shall maintain cleaning until the project, or portion thereof, is accepted by the Owner.

B. Final Cleanup and Site Rehabilitation

1. Before finally leaving the site, the Contractor shall wash and clean all exposed surfaces which have become soiled or marked.

2. Contractor shall remove from the site of the work all accumulated debris and surplus materials of any kind which resulted from his operation, including construction equipment, tools, sheds, sanitary enclosures, etc.

3. The Contractor shall leave all materials and work which he has installed in a clean condition.

4. The completed project shall be turned over to the Owner in a neat and orderly condition.

5. The site of the work shall be rehabilitated or developed in accordance with this and other sections of the Specifications and the Drawings.

6. In the absence of any portion of these requirements, the Contractor shall completely rehabilitate the site to a condition and appearance equal or superior to that which existed just prior to construction, except for those items whose permanent removal or relocation was required in the Contract Documents or ordered by the Owner.

C. Final Inspection

1. Final cleaning and repairing shall be so arranged as to be finished upon completion of the construction work.

    a. Any portion of the work finally inspected and accepted by the Owner shall be kept clean by the Contractor until the final acceptance of the entire work.

2. When the Contractor has finally cleaned and repaired the whole or any portion of the work, he shall notify the Engineer that he is ready for the final inspection of the whole or a portion of the work.

    a. The Engineer will thereupon inspect the work.

    b. If the work is found unsatisfactory, the Engineer will order further cleaning, repairs, or replacement.

3. When such further cleaning or repairing is completed, the Engineer will, upon further notice, inspect the work again.

    a. The "Final Payment" will not be processed until the Contractor has complied with the requirements set forth, and the Engineer has made his final inspection of the entire work and is satisfied that the entire work is properly and satisfactorily constructed in accordance with the requirements of the Contract Documents.

D. Project Close Out

1. As construction of the project enters the final stages of completion, the Contractor shall, in concert with accomplishing the requirements set forth in the Contract Documents, attend to or have already completed the following items as they apply to his contract:

    a. Correcting or replacing defective work, including completion of items previously overlooked or work which remains incomplete, all as evidenced by the Engineer's "Punch" Lists.

    b. Attend to any other items listed herein or brought to the Contractor's attention by the Engineer.

2. Just before the Engineer's Certificate of Substantial Completion is issued, the Contractor shall accomplish the cleaning of the various project components as specified in the Specifications and as follows:

    a. Clean all bridges, superstructures, boardwalks, retaining walls, and railings.

b. Touch up marks or defects in painted surfaces, and touch up any similar defects in factory finished surfaces.

c. Remove all stains, marks, fingerprints, soil, spots, and blemishes from all finished surfaces, such as concrete, retaining wall, timber cribbing, and similar surfaces.

3. Before the Certificate of Substantial Completion is issued, the Contractor shall submit to the Engineer (or to the Owner if indicated) certain records, certifications, etc., which are specified elsewhere in the Contract Documents.

a. A partial list of such items appears below, but it shall be the Contractor's responsibility to submit any other items which are required in the Contract Documents:

1). Test results of project components.

2). Certification of materials in compliance with Contract Documents.

3). One set of neatly marked-up record drawings showing as-built changes and additions to the work under his Contract.

4). Any special guarantees or bonds.

5). Marked-up Record Shop Drawings

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

This form is to be completed by all Designers of record for the project.

CITY OF ASHEVILLE CERTIFICATE OF COMPLIANCE

PROJECT:	
LOCATION:	
BUDGET CODE:	ITEM:
PROJECT ID:	
OWNER: City of Asheville	
TYPE OF CONTRACT:	FINAL AMOUNT:
DATE OF FINAL ACCEPTANCE:	
CONTRACTOR:	

I (we) certify that the work on the above-referenced project has been inspected in accordance with Chapter 133, Article 1, of the General Statutes, and that:

(1) The inspections of the construction, repairs or installations have been conducted with the degree of care and professional skill and judgment ordinarily exercised by a member of my (our) profession; and

(2) to the best of my (our) knowledge, and in my (our) professional opinion as an architect or engineer, the contractor has fulfilled the obligations of such plans, specifications and contract.

Signed this _____ day of _____ , 20_____

_____
Designer Signature (SEAL)_

_____
Designer Name

_____
Discipline/Title

CITY OF ASHEVILLE CERTIFICATE OF COMPLETION

PROJECT:	
LOCATION:	
BUDGET CODE:	ITEM:
PROJECT ID:	DATE:
OWNER: City of Asheville	
DESIGNER:	
PRIME CONTRACTOR:	
CONTRACTOR:	

_____

I (we) certify that all work on the above referenced project has been completed according to the plans, specifications, addenda and approved change orders and that the project is ready for owner occupancy.

The final inspection was made on _____, 20__. The guarantee period begins on _____, 20__, and shall terminate on _____, 20__.

The contractors report that final payments have been made to all material suppliers, employees and subcontractors, and copies of their lien waivers are attached.

If applicable, Builder's risk insurance was cancelled as of _____, 20__, and a copy of the cancellation notice is attached hereto.

The total time for completion as allowed in the contract plus granted time extensions is _____ days. The actual time required for completion was _____ days, and the contractor(s) is/is not (are/are not) liable for liquidated damages. The contractor(s) has (have) been notified of any proposed assessments of liquidated damages. Copies of each notification and my (our) letter of recommendations as to the amount of liquidated damages are attached.

Copies of the following items are attached as indicated below:

Written guarantees:

Affidavits:

_____

Contractor's Affidavit of Release of Liens:

Contractor's Affidavit of Payment of Debts and Claims:

_____

Consent of Surety Company to Final Payment: _____

Final Report: _____

Electronic As-built drawings: _____

Other required closing papers of the contractor:

_____
_____
_____
_____
_____
_____
_____
_____

There are no unsettled disputes between the owner and contractor, owner and designer, or the designer and contractor at this time.

Signed this _____ day of _____ 20__.

_____

(SEAL)

_____

Designer Signature

_____

Designer Name

_____

Title

SECTION 02100

CLEARING, GRUBBING, AND SITE PREPARATION

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish all labor, material, equipment, and appliances required for the complete execution of new construction work as shown on the Drawings and specified herein.

B. Principal items of work include:

1. Notifying all authorities owning utility lines running to or on the project site.

a. Protecting and maintaining all utility lines to remain in accordance with instructions of the Utility Companies and all other authorities having jurisdiction.

2. Clearing the site within the Contract Limit Lines, including removal of grass, brush, shrubs, trees, loose debris, and other encumbrances except for trees marked to remain.

3. Chipping of all tree parts and shrubs cleared from within the Contract Limit Lines and not used for lumber and stockpiling of chips for future use.

4. Boxing and protecting all trees, shrubs, lawns, and the like within areas to be preserved.

5. Relocating trees and shrubs, so indicated on the Drawings, to designated areas.

6. Repairing immediately all injury to trees, shrubs, and other plants caused by site preparation operations.

a. Work shall be done by qualified personnel in accordance with standard horticultural practices and as approved by the Engineer.

7. Removing topsoil to its full depth from designated areas and stockpiling at site(s) provided by the contractor.

8. Disposing from the site all debris resulting from work under this Section, except for trees and shrubs that have been chipped.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02200 – Earthwork
B. Section 02276 – Erosion and Sedimentation Control

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. North Carolina Administrative Code, Title 15, Chapter 2.
B. North Carolina Department of Transportation Standard Specifications for Roads and Structures 2006 Edition.

1.04 PROTECTION OF PERSONS AND PROPERTY

A. All work shall be performed in such a manner to protect all personnel, workmen, pedestrians, and adjacent property and structures from possible injury and damage.

B. All conduits, wires, cables, and appurtenances above or below ground shall be protected from damage.

C. Provide warning and barrier fence where shown on the Drawings and as specified herein. This fencing is in some cases referred to as “Construction Fence” and “Tree Protection Fence” on plans.

D. Log mats should be used during the clearing and grubbing process where conditions allow.

PART 2 -- PRODUCTS

2.01 TREE PROTECTION FENCE

A. Tree protection fence shall be made of a visible, lightweight, flexible, high strength polyethylene material.

B. Physical Properties

Fence:

Color:	International Orange
Roll Size:	4-feet x manufacturer’s standard
Mesh opening:	12-inches x 3-inches

Posts:

ASTM Designation:	ASTM 702
Length:	5 feet long (T-Type)
Weight:	1.25 pounds/Foot, minimum
Area of Anchor Plate:	14 Sq. In.

C. The fence shall be MIRASAFE as manufactured by Mirafi, Inc., Orange Construction Safety Barrier by ACF Environmental, or equal.

D. Tree protection Fence shall meet city of Raleigh Standards #40.04, as shown son Sheet 2B Detail 7.

PART 3 -- EXECUTION

3.01 TREE PROTECTION FENCING

A. Clearing Tree Protection fence shall be constructed at the locations shown on the Drawings, referenced in details, and at other locations directed by the Engineer.

3.02 CLEARING

A. Clearing of the greenway trail route shall not commence until the Owner or the Engineer has approved the alignment.

B. Clearing shall consist of cutting, removing, and chipping of all trees, fallen timber, brush, and bushes, whether dead or alive, and disposing of rubbish, landfill material, fencing, and other perishable and objectionable material within the areas to be excavated or other designated areas.

1. Only chipping of cleared material will be permitted. No cleared material may be disposed of without approval of the Owner or the Engineer.

C. Excavation resulting from the removal of trees, roots, and the like shall be filled with suitable material approved by the Engineer and thoroughly compacted as required by Section 02200 - Earthwork.

D. Unless otherwise shown or specified, the Contractor shall clear the area delineated between construction limits (slope stake lines) as shown on plans. The area cleared shall generally be at least 20-feet wide along the greenway trail centerline. The area to be cleared shall be field approved by the Owner or the Engineer.

E. Selected limbing of tree branches shall be performed by the Contractor to:

1. Remove low hanging tree limbs which extend over the greenway trail up to a height of 10-feet above the top of the trail surface,

2. Remove limbs damaged during clearing operations, and

3. Remove dead limbs of otherwise live trees.

F. In temporary construction easement locations, only those trees and shrubs shall be removed which will interfere with excavation or grading work under this Contract.

1 Removal shall be subject to the approval of the Engineer.

2 The Engineer reserves the right to order additional trees and shrubs removed at no additional cost to the Owner if such, in his opinion, are too close to the work to be maintained or have become damaged due to the Contractor's operations.

3.03 SUPPLEMENTAL CLEARING

A. When directed by the Owner or the Engineer, the Contractor shall remove fallen trees, dead trees, or trees damaged by construction activities outside of the cleared strip.

B. The limits of supplemental clearing shall be the boundary of the greenway easement or 40-feet from the trail centerline, whichever is greater.

C. In general, supplemental clearing will be limited to the removal of fallen trees, up righting of the stump, and general dressing around the up righted stump to camouflage it.

1. Camouflaging shall consist of light regrading to blend the stump ball back to grade and, where appropriate, placing of wood chips over the stump and ball.

a. In lieu of light regrading to blend the stump ball back to grade and, where appropriate, placing of wood chips over the stump and ball, and when acceptable to the Owner or the Engineer, on-site grinding of stumps is permissible provided it is done with no additional cost to the Owner.

D. When removing parts of fallen or dead trees outside the 20-feet strip, the Contractor shall not permit tracked or rubber-tired equipment outside the limits of the 20-feet cleared strip except for the express purpose of up righting or grinding of associated stumps or removing logs.

1. Use of equipment outside the 20-feet strip shall be carefully coordinated by the Contractor so as not to damage trees and other vegetation that is to remain or to create ruts in the soil.

3.04 CHIPPING OF TREES AND DISPOSING OF STUMPS

A. All up right or fallen trees and all limbs, brush, and bushes removed as part of the clearing and supplemental clearing operations shall be chipped.

1. No parts of trees, limbs, brush, or bushes removed as part of the clearing or supplemental clearing operation, except those parts of trees salvageable as timber, shall be removed from the project site without the approval of the Owner or the Engineer.

B. Wood chips shall be stored by the Contractor in a manner to facilitate their reuse in the construction of the greenway trail. Chips may be evenly distributed along the trail in the woods. Depth should be limited to 2”. Chips cannot be in piles.

C. At the option of the Contractor, trees stumps may either be ground and reduced to chips insitu when the stump lies outside the limits of the trail’s finished surface or removed and properly disposed of off site.

1. When the Contractor elects to dispose of tree stumps off site, either as part of clearing or supplemental clearing as defined in paragraphs 3.01 and 3.02, respectively, the Contractor shall furnish and satisfactorily compact suitable fill material to fill the void created by the removal of the stump.

2. In addition to fill material, the Contractor shall also furnish and place wood chips over the fill material at a depth not less than 6-inches.

3.05 STRIPPING AND STOCKPILING EXISTING TOPSOIL

A. Existing topsoil and sod on the site within clearing limits shall be stripped to whatever depth it occurs.

1. The Contractor shall furnish offsite storage areas for the stripped material. Future use of Topsoil shall be as defined in Section 02925 Topsoil.

B. The topsoil shall be free of stones, roots, brush, rubbish, or other unsuitable materials before stockpiling.

C. Care shall be taken not to contaminate the topsoil with any unsuitable materials.

D. Stripping of topsoil shall not be done where an elevated boardwalk is employed.

3.06 GRUBBING

A. Grubbing shall consist of the removal and disposal of all stumps, roots, logs, sticks, and other perishable materials to a depth below ground surface of generally six inches, with deeper grubbing depths as required to remove any tree stumps, roots and areas of thicker topsoil.

B. Contractor shall grub a strip 16-feet wide centered within the 20-feet wide cleared strip outlined in paragraph 3.01.

1. Grubbing shall be coordinated with the Owner so that a geotechnical technician can readily advise the Owner regarding subgrade conditions in advance of a rainfall event.

C. Large stumps located in areas to be excavated may be removed during clearing operations, subject to the approval of the Engineer.

D. Grubbing shall not be done where elevated boardwalk is employed.

1. Except in specific locations where tree stumps and root systems interfere with boardwalk foundation.

3.07 DISPOSAL OF MATERIAL

A. All debris resulting from the clearing and grubbing work that is not chipped shall be disposed of by the Contractor as part of the work of this Contract.

1. Material designated by the Engineer to be chipped shall be stored on the construction site as directed by the Engineer for reuse in this Project.

B. Burning of any debris resulting from the clearing and grubbing work will not be permitted.

3.08 WARNING AND BARRIER FENCE (ALSO CONSTRUCTION AND TREE PROTECTION FENCE)

A. Drive posts 12 to 18 inches into ground every 10-feet to 12-feet.

B. Wrap fence material around first terminal post allowing overlap of one material opening.

1. Use a metal tie wire or plastic tie wrap to fasten the material to itself at top, middle and bottom.

2. At the final post, cut the fabric with a utility knife or scissors at a point halfway across an opening.

3. Wrap the fabric around and tie at the final post in the same way as the first post.

C. Use tie wire or tie wrap at intermediate posts and splices as well.

1. Thread ties around a vertical member of the fence material and the post, and bind tightly against the post.

2. For the most secure fastening, tie at top, middle and bottom.

3. Overlap splices a minimum of four fence openings, tie as above, fastening both edges of the fence material splice overlap.

3.09 WORK IN WETLAND AREAS

A. All equipment, regardless of size, shall be supported with mats.

B. Coordinate work activities in wetland areas so as to minimize impacts.

- END OF SECTION -

SECTION 02200

EARTHWORK

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish all labor, equipment, and materials required to complete all work associated with excavating, including off-site borrow excavation, dewatering, backfilling, drainage layers beneath and around structures, foundation and backfill stone, filter fabric, embankments, stockpiling topsoil and any excess suitable material in designated areas, in place compaction of embankments, backfill and subgrades beneath foundations and greenway trails, shoring and bracing, disposing from the site all unsuitable materials, providing erosion and sedimentation control grading, site grading and preparation of pavement and structure subgrade, and other related and incidental work as required to complete the work shown on the Drawings and specified herein.

B. All excavations shall conform to the lines, grades, and cross sections shown on the Drawings or established by the Engineer.

C. It is the intent of this Specification that the Contractor to conduct the construction activities in such a manner that will minimize erosion of disturbed areas and off-site sedimentation.

D. All work under this Contract shall be done in conformance with and subject to the limitations of the latest editions of the North Carolina Department of Transportation Standard Specifications for Roads and Structures and the North Carolina Erosion and Sediment Control Planning and Design Manual.

E. Rock is defined as: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,090 lbf and stick-crowd force of not less than 18,650 lbf; measured according to SAE J-1179.

2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 210-hp flywheel power and developing a minimum of 48,510-lbf breakout force with a general purpose bare bucket; measured according to SAE J-732.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. DIVISION 1, GENERAL REQUIREMENTS

B. Section 02100 - Clearing, Grubbing, And Site Preparation

C. Section 02207 - Aggregate Materials.

D. Section 02274 - Geotextiles

E. Section 02275 – Synthetic Mat (Permanent Soil Reinforced Matting)

F. Section 02500 – Surface Restoration

G. Section 02510 – Paving and Surfacing

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the other requirements of the Specifications, all work herein shall conform to the applicable requirements of the following documents.

1. North Carolina Department of Transportation Standard Specifications for Roads and Structures.

2. American Society for Testing and Materials (ASTM):

ASTM C 127 Test for Specific Gravity and Absorption of Coarse Aggregate.

ASTM C 136 Test for Sieve Analysis of Fine and Coarse Aggregates.

ASTM D 422 Particle Size Analysis of Soils.

ASTM D 423 Test for Liquid Limit of Soils.

ASTM D 424 Test for Plastic Limit and Plasticity Index of Soils.

ASTM C 535 Test for Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

ASTM D 698 Standard Method of Test for the Moisture - Density Relations of Soils Using a 5.5 lb. (2.5 kg) Rammer and a 12-inch (305 mm) Drop.

ASTM D1556 Test for Density of Soil in Place by the Sand-Cone Method.

ASTM D1557 Test for Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10-lbs. (4.5 kg) Rammer and 18-inch (457 mm) Drop.

ASTM D2049 Test Method for Relative Density of Cohesionless Soils.

ASTM D2167 Test for Density of Soil in Place by the Rubber-Balloon Method.

ASTM D2216 Test for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil Aggregate Mixtures.

ASTM D2487 Test for Classification of Soils for Engineering Purposes.

ASTM D2922 Test for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.04 SUBSURFACE CONDITIONS

A. Information on subsurface conditions is referenced in Section 01010 - Summary of Work.

B. Attention is directed to the fact that there may be water pipes, sewer pipes, storm drains and other utilities located in the area of proposed excavation.

1.05 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300 - Submittals, the Contractor shall submit the following:

1. Name and location of all material suppliers.

2. Certificate of compliance with the standards specified above for the source of each material.

3. List of disposal sites for waste and unsuitable materials and all required permits for use of those sites.

4. Plans and cross sections of open cut excavations showing side slopes and limits of the excavation at grade.

1.06 PRODUCT HANDLING

A. Soil and rock material shall be excavated, transported, placed, and stored in a manner so as to prevent contamination, segregation, and excessive wetting.

1. Materials which have become contaminated or segregated will not be permitted in the performance of the work.

2. Materials which have become contaminated or segregated shall be removed from the site.

1.07 USE OF EXPLOSIVES

A. When the use of explosives is necessary for the prosecution of the work, the Contractor shall exercise the utmost care not to endanger life or property.

1. The Contractor shall be responsible for any and all damage or injury to persons or property resulting from the use of explosives.

B. All explosives shall be stored in a secure manner in compliance with all laws.

1. All such storage places shall be marked clearly "DANGEROUS EXPLOSIVES".

C. The Contractor shall notify each utility company having facilities in close proximity to the site of the work of his intention to use explosives.

1. This notice shall be given sufficiently in advance to enable the utility company to take whatever steps it may consider necessary to protect its property from injury.

2. The Contractor shall also give the Engineer and all occupants of adjacent property notice of his intention to use explosives.

D. The Contractor shall submit a blasting plan to the Engineer at least 24 hours before each shot.

E. The blasting plan shall contain the full details of the drilling and blasting patterns and shall contain the following information:

1. Station limits of shot,

2. Plan of drill hole pattern, blast hole spacing, blast hole diameters and free face,

3. Initiation sequence of blast holes including delay timer and delay system,

4. Manufacturers data sheet for all explosives, primers, and initiators employed,

5. Loading diagram showing type and amount of explosives, primers, initiators, and location and depth of stemming.

F. The blasting plan submitted is for quality control and record keeping purposes.

1. Review by the Engineer shall not relieve the Contractor of his responsibilities as provided herein.

PART 2 -- PRODUCTS

2.01 SELECT FILL

A. Soils from off site excavations capable of being compacted to the specified densities, with the exceptions of topsoil and organic material, and meeting the requirements stipulated in Paragraph B below may be used in specified locations as select fill for backfilling, constructing embankments, and reconstructing existing embankments.

1. Embankment materials shall be compacted at a moisture content satisfactory to the Engineer.

a. Moisture content shall be approximately that required to produce the maximum density except that the moisture content shall not be more than 1% below nor more than 4% above the optimum moisture content for the particular material tested as determined by ASTM D698.

2. The Contractor shall dry or add moisture to the material when required to provide a uniformly compacted and stable embankment.

a. When air drying of excavated material is necessary, the Contractor may spread, disc, windrow, etc. as necessary at locations on site as directed by the Engineer.

B. The material shall be neither expansive nor have high organic content and shall meet the following requirements:

1. Maximum Liquid Limit shall not exceed 50 as determined by ASTM D 423.

2. Maximum Plasticity Index shall not exceed 30 as determined by ASTM D 424.

2.02 STRUCTURAL FILL - ABC

A. The Contractor shall provide structural fill as indicated on the Drawings and specified herein.

1. The material and its placement shall be as specified in Section 02207 - Aggregate Materials.

2.03 UNDERCUT EXCAVATION

A. The Contractor shall excavate, properly dispose of, and replace with select fill or structural Fill – ABC unsuitable material below subgrade elevation when directed by the Owner.

B. Undercut excavation shall be measured in the presence of the owner or the owners representative.

C. Excavation, disposal, and replacement of unsuitable fill resulting from collection of rainwater shall not be classified as undercut excavation.

1. Contractor shall excavate, properly dispose of, and replace with select fill such material without compensation.

2.04 GEOTEXTILES

A. The Contractor shall provide geotextiles as indicated on the Drawings and specified herein.

1. The materials and its placement shall be as specified in Section 02274 - Geotextiles.

PART 3 -- EXECUTION

3.01 EXCAVATION

A. Excavation shall include the removal of all soil, rock, weathered rock, rocks of all types, boulders, conduits, pipe, and all other obstacles encountered and shown to be removed within the limits of excavation shown on the Drawings or specified herein.

B. Where blasting is necessary to perform the required excavations, the number and size of the charges shall be subject to the acceptance of the Engineer.

1. Explosives shall be of such quantity and power and shall be used in such locations as will neither open seams nor otherwise disturb the rock outside the prescribed limits of excavation.

2. As the excavation approaches its final limits, the depth of holes for blasting and the amount of explosives used for each hole shall be reduced so that the underlying or adjacent rock will be neither disturbed nor shattered.

3. Blasting shall not be performed within 100 feet of newly placed concrete that has cured less than 7 days.

4. No blasting shall be permitted within 50 feet of any proposed or existing structure forming a part of this contract.

5. Peak particle velocities shall not exceed 2-inches per second at any structure forming a part of this Contract.

C. All suitable material removed in the excavation shall be used as far as practicable in the formation of embankments, subgrades, and shoulders and at such other places as may be indicated on the Drawings or indicated by the Engineer.

1. No excavated material shall be wasted except as may be permitted by the Engineer.

2. Refer to the drawings for specific location and placement of suitable excavated materials in the formation of embankments, backfill, and structural and trail foundations.

3. The Engineer will designate materials that are unsuitable.

4. The Contractor shall furnish off site disposal areas for the unsuitable material.

5. Where suitable materials containing excessive moisture are encountered above grade in cuts, the Contractor shall construct above grade ditch drains prior to the excavation of the material when in the opinion of the Engineer such measures are necessary to provide proper construction.

D. All excavations shall be made in the dry in such a manner and to such widths as will yield ample room for properly constructing and inspecting the structures and/or piping they are to contain and for such sheeting, timbering, pumping, and drainage systems as may be required.

E. Excavation slopes shall be flat enough to avoid slides that will cause disturbance of the subgrade or damage of adjacent areas.

1. Excavation requirements and slopes shall be as indicated in the Drawings.

2. All slopes shall be finished to reasonably uniform surfaces acceptable for seeding and mulching operations.

3. Neither rock nor boulders which protrude more than 1 foot within the typical section cut slope lines shall be left in place.

4. All rock cuts shall be cleaned of loose and overhanging material.

5. All protruding roots and other objectionable vegetation shall be removed from slopes.

F. All structures shall bear on an aggregate base, crushed stone, or screened gravel bedding placed to the thickness shown on the Drawings or specified in these Specifications but not less than 6-inches thick.

G. The bottom of all excavations for structures shall be examined by the Engineer for bearing value and the presence of unsuitable material.

1. If, in the opinion of the Engineer, additional excavation is required due to the low bearing value of the subgrade material, or if the in-place soils are soft, yielding, pumping, and wet, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted select fill and/or crushed stone or screened gravel as indicated by the Engineer.

a. Payment for such additional work ordered by the Engineer shall be made as an extra by a Change Order in accordance with the General Conditions and Division 1.

b. No payment will be made for subgrade disturbance caused by inadequate dewatering or improper construction methods.

H. All cuts shall be brought to the grade and cross section shown on the Drawings or established by the Engineer prior to final inspection and acceptance by the Engineer.

I. Slides and overbreaks which occur due to negligence, carelessness, or improper construction techniques on the part of the Contractor shall be removed and disposed of by the Contractor at no additional cost to the Owner.

1. If grading operations are suspended for any reason whatsoever, partially completed cut and fill slopes shall be brought to the required slope, and the work of seeding and mulching or other required erosion and sedimentation control operations shall be performed.

3.03 SHEETING AND BRACING

A. The Contractor shall furnish, place, and maintain such sheeting and bracing which may be required to support sides of excavation or to protect structures from possible damage and to provide safe working conditions.

1. The Contractor shall be responsible for the adequacy of all sheeting and bracing used.

2. The Contractor shall be responsible for all damage resulting from sheeting and bracing failure or from placing, maintaining, and removing it.

B. The Contractor shall exercise caution installing and removing sheeting to insure that excessive or unusual loadings are not transmitted to any new or existing structure.

1. The Contractor shall promptly repair at his expense any and all damage that can be reasonably attributed to sheeting installation or removal.

C. All sheeting and bracing shall be removed upon completion of the work except as indicated herein.

1. The Engineer may permit sheeting to remain in place at the request and expense of the Contractor.

2. The Engineer may order certain sheetings left permanently in place in addition to that required by the Contract.

a. The cost of the materials so ordered left in place will be paid as an extra by a Change Order in accordance with the General Conditions and Division 1.

D. Any sheeting or bracing left in place shall be cut off at least two feet below the finished ground surface or as directed by the Engineer.

3.04 PROTECTION OF SUBGRADE

A. To minimize the disturbance of bearing materials and provide a firm foundation, the Contractor shall comply with the following requirements:

1. During and after construction, surface soils should be protected from excessive infiltration and surface water by grading the site to promote the rapid clearing of rainwater and surface runoff from the pavement areas.

2. The Contractor shall provide positive protection against penetration of frost into materials below the bearing level during work in winter months.

a. Protection may consist of a temporary blanket of straw or salt hay covered with a plastic membrane or other acceptable means.

3. Some of the onsite soils are moisture sensitive. To minimize deterioration of exposed soil subgrade, aggregate base course should be placed and compacted after a section of greenway is graded to finished subgrade elevation.

4, Subgrade soils disturbed by the operations of the Contractor shall be excavated and replaced with compacted select fill or crushed stone at the Contractor's expense.

3.05 PROOFROLLING

A. The subgrade of all structures and all areas that will support pavements or structural fill shall be proofrolled.

1. After stripping of topsoil and excavating to subgrade, i.e., grubbing, but before placing of fills or coarse aggregate base course, the exposed subgrade shall be carefully inspected by probing and testing as needed.

2. Any topsoil or other organic material still in place; any frozen, wet, soft, or loose soil; or any other undesirable material shall be removed when directed by the Engineer.

3. The exposed subgrade shall then be proofrolled with a suitably loaded tandem-wheeled dump truck or other device acceptable to the Engineer.

B. Proofrolling shall check for pockets of soft material hidden beneath a thin crust of better soil.

C. Any unsuitable materials exposed during proofrolling shall be removed and replaced with approved compacted material.

3.06 DEWATERING

A. The Contractor shall dewater as required for the completion of the work.

1.1 Procedures for dewatering proposed by the Contractor shall be submitted to the Engineer for review prior to any earthwork operations.

1.2 All water removed by dewatering operations shall be disposed of in accordance with the North Carolina Sedimentation Pollution Control Act.

B. The dewatering system shall be of sufficient size and capacity required to control groundwater or seepage to permit proper excavation operations, embankment construction and reconstruction, and subgrade preparation or to allow concrete to be placed in a dry condition.

1. The system shall include a sump system or other equipment, appurtenances, and other related earthwork necessary for the required control of water.

2. The Contractor shall drawdown groundwater to at least 3 feet below the bottom of excavations at all times in order to maintain a dry and undisturbed condition.

C. The Contractor shall control all water, regardless of source, by acceptable means.

1. Water shall be controlled and its disposal provided for at each berm, structure, etc. when necessary.

2. The entire periphery of each excavation area shall be ditched and diked to prevent water from entering the excavation where applicable.

3. The Contractor shall be fully responsible for disposal of the water and shall provide all necessary means at no additional expense to the Owner.

4. The Contractor shall be solely responsible for proper design, installation, proper operation, maintenance, and any failure of any component of the system.

D. The Contractor shall be responsible for and shall repair, without cost to the Owner, any damage to work in place and the excavation due to heave.

1. The Contractor shall be responsible for damages to any other areas or structures caused by his failure to maintain and operate the dewatering system proposed and installed.

E. The Contractor shall take all steps he considers necessary to familiarize himself with the surface and subsurface site conditions.

1. Contractor shall obtain the data that is required to analyze the water and soil environment at the site and to assure that the materials used for the dewatering systems will perform properly during the period of dewatering.

F. Prior to the execution of the work, the Contractor, Owner and Engineer shall jointly survey the condition of adjoining structures.

1. Photographs and records shall be made of any prior settlement or cracking of structures, pavements, and the like that may become the subject of possible damage claims.

3.07 EMBANKMENTS

A. The Contractor shall perform the construction of embankments in such a manner that cut and fill slopes will, at the option of the Contractor, be completed to final slopes and grade in a continuous operation.

B. Surfaces upon which embankments are to be constructed shall be stripped of topsoil, organic material, rubbish, and other extraneous materials.

1. After stripping and prior to placing embankment material, proofrolling shall be performed as specified heretofore.

2. Following successful proofrolling, the Contractor shall compact the top 12-inches of in place soil as specified under Paragraph 3.09, COMPACTION.

C. Ground surfaces on which embankment is to be placed shall be scarified or stepped in a manner which will permit bonding of the embankment with the existing surface.

1. Embankment soils shall be as specified under PART 2 - PRODUCTS.

2. Where excavated material does not meet the requirements specified for embankment, the Contractor shall furnish off site borrow material meeting the specified requirements for select fill at no additional expense to the Owner.

a. Fill material borrowed off site shall be of a nature meeting the requirements stipulated herein.

3. Embankment soils shall be deposited and spread in successive, uniform, approximately horizontal layers not exceeding 8-inches in compacted depth for

the full width of the cross section.

4. Embankment soils shall be kept approximately level by the use of effective spreading equipment.

5. Embankment soils shall be distributed over the full width of the embankment.

   a. Deep ruts shall not be permitted to form during the construction of the embankment.

5. The embankment shall be properly drained at all times.

6. Each layer of the embankment soils shall be thoroughly compacted to the density specified under Paragraph 3.09, COMPACTION.

D. The embankment soils shall be of the proper moisture content before rolling for compaction to obtain the prescribed compaction.

   1. Wetting, drying, or manipulating of the soils shall be required when necessary to secure a uniform moisture content throughout each layer.

   2. Should the soils be too wet to permit proper compacting or rolling, all work on all portions of the embankment thus affected shall be delayed until the material has dried to the required moisture content.

   3. Samples of all embankment materials for testing, both before and after placement and compaction, will be taken at frequent intervals.

      a. From these tests, corrections, adjustments, and modifications of methods, materials, and moisture content shall be made to construct the embankment as specified.

E. Where embankment is to be placed and compacted on hillside, or when new embankment is to be compacted against existing embankments, or when embankment is built in part widths, the slopes that are steeper than 4:1 shall be loosened or plowed to a minimum depth of 6 inches, or, if in the opinion of the Engineer, the nature of the ground is such that greater precautions should be taken to bind the new fill to the original ground, then benches shall be cut in the existing ground as indicated by Engineer.

F. When rock and other embankment material are excavated at approximately the same time, the rock may be incorporated into the outer portions of the embankments, and the other material which meets the requirements for select fill shall be incorporated into the formation of the embankments.

   1. Stones or fragmentary rock larger than 4-inches in its greatest dimension shall not be permitted within the top 6-inches of the final subgrade.

2. Stones, fragmentary rock, or boulders larger than 12-inches in its greatest dimension shall not be permitted in any portions of embankments and shall be properly disposed of by the Contractor.

3. When rock fragments or stone are used in embankments, the material shall be brought up in layers as specified or directed, and every effort shall be exerted to fill the voids with finer material to form a dense, well compacted mass which meets the specified densities.

3.08 BACKFILLING

A. All structures and pipes shall be backfilled with the type of materials shown on the Drawings and specified herein.

1. Select fill shall be deposited in successive, uniform, approximately horizontal layers not exceeding 8-inches in depth for the full width.

2. Stones or fragmentary rock larger than 4-inches in its greatest dimension shall not be permitted within the top 6-inches of the ground nor within 6-inches of pipe.

3. No stone or fragmentary rock larger than 12-inches in their greatest dimension shall be permitted in any portion of backfill.

4. Compaction shall be in accordance with the requirements of Paragraph 3.09, COMPACTION.

B. Where sheeting is used, the Contractor shall take all reasonable measures to prevent loss of support beneath and adjacent to pipes and existing structures when sheeting is removed.

1. If significant volumes of soil cannot be prevented from clinging to the extracted sheets, the voids shall be continuously backfilled as rapidly as possible.

2. The Contractor shall thereafter limit the depth below subgrade that sheeting will be driven in similar soil conditions or employ other appropriate means to prevent loss of support.

3.09 COMPACTION

A. The Contractor shall compact embankments, backfill, crushed stone, aggregate base, and in place subgrade in accordance with the requirements of this Section.

1. The densities specified herein refer to percentages of maximum density as determined by the noted test methods.

2. Compaction of materials on the project shall be in accordance with the following schedule:

	Density % Std. Proctor (D698)	Density % Mod. Proctor (D1557)	Max. Lift Thickness as Compacted Inches
Embankments Beneath Structures*	98	95	8
Other Embankments	95	92	8
Backfill Around Structures	95	92	8
Backfill in Pipe Trenches	95	92	8
Crushed Stone Beneath Structures	**	**	12
Select Sand	--	98	8
Aggregate Base Course (ABC) Beneath Pavements and Structures	--	98	8
Crushed Stone Backfill	**	**	12
In place Subgrade Beneath Structures	98	95	Top 12-inches

* Embankments beneath structures shall include a zone 10 feet from the foundation of the structure extending down to the natural ground on a 45□ slope.

** The aggregate shall be compacted to a degree acceptable to the Engineer by use of a vibratory compactor and/or crawler tractor.

B. Field density tests will be made by the Owner to determine if the specified densities have been achieved.

1. These tests shall be the basis for accepting or rejecting the compaction.

2. In-place density tests will be performed in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 2922.

3. The Owner will be the sole judge as to which test method will be the most appropriate. Failure to achieve the specified densities shall require the Contractor to re-compact the material or remove it as required.

4. The Contractor shall, if necessary, increase his compactive effort by increasing the number of passes, using heavier or more suitable compaction equipment, or reducing the thickness of the layers.

5. The Contractor shall adjust the moisture contents of the soils to bring them within the optimum range by drying or adding water as required.

C. Testing will be performed as frequently as deemed necessary by the Owner or the Engineer and with the concurrence of the Contractor.

1. As a minimum, one in-place density test shall be performed for each 1,000 cubic yards of embankment placed and 500 cubic yards of backfill placed, but not less than one test performed each day for either.

3.10 REMOVAL OF EXCESS AND UNSUITABLE MATERIALS

A. The Contractor shall remove and properly dispose of all unsuitable materials.

1. Within thirty days after Notice to Proceed, the Contractor shall submit to the Engineer for review all required permits and a list of disposal sites for the unsuitable materials.

2. If the disposal site is located on private property, the submittal shall also include written permission from the owner of record.

B. All unsuitable materials shall be disposed of in locations and under conditions that comply with all applicable federal, state, and local laws and regulations.

1. Stockpiling or wasting of unsuitable material will not be allowed in the floodway.

C. The Contractor shall obtain an off-site disposal area prior to beginning excavation operations.

D. All excess and unsuitable materials shall be hauled in trucks of sufficient capacity and tight construction to prevent spillage and seepage.

1. Trucks shall be covered to prevent the propagation of dust.

E. When all excess and unsuitable material disposal operations are completed, the Contractor shall leave the disposal sites in a condition acceptable to the Owner and owner of the disposal site.

3.11 PLACEMENT OF AGGREGATE BASE COURSE

A. When the proposed paved trail is within 50-feet of the bank of an adjacent stream, placement of aggregate base course material shall be closely coordinated with excavating and compacting.

B. Unless otherwise approved by the Engineer, all excavated and embankment areas shall be stabilized with the placement of aggregate base course material on the same day as the excavation or embankment operation.

- END OF SECTION -

SECTION 02207

AGGREGATE MATERIALS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall furnish all labor, equipment, and materials required to complete all work associated with the installation of aggregate material beneath foundations, as backfill, as roadway subgrades, and other related and incidental work as required to complete the work shown on the Drawings and specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. DIVISION 1, GENERAL REQUIREMENTS

B. Section 02200 - Earthwork

C. Section 02276 - Erosion and Sedimentation Control

D. Section 02510 - Paving and Surfacing

E. Section 02712 - Foundation Drainage Systems

F. Section 02910 - Final Grading and Landscaping

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of the other requirements of the Specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. North Carolina Department of Transportation Standard Specifications for Roads and Structures.

2. ASTM C 127 Test for Specific Gravity and Absorption of Coarse Aggregate.

3. ASTM C 136 Test for Sieve Analysis of Fine and Coarse Aggregates.

4. ASTM C 535 Test for Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300, Submittals.

1. Materials gradation and certification.

2. ASTM C127, ASTM C136, and ASTM C535 test results

PART 2 -- PRODUCTS

2.01 CRUSHED STONE, SCREENED GRAVEL and AGGREGATE BASE COURSE (ABC)

A. Crushed stone or screened gravel shall meet the requirements of Aggregate Standard Size No. 57 or No. 67 as defined by NCDOT Standard Specifications for Roads and Structures.

B. Aggregate Base Course shall meet the requirements of NCDOT Standard Specifications for Roads and Structures, Section 520, Aggregate Base Course, Type "A" or "B".

C. Sediment Control Stone shall meet the requirements of No. 5 or No. 57 stone as defined by Section 1005 of the NCDOT Standard Specifications.

D. Rip Rap shall meet the requirements as specified in Section 1042-1 of the NCDOT Standard specifications for Plain Rip Rap, and shall be of Type referenced on plans.

2.02 SELECT SAND

A. Select sand shall meet the requirements of Sections 1005 and 1014 of the NCDOT Standard Specifications for Roads and Structures for materials and gradation. The size used shall be Standard Size No. 2S or 2MS as listed and defined in Table 1005-2, "Aggregate Gradation", of the NCDOT Standard Specifications for Roads and Structures.

2.03 STRUCTURAL FILL

A. Clean sand, quarry screenings, ABC stone, or washed No. 57 stone as defined by NCDOT Standard Specifications for Roads and Structures.

PART 3 -- EXECUTION

3.01 CRUSHED STONE, SCREENED GRAVEL AND AGGREGATE BASE COURSE (ABC)

A. Contractor shall install crushed stone, screened gravel, and ABC in accordance with the NCDOT Standard Specifications for Roads and Structures and as shown on the Drawings and indicated in the Contract Documents.

1. Unless otherwise stated herein or shown on the Drawings, all mat foundations or bottom slabs for the proposed structures shall have a blanket of crushed stone or ABC 6-inches thick minimum placed directly beneath the proposed mat.

a. The blanket shall extend a minimum of 12 inches beyond the extremities of the mat.

2. For subgrade preparation at structures and structural fill, the foundation material shall be ABC where specifically specified on Drawings, otherwise, crushed stone or screened gravel shall be used.

3. For ground under drains, pipe bedding, and drainage layers beneath structures the coarse aggregate shall meet the requirements of aggregate standard Size

No. 57 or No. 67, as defined by NCDOT Standard Specifications for Roads and Structures.

3.02 SELECT SAND

A. Contractor shall install select sand in accordance with the NCDOT Standard Specifications for Roads and Structures and as shown on the Drawings and indicated in the Contract Documents.

3.02 UNSUITABLE AGGREGATE MATERIAL

A. Excavation, disposal, and replacement of unsuitable aggregate material resulting from collection of rainwater shall not be classified as undercut excavation.

1. Contractor shall excavate, properly dispose of, and replace unsuitable material without compensation.

- END OF SECTION -

SECTION 02260

SHOULDER CONSTRUCTION & SHAPING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish all labor, equipment, and materials required to complete all work associated with shoulder construction. This work includes, but is not limited to the excavation, borrow excavation, off-site borrow excavation, embankments, final shaping of shoulders, and other related and incidental work as required to complete the work shown on the Drawings and specified herein.

B. All excavations shall conform to the lines, grades, and cross sections shown on the Drawings or established by the Engineer.

C. It is the intent of this Specification that the Contractor conduct the construction activities in such a manner that will minimize erosion of disturbed areas and off-site sedimentation.

D. All work under this Contract shall be done in conformance with and subject to the limitations of the latest editions of the North Carolina Department of Transportation Standard Specifications for Roads and Structures and the North Carolina Erosion and Sediment Control Planning and Design Manual.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. DIVISION 1, GENERAL REQUIREMENTS

B. Section 02100 - Clearing, Grubbing, And Site Preparation

C. Section 02200 – Earthwork

D. Section 02207 - Aggregate Materials.

E. Section 02274 - Geotextiles

F. Section 02275 – Synthetic Mat (Permanent Soil Reinforced Matting)

G. Section 02510 – Paving and Surfacing

H. Section 02920 – Soil Preparation

I. Section 02925 – Topsoil

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the other requirements of the Specifications, all work herein shall conform to the applicable requirements of the following documents.

1. North Carolina Department of Transportation Standard Specifications for Roads and Structures.

2. American Society for Testing and Materials (ASTM):

ASTM C 127 Test for Specific Gravity and Absorption of Coarse Aggregate.

ASTM C 136 Test for Sieve Analysis of Fine and Coarse Aggregates.

ASTM D 422 Particle Size Analysis of Soils.

ASTM D 423 Test for Liquid Limit of Soils.

ASTM D 424 Test for Plastic Limit and Plasticity Index of Soils.

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ASTM D 698 Standard Method of Test for the Moisture - Density Relations of Soils Using a 5.5 lb. (2.5 kg) Rammer and a 12-inch (305 mm) Drop.

ASTM D1556 Test for Density of Soil in Place by the Sand-Cone Method.

ASTM D1557 Test for Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10-lbs. (4.5 kg) Rammer and 18-inch (457 mm) Drop.

ASTM D2049 Test Method for Relative Density of Cohesionless Soils.

ASTM D2167 Test for Density of Soil in Place by the Rubber-Balloon Method.

ASTM D2216 Test for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil Aggregate Mixtures.

ASTM D2487 Test for Classification of Soils for Engineering Purposes.

ASTM D2922 Test for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.04 SUBSURFACE CONDITIONS

A. Information on subsurface conditions is referenced in Section 01010 - Summary of Work.

B. Attention is directed to the fact that there may be water pipes, sewer pipes, storm drains and other utilities located in the area of proposed excavation.

1.05 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300 - Submittals, the Contractor shall submit the following:

1. Name and location of all material suppliers.

2. Certificate of compliance with the standards specified above for the source of each material.

3. List of disposal sites for waste and unsuitable materials and all required permits for use of those sites.

4. Plans and cross sections of open cut excavations showing side slopes and limits of the excavation at grade.

1.06 PRODUCT HANDLING

A. Soil and rock material shall be excavated, transported, placed, and stored in a manner so as to prevent contamination, segregation, and excessive wetting.

A. Materials which have become contaminated or segregated will not be permitted in the performance of the work.

B. Materials which have become contaminated or segregated shall be removed from the site.

PART 2 -- PRODUCTS

2.01 EARTHEN MATERIALS

A. Shoulder material shall consist of soil material obtained from unclassified excavation, fine grading operations, or from borrow sources. Soil material shall be neither expansive nor have high organic content and shall meet the following requirements:

1. Maximum Liquid Limit shall not exceed 50 as determined by ASTM D 423.

2. Maximum Plasticity Index shall not exceed 30 as determined by ASTM D 424.

2.02 ABC MATERAILS

A. The material and its placement shall be as specified in Section 02207 - Aggregate Materials.

PART 3 -- EXECUTION

3.01 Shoulder Construction & Shaping

A. Where Earth Material is shown, construct the top 6 in. of shoulders with soils capable of supporting vegetation.

B. Construct the shoulders in proper sequence with the type of base and pavement being constructed. Perform the work in such a manner as to provide proper drainage at all times. Shape and roll the shoulder material during placement in such a manner as will provide for satisfactory bonding of layers and compacted to a degree satisfactory to the Engineer.

C. Prior to placing any earth material on existing graded shoulders, remove all existing vegetation and scarify the existing shoulders to ensure a proper bond.

D. Perform the final shaping of the shoulders, adjacent slopes, and ditches in accordance with the typical section shown on the plans.

E. Provide adequate equipment to perform the work. Exercise care not to damage base, surface, pavement, or drainage features during the construction of the shoulders. Should damage occur because of the Contractor's operations, repair the damaged portions or remove and replace them as directed at no cost to the Owner.

- END OF SECTION -

SECTION 02274

GEOTEXTILES AND GEOGRID

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall furnish and install all Geotextiles and Geogrids including all necessary and incidental items as detailed or required for the Contractor to complete the installation in accordance with the Drawings and these Specifications.

B. Filter fabric, as called out on plans, shall meet the requirements of geotextiles as specified in this section.

C. Geogrid and geotextile shall be installed at locations shown on plans and as specified by the Engineer. Geogrid or geotextile shall be installed at undercut locations as directed by the Engineer.

1.02 SUBMITTALS

A. Prior to shipping to the site, the Contractor shall submit to the Engineer copies of mill certificates or affidavits signed by a legally authorized official of the Manufacturer for each type of Geotextile and Geogrid.

1. The mill certificate or affidavit shall attest that the Geotextile and Geogrid meet the chemical, physical, and manufacturing requirements stated in the specifications.

2. Deviations shall be identified and numerated.

B. The Contractor shall submit a 1 yard square sample of each Geotextile and Geogrid he proposes to use, seamed and unseamed as appropriate.

1 The samples shall be labeled with the manufacturer's lot number, machine direction, date of sampling, project number, specifications, manufacturer, and product name.

PART 2 -- MATERIALS

2.01 MATERIALS

A. Filter Fabric below stone and in other areas shall be a nonwoven, needle punched, synthetic Geotextile fabric.

1. Physical properties of Filter Fabric shall meet the requirements of Type 2, Table 1056-1 of NCDOT Specifications.

B. Fabric for Soil Stabilization shall be a synthetic Geotextile fabric that conforms to Section 1056 of the NCDOT Specifications.

1. Physical properties of Fabric for Soil Stabilization shall meet the requirements of Type 4, Table 1056-1 of NCDOT Specifications.

C. Separator Fabric shall be a synthetic woven geotextile fabric resistant to naturally occurring chemicals, alkalis, and acids.

1. The fabric filaments or yarns shall form a stable network such that dimensional stability of filaments or yarns is retained relative to each other, including selvages.

2. Permittivity shall be 0.02 sec^{-1}.

3. Separator Fabric shall meet the following criteria:

a.	Apparent Opening Size	0.60 mm max
b.	Ultraviolet Stability (after 500 hrs)	50%
c.	Strength	
1).	Grab Tensile Strength	180 pounds[1]
2).	Tear Strength	67 pounds[1]
3).	Puncture Strength	67 pounds[1]
4).	Burst Strength	300 psi[1]

[1] Maximum Elongation less than 50%

D. Geogrid reinforcement fabric shall be polymer grid Geogrid structure.

3. Geogrid shall be specifically manufactured for use as a soil reinforcement.

4. Geogrid shall have high tensile strength in two perpendicular directions.

5. Geogrid shall be U.V. stabilized, capable of withstanding direct exposure to sunlight for not less than 120 days.

a. Geogrid shall exhibit no measurable deterioration when measured by ASTM D 4355.

4. Evaluation of Geogrid shall be based upon testing of the total structure, not simply by adding the values of the individual components.

5. Geogrid shall meet the following criteria.

d. Aperture size 0.75 to 1.0 inches

e. Open area 70% minimum

f. Strength

1). at 2% strain 280 foot pounds

2). at 5% strain 580 foot pounds

3). In machine and cross machine directions, no offset allowance or preloading permitted.

4). Secant aperture stability 3.2 by in-plane rotation

PART 3 -- EXECUTION

3.01 SHIPPING, HANDLING AND STORAGE

A. During shipping and storing, protect all Geotextiles and Geogrids from direct sunlight, temperature greater than 140˚ F, water, mud, dirt, dust, and debris.

B. To the extent possible, the Geotextile and Geogrid shall be maintained wrapped in heavy-duty protective covering until use.

3.03 SEPERATOR FABRIC / GEOTEXTILE INSTALLATION

A. Installation shall be in accordance with manufacturers recommendations.

B. Prohibit tracked vehicles from operating directly on fabric.

C. Place to the lines and grades shown on the Drawings or as directed by the Owner or Engineer.

1. Reject Geotextile if it has defects, rips, holes, flaws, evidence of deterioration, or other damage not visible in the original inspection and exposed during unrolling.

2. Place Geotextiles smooth and free of wrinkles.

3. Overlap not less than 12-feet.

6. Secure in place with ABC.

7. When placed on slopes, lap upslope fabric portion such that it is the upper or exposed Geotextile.

8. Prior to placement of overlying materials, temporarily secure Geotextiles in a manner recommended by the manufacturer and accepted by the Owner or Engineer.

9. Repair or replace any torn or punctured Geotextile.

3.04 GEOGRID INSTALLATION

A. Installation shall be in accordance with manufacturers recommendations.

B. Prohibit tracked vehicles from operating directly on fabric.

C. Embed Geogrid in the middle of the ABC base.

D. Place to the lines and grades shown on the Drawings or as directed by the Owner or Engineer.

1. Reject Geogrid if it has defects, rips, holes, flaws, evidence of deterioration, or other damage not visible in the original inspection and exposed during unrolling.

2. Place Geogrid smooth and free of wrinkles.

3. Overlap not less than 12-feet.

4. Secure in place with ABC.

E. When placed on slopes, lap upslope fabric portion such that it is the upper or exposed Geogrid.

F. Prior to placement of overlying materials, temporarily secure Geogrid in a manner recommended by the manufacturer and accepted by the Owner or Engineer.

G. Repair or replace any torn or punctured Geogrid.

- END OF SECTION -

SECTION 02275

SYNTHETIC MAT (PSRM, PERMANENT SOIL REINFORCED MATTING)

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. This specification is for turf reinforcement mat that will allow vegetation to grow through the material after installation.

B. This work consists of furnishing materials and performing all work necessary to install nylon mat on roadway ditches or slopes, or as directed by the engineer.

1.02 SUBMITTALS

A. Prior to shipping to the site, the Contractor shall submit to the Engineer copies of mill certificates or affidavits signed by a legally authorized official of the Manufacturer for each type of turf reinforcement mat.

1. The mill certificate or affidavit shall attest that the turf reinforcement mat meets the chemical, physical, and manufacturing requirements stated in the specifications.

2. Deviations shall be identified and numerated.

B. The Contractor shall submit a 1 yard square sample of each turf reinforcement mat he proposes to use, seamed and unseamed as appropriate.

i. The samples shall be labeled with the manufacturer's lot number, machine direction, date of sampling, project number, specifications, manufacturer, and product name.

PART 2 -- MATERIALS

2.01 MATERIALS

A. Synthetic mat shall consist of three-dimensional structure of entangled nylon monofilaments, melt-bonded at their intersections, forming a stable mat of suitable weight and configuration. The mat shall be crush-resistant, pliable, resilient, water-permeable, and highly resistant to chemicals and environmental degradation. The mat shall comply with the following physical properties:

1.	Material type	Nylon 6 plus a minimum content of 0.5 percent by weight of carbon black
2.	Filament diameter	0.157 inch, minimum
3.	Weight	0.747 +/- 0.075 lb/yd^2
4.	Thickness	0.70 in, minimum
5.	Nominal width of roll	38 in
6.	Nominal length of roll	109 yd

7. Color Black

8. Tensile Properties[1]

a. Strength

Length Direction	7.5 lb/in, minimum
Width Direction	4.4 lb/in, minimum

b. Elongation

Length Direction	50 percent, minimum
Width Direction	50 percent, minimum

c. Resiliency[2]

30 minute recovery (3 cycles)	80 percent, minimum

[1]ASTM D 1682 Strip test procedure modified to obtain filament bond strength to indicate tensile properties.
[2]Compression load cycling of 100 16/in2 on 2 inch x 2 inch sample size, crosshead speed of 2 in/min.

Pins shall be 1-inch x 2-inch x 12-inch wedge-shaped wood stakes or 12-inch x 12-inch x 6-inch 0.162-inch gauge or larger, one-piece or two-piece, ungalvanized steel “T” pins.

PART 3 -- EXECUTION

3.01 SHIPPING, HANDLING AND STORAGE

A. During shipping and storing, protect all turf reinforcement mat from direct sunlight, temperature greater than 140º F, water, mud, dirt, dust, and debris.

B. To the extent possible, the turf reinforcement mat shall be maintained wrapped in heavy-duty protective covering until use.

3.03 GEOTEXTILE INSTALLATION

A. Installation shall be in accordance with manufacturers recommendations.

B. Prohibit tracked vehicles from operating directly on fabric.

C. Place to the lines and grades shown on the Drawings or as directed by the Owner or Engineer.

1. Reject turf reinforcement mat if it has defects, rips, holes, flaws, evidence of deterioration, or other damage not visible in the original inspection and exposed during unrolling.

2. Place turf reinforcement mat smooth and free of wrinkles.

3. All surfaces to be protected shall be graded and finished so as to be stable and firm. Prepare surfaces that become crusted shall be reworked to an acceptable

condition before placing the mat.

4. Synthetic mat used as a ditch lining shall be applied with the length of the roll laid parallel to the flow of water. Start the installation with the initial strip placed in the center of the ditch to avoid an overlap in the center of the ditch. Where more than one width is required, a longitudinal lap joint of not less than 3 inches shall be used, with the upslope on top. All lap joints and upslope edges shall be pinned or staked at intervals of 3 feet or less.

5. All wood stakes shall be driven to within 2 inches of the ground surface. All steel pins shall be driven flush to the ground surface.

6. An anchor slot shall be placed at the upslope and downslope ends of the mat placement. At least 12 inches of the end of the mat shall be buried vertically in a slot dug in the soil. The mat shall be secured in the anchor slot by pins or stakes at intervals of 3 feet or less prior to burying. The soil shall be firmly tamped against the mat in the slot.

7. Successive lengths of mat shall be overlapped at least 3 feet, with the upstream length on top. Pin or stake the overlap by placing 3 pins or stakes evenly spaced across the end of each of the overlapping lengths and by placing 3 pins or stakes across the width of the center of the overlap area. Check slots shall be constructed by placing a tight fold at least 8 inches vertically into the soil. Check slots shall be spaced so that a check slot occurs within each 25 feet. Pin or stake the mat in the check slot at each edge overlap and in the center of the mat.

8. Upslope edges of mat used as ditch lining shall terminate on 6-inch wide horizontal shelves running parallel to the axis of the ditch for the full length of the ditch. Edges of the mat shall be pinned or staked at 3-foot intervals, backfilled with soil and tamped to original slope.

9. After the mat has been placed, the area shall be evenly seeded as specified, allowing the seeds to drop to the grade through the openings in the mat.

10. The contractor shall maintain the blanket until all work on the contract has been completed and accepted. Maintenance shall consist of the repair of areas where damaged by any cause.

- END OF SECTION -

SECTION 02276

EROSION AND SEDIMENTATION CONTROL

PART 1 -- GENERAL

1.01 THE REQUIREMENTS

A. Furnish all labor, equipment and materials required to complete all work associated with providing erosion and sedimentation control grading, site grading and preparation of pavement and structure subgrade, and other related and incidental work as required to complete the work on the Drawings and specified herein.

B. All excavations shall be in conformity with the lines, grades, and cross sections shown on the Drawings or established by the Engineer.

C. It is the intent of this Specification that the Contractor conduct the construction activities in such a manner that erosion of disturbed areas and off site sedimentation is absolutely minimized.

D. All work under this Contract shall be done in conformance with and subject to the limitations of the North Carolina Rules and Regulations for Erosion and Sedimentation Control as adopted by the North Carolina Sedimentation Control Commission (15 NCAC, Chapter 4).

E. The following excerpts from the regulations are particularly important:

1. ...slopes left exposed will, within 15 working days or 30 calendar days, whichever is shorter, of completion of any phase of grading, be planted or otherwise provided with ground cover, devices, or structures sufficient to restrain erosion...(Section 6b)

2. ...a ground cover sufficient to restrain erosion must be planted or otherwise provided within 30 working days on that portion of the tract (disturbed area) upon which further active construction is not being undertaken...(Section 6c)

F. Erosion and sedimentation controls applicable to this project shall include but not be limited to the following items of work:

1. Erect silt fence at locations shown on the Drawings and at other locations directed by the Engineer.

2. Provide temporary sedimentation basins for the settling of water pumped from the excavations or intercepted by drainage ditches for keeping water out of the excavations or to protect existing structures.

a. The Contractor shall remove trapped sediments from the basins as necessary to maintain their effectiveness or as directed by the Engineer.

b. Sediment material removed from the basins shall be disposed off site by the Contractor at no additional cost to the Owner.

3. Construct temporary diversion ditches adjacent to disturbed areas as shown on the Drawings to collect surface runoff from disturbed areas and direct the runoff to the temporary sediment basins or to divert non-sediment laden runoff away from undisturbed areas and/or temporary sediment basins

   a. All such temporary diversion ditches shall terminate with temporary sediment basins as shown on the Drawings, unless diverting non-sediment laden runoff.

4. Provide temporary sediment basins at locations shown on the Drawings and at other locations directed by the Engineer.

5. Provide gravel and rip rap filter berm basins at locations shown on the Drawings and at other locations directed by the Engineer.

6. Provide temporary or permanent ground cover adequate to restrain erosion on erodible slopes or other areas that will be left unworked for periods exceeding 30 calendar days.

7. Construct 50 feet minimum temporary gravel buffer construction entrances as specified herein or as shown on the Drawings from public roads to all access roads used by the Contractor.

   a. The Contractor shall maintain the gravel buffers for the Contract duration or until final pavement, where applicable, has been constructed.

8. Provide other types of erosion and sedimentation control devices at the locations shown on the Drawings or as specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01090 - Reference Standards

B. Section 02100 - Clearing, Grubbing, and Site Preparation

C. Section 02200 - Earthwork

D. Section 02910 - Final Grading and Seeding

E, Section 02920 - Landscaping

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of other requirements of these specifications, all work hereunder shall conform to the applicable requirements of the referenced portions of the

following documents, to the extent that the requirements therein are not in conflict with the provisions of this Section.

1. 15 NCAC, Chapter 4

1.04 SUBMITTALS

A. Prior to the start of the work, prepare and submit a plan for applying temporary and permanent erosion and sedimentation control measures.

1. Construction work shall not commence until the schedule of work and the methods of operations have been reviewed and approved.

B. In accordance with the procedures and requirements set forth in the General Conditions, Division 1, and Section 01300 - Submittals, the Contractor shall submit the following:

1. Name and location of all material suppliers.

2. Certificate of compliance with the standards specified above for each source of each material.

3. List of disposal sites for waste and unsuitable materials and all required permits for use of those sites.

1.05 EROSION AND SEDIMENTATION CONTROL DEVICES

A. The following erosion and sedimentation control devices shall be incorporated into the work.

1. Standard Temporary Silt Fence shall be constructed at the locations shown on the Drawings and at other locations directed by the Engineer.

a. Silt Fence shall meet City of Asheville Standard #7B.01a, as shown on Sheet G-3D.
b. Silt Fence shall meet the requirements of this section, Article 2.02

2. Silt Fence Outlets shall be constructed at the locations shown on the Drawings and at other locations directed by the Engineer.

a. Silt Fence Outlets shall meet City of Asheville Standard #7B.01b, as shown on Sheet G-3D.
b. Combination Fence shall meet the requirements for warning and barrier fence in Section 2100, p. 2.

3. Check Dams shall be constructed at locations shown on the Drawings and at other

locations directed by the Engineer.

a. Dams shall be constructed by excavating for the keyed rip rap and constructing the stone check dam as per City of Asheville Standard #7B.01f, as shown on Sheet G-3D.

b. Dimensions shall be as shown on the Drawings.

4. Rock Inlet Protection shall be constructed at locations shown on the Drawings.

a. Rock Inlet Protection shall be constructed in accordance with detail on Drawings and instructions noted on Drawings.

5. Inlet Protection shall be constructed at locations shown on the Drawings.

b. Inlet Protection shall be constructed in accordance with detail on Drawings and instructions noted on Drawings as per City of Asheville Standard #7B.01g.

6. Construction Entrance shall be constructed at locations shown on the Drawings and at other locations where construction equipment regularly enters onto paved streets.

a. Entrances shall be constructed by placing stone to the dimensions shown on the Drawings, as per City of Asheville Standard #7B.01c.

b. Install silt fence and tree protection fence to insure that construction equipment uses the entrance, as shown on Sheet G-3D.

7. Rip Rap Lined Channels shall be constructed at locations shown on the Drawings.

a. Channel shall be constructed by excavating to the typical section according to dimensions shown in the Drawings, installing the filter fabric, and placing the rip rap to form a rip rap lined channel.

8. Temporary Silt Ditch shall be constructed at locations shown on the Drawings.

a. Dimensions shall be as shown on the Drawings.

9. Gravel Lined Swale

a. Dimensions shall be as shown on the Drawings. See sheet TH7.2 for details

1.06 GUARANTEE

A. All restoration and revegetation work shall be subject to the warranty period of the Contract as specified in the General Conditions.

PART 2 -- MATERIALS

2.01 MATERIALS

A. Materials for use in erosion and sedimentation control devices shall be in accordance with the North Carolina Erosion and Sediment Control Planning and Design Manual.

2.02 STANDARD TEMPORARY SILT FENCE

A. Silt Fence shall be a woven geotextile filter fabric made specifically for sediment control.

1. Filter fabric shall not rot when buried; shall resist attack from soil chemicals, alkalies, and acids in the pH range from 2 to 13.

2. Filter fabric shall resist damage due to prolonged ultraviolet exposure.

3. Filter fabric shall be Carthage Mills Type FX-11, LINQ Industrial Fabrics Type GTF-180, Amoco Fabrics & Fibers Co. 2130, or equal.

B. Filter fabric for the silt fence shall have the following minimum properties:

Property	Value	Test Method
Grab Tensile Strength	110 lbs	ASTM D 4632
Grab Elongation	15%	ASTM D 4632
Trapezoid Tear Strength	50 lbs	ASTM D 4533
Mullen Burst Strength	270 lbs	ASTM D 3786
Puncture Strength	60 lbs	ASTM D 4833
Retained Strength (500 hrs. accelerated UV exposure)	80%	ASTM D 4355
Filtration Efficiency	75%	VTM-51
Height		36 inches

C. Steel posts for silt fence shall be steel with the following properties:

ASTM	A702
Length	5-Feet Long (T-Type)
Weight	1.25 Pounds/Foot (min.)

Area of Anchor Plate 14 Square Inches

1. Secure wire fabric to posts with not less than five fasteners.

D. Wire Fabric for the silt fence shall be 4-inches by 4-inches or 2-inches by 4-inches grid and have the following properties:

Wire Fabric	832-12-10-12.5 Class 1, ASTM A116
Width	32-Inches
Number of Line Wires	8
Stay Wire Spacing	12-Inches
Line and Stay Wires	12 Gage
Top and Bottom Wires	10 Gage
Wire Coating	Class 1 Zinc Coating

1. Attach woven geotextile filter fabric to wire fabric with wire or metal clips at 8-inches on centers.

2.03 SEDIMENT CONTROL STONE

A. Sediment control stone for silt basins, check dams, etc. shall be NCDOT No. 5 or No. 57 stone as defined by Section 1005 of the NCDOT Standard Specifications.

2.04 RIP RAP

A. The Contractor shall place rip rap of the class indicated on the Drawings, as specified herein, and as specified in Section 1042-1 of the NCDOT Standard specifications for Plain Rip Rap.

1. The stone for rip rap shall consist of field stone or rough unhewn quarry stone.

2. The stone shall be sound, tough, dense, and resistant to the action of air and water.

3. Neither the width nor thickness of individual stones shall be less than one-third their length.

2.05 JUTE NETTING DITCH LINING

A. The net shall consist of clean wheat straw from agricultural crops made into a knitted straw blanket that is machine assembled.

1. The straw shall be evenly distributed throughout the blanket.

2. The net shall be covered with a photodegradable synthetic mesh attached to the straw with degradable thread.

B. The Contractor shall place the straw with net temporary liner where directed immediately after the ditch has been properly graded and prepared, limed, fertilized, and seeded.

1. The netting shall be on top with the straw in contact with the soil.

C. The Contractor shall immediately repair or replace any section of straw with net ditch lining which is functioning improperly or has been damaged in any way until a stable growth of grass has been established.

D. Straw with net shall be North American Green S150 matting, ECS High Velocity Straw Mat, Contech High Velocity Ero Mat, or equal with a minimum shear stress value of 0.50 lb/ft^2.

2.06 CURLED WOOD MAT TEMPORARY DITCH LINING

A. The mat shall consist of machine-produced mat of curled wood excelsior with a majority of the fibers 6 inches or longer with consistent thickness and the fibers evenly distributed over the entire area of the blanket.

1. The top of the mat shall be covered with a biodegradable synthetic mesh.

2. The mesh shall be attached to the curled wood excelsior with photodegradable synthetic yarn.

B. The Contractor shall place the curled wood mat temporary liner where directed immediately after the ditch has been properly graded and prepared, limed, fertilized, and seeded.

1. The mesh shall be on top with the wood fibers in contact with the soil.

C. The Contractor shall immediately repair or replace any section of mat which is not functioning properly or has been damaged in any way until a stable growth of grass has been established.

D. Curled wood mat shall be Excelsior High Impact, North American Green C125, Contech Excelsior Erosion Blankets (Super Plus), or equal, matting with a minimum shear stress value of 0.50 lb/ft^2.

PART 3 -- EXECUTION

3.01 MONITORING

A. The Contractor shall designate in writing not less than two individuals of his firm who will regularly inspect all erosion and sedimentation control measures and storm water runoff.

1. Provide names in writing.

2. Conduct inspections together to establish continuity when conducting independent inspections.

3. Advise Owner in writing when necessary to change individual.

    a. Cite reason for change.

    b. Cite qualifications of replacement.

    c. Conduct inspections with remaining individual to establish continuity when conducting independent inspections

B. Inspect all erosion and sedimentation control measures.

1. Each workday.

2. Within 24-hours following any storm event producing greater than 0.5-inches of rainfall within a continuous 24-hour period.

    a. Provide rain gage or gages on site.

    c. Record rainfall amounts by date and amount.

    d. Monitor weather.

        1). Provide inspections on non-working days when rainfall is anticipated on non-working days.

            a). For the purpose of this specification, non-working day shall include Saturdays, Sundays, holidays, and days where Contractor does not work due to weather.

3. Provide reports of all inspections.

    a. Use form provided at end of specification section.

        1). Contractor shall serve as Owner's designee.

    b. Provide following minimum data:

        1). Date, exact place, and time.

        2) Individual or individuals performing the inspection.

    c. Supplement with additional information deemed appropriate by inspectors.

d. Provide copy of report to Owner and Engineer each week.

1). Signed by a corporate officer.

a). President,

b). Secretary,

c). Treasurer, or

d). Vice President.

2). Notarized.

3). With the following certification:

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."

C. Inspect runoff after commencement of construction.

1. Observe for storm water discharge characteristics.

a. Clarity

1). Shall be based upon a subjective scale from 1 through 10, inclusive.

a). "1" shall mean that appearance of storm water resembles that of potable water.

b). "10" shall mean that one cannot see an object, such as one's hand, when held no more than 4-inches beneath the surface of the water.

b. Floating solids

1). Shall be based upon a subjective scale from 1 through 10, inclusive.

a). “1" shall mean that there is no evidence of floating solids.

b). “10" shall mean that the surface is covered with floating solids.

c. Suspended solids

1). Shall be based upon a subjective scale from 1 through 10, inclusive.

a). “1" shall mean that there is no evidence of suspending solids evidence by placing one’s hand in the stream with the palm parallel to the direction of flow.

b). “10" shall mean that there is evidence of suspending solids evidence by placing one’s hand in the stream with the palm parallel to the direction of flow

d. Sheen

1). Shall be based upon observation.

e. Other obvious indicators of storm water pollution.

2. Conduct observations as a team.

a. To provide consistency in reporting.

b. For initial six observations.

3. Observe at all areas where storm water leaves site of construction activities.

4. Notify Owner immediately when visible sedimentation leaves construction site.

a. By telephone.

c. In writing.

c. Immediately implement corrective action.

1). To control off site discharge of sedimentation.

2). Include narrative of corrective action taken.

5. Conduct observations simultaneously with inspection of erosion and sedimentation control measures.

D. Provide to Owner at the completion of the project bound originals of all inspection reports.

3.02 INSTALLATION

A. Prior to commencing any work, Owner shall make application for Grading Permit from City of Asheville Inspections Department.

1. Contractor shall obtain permit from City of Asheville's Inspections Department.

B. Due to the nature of the work required by this Contract, it is anticipated that the location and nature of the erosion and sedimentation control devices will be adjusted on several occasions to reflect the current phase of construction.

1. Erosion and sedimentation control devices shall be established prior to or concurrent with clearing or grading operations in a given area.

2. Where such practice is not feasible, the erosion and sedimentation control device(s) shall be established immediately following completion of the clearing operation.

C. The construction schedule adopted by the Contractor will impact the placement and need for specific devices required for the control of erosion.

1. The Contractor shall develop and implement any additional techniques which may be required to minimize erosion and off site sedimentation.

2. The location and extent of erosion and sedimentation control devices shall be revised when the construction results in a change in either the quantity or direction of surface runoff from construction areas.

3. All deviations from the erosion and sedimentation control provisions shown on the Drawings shall have the prior acceptance of the Engineer.

D. The Contractor shall furnish the labor, materials, and equipment required for routine maintenance of all erosion and sedimentation control devices.

1. Maintenance shall be scheduled as required for a particular device to maintain the removal efficiency and intent of the device.

2. Maintenance shall include but not be limited to the following:

a. The removal and satisfactory disposal of trapped sediments from basins or silt barriers.

b. Replacement of filter fabrics used for silt fences.

3. Sediments removed from erosion and sedimentation control devices shall be disposed of at locations that will not result in off site sedimentation.

a. Stockpile material at suitable location along project corridor for distribution along greenway as construction nears completion.

b. Stockpiled sediment removed from basins or silt barriers shall be neatly distributed over the disturbed area at the completion of the project.

4. Maintenance shall continue until all denuded areas are stabilized.

E. The Contractor shall provide temporary or permanent ground cover adequate to restrain erosion on all disturbed areas that will be left unworked for periods exceeding 15 working days or 30 calendar days, whichever is shorter.

F. The Contractor shall provide temporary sedimentation basins for the settling of water pumped from the excavations or intercepted by drainage ditches for keeping water out of the excavations or to protect existing structures.

1. The Contractor shall remove trapped sediments from the basins as necessary to maintain their effectiveness or as directed by the Owner or the Engineer.

2. Sediment material removed from the basins shall be stockpiled as outlined in paragraph 3.02D.3.a

3. Sediment material removed from the basins shall be disposed of as outlined in paragraph 3.02D.3.b

G. Rip rap shall be graded so that the smaller stones are uniformly distributed through the mass.

1. The Contractor may place the stone by mechanical methods, augmented by hand placing where necessary or ordered by the Engineer.

2. The placed rip rap shall form a properly graded, dense, neat layer of stone.

3. The placed rip rap shall have a minimum depth of 24 inches.

H. Stone for erosion control shall be dumped and placed in such manner that the larger rock fragments are uniformly distributed throughout the rock mass and the smaller fragments fill the voids between the larger fragments.

1. Rearranging of individual stones by equipment or by hand shall only be required to the extent necessary to secure the results specified and to protect structures from damage when rock material is placed against the structures.

I. Silt fence shall be erected as shown on the Drawings and specified herein.

1. Silt fence shall be erected and maintained to the satisfaction of the Engineer until a permanent vegetative ground cover has been established.

2. Proper maintenance shall include, but not be limited to, the periodic removal of trapped sediments and replacement of the filter fabric should it deteriorate to a point that, in the opinion of the Engineer, it will no longer provide an adequate run off filter.

    a. Silt fence shall be erected around all catch basins which are located downstream from any construction work.

    b. Should any catch basins be indicated to be relocated or modified, silt fence shall be utilized until work is completed on the catch basins.

    c. Upon completion of the modification, the area shall be rough graded until the end of the project, at which time final grading shall occur.

    d. Provide silt fence around any stockpile of material outlined in paragraph 3.02C.3.a.

3. Upon completion of the project, the Contractor shall remove all silt fence in areas where a permanent stand of grass has been established, and erosion is no longer evident.

    a. Removal of the remainder of the silt fence shall occur as other areas are established.

    b. Removal of any silt fence shall be permitted only with the prior approval of the Owner or the Engineer.

J. Engineer may direct the Contractor to place Straw with Net and Curled Wood Mat Temporary Ditch Lining at locations not shown on Drawings.

1. All temporary ditch linings shall be unrolled in the ditch in the direction of the flow of water.

2. Temporary linings shall overlap the buried end of the downstream blanket by a minimum of 6 inches.

3. All anchor trenches shall be a minimum of 12 inches deep.

4. All mat shall be stapled as per manufacturer's specifications.

K. Additional Requirements

1. All storm sewer piping shall be blocked at the end of every working day until the inlet is constructed above grade.

2. All streets around the construction area shall be scraped as necessary to prevent accumulation of dirt and debris.

3. The Contractor shall provide adequate means to prevent any sediment from entering any storm drains, curb inlets (curb inlet filter box), ditches, streams, or bodies of water downstream of any area disturbed by construction.

   a. Excavation materials shall be placed upstream of any trench or other excavation to prevent sedimentation of offsite areas.

   b. In areas where a natural buffer area exists between the work area and the closest stream or water course, this area shall not be disturbed.

4. The Engineer may direct the Contractor to place additional sediment and erosion control devices at other locations not shown on the Drawings.

3.03 ASSESSMENT OF FINES

A. In addition to periodic inspections of erosion and sedimentation control measures by the Owner and the Engineer, measures may be inspected by additional representatives of the Owner and representatives of the State of North Carolina.

   1. Contractor shall comply with all instructions in the maintenance of erosion and sedimentation control measures.

      a. Compensation for maintenance shall be in accordance with the Contract Documents.

   2. Contractor shall supplement installed erosion and sedimentation control measures with additional measures as directed by any representative of the Owner or the State of North Carolina.

      a. Compensation for additional measures shall be in accordance with the Contract Documents.

B. Fines may be imposed by Owner or State of North Carolina for erosion and sedimentation control violations.

   1. Such fines will be assessed against the Owner as the permittee of the erosion and sedimentation control permit.

   2. Contractor shall be fully responsible for payment of any fines associated with such violations.

      a. Owner shall deduct fine or fines from monies due the Contractor.

         1). Contract price shall be adjusted by change order to reflect any and all fines for violations of erosion and sedimentation control.

- END OF SECTION -

SECTION 02510

PAVING AND SURFACING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall furnish all labor, equipment, and materials and perform all operations in connection with the construction of asphalt concrete pavement, concrete curb and gutters, and concrete sidewalks complete as specified herein and as detailed on the Drawings.

B. All new greenway trails including the replacement of portions of the existing trails shall be to the limits, grades, thicknesses, and types as shown on the Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. DIVISION 1, GENERAL REQUIREMENTS

1.03 RELATED SECTIONS

A. Section 01400 – Quality Control

B. Section 02200 - Earthwork

C. Section 02207 - Aggregate Materials

1.04 STANDARD SPECIFICATIONS

A. Except as otherwise provided in the Specifications or on the plans, all work shall be in accordance with the North Carolina Department of Transportation Standard Specifications for Roads and Structures, except that any reference to "NCDOT", "Department" or "Unit" shall mean the "Owner".

a. When reference to these Specifications is intended, the description will be “NCDOT Section 610 “or “NCDOT Specifications.”

B. Price Adjustment- Asphalt Binder for Plant Mix: Price adjustments for asphalt binder for plant mix will be made in accordance with Section 620 of the NCDOT Standard Specifications.

The base price index for asphalt binder for plant mix as of September 1, 2016 is $337.50 per ton.

a. This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier’s terminals on September 1, 2016.

C. All Quality Control for Asphalt Pavements shall be in accordance with Section 609 of the NCDOT Specifications, except that testing frequencies of core samples shall be as described below:

1. Conduct density sampling based on test sections consisting of not more than 1000 linear feet or fraction thereof per day on pavement placed at the proper laydown width. This is a modification to NCDOT Standard Specifications 609-5 (D) (1), third paragraph (2000 feet is reduced to 1000 feet).

2. Conduct sampling and testing as specified in NCDOT Standard Specifications based on test sections consisting of not more than 1000 linear feet or fraction thereof per day on pavement placed at the paver laydown width. This is a modification to NCDOT Standard Specifications 609-5 (D) (4), fifth paragraph (2000 feet is reduced to 1500 feet).

D. Except with the approval of the Engineer, the placing of asphalt concrete surface paving shall be subject to the Seasonal and Weather Restrictions set forth in the NCDOT Specifications.

PART 2 -- MATERIALS

2.01 SELECT FILL

A. The Contractor shall place select fill as necessary to complete the embankments, shoulders, subgrade foundation, and replacement for removed unsuitable material in accordance with NCDOT Section 235, and Section 02200 - Earthwork, except that Article 235-6 of the NCDOT Specification is hereby deleted.

2.02 GRAVEL

A. All work, including materials, associated with gravel shall be in accordance with NCDOT Section 545, Incidental Stone Base, except that Articles 545-6 and 545-7 are deleted.

B. #67 Stone for parking gravel shall be NCDOT No. 67 stone as defined by Section 1005 of the NCDOT Standard Specifications.

2.03 AGGREGATE STABILIZATION

A. All work, including materials, associated with Aggregate Stabilization shall be in accordance with NCDOT Section 510, Aggregate Stabilization, except that Articles 510-6 and 510-7 are deleted.

2.04 AGGREGATE BASE COURSE (ABC)

A. All work, including materials, associated with Aggregate Base Course shall be in accordance with NCDOT Section 520, Aggregate Base Course, except that Articles 520-7, 520-12, and 520-13 are deleted.

2.05 ASPHALT CONCRETE BASE COURSE AND SURFACE COURSE

A. Greenway Trail - All work, including materials, associated with asphalt concrete surface course shall be in accordance with Section 610, Asphalt Concrete Surface Course, Type S9.5B, of the NCDOT Standard Specifications for Roads and Structures, except that Article 610-15 shall be deleted.

B. Parking lots, Roadways, and Widening - - All work, including materials, associated with asphalt concrete surface course shall be in accordance with Section 610, Asphalt Concrete Surface Course, Type S9.5B, Type B25.0B, of the NCDOT Standard Specifications for Roads and Structures, except that Article 610-15 shall be deleted.

C. The job mix formula shall be delivered to the Engineer at least two weeks prior to beginning paving operations.

2.06 CONCRETE CURB AND GUTTERS

A. Concrete shall be air-entrained by admixture only, proportioned and mixed for a 28-day minimum compressive strength in accordance with the requirements of Section 03300 - Cast-In-Place Concrete.

B. Premolded filler for expansion joints shall conform to ASTM D 1751.

1. Filler shall be ½-inch thick, minimum.

2.07 CONCRETE SIDEWALKS AND TRAIL

A. Concrete shall be air-entrained by admixture only, proportioned and mixed for a 28-day minimum compressive strength in accordance with the requirements of Section 03300 - Cast-In-Place Concrete.

B. Premolded filler for expansion joints shall conform to ASTM D 1751.

1. Filler shall be ½-inch thick, minimum.

2.08 ASPHALT TACK COAT

A. All work, including materials, associated with asphalt tack coat shall be in accordance with Section 605, Asphalt Tack Coat, of the NCDOT Standard Specifications for Roads and Structures, except that Article 605-10 is deleted.

PART 3 -- EXECUTION

3.01 EMBANKMENT

A. The embankment shall be constructed in accordance with Section 02200 - Earthwork.

3.02 SUBGRADE

A. Where shown on the Drawings, the subgrade shall be aggregate stabilized with the addition and mixing of coarse aggregate with the top 3-inches of subgrade in accordance with NCDOT Section 510-4.

1. Aggregate stabilization shall be applied to the subgrade at a rate of 300-pounds per square yard.

2. Following the application of stabilizer aggregate, the subgrade shall be formed true to crown and grade and shall be compacted with a roller of suitable size to achieve the maximum densities determined by AASHTO T99 Standard Specifications.

3.03 BASE COURSE

A. The finished base course of all paving shall be ABC.

B. Prior to placing ABC, the subgrade shall be inspected for damage or defects and repaired to the satisfaction of the Engineer.

C. The base course shall be of the compacted thickness shown on the Drawings, formed true to crown and grade.

D. Gravel roads, including repair to existing gravel roads, shall be ABC of the compacted thickness shown on the Drawings, or in the case of existing gravel road the existing thickness, formed true to crown and grade.

1. No fill material except new ABC shall be placed on top of existing gravel.

3.04 ASPHALT CONCRETE SURFACE COURSE (Type S9.5B)

A. Prior to placement of the asphalt concrete surface course, the base course shall be inspected for damage or defects and repaired to the satisfaction of the Engineer.

1. The surface of the base/binder course shall be approved by the Engineer prior to placing the asphalt concrete surface course.

B. An asphalt tack coat shall be applied to the surface of the approved base course as described in NCDOT Section 605.
1. Equipment for applying the tack coat shall be as described in NCDOT Section 600-5.

C. The Asphalt Concrete Surface Course shall be placed and compacted on the base course in layers not to exceed 2-inches and at the minimum rate of 110-pounds per square yard per inch.

1. Compacted thickness shall be as shown on the Drawings.

3.05 ASPHALT CONCRETE BASE COURSE (Type B25.0B)

A. Prior to placement of the asphalt concrete base course, ABC base course shall be inspected for damage or defects and repaired to the satisfaction of the Engineer.

1. The surface of the ABC base course shall be approved by the Engineer prior to placing the asphalt concrete base course.

B. An asphalt tack coat shall be applied to the surface of the approved ABC base course as described in NCDOT Section 605.
1. Equipment for applying the tack coat shall be as described in NCDOT Section 600-5.

C. The Asphalt Concrete Base Course shall be placed and compacted on the base course in layers not to exceed 5.5-inches and at the minimum rate of 114-pounds per square yard per inch.

1. Compacted thickness shall be as shown on the Drawings.

3.06 CONCRETE CURB AND GUTTER

A. The expansion joint filler for concrete curb and gutters shall be cut to conform with the cross section of the curb.

B. Expansion joints shall be spaced at intervals of not more than 50-feet.

C. Formed control joints shall be installed at intervals not exceeding 10 feet.

1. Depth of control joint shall be a minimum of 1½ -inches.

D. Curved forms shall be used where radii are indicated.

E. Upon removal of the forms, exposed curb faces shall be immediately rubbed down to a smooth and uniform surface.

F. No plastering shall be permitted.

3.07 CONCRETE SIDEWALK AND TRAIL

A. No concrete shall be placed until forms and subgrade have been approved by the Owner.

B. Expansion joints shall be placed at intervals not greater than 50-feet and between all rigid objects.

C. Grooved construction joints shall be cut to a depth equal to not less than 1/5 the total slab thickness.

1. Construction joints shall be placed at intervals equal to but not more than the width of the sidewalk.

D. Sidewalk surface shall be finished to line and grade and cross section with a float, troweled smooth, and given a broom finish.

3.08 UNDERGROUND UTILITY LINES

A. Where an underground utility line is beneath the new trail, the backfilling shall be carried out with special care.

B. The final consolidation shall be accomplished by a vibratory roller.

C. Construction of the trail over the trench shall be deferred as long as practicable.

3.09 JUNCTION WITH OTHER PAVING

A. Where new asphalt concrete pavement abuts existing asphalt concrete pavement, the existing pavement shall be cut back to insure obtaining the specified compaction of the new pavement courses and interlocking adjoining courses.

B. Existing subbase courses shall be cut back from the subgrade level of the new pavement on a 1:1 slope into the existing pavement, and the asphalt courses of the existing pavement shall be removed for an additional 6-inches back from the slope.

C. The edge of the existing asphalt courses shall be saw cut straight and true.

D. The faces between new and existing asphalt courses shall receive an application of tack coat.

3.10 MILLING

A. Perform the work covered by this section including, but not limited to, milling and re-milling
the pavement at locations, depths, widths and typical sections indicated in the contract; cleaning the milled surface; loading, hauling and stockpiling the milled material for use in recycled asphalt mixtures; and disposal of any excess milled material. Except where the milled material is used in the work or where otherwise directed, provide
areas outside the right of way to dispose of milled material, which shall be property of the
Contractor.

B. Mill the existing pavement to restore the pavement surface to a uniform longitudinal profile
and cross section in accordance with typical sections shown in the plans. Where indicated in the contract, remove pavement to a specified depth and produce a specified cross slope. Mill intersections and other irregular areas unless otherwise directed by the Engineer.
The Contractor may elect to make multiple cuts to achieve the required depth of cut or cross
slope required by the plans.

Establish the longitudinal profile of the milled surface by a mobile string line on the side of
the cut nearest the centerline of the road. Establish the cross slope of the milled surface by
an automatic cross slope control mechanism or by a second skid sensing device located on the opposite edge of the cut. The Engineer may waive the requirement for automatic grade and cross slope controls where conditions warrant.
Operate the milling equipment so as to prevent damage to the underlying pavement structure, utilities, drainage facilities, curb and gutter, paved surfaces outside the milled area and any other appurtenances. Produce milled pavement surfaces that are reasonably smooth and free of excessive scarification marks, gouges, ridges, continuous grooves or other damage. Repair any leveling or patching required as a result of negligence by the Contractor with hot asphalt plant mix in a manner acceptable to the Engineer. Coordinate the adjustment of manholes, meter boxes and valve boxes with the milling operation in accordance with Article 858-3 including a temporary asphalt ramp. When necessary, the contractor may remove the top section of a utility and use a bridge steel plate placed to cover the entire width of the structure, ensuring no debris is dropped inside the structure. Backfill with compacted material and hot mix asphalt as a temporary riding surface as well as any further necessary requirements of the utility owner. This steel plate must be capable of carrying any traffic load carried by the facility. Where necessary, double-reference the location of each structure that has been removed and maintain a map of their location. Construct a temporary ramp of asphalt plant mix to extend a minimum of 3 ft around raised
structures before opening to traffic.
The Engineer may require re-milling of any area exhibiting laminations or other defects.
Thoroughly clean the milled pavement surface of all loose aggregate particles, dust and other objectionable material. Disposing or wasting of oversize pieces of pavement or loose
aggregate material will not be permitted within the right of way. Conduct pavement removal operations so as to effectively minimize the amount of dust being emitted. Plan and conduct the operation so it is safe for persons and property adjacent to the work including the traveling public.

C. TOLERANCE

Remove the existing pavement to the depth required by the contract. The Engineer may vary the depth of milling.

3.11 No. 67 Stone for Parking

A. Place No. 67 Stone in areas as directed the plans. Weight Tickets shall say Beaucatcher Mountain Greenway.

-END OF SECTION-

SECTION 02630

PIPE CULVERTS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall furnish and install to the required line and grade all piping, together with all fittings and appurtenances, required for a complete installation.

B. The Contractor shall furnish all labor, materials, equipment, tools, and services required for furnishing, and installing all piping shown on the Drawings, specified in this Section, and required for the Work.

1. Piping shall be furnished and installed of the material, sizes, classes, and at the locations shown on the Drawings and/or designated in this Section.

2. Piping shall include all fittings, sleeves, gaskets, and other associated appurtenances.

3. HDPE pipe culverts are not required to be watertight.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Division 1, General Requirements

B. Division 2, Site Work

C. Division 8, Incidentals

D. NCDOT Standard Drawing 300D01

1.03 MATERIAL CERTIFICATION AND SHOP DRAWINGS

A. The Contractor shall furnish to the OWNER (through the Engineer) a Material Certification stating that the pipe materials and specials furnished under this Section conform to all applicable provisions of the corresponding Specifications.

1. Corrugated polyethylene culvert pipe shall meet the requirements of AASHTO M294 for Type S or Type D.

2. End treatments, pipe tees and elbows shall meet all applicable requirements of AASHTO M294, Section 7.8.

3. HDPE Pipe shall be corrugated.

4. The requirements for Certifications shall be as specified in Section 01300 - Submittals.

PART 2 -- PRODUCTS

2.01 GENERAL

A. Mark each length of pipe and drainage structure with manufacturer's name or trademark, size, AASHTO classification, and the date of manufacture.

B. Exercise special care in handling during delivery, distribution, and storage of pipe and precast drainage structures.

1. Avoid damage and unnecessary stresses.

2. Damaged pipe or drainage structure will be rejected and shall be replaced at the Contractor's expense.

3. Store prior to use to keep interior free from dirt and foreign matter.

PART 3 -- EXECUTION

3.01 INSTALLATION

A. Install by skilled workmen and in accordance with NCDOT Standard Drawing 300D01 and as recommended by the pipe manufacturer.

1. Use proper tools and appliances for the safe and convenient handling and installing of the pipe.

2. Remove and replace any defective piece discovered after having been installed at contractor’s expense.

3. Erect piping to accurate lines and grades with no abrupt changes in line or grade.

4. Support and brace against temporary and permanent movement.

5. Install with vertical and horizontal angles properly related to adjoining surfaces or pipes to give the appearance of good workmanship.

B. Excavate in such a manner and to such widths to provide ample room for properly installing the pipe and permitting thorough compaction of backfill around the pipe.

1. All excavation and trenching shall be done in strict accordance with these specifications and all applicable parts of the OSHA Regulations, 29CFR 1926, Subpart P.

C. All excavation and backfill required for pipe installation shall be incidental and included in the pay item for HDPE pipe and for RCP pipe.

D. Hand excavate wherever, in the opinion of the Engineer, it is necessary for the

protection of existing utilities, poles, trees, pavements, or obstructions.

E. Lower pipe into trench so as to prevent dirt and other foreign substances from gaining entrance.

1. Provide proper facilities for lowering section of pipe into trenches.

2. Prohibit dropping or dumping of pipe into trench.

F. Allow full length of each section of pipe to rest solidly upon bed of the trench with recesses excavated to accommodate bells.

G. Compact bedding after pipe is placed in accordance with NCDOT Standard 300D01. Haunch zone of pipe backfill shall be fully compacted in accordance with NCDOT Standard 300D01.

H. Laying of pipe in water is prohibited. Pipe constructed in the wet must be constructed in accordance with Details shown on Sheet 2I of plans.

3.02 BACKFILL

A. Place fill around the pipe in accordance in accordance with NCDOT detail 300D01. Compact to the density required by section 02200. Approval of the backfill material is required prior to its use.

Take care during backfill and compaction operations to maintain alignment and prevent damage to the joints. Keep backfill free from stones, frozen lumps, chunks of highly plastic clay, or other objectionable material.

Grade and maintain all pipe backfill areas in such a condition that erosion or saturation will not damage the pipe foundation or backfill.

Do not operate heavy equipment over any pipe until it has been properly backfilled with a minimum 3 feet of cover, or the same depth above the top of loose material over pipe for Type-B pipe installation. Remove and replace, at no cost to the Department, pipe that becomes misaligned, shows excessive settlement, or has been otherwise damaged by the Contractor's operations.

3.03 HDPE PIPE

A. Laid according to the respective manufacturer's recommendation.

1. ASTM D2321

B. Do not install when temperature is less than 60°F

1. Except as otherwise recommended by manufacturer and approved by Engineer.

3.04 Concrete Culvert PIPE

A. Use concrete pipe from sources participating in the Department's Concrete Pipe QC/QA Program. A list of participating sources is available from the Materials and Tests Unit's Central Laboratory. The Department will remove a manufacturer of concrete pipe from this program if the monitoring efforts indicated that non-specification material is being provided or testing procedures are not being followed.

B. Reinforced Concrete Culvert Pipe

Reinforced concrete culvert pipe shall meet AASHTO M 170 for the class of pipe called for in the plans except as follows:

(1)The permissible wall thickness outside of the joint configuration shall not be more than that shown in the design by more than 5% or 3/16", whichever is greater.

(2) The maximum weighted average loss for both fine and coarse aggregates shall be 15% when subjected to 5 cycles of the soundness test.

(3) The maximum percentage of wear for coarse aggregates is 55%.

The design wall thickness shall be either the wall thickness shown in AASHTO M 170 for the applicable class and wall or the wall thickness shown in a modified design that has been approved by the Engineer. A wall thickness greater than permitted by the above tolerance will be cause for rejection of the pipe. The circumferential steel in single cage pipe shall not be more than 3" from either end of the pipe section excluding the tongue and groove. On double cage pipe, extend one cage into the tongue or groove. Place the other cage so a circumferential wire shall be not less than 2" from the other end of the barrel of the pipe.

C Precast Concrete Pipe End Sections

Precast concrete pipe end sections shall meet AASHTO M 170 and Section 1077 except those requirements pertaining to design.

Design concrete pipe end sections in accordance with the plans or with plans prepared by the manufacturer which have been approved by the Engineer. Reinforce all concrete pipe end sections. Use air entrained concrete in pipe end sections with a strength of 3,500 psi when tested in accordance with AASHTO T 22.

C. Concrete Pipe Tees and Elbows

Concrete pipe tees and elbows shall meet AASHTO M 170 for the class of pipe tee or elbow called for in the plans.

D. Marking

(1) Clearly etchmark the following information on the outside of each section of pipe, pipe end section, tee and elbow:

(a) Pipe class and type of wall if reinforced,

(b) The date of manufacture, and

(c) Name or trademark of the manufacturer.

(2) Clearly stamp, stencil, sticker or paint the following information on each section of pipe, pipe end section, tee and elbow:

(a) The State assigned plant number,

(b) The inside diameter of the pipe product, and

(c) The year of manufacture. This marking shall be in the following format: State plant number - diameter - year (CP99-24-06).
When concrete pipe, pipe end sections, tees and elbows have been inspected and accepted they will be stamped with the Department seal of approval. Do not use pipe sections, pipe end sections, tees, or elbows which do not have this seal of approval. Failure of as much as 20% of any lot of pipe due to cracks, fractures, variation in alignment or other manufacturing defects will be cause for the rejection of the entire lot.
The lots shall be as designated by the manufacturer before inspection.
Individual lengths of pipe within the lot which were not specifically rejected but which are considered acceptable by the manufacturer may be removed from the rejected lot and resubmitted for inspection as a separate lot.
(F) Joint Materials

Cement shall meet Article 1024-1. Sand shall meet Article 1014-1 for fine aggregate or Article 1040-7 for mortar sand. Hydrated lime shall meet Article 1040-6.
Flexible plastic joint material shall meet AASHTO M 198 for Type B flexible plastic gaskets, except as follows:
(1) The flash point, Cleveland Open Cup (C.O.C.) shall be at least 325°F.
(2) The fire point, C.O.C. shall be at least 350°F.

3.05 Drainage Structures

A. Excavation

Perform excavation with equipment of adequate weight, size and capability. Where necessary, provide a competent person and protection of personnel in excavation by sloping, shoring or bracing in accordance with Federal, State or local standards and Article 107-1.

B. Foundation

Do not place masonry drainage structure until the foundation has achieved adequate strength.
Where the foundation material is found to be of poor supporting value or of rock, minor adjustments in the location of the structure may be approved to provide a more suitable foundation. Where this is not practical, undercut the foundation and condition by backfilling with an approved select material.
Set precast foundation slabs to within ± 1/2" of grade on a 2" to 3" thick bed of compacted foundation conditioning material.

C. Cast-In-Place Concrete, Brick and Block Masonry

Install drainage structures to plan line and grade or approved to meet drainage conditions.
Do not modify the drainage structure by corbeling or use of concrete slabs unless otherwise directed.
Construct concrete in accordance with Section 825 and give an ordinary surface finish.
Construct brick masonry in accordance with Section 830. Construct block masonry in accordance with Section 834. Furnish and place reinforcing steel in accordance with

Section 425.
Obtain approval if field conditions necessitate a variance from the plan dimensions of the
structure or footings.

D. Installation of Precast Units

Install drainage structures to plan line and grade or approved to meet drainage conditions.
Do not modify the drainage structure by corbeling or use of concrete slabs unless otherwise directed.
Assemble the precast drainage structure units in accordance with the manufacturer's instructions. Subarticle 840-3(C) applies where it is necessary to use cast-in-place concrete, brick masonry or block masonry construction as part of the structure. Fill any void greater than 1" with a brick or block bat fully encased in mortar. Obtain approval if field conditions necessitate a variance from the plan dimensions of the
structure or footings.

E. Fittings and Connections

As the work is built up, accurately space, align and thoroughly bond fittings that enter the
structure.
Make pipe connections so the pipe does not project beyond the inside wall of the drainage structure and grout as necessary to make smooth and uniform surfaces on the inside of the structure.
Set metal frames for grates and covers in full mortar beds or secure by approved methods.

F. Backfill

Complete drainage structure and remove all forms and falsework. Backfill with approved
material, compacted to the density required by Subarticle 235-3(C), after the drainage structure has cured for at least 7 curing days, unless otherwise permitted. Define a “curing day” in accordance with Article 825-9 for concrete or Article 830-5 for brick or block masonry.

3.06 Headwalls

Use Portland cement concrete, brick masonry or precast concrete for the headwall unless otherwise specified in the plans.
If precast sections are proposed, submit in writing for approval.

A. Foundation

Do not place concrete or masonry until the foundation is approved.
Excavate foundation to a firm surface, make level or stepped and clean surfaces of loose

material. Make excavation true to lines and dimensions shown on plans.
Where the foundation material is found to be of poor supporting value or of rock, the Engineer may make minor adjustments in the location of the structure to provide a more suitable foundation. Where this is not practical, undercut the foundation and condition by
backfilling with an approved select material.

B. Concrete and Masonry

Construct concrete in accordance with Section 825 and give an ordinary surface finish.
Construct brick masonry in accordance with Sections 830 and 832. Furnish and place reinforcing steel in accordance with Section 425.
Provide the class of concrete indicated in the plans.
Obtain approval if field conditions necessitate a variance from the plan dimensions of the
structure and footings.
Construct headwalls on the end of a full joint of pipe and in accordance with the details in
the plans.
Any headwall that incorporates an opening for circular pipe 54" or greater shall be reinforced.

C. Backfill

Complete headwall construction, and remove all forms. Backfill with approved material after the concrete or brick masonry has cured for at least 7 curing days unless otherwise permitted. A “curing day” is defined in Article 830-5. Within 4 calendar days after the completion of the 7 day curing period, shape, compact and complete backfill in accordance with the contract.

- END OF SECTION -

PAVEMENT JOINT SEALANTS

SECTION 02764

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Expansion and contraction joints within portland cement concrete pavement.

B. Related Sections include the following:

1. Division 2 Section "Cement Concrete Paving" for constructing joints in concrete paving.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Verification: For each type and color of joint sealant required. Install joint-sealant samples in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.

D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Compatibility and Adhesion Test Reports: From joint sealant manufacturer indicating the following:

1. Materials forming joint substrates and joint-sealant backer materials have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

F. Product Test Reports: From a qualified testing agency indicating joint sealants comply with requirements, based on comprehensive testing of current product formulations.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency, based on testing current sealant formulations within a 36-month period.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

D. Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturer, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use manufacturer's standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

    a. Perform tests under environmental conditions replicating those that will exist during installation.

2. Submit not fewer than nine pieces of each type of material, including joint substrates, joint-sealant backer materials, secondary seals, and miscellaneous material.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
5. Testing will not be required if joint sealant manufacturer submits joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F (4.4 deg C).
2. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than that allowed by joint sealant manufacturer for application indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range for this characteristic.

2.2 COLD-APPLIED JOINT SEALANTS

A. Multi-component Sealant for Concrete: Pourable, chemically curing elastomeric formulation complying with the following requirements for formulation and with ASTM C 920 for type, grade, class, and uses indicated:

1. Urethane Formulation: Type M; Grade P; Class 12-1/2

B. Single-Component Urethane Sealant for Concrete: Single-component, pourable, coal-tar-modified, urethane formulation complying with ASTM C 920 for Type S

C. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS.

D. Type SL Silicone Sealant for Concrete and Asphalt: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL.

E. Multi-component Low-Modulus Sealant for Concrete and Asphalt: Proprietary formulation consisting of reactive petropolymer and activator components producing a pourable, self-leveling sealant.

F. Products: Subject to compliance with requirements, provide one of the following:

1. Multi-component Sealant for Concrete:

    a. Vulkem 202; Mameco International.
    b. SEALTIGHT GARDOX; W.R. Meadows, Inc.
    c. Urexpan NR-300; Pecora Corporation.
    d. Sonomeric 2; Sonneborn Building Products Div., ChemRex, Inc.

2. Single-Component Urethane Sealant for Concrete:

    a. Vulkem 200; Mameco International.
    b. Sonomeric 1; Sonneborn Building Products Div., ChemRex, Inc.

2.3 HOT-APPLIED JOINT SEALANTS

A. Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3569.

B. Sealant for Concrete and Tar Concrete: Single-component formulation complying with ASTM D 3581.

C. Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3406.

D. Sealant for Concrete and Asphalt: Single-component formulation complying with ASTM D 3405.

E. Available Products: Subject to compliance with requirements, hot-applied joint sealants that may be incorporated into the Work include, but are not limited to, the following:

F. Products: Subject to compliance with requirements, provide one of the following:

1. Elastomeric Sealant for Concrete:

    a. Superseal 444/777; Crafco, Inc.
    b. POLY-JET 3569; W.R. Meadows, Inc.

2. Sealant for Concrete and Tar Concrete:

    a. SUPERSEAL 1614A; Crafco Inc.
    b. POLY-JET 1614; W.R. Meadows, Inc.
    c. POLY-JET 3406; W.R. Meadows, Inc.
    d. POLY-JET 3569, W.R. Meadows, Inc.

3. Elastomeric Sealant for Concrete:

    a. Superseal 444/777; Crafco, Inc.
    b. POLY-JET 3406; W.R. Meadows, Inc.

4. Sealant for Concrete and Asphalt:

    a. ROADSAVER 221; Crafco Inc.

b. Product #9005; Koch Materials Company.
c. Product #9030; Koch Materials Company.
d. SEALTIGHT HI-SPEC; W.R. Meadows, Inc.

2.4 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint sealant manufacturer based on field experience and laboratory testing.

B. Round Backer Rod for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depths, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

2.5 PRIMERS

A. Primers: Product recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint- sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of backer materials.
2. Do not stretch, twist, puncture, or tear backer materials.
3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants by proven techniques to comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by joint sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint sealant manufacturer's written instructions, unless otherwise indicated.

G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION

SECTION 02780

UNIT PAVERS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Concrete pavers set in aggregate setting beds.

1.2 SUBMITTALS

A. Product Data: For materials other than water and aggregates.

B. Samples for unit pavers.

1.3 QUALITY ASSURANCE

A. Mockups: Build mockups for each form and pattern of unit paver.

   1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 PROJECT CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or build on frozen subgrade or setting beds.

B. Weather Limitations for Bituminous Setting Bed: Install bituminous setting bed only when ambient temperature is above 40 deg F (4 deg C) and when base is dry.

C. Cold-Weather Requirements for Mortar and Grout: Heat materials to provide mortar and grout temperatures between 40 and 120 deg F (4 and 49 deg C). Protect unit paver work against freezing for 24 hours after installation.

PART 2 - PRODUCTS

2.1 CONCRETE PAVERS

A. Concrete Pavers: Solid interlocking paving units complying with ASTM C 936, made from normal-weight aggregates.
   1. Products: Subject to compliance with requirements, provide the following:

2. Thickness: 3-1/8 inches (80 mm).
3. Face Size and Shape: 3-7/8-by-7-7/8 inch (98-by-200 mm) rectangle.
4. Color: As selected by Engineer from manufacturer's full range.

2.2 AGGREGATE SETTING-BED MATERIALS

A. Graded Aggregate for Base: Sound, crushed stone or gravel complying with requirements in Division 2 Section "Earthwork" for base course.

B. Sand for Leveling Course: Sound, sharp, washed, natural sand or crushed stone complying with gradation requirements in ASTM C 33 for fine aggregate.

C. Sand for Joints: Fine, sharp, washed, natural sand or crushed stone with 100 percent passing No. 16 (1.18-mm) sieve and no more than 10 percent passing No. 200 (0.075-mm) sieve.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

B. Cut unit pavers with motor-driven masonry saw equipment to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible.

1. For concrete pavers, a block splitter may be used.

C. Joint Pattern: As indicated.

D. Tolerances: Do not exceed 1/16-inch (1.6-mm) unit-to-unit offset from flush (lippage) nor 1/8 inch in 24 inches (3 mm in 600 mm) and 1/4 inch in 10 feet (6 mm in 3 m) from level, or indicated slope, for finished surface of paving.

E. Expansion and Control Joints: Provide foam filler as backing for sealant-filled joints. Install joint filler before setting pavers.

F. Expansion and Control Joints: Provide joint filler at locations and of widths indicated. Install joint filler before setting pavers. Make top of joint filler flush with top of pavers.

G. Provide edge restraints as indicated. Install edge restraints before placing unit pavers.

3.2 AGGREGATE SETTING-BED APPLICATIONS

A. Compact soil subgrade uniformly to at least 95 percent of ASTM D 698 laboratory density.

B. Place aggregate base, compact by tamping with plate vibrator, and screed to depth indicated.

C. Place leveling course and screed to a thickness of 1 to 1-1/2 inches (25 to 38 mm), taking care that moisture content remains constant and density is loose and constant until pavers are set and compacted.

D. Treat leveling course with herbicide to inhibit growth of grass and weeds.

E. Set pavers with a minimum joint width of 1/16 inch (1.5 mm) and a maximum of 1/8 inch (3 mm), being careful not to disturb leveling base. If pavers have spacer bars, place pavers hand tight against spacer bars.

F. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a 3500- to 5000-lbf (16- to 22-kN) compaction force at 80 to 90 Hz.

G. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling.

- END OF SECTION -

SECTION 02831

METAL FENCING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall furnish and install steel fencing, posts, gates, etc. of the height specified, where shown on the Drawings and in compliance with these Specifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03300 - Cast-in-Place Concrete.

1.03 SUBMITTALS

A. Shop Drawings shall be furnished in accordance with Section 01300, Submittals.

PART 2 -- PRODUCTS

2.01 GENERAL

A. All galvanized components shall be hot dipped galvanized.

1. Coating shall be 1.8 ounces per square foot of surface.

2. Alternate coatings which employ a zinc coating of less than 1.8 ounces per square foot are not acceptable.

B. Dimensions shall be as shown on the Drawings.

2.02 CHAIN LINK FABRIC

A. Fabric shall be 9 gauge matte black vinyl coated wire woven in a 2-inch diamond mesh conforming to ASTM A491.

1. Top and bottom selvage shall have a barbed finish.

2. Minimum weight of aluminum coating shall be 0.40 ounce per square foot of wire surface.

3. The wire shall have a minimum tensile strength of 80,000 lbs. per square inch.

2.03 POSTS

A. Posts and rails shall be galvanized standard weight pipe conforming to the requirements of ASTM F1083.

1. Line posts shall be Schedule 40, 2_-inch O.D. galvanized pipe with minimum bending strength of 201 pounds under a 6-foot cantilever load.

2. All end, corner, intermediate, and pull posts and gate leaves 6-feet 0-inches wide and less shall be 2_-inch O.D. galvanized Schedule 40 pipe with minimum bending strength of 381 pounds on 6-foot cantilever load.

3. Gate posts for gate leaves shall be Schedule 40 pipe complying with ASTM F1083 of diameters as follows:

Gate Leaf Width	Pipe O.D.	Weight per Ft.
0 - 6 -feet	2_-inches	5.79 pounds
> 6 -13 -feet	4 -inches	9.1 pounds
>13 - 18 -feet	6_-inches	18.97 pounds
> 18 -feet	8_-inches	24.7 pounds

2.04 TENSION WIRE

A. Top and bottom tension wire shall be No. 7 gauge aluminum coated steel wire.

2.05 POST TOPS AND BARBED WIRE SUPPORTS

A. Gate, end, corner, and line post tops shall be malleable iron or pressed steel hot dipped galvanized conforming to ASTM A153.

B. Extension arms for supporting three strands of barbed wire for line posts shall be pressed steel with malleable iron base or solid aluminum alloy castings.

C. Angles for line post extension arms shall be approximately 45 degrees from the vertical.

1. Angle shall support three strands of barbed wire.

2. The top slot for barbed wire shall be a minimum of 12 inches above the fabric and a minimum of 10 inches from the fence line.

2.06 BARBED WIRE

A. Barbed wire shall consist of three strands of 12½ gauge aluminum coated steel wire with 4-point barbs of 14 gauge aluminum wire spaced 5 inches apart conforming to ASTM A585.

2.07 BRACES AND TOP RAILS

A. Braces and top rails where shown on the Drawings shall be 1.66-inch O.D., Schedule 40 galvanized pipe with minimum vertical bending strength of 202 pounds on 10-foot span.

B. Top rails shall be continuous and pass through the post tops.

1. The coupling used to join the top rail lengths shall allow for expansion.

2. Brace rails shall be provided at all terminal posts located between the top and grade lines and extending from the terminal post to the first adjacent post.

3. Braces shall be securely fastened at both ends.

4. Brace ends for receiving brace rails shall be malleable iron or castings of 356.0 (formerly SG70A) alloy or equivalent of ASTM B26 or B108.

C. Truss and stretcher bands shall be pressed steel, supplied with carriage bolts and nuts. Bolts shall be $^{5}/_{16}$-inch by 1¼-inch.

2.08 FABRIC TIES

A. Wire ties shall be preformed 0.148-inch diameter aluminum.

1. Flat band type ties shall be 1100-H18 or 3003-H14, .064-inch thick by ½-inch wide.

B. Hog rings for attaching tension wire to fabric shall be 0.105-inch diameter, Alloy 1100-H14.

2.09 GATES

A. Gate frames shall be 2-inch O.D. ASTM F1083 pipe, 2.72 lbs. per foot hot dipped galvanized.

1. Fabric shall match fence.

2. Gate frames shall be welded or assembled with riveted corner castings.

3. Gate frames shall be equipped with _-inch diameter adjustable truss bars.

4. Hinges shall be ball and socket.

B. Gate shall be equipped with positive latching device with provision for padlocking.

1. Personnel gates shall be minimum 36-inch clear opening.

PART 3 -- EXECUTION

3.01 INSTALLATION

A. All line posts shall be spaced equidistant in the fence line on a maximum of 10-foot centers.

1. Posts shall be set plumb in concrete bases as detailed on Drawings.

2. The top of the posts shall be brought to a smooth grade line.

3. The wire fence shall be set accurately to line and grade and shall be plumb.

B. End, corner, pull, or intermediate posts shall be placed in the following locations:

1. Corners

2. Changes in direction

3. Abrupt changes in grade

4. Intervals no greater than 500 feet in the fence line.

C. Each end or gate post shall have one brace assembly.

D. Each corner or intermediate post shall have two brace assemblies.

E. Horizontal braces shall be provided at all terminal posts, corner posts, and intermediate posts between top rail and ground.

1. Braces shall extend from the above-mentioned posts to the first adjacent line posts.

2. Braces shall be securely fastened to the line posts by brace ends and brace bands and to the terminal posts by approved rail end connectors.

3. Diagonal brace rods shall be trussed from the brace end on the line post back to the terminal post, corner post, or intermediate post and fastened to it by an approved connector.

3.02 POST FOUNDATIONS

A. Line posts shall be spaced at a maximum 10-foot O.C.

1. Post holes shall be in true alignment and of sufficient size to provide a permanent foundation of concrete.

2. Holes shall be well centered on the posts.

3. When post is to be installed in soil, the minimum hole diameter of 12 inches is required for all posts.

4. When post is to be installed in cast-in-place concrete, the minimum hole diameter shall be as shown in the Drawings.

B. Post foundations in soil shall be carefully rodded or tamped into place.

1. Concrete shall be Class "B" in conformance with Section 03300 - Cast-in-Place Concrete.

2. The top of concrete shall extend 2 inches above ground line.

3. Top of concrete shall be neatly troweled and leveled up from edges to the posts so as to have a pitch outward in all directions.

C. Post foundations in cast-in-place concrete shall be filled with non-shrink grout.

D. No materials shall be installed on the posts nor shall any load be applied to the posts within 3 days after the individual post foundation is completed.

E. Install fabric 3 inches above ground level and flush with cast-in-place concrete.

F. Fence shall be stretched tight and securely fastened to posts at points spaced a maximum of 12-inches apart.

G. Fabric shall be securely tied to tension wire at intervals not exceeding 24-inches.

H. Additional strands of barbed wire shall be added beneath the chain link fabric at all ditch crossings to maintain the security of the fence installation.

3.03 RELOCATING OF EXISTING FENCE

A. Where shown on the Drawings that relocating of an existing fence is required, the fence, after relocating, shall be in a condition that is equal to or better than before the fence was removed.

B. The Contractor may, at his option, remove and relocate the existing fencing or remove and replace the existing fencing.

C. The Contractor shall replace any of the fence components which have been unnecessarily damaged by him.

- END OF SECTION -

Section 02834 (32 32 23)

Precast Block Gravity WALL

PART 1 GENERAL

1.1 General Information

A. Work includes supplying and installing precast concrete retaining wall blocks to the lines and grades assigned within the specified construction drawings herein.
B. The contractor is solely responsible for the means and methods of construction as well as safety of workers and of the public.

1.2 Reference Standards

A. ASTM C39: Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens .
B. ASTM C94: Standard Test Method for Ready-Mixed Concrete.
C. ASTM C136: Standard Test Method for Sieve Analysis of Fine and Coarse Aggregate
D. ASTM C1372: Standard Test Method for Segmental Retaining Wall Units.
E. ASTM D698: Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard effort .
F. ASTM D1557: Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified effort .
G. ASTM D6916: Standard Test Method for Determining the Shear Strength between Segmental Concrete units.

1.3 Delivery, Storage and Handling

A. Contractor shall check the materials upon delivery to assure proper material has been received.
B. Contractor shall prevent excessive mud, wet concrete and like substances from adhering to the Precast Block units.
C. Contractor shall protect the materials from damage. Damaged material shall not be incorporated in the wall or surrounding reinforced soil embankments.
D. Exposed faces of precast concrete retaining wall blocks shall be reasonably free of large chips, cracks, or stains when viewed from a distance of 10 feet.

PART 2 MATERIALS

2.1 Wall Units

A. Contractor shall choose a Precast concrete retaining wall blocks system as produced by one of the following licensed Precast Block manufacturer or another system that is equivalent:

- Verti-Block Wall System
- Keystone Century Wall System
- Redi-Rock Wall System

Contractor shall submit specification of wall system to Engineer for approval.

B. Exterior precast concrete block dimensions shall be uniform and consistent. Maximum dimensional tolerances shall be within 1 percent excluding the architectural surface. Maximum width (face to back) dimensional deviation including the architectural surface shall be 1 inch.

C. Exposed face shall be finished as specified. Other surfaces to be smooth form type. Small bug holes on the block face may be patched to blend into the remainder of the block face.

D. Concrete for precast blocks shall have a minimum of 28-day compressive strength of 4,000 psi (pounds per square inch).

E. Wall units shall be made with Ready-Mixed concrete in accordance with ASTM C94, latest revision, and per the following chart:

Climate	Air Content	28 Day Compres	Slump*
Severe	4 1/2 % - 7 1/2 %	4000	5” ± 1 1/2”
Moderate	3% - 6%	4000	5” ± 1 1/2”
Negligible	1 1/2% - 4 1/2%	4000	5” ± 1 1/2”

*Higher slumps are allowed if achieved by use of appropriate admixtures. Nevertheless, all material used in the wall units must meet applicable ASTM and local requirements for exterior concrete.

F. Typical applications do not require reinforcing steel. However, if an application outside the scope of this design manual calls for it, reinforcing steel (if used) shall be Grade 60 . Minimum clear cover to reinforcement shall be 1 .5 inches.

G. The face pattern shall be selected from the manufacturer’s standard molds. The color of each block unit shall be natural gray (precast concrete). A concrete stain may be field applied to color the block units if specified by the Owner.

H. The appearance of the overall wall shall be a stone or synthetic stone finish in accordance with City of Asheville zoning standards. Contractor shall submit sample and specification of wall system to Engineer for approval.

2.2 Leveling Pad and Drainage Pipe

A. Leveling Pad shall consist of (1 inch minus) crushed stone base.

B. Drainage infill material shall be stone and be poured into the hollow core of each Precast Block as each row of blocks is installed. Ensure that all voids are filled and no air pockets are detected.

C. Backfill material shall be approved by the geotechnical engineer. Native site excavated soils may be compacted in place if approved unless otherwise specified in the drawings. Unsuitable soils with a PL greater than 6, organic soils, and frost susceptible soils shall not be used within a 1 to 1 influence area.

D. Non-woven geotextile cloth shall be placed between the native retained soil and the block wall.

E. Where additional fill is needed, Contractor shall submit sample and specification to Engineer for approval.

Drainage

A. Internal and external drainage shall be a perforated 4 inch drain pipe but must be evaluated by a professional engineer who is responsible for the final wall design for exact requirements.

2.3 GEOTEXTILE FABRIC

A. Provide a geotextile filter for separation from backfill at the tails of the blocks. The geotextile shall be a needle punched non-woven fabric with a minimum grab tensile strength of 120 pounds (Reference ASTM D4632). The geotextile may cover the entire back face of the blocks or may be cut into strips to cover the gaps between tail units with a minimum of 6 inches of overlap over the concrete tail on both sides.

PART 3 CONSTRUCTION

3.1 EXCAVATION

A. Excavate as required to the lines and grades shown on construction drawings for installation of the retaining wall. Excavate to the base level for a sufficient distance behind the face to permit installation of the base.

B. Slope or shore excavation as necessary for safety and for conformance with applicable OSHA requirements.

3.2 FOUNDATION AND SOIL PREPARATION

A. On-site foundation soil shall be examined by the Geotechnical Engineer to ensure that the bearing foundation soil strength meets or exceeds assumed design conditions and strength. Soil not meeting the required strength shall be removed and replaced with acceptable, compacted material.

B. Level the gravel base to lines and grades demonstrated on the construction plans. Native foundation soil shall be compacted to 95 percent of the maximum dry density (ASTM D698, Standard Proctor) or 90 percent of modified proctor to ensure a hard and level surface on which the first set of blocks may be suitable replacement fill.

C. Prepare and smooth the granular material to ensure complete contact of the first course with the base. The surface of granular base may be dressed with finer aggregate to aid leveling, provided that the thickness of dressing layer should not exceed 3 times the maximum particle size used. Native soil compacted in place as each course is set.

D. Contractor may substitute concrete for granular base material. Concrete may be placed full thickness or as a topping to level the base. If used as a topping, the concrete shall have a minimum thickness of 3 inches.

3.3 UNIT INSTALLATION

A. Place the first course of standard wall block units directly on the compacted (1 inch minus) fractured gravel base. Ensure full contact between adjacent blocks so they fit tightly together. Check all blocks for uniform alignment and level placement.

B. Fill and compact the unity core and all voids between and within the blocks with clean (1 inch minus) gravel to lock firmly into place. Continue to check for level and alignment between all blocks.

3.4 UNIT INSTALLATION - CONTINUED

A. Place clean native soil behind the units in maximum loose lifts of 8 inches and compact. Compact all backfill to a minimum of 95 percent of the maximum dry density (ASTM D698, Standard Proctor). For cohesive soils, the moisture content at the time of compaction should be adjusted to within -2 and +3 percent of optimum. Place backfill in successive lifts until level with the top of the facing unit.

B. Remove and sweep off all excess aggregate and other materials from the top of the blocks before continuing on the next block course.

C. Install next course of precast concrete retaining wall blocks to bond on top of the base row. Position blocks to be offset from seams of blocks on lower course. Blocks shall be placed at a 2 3/16 inch setback and recessed over the alignment hoop. Check each block for proper alignment and level. Continue to unit fill and backfill behind each course of units. Hand-operated place and compaction equipment shall be used around the block and within 3 feet of the wall to achieve consolidation.

D. Continue to install subsequent courses of blocks in a like manner to elevations shown on the construction plans. Construct wall in level stages, placing the units at each course for the entire length of the wall, if possible. Unit fill and backfill shall be placed to the level of the top of the facing block unit before placing the next course.

E. Final grade above and below the retaining wall shall provide for positive drainage and prevent ponding. Protect completed wall from other construction. Do not operate large equipment or store materials above the wall that exceed the design surcharge loads. All walls shall be installed in accordance with local building codes and requirements.

PART 4 QUALITY ASSURANCE

4.1 CONSTRUCTION QUALITY CONTROL

A. The contractor is responsible to ensure that all installation and materials meet the quality specified in the construction drawings.

B. The contractor shall verify that installation is in accordance with the specifications and construction drawings.

4.2 QUALITY ASSURANCE

A. The Owner is responsible to engage testing and inspection service to provide quality construction assurance.

B. Compaction testing shall be done a minimum of every 1 foot of vertical fill and every 100 lineal feet along the wall.

C. Testing shall be done at a variety of locations to cover the entire backfill zone.

D. The inspection professional should perform sufficient testing and observation to verify that wall installation substantially conforms to the design drawings and specifications and complies with all ASTM standards.

Section 02834 (32 32 23)

MSE Block Reinforced Wall

PART 1 GENERAL

1.1 GENERAL INFORMATION

A. When wall heights exceed those listed in the gravity wall chart, geogrid can be added to provide a stable wall condition. Layers of geogrid inserted between the blocks and extending behind the wall interlock with the surrounding soil to create a cohesive soil mass. This mass uses its own weight and internal shear strength to resist both the sliding and the overturning pressures from the soil being retained. The crushed stone in the MSE block hollow core provides a connection between the layers of geogrid and the MSE block wall, locking the two systems together. The reinforced soil mass becomes the structure and the MSE block wall becomes the facing. The specific location and embedment length of the grid layers depends upon the site conditions, wall heights and Long-Term Allowable Design Strength of the grid being used. Consult with your design engineer for specifics on installation of reinforced walls.
B. Geogrids are flexible, synthetic meshes which are manufactured specifically for slope stabilization and earth retention. These “grids” are available in a variety of materials, sizes and strengths. They can be made of high tensile strength plastics or woven polyester yarns and are typically packaged at the factory in rolls. The grids are rated by Long-Term Allowable Design Strength (LTADS) with values ranging from 500 to 4,000 pounds per linear foot (7.3 kN/m to 58.4 kN/m).
C. Work includes supplying and installing precast concrete retaining wall blocks to the lines and grades assigned within the specified construction drawings herein.
D. The contractor is solely responsible for the means and methods of construction as well as safety of workers and of the public.

1.2 REFERENCE STANDARDS

A. ASTM C39: Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
B. ASTM C94: Standard Test Method for Ready-Mixed Concrete.
C. ASTM C136: Standard Test Method for Sieve Analysis of Fine and Coarse Aggregate.
D. ASTM C1372: Standard Test Method for Segmental Retaining Wall Units.
E. ASTM D698: Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard effort.
F. ASTM D1557: Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified effort.
G. ASTM D6916: Standard Test Method for Determining the Shear Strength between Segmental Concrete units.

1.3 DELIVERY, STORAGE AND HANDLING

A. Contractor shall check the materials upon delivery to assure proper material has been received.
B. Contractor shall prevent excessive mud, wet concrete and like substances from adhering to the MSE block units.
C. Contractor shall protect the materials from damage. Damaged material shall not be incorporated in the wall or surrounding reinforced soil embankments.

PART 2 MATERIALS

2.1 Wall Units

A. Contractor shall choose a MSE retaining wall blocks system as produced by one of the following licensed MSE block manufacturer or another system that is equivalent:

- Verti-Block Wall System
- Keystone Century Wall System
- Redi-Rock Wall System

Contractor shall submit specification of wall system to Engineer for approval.

B. Exterior precast concrete block dimensions shall be uniform and consistent. Maximum dimensional tolerances shall be within 1 percent excluding the architectural surface. Maximum width (face to back) dimensional deviation including the architectural surface shall be 1 inch.

C. Exposed face shall be finished as specified. Other surfaces to be smooth form type. Small bug holes on the block face may be patched to blend into the remainder of the block face.

D. Concrete for precast blocks shall have a minimum of 28-day compressive strength of 4,000 psi (pounds per square inch).

E. Wall units shall be made with Ready-Mixed concrete in accordance with ASTM C94, latest revision, and per the following chart:

Climate	Air Content	28 Day Compres	Slump*
Severe	4 1/2 % - 7 1/2 %	4000	5” ± 1 1/2”
Moderate	3% - 6%	4000	5” ± 1 1/2”
Negligible	1 1/2% - 4 1/2%	4000	5” ± 1 1/2”

*Higher slumps are allowed if achieved by use of appropriate admixtures. Nevertheless, all material used in the wall units must meet applicable ASTM and local requirements for exterior concrete.

F. Typical applications do not require reinforcing steel. However, if an application outside the scope of this design manual calls for it, reinforcing steel (if used) shall be Grade 60 . Minimum clear cover to reinforcement shall be 1 .5 inches.

G. The face pattern shall be selected from the manufacturer’s standard molds. The color of each block unit shall be natural gray (precast concrete). A concrete stain may be field applied to color the block units if specified by the Owner.

H. The appearance of the overall wall shall be a stone or synthetic stone finish in accordance with City of Asheville zoning standards. Contractor shall submit sample and specification of wall system to Engineer for approval.

2.2 Leveling Pad and Drainage Pipe

A. Leveling Pad shall consist of (1 inch minus) crushed stone base.

B. Drainage infill material shall be stone and be poured into the hollow core of each MSE block as each row of blocks is installed. Ensure that all voids are filled and no air pockets are detected.

C. Backfill material shall be approved by the geotechnical engineer. Native site excavated soils may be compacted in place if approved unless otherwise specified in the drawings. Unsuitable soils with a PL greater than 6, organic soils, and frost susceptible soils shall not be used within a 1 to 1 influence area.

D. Non-woven geotextile cloth shall be placed between the native retained soil and the block wall.

E. Where additional fill is needed, Contractor shall submit sample and specification to Engineer for approval.

Drainage

A. Internal and external drainage shall be a perforated 4 inch drain pipe but must be evaluated by a professional engineer who is responsible for the final wall design for exact requirements.

2.3 GEOTEXTILE FABRIC

A. Provide a geotextile filter for separation from backfill at the tails of the blocks. The geotextile shall be a needle punched non-woven fabric with a minimum grab tensile strength of 120 pounds (Reference ASTM D4632). The geotextile may cover the entire back face of the blocks or may be cut into strips to cover the gaps between tail units with a minimum of 6 inches of overlap over the concrete tail on both sides.

PART 3 CONSTRUCTION

3.1 EXCAVATION

A. Excavate as required to the lines and grades shown on construction drawings for installation of the retaining wall. Excavate to the base level for a sufficient distance behind the face to permit installation of the base.

B. Slope or shore excavation as necessary for safety and for conformance with applicable OSHA requirements.

3.2 FOUNDATION AND SOIL PREPARATION

A. On-site foundation soil shall be examined by the Geotechnical Engineer to ensure that the bearing foundation soil strength meets or exceeds assumed design conditions and strength. Soil not meeting the required strength shall be removed and replaced with acceptable, compacted material.

B. Level the gravel base to lines and grades demonstrated on the construction plans. Native foundation soil shall be compacted to 95 percent of the maximum dry density (ASTM D698, Standard Proctor) or 90 percent of modified proctor to ensure a hard and level surface on which the first set of blocks may be suitable replacement fill.

C. Prepare and smooth the granular material to ensure complete contact of the first course with the base. The surface of granular base may be dressed with finer aggregate to aid leveling, provided that the thickness of dressing layer should not exceed 3 times the maximum particle size used. Native soil compacted in place as each course is set.

D. Contractor may substitute concrete for granular base material. Concrete may be placed full thickness or as a topping to level the base. If used as a topping, the concrete shall have a minimum thickness of 3 inches.

3.3 UNIT INSTALLATION

A. Place the first course of standard wall block units directly on the compacted (1 inch minus) fractured gravel base. Ensure full contact between adjacent blocks so they fit tightly together. Check all blocks for uniform alignment and level placement.

B. Fill and compact the unity core and all voids between and within the blocks with clean (1 inch minus) gravel to lock firmly into place. Continue to check for level and alignment between all blocks.

3.4 UNIT INSTALLATION - CONTINUED

A. Place clean native soil behind the units in maximum loose lifts of 8 inches and compact. Compact all backfill to a minimum of 95 percent of the maximum dry density (ASTM D698, Standard Proctor). For cohesive soils, the moisture content at the time of compaction should be adjusted to within -2 and +3 percent of optimum. Place backfill in successive lifts until level with the top of the facing unit.

B. Remove and sweep off all excess aggregate and other materials from the top of the blocks before continuing on the next block course.

C. Install next course of precast concrete retaining wall blocks to bond on top of the base row. Position blocks to be offset from seams of blocks on lower course. Blocks shall be placed at a 2 3/16 inch setback and recessed over the alignment hoop. Check each block for proper alignment and level. Continue to unit fill and backfill behind each course of units. Hand-operated place and compaction equipment shall be used around the block and within 3 feet of the wall to achieve consolidation.

D. Continue to install subsequent courses of blocks in a like manner to elevations shown on the construction plans. Construct wall in level stages, placing the units at each course for the entire length of the wall, if possible. Unit fill and backfill shall be placed to the level of the top of the facing block unit before placing the next course.

E. Final grade above and below the retaining wall shall provide for positive drainage and prevent ponding. Protect completed wall from other construction. Do not operate large equipment or store materials above the wall that exceed the design surcharge loads. All walls shall be installed in accordance with local building codes and requirements.

PART 4 QUALITY ASSURANCE

4.1 CONSTRUCTION QUALITY CONTROL

A. The contractor is responsible to ensure that all installation and materials meet the quality specified in the construction drawings.

B. The contractor shall verify that installation is in accordance with the specifications and construction drawings.

4.2 QUALITY ASSURANCE

A. The Owner is responsible to engage testing and inspection service to provide quality construction assurance.

B. Compaction testing shall be done a minimum of every 1 foot of vertical fill and every 100 lineal feet along the wall.

C. Testing shall be done at a variety of locations to cover the entire backfill zone.

D. The inspection professional should perform sufficient testing and observation to verify that wall installation substantially conforms to the design drawings and specifications and complies with all ASTM standards.

SECTION 02910

SEEDING AND MULCHING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish all labor, equipment, and materials necessary for final grading, seeding, furnishing, stockpiling, and placing topsoil, as well as any miscellaneous site work required to complete the work as shown on the Drawings and specified herein.

1. Under this Section, all areas of the project site disturbed by excavation, materials storage, temporary access roads, etc., shall be reseeded.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02100 – Clearing, Grubbing, and Site Preparation

B. Section 02200 – Earthwork

C. Section 02276 - Erosion and Sedimentation Control

D. Section 02925 - Topsoil

1.03 SUBMITTALS

A. Submit the following in accordance with Section 01300 - Submittals.

1. Product Data

2. Certification of all materials

3. Three copies of composition and germination certification and test results for grass seed.

4. Product Labels

5. Product Material Safety Data Sheet(s) (MSDS)

6. Product Application Rate

7. Documentation of quantities used

8. Copy of North Carolina Department of Agriculture license for company or person applying products.

PART 2 -- PRODUCTS

2.01 FERTILIZER

A. Fertilizer shall be a complete commercial fertilizer with components derived from commercial sources.

1. Fertilizer analysis shall be determined from field soil sampling in appropriate number taken by the Contractor and analyzed by the N.C. Department of Agriculture or other independent laboratory.

2. Contractor shall furnish fertilizer in accordance with the recommendations of the N.C. Department of Agriculture.

3. One-quarter of the Nitrogen shall be in the form of nitrates, one-quarter in the form of ammonia salts, and one-half in the form of natural organic Nitrogen.

4. Available Phosphoric Acid shall be free from superphosphate, bone, or tankage.

5. Potash shall be Sulphate of Potash.

6. Elements shall conform to the standards of Association of Official Agricultural Chemists.

B. Fertilizer shall be delivered in standard size bags marked with the weight, analysis of contents, and the name of the manufacturer.

C. Fertilizer shall be stored in weatherproof storage areas and in such a manner that its effectiveness will not be impaired.

2.02 LIME

A. Lime shall be pulverized meeting the following gradation.

1. At least 50% shall pass a No. 200 U.S.S. mesh sieve.

2. At least 90% shall pass a No. 100 U.S.S. mesh sieve.

3. Not less than 100% shall pass a No. 10 U.S.S. mesh sieve.

B. Total carbonates shall not be less than 80% or 44.8% Calcium Oxide equivalent.

1. For the purpose of calculation, total carbonates shall be considered as Calcium Carbonate.

2.03 GRASS SEED

A. The Contractor shall furnish the kinds and amounts of seed to be seeded in all areas disturbed by the construction work.

1. All seed shall be labeled to show that it meets the requirements of the North Carolina Seed Law.

2. All seed must have been tested within 6-months immediately preceding the planting of such material on the job.

B. The inoculant for treating legume seed shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species.

1. Inoculants shall not be used later than the date indicated on the container.

C. The quality of the seed shall conform to the following table:

Type	Minimum Seed Purity (%)	Minimum Germination (%)	Maximum Weed Seed (%)
Fescue (fungus free)	98	90	1.00
Hybrid Rye	98	85	0.10
Sudan grass	98	85	0.25
Millet	98	85	0.50
Sericea Lespedeza			
Scarified	98	85	0.50
Unscarified	98	85	0.50

D. Scarified Lespedeza may contain 20% hard seed and unscarified 50% hard seed.

E. Seed containing prohibited noxious weed seed shall not be permitted.

1. Seed shall be in conformance with N.C. Seed Law restrictions for restricted noxious weeds.

F. Seed mixtures to be used on the project shall be as shown on plans.

2.04 WOOD CELLULOSE FIBER MULCH

A. For use in hydroseeding grass seed in combination with fertilizers and other approved additions, wood cellulose fiber mulch shall consist of especially prepared wood cellulose fibers such as "Conwed", "Silva-Fiber", or equal, have no growth or germination inhibiting factors, and be dyed green.

B. The wood cellulose fiber shall have the additional characteristic of dispersing rapidly in water to form homogeneous slurry and remain in such state when agitated in the hydraulic mulching unit, or adequate equal, with the specified materials.

C. When applied, the wood cellulose fiber with additives shall form an absorptive mat but not a plant inhibiting membrane, which will allow moisture, natural or mechanical, to percolate into underlying soil.

D. The mulch shall be supplied in packages compressed to contain 50 pounds of material having an equilibrium air dry moisture content at time of manufacture of 12% plus or minus 2%.

E. Wood cellulose fiber mulch shall be stored in a weatherproof storage area and in such a manner that effectiveness will not be impaired.

2.05 STRAW MULCH

A. Straw used for mulch shall be small grain hay.

B. Hay shall be undamaged, air dry, threshed straw, free of undesirable weed seed.

C. Straw mulch is not required for seeded areas treated with a temporary soil stabilizer.

2.06 WOOD CHIPS

A. Wood chips shall consist of the chippings of all trees, shrubs, and other vegetative material cleared as outlined in Section 02100 from within the Contract Limit Lines and stockpiled on the project site, or wood chips furnished by the Owner.

2.07 TACKIFIER

A. Provide tackifier to facilitate securing of mulch after application.

B. Provide tackfier compatible with and recommended by mulch supplier.

2.08 TEMPORARY SOIL STABILIZER

A. The temporary agent for soil erosion control shall consist of an especially prepared highly concentrated powder which, when mixed with water, forms a thick liquid such as "TerraTack III", "Curasol AE", "Aerospray 70", or equal and having no growth or germination inhibiting factors.

1. The agent shall be used for hydroseeding grass seed in combination with other approved amendments resulting in a highly viscous slurry which, when sprayed directly on the soil, forms a gelatinous crust.

2.09 HERBICIDES

A. Commercial-type herbicide in granular or liquid form shall provide preemergence control of miscellaneous grasses and broadleaf weeds.

B. The herbicide selected shall be safe for use around ornamental plantings, have long-lasting weed control, and shall be resistant to leaching away under excessive rainfall.

C. Herbicide shall be "Treflan", "Dymid", or equal.

D. Methods and rates of application shall be in strict compliance to manufacturer's directions and acceptable to the Engineer.

E. Documentation for each product being used shall be provided with regard to Paragraph 1.03 Submittals. This information shall include, but not be limited to documentation of products and quantities used, product labels, msds information, application rates, and copy of Applicator license as issued by The North Carolina Department of Agriculture.

2.10 WETLAND SEED

A. The Contractor shall furnish the kinds and amounts of seed to be seeded in all areas disturbed by the construction work.

3. All seed shall be labeled to show that it meets the requirements of the North Carolina Seed Law.

4. All seed must have been tested within 6-months immediately preceding the planting of such material on the job.

B. The inoculant for treating legume seed shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species.

1. Inoculants shall not be used later than the date indicated on the container.

D. The quality of the seed shall conform to the following table:

Species	**Common Name**	**Percent**
Elymus virginicus	Virginia wild rye	15
Panicum virgatum	Switchgrass	15
Agrostis stolonifera	Creeping bentgrass	10
Rudbeckia hirta	Black-eyed susan	10
Coreopsis lanceolata	Coreopsis	10
Panicum clandestinum	Deer tongue	10
Andropogon gerardii	Big bluestem	5
Juncus effusus	Soft rush	5
Echinochloa muricata	Awned barnyard grass	5
Schizachyrium scoparium	Little bluestem	5
Sorghastrum nutans	Indian grass	5
Tripsacum dactyloides	Gamma	5
		100

F. Seed containing prohibited noxious weed seed shall not be permitted.

2. Seed shall be in conformance with N.C. Seed Law restrictions for restricted noxious weeds.

F. Seed mixtures to be used on the project shall be as shown on plans.

PART 3 -- EXECUTION

3.01 GRADING

A. After approval of the rough grading, the Contractor shall commence his preparations of the subgrade for the various major conditions of the work as follows:

1. Bare soil for riprap area at subgrade (24-inches below final grade or as directed by the Engineer).

2. Topsoil for lawn and road shoulder seed area - scarify 4-inch depth of subgrade (12-inches below final grade) prior to placing topsoil.

B. Final surface grading of the topsoiled and riprapped areas shall be mechanically raked or hand raked to an even finished surface alignment.

3.02 TOPSOIL

A. See Section 02925 Topsoil.

3.03 HYDROSEEDING AND GRASS

A. The Contractor shall grow a stand of grass by hydroseeding method on all disturbed areas.

B. The Contractor shall be responsible for the satisfactory growth of grass throughout the period of the one-year guarantee.

C. The Contractor's work shall include the preparation of the topsoil and bare soil seed bed, application of fertilizer, limestone, mulching, inoculant, temporary soil stabilizer, watering, and all other operations necessary to provide a satisfactory growth of sod at the end of the one-year warranty period.

1. Areas without satisfactory sod at the end of one year shall be replanted until satisfactory growth is obtained and acceptable to the Engineer.

D. All areas to be seeded shall be done by the hydraulic seeding method including all additives and amendments required.

1. A "Reinco", "Finn", or "Bowie" type hydromulcher with adjustable nozzles and extension hoses, or equal, shall be utilized.

2. General capacity of tank should range from 500 to 2,500 gallons, or as approved by the Engineer.

A. Use tackifier to secure mulch.

1. Apply at rate of 30-pounds per acre on slopes 2:1 or flatter.

2. Apply at rate of 40 pounds per acre on slopes steeper than 2:1.

F. Hydraulic seeding shall be carried out in three steps.

1. Step one shall consist of the application of lime.

2. In step two the seed mixture shall be mixed with the fertilizer, wood cellulose fiber mulch, and any required inoculants and applied to the seedbed.

3. Step three shall consist of application of top dressing during the first spring or fall, whichever comes first, after step two.

G. Top dressing shall consist of a commercial grade fertilizer plus Nitrogen or other analysis as may be recommended by soil testing.

1. Types and application rates of seed mixtures, lime, fertilizer, and wood cellulose fiber mulch, shall be as shown in the Seeding Schedule.

H. Ingredients for the mixture and steps should be dumped into a tank of water and thoroughly mixed to a homogeneous slurry and sprayed out under a minimum of 300-350 pounds pressure, in suitable proportions to accommodate the type and capacity of the hydraulic machine to be used.

1. Applications shall be evenly sprayed over the ground surface.

2. The Contractor shall free the topsoil of stones, roots, rubbish, and other deleterious materials and dispose of same off the site.

3. The bare soil, except existing steep embankment area, shall be rough raked to remove stones, roots, and rubbish over 4-inches in size, and other deleterious materials and dispose of same off the site.

I. No seeding shall be undertaken in windy or unfavorable weather, when the ground is too wet to rake easily, when it is in a frozen condition, or when it is too dry.

1. Any bare spots shown in two to three weeks shall be recultivated, fertilized at half the rate, raked, seeded, and mulched again by mechanical or hand broadcast method acceptable to the Engineer.

J. Areas that have been seeded with a temporary seed mixture shall be mowed to a height of less than 2-inches and scarified prior to seeding with the permanent seed mixture.

K. The Contractor shall provide, at his own expense, protection for all seeded areas against trespassing and damage at all times until acceptance of the work.

1. Slopes shall be protected from damage due to erosion, settlement, and other causes and shall be repaired promptly at the Contractor's expense.

L. The Contractor shall water newly seeded areas of lawns, road shoulder, and other areas seeded once a week until the grasses have germinated sufficiently to produce a healthy turf, or unless otherwise directed by the Engineer.

1. Each watering shall provide 3-gallons per square yard.

2. The Contractor shall furnish all necessary hoses, sprinklers, and connections.

M. The first and second cutting of the lawn grasses only shall be done by the Contractor.

1. All subsequent cuttings will be done by the Owner's forces or individual property owners.

3.04 DITCH AND SWALE EROSION PROTECTION

A. All ditches and swales indicated on the Drawings shall be lined with an erosion control blanket of single width.

1. The area to be covered shall be properly graded and hydroseeded before the blanket is applied.

2. Installation shall be in accordance with Section 02276 - Erosion and Sedimentation Control.

3.05 RIP RAP AND HERBICIDE

A. All topsoil and vegetative matter shall be removed from the subgrade surfaces prior to the application of the weed killer (herbicide) and the placement of landscape gravel or rip rap.

B. Furnish and install sufficient quantity of landscape gravel or rip rap to cover over the ground to a minimum 4-inch depth for landscape gravel and 24-inch depth for rip rap unless otherwise noted or indicated on the Drawings.

1. Furnish and apply an approved herbicide to the subgrade surface just prior to installing the landscape gravel or rip rap.

C. During placing, the stone shall be graded so that the smaller stones are uniformly distributed through the mass.

1. The Contractor may place the stone by mechanical methods augmented by hand placing where necessary or ordered by the Engineer.

2. The placed rip rap shall form a properly graded, dense, neat layer of stone.

D. A second application of the herbicide shall be made on the surface of the landscape gravel or rip rap not earlier than the expiration of the first 6-months nor later than 12-months utilizing the same methods and rates apply as specified previously.

3.06 MAINTENANCE

A. The Contractor shall provide, at his own expense, protection for all seeded areas against trespassing and damage at all times until acceptance of the work.

1. Maintenance shall include, but not be limited to, fertilizing, mowing, repairing, irrigating, and controlling weeds.

2. Slopes shall be protected from damage due to erosion, settlement, and other causes and shall be repaired promptly at the Contractor's expense.

3. The Contractor shall be responsible for maintaining all seeded areas until the end of the warranty period.

B. Annual fertilizing shall consist of an application of 500 pounds per acre of 10-10-10 commercial grade fertilizer or its equivalent and 60 pounds per acre of nitrogen in early fall or other analysis as may be determined by soil test.

1. Annual fertilization shall be in addition to top dressing and shall be performed by the Contractor each fall season after planting until the work is substantially complete.

C. Mowing shall be scheduled so as to maintain a minimum stand height of 4-inches or as directed by the Engineer.

1. Stand height shall be allowed to reach 8 to 10-inches prior to mowing.

D. All seeded areas shall be inspected on a regular basis.

1. Any necessary repairs or reseedings made within the planting season, if possible.

2. If the stand should be over 60% damaged, it shall be re-established following the original seeding recommendations.

E. Weed growth shall be maintained mechanically and/or with herbicides.

1. When chemicals are used, the Contractor shall follow the current North Carolina Agricultural Experiment Stations' weed control recommendations and adhere strictly to the instructions on the label of the herbicide.

2. No herbicide shall be used without prior approval of the Engineer.

3.07 CLEANUP

A. The Contractor shall remove from the site all subsoil excavated from his work and all other debris including, but not limited to, branches, paper, and rubbish in all landscape areas, and remove temporary barricades as the work proceeds.

B. All areas shall be kept in a neat, orderly condition at all times.

C. Prior to final acceptance, the Contractor shall clean up the entire disturbed area to the satisfaction of the Engineer.

3.08 TEMPORARY SEEDING

A. The work covered by this section consists of the seeding and mulching of selected areas in advance of the permanent seeding and mulching operations so as to minimize erosion of graded areas during construction operations. Temporary seeding shall be considered as a supplement to and not as a substitute for the requirements for the control of erosion and siltation provided in other sections of the specifications. The work shall include preparing seedbeds; furnishing, placing, and covering fertilizer and seed; furnishing and placing mulch; mowing; and other operations necessary for the seeding of the required areas; all in accordance with these specifications.

The work of temporary seeding and mulching shall be done promptly at the locations and times directed by the Engineer.

Temporary seeding and mulching shall be done under any of the following conditions as directed by the Engineer:

1. When it is impossible or impractical to bring an area to the final line, grade, and finish so that permanent seeding and mulching operations can be performed without subsequent serious disturbance by additional grading;

2. When erosion occurs or is considered to be potentially substantial on areas of graded roadbed where construction operations are temporarily suspended or where the grading of the roadbed has been completed substantially in advance of the paving construction;

3. During seasons of the year when permanent seeding and mulching is prohibited by the special provisions;

4. When an immediate cover would be desirable to minimize erosion, siltation, or pollution on any area.

The quantity of seed or fertilizer to be used and mowing to be performed will be affected by the actual conditions which occur during the construction of the project. The quantity of seed or fertilizer or mowing may be increased, decreased, or eliminated entirely at the direction of the Engineer. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

B. All seeding and mulching shall conform to the recommendations shown in the plans.

1. No permanent seeding shall be performed from June 1 - August 31 and December 1 - January 31.

2. Temporary seed mixtures will be used during these times if seeding is necessary.

3. Areas seeded with temporary seed mixtures shall be reseeded by the Contractor at no additional cost to the Owner with permanent seed as directed by the Engineer.

3.10 WETLAND SEEDING APPLICATION

A. Wetland seeding locations shall be identified by the engineer.

B. Wetland Seeding shall be applied at a rate of 20 – 25 LB/AC

- END OF SECTION -

SOIL PREPARATION

SECTION 02920

PART 1: GENERAL

1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division - 1 Specification sections apply to Work of this section.

1.2 DESCRIPTION: The work of this section consists of ripping, fertilizing, soil conditioning and fine grading of topsoil in preparation for seeding, or planting operations.

1.3 RELATED SECTIONS:

A. Earthwork – Section 02200
B. Seeding and Mulching – Section 02910
C. Topsoil – Section 02925
D. Trees and Shrubs - 02950

1.4 SUBMITTALS:

A. Quality Control Submittals:

1. Existing Soil Testing: Contractor shall be responsible for providing and paying for two (2) soil tests from two (2) locations (to be determined in-field by Project Manager and Contractor) prior to any soil preparation work is to begin. Test results shall be provided to Project Manager as per Section 01300. Cost to be calculated into seeding and soil preparation costs. A certified soil testing laboratory or the North Carolina State University Agricultural Cooperative Extension Agency may provide said test.

2. Certificates: State, federal and other inspection certificates shall accompany invoice for materials showing source or origin. Submit to Project Manager prior to acceptance of material.

3. Material Analysis: Provide soil conditioner analysis performed no more than 3 months prior to delivery to site. Submit 0.5 cubic foot sample of soil conditioner at least 24 hours prior to delivery to the site.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark and conformance to state law, bearing name and warranty or producer. If fertilizers are delivered in bulk, supplier shall provide the same certification as above.

B. Notify Project Manager of delivery schedule in advance so material can be inspected upon arrival at project site. Immediately remove unacceptable material from project site.

1.6 PROJECT/SITE CONDITIONS:

A. General: Do not perform work when climate and existing site conditions will not provide satisfactory results.

B. Vehicular accessibility on site shall be as directed by the Project Manager. Repair damage to prepared ground and surface caused by vehicular movement during work under this section to original condition at no additional cost to the City.

PART 2: PRODUCTS

2.1 SOIL MATERIALS:

A. Soil Conditioner:

1. Composted material meeting the following requirements – shall be adjusted accordingly dependent upon Contractor's soil test results (at no additional cost to College):
   a. Organic matter: 25% minimum
   b. Salt content: 4.0 mmhos/cm maximum
   c. pH: 8.5 maximum
   d. Carbon to nitrogen ratio of 10:1 to 25:1
   e. No live noxious weed seeds or plants shall be present

2. Mountain peat, aspen humus, gypsum, manure and sand will not be accepted.

2.2 OTHER MATERIALS:

A. Fertilizer: Diamonium phosphate (18-46-0). Shall be adjusted accordingly dependant upon Contractor's soil test results (at no additional cost).

B. Post Emergent Herbicide: Roundup (Glyphosate) as manufactured by Monsanto Company or approved equal.

C. Sand: Washed local sand with no deletrious materials.

PART 3: EXECUTION

3.1 EXAMINATION:

A. General: Verify that existing site conditions are as specified and indicated before beginning work under this Section.

1. Grades: Inspect to verify rough grading is within +/- 0.1 foot of grades indicated and specified.
2. Damaged Earth: Inspect to verify that earth rendered unfit to receive planting due to concrete, water, mortar, limewater or any other contaminant dumped on it has been removed and replaced with clean earth from a source approved by the Project Manager.

B. Unsatisfactory Conditions: Report in writing to General Contractor with copy to Project Manager.

C. Acceptance: Beginning of installation means acceptance of existing conditions by installer.

3.2 PREPARATION

A. Protection:

1. Locate sewer, water, irrigation, gas, electric, phone and other pipelines or conduits and equipment prior to commencing work.
2. Be responsible for proper repair to landscape, utilities, walls, pavements and other site improvements damaged by operations under this section.

B. Weed Control: Remove annual weeds by tilling. Remove perennial weeds by applying herbicide 1 week before soil preparation and as needed, but no sooner than 3 months before beginning work.

C. Surface Grade: Remove weeds, debris, clods and rocks larger than ½". Dispose of accumulated debris at direction of Project Manager.

D. Runoff: Take measures and furnish equipment and labor necessary to control the flow, drainage, and accumulation of water. Insure that all water will run off the grades.

E. Erosion Control: Take measures and furnish equipment and labor necessary to control and prevent soil erosion, blowing soil and accumulation of wind-deposited material on the site throughout duration of work.

3.3 INSTALLATION

A. Soil Preparation in seeding areas:

1. Evenly distribute soil conditioner and first application of fertilizer at the following rates (rates shall be finalized after existing soil tests are complete):
   a. Soil conditioner at the rate of 4 to 6 cubic yards per 1,000 square feet.
   b. 18-46-0 fertilizer at the rate of 4 to 7 lbs. per 1,000 square feet.

2. After applying soil conditioner and fertilizer, thoroughly till area to depth of

6" minimum by plowing, harrowing, or disking until soil is well pulverized and thoroughly mixed.

3. Lime or additional fertilizer may be required to be added – determinate on the Contractor's soil test results on the existing soil. This will be at no additional cost to the Contract.

B. Fine Grading in all Landscape Areas:

1. Do fine grading for all areas prior to seeding or planting.
2. For ground surface areas surrounding buildings to be landscaped, maintain required positive drainage away from buildings.
3. Establish finish grades to within 0.1 foot of grades indicated. Allow 1-1/2 inch for thickness of sod.
4. Noxious weeds or parts thereof shall not be present in the surface grade prior to seeding.
5. Prior to acceptance of grades, hand rake to smooth, even surface, free of debris, clods, rocks and vegetable matter greater than 0.5 inch.

3.4 NOTIFICATION AND INSPECTION

A. Inspection: Provide notice to Project Manager requesting inspection at least seven (7) days prior to anticipated date of completion.

B. Deficiencies: Project Manager will specify deficiencies to Contractor who shall make satisfactory adjustments and shall again notify Project Manager for final inspection.

3.5 CLEANING

A. General: Remove debris and excess materials from site. Clean out drainage inlet structures. Clean paved and finished surfaces soiled as a result of work under this Section, in accordance with direction given by Project Manager.

3.6 PROTECTION

A. General: Provide and install barriers as required and as directed by Project Manager to protect completed areas against damage from pedestrian and vehicular traffic until acceptance by City. Contractor is not responsible for malicious destruction caused by others.

END OF SECTION

TOPSOIL

SECTION 02925

PART 1: GENERAL

1.01 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division - 1 Specification sections apply to Work of this section.

1.02 DESCRIPTION: The work of this section consists of furnishing, stockpiling and placing topsoil on a previously prepared subgrade.

1.03 RELATED WORK:

A. Earthwork - Section 02200

B. Seeding & Mulching – Section 02910

C. Soil Preparation - Section 02920

D. Trees and Shrubs - Section 02950

1.04 QUALITY ASSUARANCE: Contractor shall submit soil analysis report for on-site topsoil from the State University Agricultural Extension Service or other approved soil testing laboratory. Report shall cover soil textural classification (percentages of sand, silt, and clay), pH and include additive recommendations. Testing will be at the expense of the Contractor. Contractor to amend topsoil per test recommendations with approval of Project Manager.

1.05 DELIVERY, STORAGE AND HANDLING: Do not deliver or place topsoil in frozen, wet, or muddy condition.

PART 2: PRODUCTS

2.01 ON-SITE TOPSOIL:

A. Topsoil previously stripped and stockpiled under Section 02200.

PART 3: EXECUTION

3.01 PLACING TOPSOIL:

A. Scarify compacted subgrade to a 6-inch depth to bond topsoil to subsoil. Place topsoil to a minimum depth of 4-inches after settlement. Topsoil shall be free from weeds, sod, clods and stones larger than 1-inch, toxic substances, litter or other deleterious material. Spread evenly and grade to elevations and slopes shown. Hand rake areas inaccessible to machine grading.

B. Utilize salvaged topsoil as the top layer to the extent available until exhausted. If salvaged topsoil runs out prior to complete site respreading – then the contractor shall import appropriate topsoil at no additional cost to the project.

C. Topsoil shall be placed over all areas disturbed during construction except those areas which will be paved, graveled or rip rapped, or receive wood chips.

C. Topsoil shall not be placed when conditions are frozen or muddy.

D. The final surface shall be hand or mechanically raked to an even surface to the finish grade as shown on Drawings.

E. All stones and roots over 2-inches, rubbish, and other deleterious materials shall be removed and disposed of.

END OF SECTION

TREES AND SHRUBS

SECTION 02950

PART 1 – GENERAL

1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division 1 Specification Sections apply to Work of this Section.

1.2 DESCRIPTION: The work of this section consists of providing, installing, and maintaining live woody plant material.

1.3 RELATED SECTIONS:

A. This is intended to supplement the requirements of section 1060 in the *NCDOT 2012 Standard Specifications for Roads and Structures*.

1.4 SUBMITTALS

A. Delivery tickets for all bulk materials with Engineer's approval or acknowledgment that materials were received in satisfactory condition.

B. Product certificates signed by manufacturers certifying that their products comply with specified requirements.

1. Manufacturer's certified analysis for standard products, where applicable.
2. Analysis for other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Planting schedule indicating anticipated dates and locations for each type of planting.

D. Three (3) copies of a written warranty stating all items included in the warranty, conditions of the warranty, and beginning and ending of warranty period(s).

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful landscape establishment.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that landscaping is in progress.

B. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Engineer's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without

delaying the Work.

C. Provide quality, size, genus, species, and variety of trees indicated, complying with applicable requirements of ANSI Z60.1 "American Standard for Nursery Stock", and all applicable state and local rules and regulations.

D. Inspection: Engineer may inspect plants either at place of growth or at site before planting, for compliance with requirements for name, variety, size, and quality.

1. The Engineer reserves the right to reject at any time or place prior to final acceptance all plant materials, which in the Engineer's opinion fail to meet specifications. Inspection of materials is primarily for quality, size, and variety, but other requirements are not waived even though visual inspection results in approval. Plants are to be inspected where available; however, inspection at the places of supply shall not preclude the right of rejection at the site or at a later time prior to final acceptance. Rejected material shall be removed from the site within 24 hours.

E. Soil Analysis: The Contractor shall furnish a soil analysis made by a qualified independent soil-testing agency stating percentages of organic matter, inorganic matter (silt, clay, and sand), deleterious material, pH, and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for growth of applicable planting material. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce a satisfactory topsoil.
2. Provide testing from 4 locations per direction of Engineer.
3. The Contractor shall perform soil tests 30 days prior to mobilizing for landscape construction.
4. Soil testing shall be provided by a certified soil testing laboratory located within the State of North Carolina, the NCSU Cooperative Extension Service or other approved testing facility. Soil shall be tested for soluble salts and nutrient levels. Testing facility shall provide interpretation of results and recommendation for soil amendments for each type of planting.
5. Deficient nutrients shall be corrected with the addition of appropriate fertilizer and amendment materials. The Contractor shall submit a Change Order Request for all additional materials that are recommended but are not included in this Specification.

F. Measurements: Measure trees according to ANSI Z60.1 with branches and trunks in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches (150 mm) above ground for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above ground for larger sizes. Measure main body of tree for height and spread; do not measure branches or roots tip-to-tip.

G. Pre-installation Conference: Contractor shall attend pre-installation conference on-site at a time specified by Engineer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site. The Engineer reserves the right to inspect containers before or after installation to verify compliance with Specifications.

B. Trees: Deliver nursery stocked or freshly dug trees. Do not prune before delivery, except as approved by Engineer. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees in such a manner as to destroy natural shape. Provide protective covering during delivery. Plant materials delivered without protective covering may be rejected. Do not drop trees during delivery. Label at least one tree of each variety with a securely attached waterproof tag bearing a legible plant name. Remove all tags and flagging as directed by Engineer.

C. Handle balled and burlapped stock by the root ball only.

D. Deliver trees after preparations for planting have been completed and install immediately. If planting is delayed more than 6 hours after delivery, set planting materials in shade, protect from weather and mechanical damage, and keep roots moist.

1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
2. Do not remove container-grown stock from containers before time of planting.
3. Water root systems of trees stored on site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.7 PROJECT CONDITIONS

A. Utilities: Determine location of above grade and underground utilities and perform work in a manner that will avoid damage. Hand excavate, as required. Maintain grade stakes until their removal is mutually agreed upon by parties concerned. Contractor shall be responsible for utility locating, repair of utilities damaged by Contractor, and establishment of grade controls.

B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Engineer before planting.

C. Protection: Erect and maintain barricades, warning signs and lights, and provide guards as necessary or required to protect all persons on the site.

1.8 COORDINATION AND SCHEDULING

A. Coordinate installation of planting materials during normal planting seasons for

each type of plant material required.

B. Plant trees after final grades have been accepted and prior to planting turf, unless otherwise authorized by Engineer.

1.9 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the City of Asheville of other rights the City may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Warrant trees and shrubs for a period of one year after date of Final Acceptance, against defects including death and unsatisfactory growth. Warranty shall not cover defects resulting from lack of adequate maintenance, neglect, or abuse by the City, abnormal weather conditions unusual for warranty period, or incidents that are beyond Contractor's control.

C. Replace planting materials that are excessively pruned, more than 20 percent dead, or in an unhealthy or declining condition immediately upon notice from the Engineer.

D. All plants shall be true to name and meet all conditions of these specifications. Any plant that is not true to name as indicated by form, leaf, flower, or fruiting characteristics shall be replaced at the Contractor’s expense.

E. Inadequate or improper maintenance by the City shall not be cause for replacement, provided the Contractor shall have submitted a letter or report to the City on improper or inadequate maintenance practices and recommended remedial actions.

F. The warranty shall not be enforced should any plant die due to vandalism after Final Acceptance.

1.10 TREE MAINTENANCE DURING CONSTRUCTION PERIOD:

A. Maintain trees by pruning, cultivating, watering, winter watering, weeding, restoring planting saucers, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as required to keep trees free of insects and disease. Trees shall be maintained until Final Acceptance of the entire project.

B. Watering – 1 year of watering and maintenance is required. Use low flow hose end nozzle to thoroughly soak the root ball multiple times during the first four weeks of establishment. After the first four weeks, water volume can be reduced to a level of 1” of moisture/week during the active growing season defined as April 15th through November 1st. If precipitation is greater than or equal to 1” in any given week during the active growing season, no additional watering shall be required.

C. Root Pruning – Areas requiring root pruning must be approved by a Certified Arborist to prevent a hazardous tree condition. Acceptable methods of cutting

are by sharp hand pruners, loppers, hand saw, or hydraulic tools – implement used must leave a “clean” cut. If excavation causes pruned roots over 1.5” in diameter to remain exposed for more than 24 hours, roots on the tree side shall be kept moist – acceptable methods include backfill with topsoil, moist mulch, or drape with wet burlap. Where concrete is poured adjacent to pruned roots heavy duty plastic shall be installed against the tree side of the pruned roots to prevent uptake.

PART 2 - PRODUCTS

2.1 PLANT MATERIALS

A. General: Furnish nursery-grown trees and shrubs conforming to ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully-branched, healthy, vigorous stock free of disease, insects, eggs, larvae, girdling, and defects such as sun scald, injuries, abrasions, and disfigurement. Trees of a larger size may be used if acceptable to Engineer with a proportionate increase in size of roots and balls.

B. Label at least 1 plant of each variety and caliper with a securely attached waterproof tag bearing legible designation of botanical and common name.

C. All plants shall be the species designated on the Drawings. No substitutions will be accepted without the prior written approval of the Engineer. Contractor must provide proof of non-availability.

2.2 TREES

A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, conforming to ANSI Z60.1 for type of trees required.

1. Branching Height: 1/3 to ½ of tree height.

B. Provide balled and burlapped trees. Container-grown trees will be acceptable in lieu of balled and burlapped trees subject to meeting ANSI Z60.1 limitations for container stock.

C. All deciduous trees of one species used in formal rows or groupings shall exhibit cultural uniformity, i.e. “matched” in height, crown width and shape, height to first branch, and trunk taper. For this reason it is desired that these trees be produced by a single grower as it is Essential for Synchronization.

2.3 SHRUBS

A. Provide plants well established and rooted in removable containers with not less than the minimum number and length of branches required by ANSI Z60.1 for the pot size indicated.

2.4 ORNAMENTAL GRASSES

A. Provide plants well established and rooted in removable containers with not less than the minimum number and length of branches required by ANSI Z60.1 for the pot size indicated.

2.5 MULCH

A. Organic Mulch: Organic mulch, free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of shredded hardwood wood material not larger than three inches (3") in length/dimension. Submit 1.0 CF sample for approval.

2.5 TOPSOIL

A. Shall be soil stockpiled on site or excavated from plant pit.

2.6 WATER

A. Contractor shall supply water for temporary watering of landscaping until final acceptance.

B. Water shall not contain any substances injurious to plant growth.

2.7 MISCELLANEOUS MATERIALS

A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's instructions.

B. Pre-Emergent Herbicide: Treflan as manufactured by Elanco Company, or an approved equal.

C. Herbicides and Pesticides: EPA registered and approved, of type recommended by manufacturer.

D. Tree Stakes: 8' tall shaved juniper stakes 2" in diameter, or an approved equal.

E. PVC Pipe: ½" diameter and 3' long (approx. – field measure), or an approved equal.

F. Tree Ties: Grommeted nylon straps, 1 ½" wide, or approved equal.

G. Staking Wire: Fourteen (14) or sixteen (16) gauge or larger galvanized steel, or an approved equal.

I. Evergreen Tree Guying Anchor: #4 deformed steel rebar or larger or steel T-bars 30 inches long.

1. Deadman Type: Locust, catalpa, cedar or redwood, with minimum length of 24 in. and sufficient diameter to hold eyebolt securely. Provide each deadman with on (1) ¾ in. x 4 in. galvanized eyebolt, centered and secured on its side.
2. Optional Anchor Types: Screw-type galvanized steel ground anchor, or

Universal ground anchors, as manufactured by Laconia Malleable Iron Company, Laconia, NH, or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Cooperate with any other contractors and trades which may be working in and adjacent to the landscape work areas. Examine drawings which show the development of the entire site and become familiar with the scope of all work required.

3.2 FINISH AND FINE GRADING

A. Tillable Soil: Mechanically rip or disk subsoil in all areas to be planted to minimum depth of 6 inches prior to placing top soil and soil amendments.

B. Positive Surface Drainage: Finish and fine grade the project area to establish an even and well matched gradient over the entire surface. Provide positive surface drainage, with no depressions, settling, or irregularities in the finished grade.

C. Transitional Areas: At any transitional point or line where one plane intersect another, such as from a sloping area or berm to a level area, a smooth and gentle transition shall be made. There shall be no abrupt changes in grade unless specifically noted otherwise. Match the grades of new work with existing areas outside the project area.

D. Finish Grade Tolerance: The finish grade elevation shall not vary above or below the proposed grade more than 0.05 foot.

3.3 PREPARATION: Lay out individual tree locations and areas for multiple plantings. Stake locations, outline areas, and secure Engineer's acceptance before the start of planting work. Make adjustments as directed at no additional cost to the City.

3.4 WEED CONTROL

A. In areas that have been regraded and/or have existing weed growth, weed control measures appropriate to the amount of growth and/or species shall be provided. Submit weed control plan to Engineer for approval.

B. Clear and grub, apply pre-emergent herbicide, and/or apply post emergent herbicide as necessary to eliminate weeds. Do not proceed with landscape work until weed growth has been controlled.

3.5 TOPSOIL PLACEMENT: Place topsoil to a depth of 4" in shrub beds

3.6 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits: Excavate with vertical sides and with bottom of excavation slightly raised at center to assist drainage. Roughen sides of planting pit. Excavation of tree pits shall be to a depth that allows the root collar to be apparent at surface of ball. If root collar is not apparent Contractor will be responsible for removing excess soil from top of rootball. The trees and shrubs shall be planted no more than 2" above grade and shall not be planted below grade

1. Balled and Burlapped Trees: Excavate approximately 2 times as wide as ball diameter. The depth of the plant pit shall be 2 inches less than the depth of the ball in well drained soils and 4 inches less than the ball depth in poorly drained soils.
2. Container-Grown Trees and Shrubs: Excavate approximately 2 times as wide as container diameter. The depth of all plant pits shall be 1 inch less than depth of container.
3. Where drain tile is shown or required under planted areas, excavate to top of porous backfill over tile.

B. Obstructions: Notify Engineer if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavation.

C. Drainage: Notify Engineer if subsoil conditions show evidence of water seepage or retention in tree or shrub pits.

1. Fill the pit with water and allow it to completely drain before planting occurs.
2. If water does not drain out of pit within 24 hours, notify Engineer.

3.7 PLANTING TREES AND SHRUBS

A. Balled and Burlapped Stock:

1. Set balled and burlapped stock plumb and in center of pit with top of ball raised above adjacent finish grades as indicated.
2. Remove all burlap, lacing, and wire basket from at least the top ½ of the rootball and discard from the planting hole. Do not remove burlap and lacing from under balls. Remove wire baskets entirely. Remove pallets, if any, before setting. Do not use planting stock if ball is cracked or broken before or during planting operation.
3. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill. Create 48" diameter saucer around tree and fill with 4" specified wood mulch.
4. Remove Burlap or trunk wrap after backfilling.

B. Container Grown Stock:

1. Carefully remove containers so as not to damage root balls.

2. Lightly scratch sides of exposed root ball to loosen surface roots.
3. Set plants plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.
4. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.

3.8 PRUNING OF PLANTS:

All Pruning, thinning, shaping, or removing of injured or dead branches shall be done by or under the supervision of an ISA Certified Arborist or City approved professional. ANSI A-300 Pruning Standards shall be strictly adhered to.

3.9 MULCHING

A. Mulch backfilled surfaces of pits, planted areas, non-irrigated zones, and other areas indicated.

B. Pre-Emergent Herbicide: Apply pre-emergent herbicide to all shrub bed areas at the rate recommended by the manufacturer. Do not apply to annual, perennial, or ground cover areas.

C. Mulch in shrub bed areas: Apply 3” (100 mm) thick layer of mulch and finish level with adjacent finish grades. Do not place mulch against trunks or stems.

D. Mulch tree rings in turf and native grass areas with 3 inch depth specified mulch. Mulch ring to be 48" diameter.

3.10 INSTALLATION OF MISCELLANEOUS MATERIALS

A. Apply antidesiccant using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage.

1. When deciduous trees or shrubs are moved in full-leaf, spray with antidesiccant at nursery before moving and again 2 weeks after planting.

3.11 CLEANUP AND PROTECTION

A. During landscaping, keep pavements clean and work area in an orderly condition.

B. Protect landscaping from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

C. At the time of the final inspection of the work, clean all paved areas by sweeping and washing. Remove construction equipment, excess materials, debris or rubbish from the site.

3.12 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the City's property.

3.13 STAKING

A. Remove all staking materials after the one year period.

PART 4 – MEASUREMENT AND PAYMENT

4.1 Trees

A. Measurement

The quantity of Trees to be paid for will be the actual number of trees incorporated into the Work of the type, size, and at the locations shown on the Drawings.

B. Payment

The unit price for Trees shall include full compensation for all labor, equipment, and materials associated with procuring, delivering, planting, and maintaining the trees in accordance with this section. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer.

4.2 Shrubs

A. Measurement

The quantity of Shrubs to be paid for will be the actual number of shrubs incorporated into the Work of the type, size, and at the locations shown on the Drawings.

B. Payment

The unit price for shrubs shall include full compensation for all labor, equipment, and materials associated with procuring, delivering, planting, and maintaining the shrubs in accordance with this section. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer.

4.3 Additional Landscaping Allowance

1. Measurement and Payment

The quantity of Additional Landscaping Allowance to be paid as a lump sum for material incorporated into the Work at direction of the Engineer. The lump sum price for Additional Landscaping Allowance shall include full compensation for all

labor, equipment, and materials associated with procuring, delivering, planting, and maintaining the additional landscaping in accordance with this section. Partial payments will be equal to the percentage of such item that is complete as estimated by the Engineer.

END OF SECTION

SECTION 03300

CAST IN PLACE CONCRETE

PART 1 - MATERIALS

A. Portland cement concrete and admixtures for structures, culvert end walls, curb and gutter, wheelchair ramps, sidewalks, and other items as specified on the plans shall meet the requirements of Section 1000 of the NCDOT Standard Specifications for Class A or Class B as listed below.

Item	Concrete
Concrete Stairs with Bike Channel	Class AA[1]
4.5” Sidewalk	Class AA[1]
4.5” Sidewalk With 6” Curb	Class AA[1]
6” Driveway	Class AA[1]
Concrete Curb Ramp	Class AA[1]
Single Face Concrete Barrier	Class AA[1]
MSD Pipe Encasement	Class A
Concrete for Trail Accessory Foundations	Class B
Concrete Paved Ditch	Class B
Surface Mounted Monolithic Concrete Island	Class B
1’-6” Concrete Curb and Gutter	Class B
Flowable Fill	Class B[2]

[1] Contractor has the option of utilizing 4000 PSI Concrete in lieu of Class AA concrete. 4000 PSI Mix design shall be approved by the Engineer before use.

[2] Contractor has the option of utilizing 150 PSI Concrete in lieu of Class B concrete. 150 PSI Mix design shall be approved by the Engineer before use.

B. Joint filler shall be a non-extruding joint material conforming to ASTM C1751.

C. Aggregate for portland cement concrete shall meet the requirements for fine and course aggregate of Section 1014 of the NCDOT “Standard Specifications for Roads and Structures.”

D. Water for mixing or curing the concrete shall be free from injurious amounts of oil, salt, acid, or other products injurious to the finished product.

PART 2 - QUALITY ASSURANCE

A. Concrete shall be only plant-mixed, transit-mixed or ready-mixed concrete. The time elapsing from mixing to placing the concrete shall not exceed ninety (90) minutes. Concrete shall not be deposited on frozen subgrade and shall not be poured when the air temperature is falling and below 40° F, and the predicted low temperature for the succeeding 24 hour period is less than 32° F.

B. All concrete when placed in the forms shall have a temperature of between 50° F and 90° F and shall be maintained at a temperature of not less than 50° F for at least

72 hours for normal concrete and 24 hours for high early strength concrete, or for as much time as is necessary to secure proper rate of airing and designed compressive strength. The use of admixture, retarders, and accelerators shall be used as directed by the Engineer.

PART 3 - CONSTRUCTION METHODS - GENERAL

A. Proportioning of Concrete: The concrete shall be mixed in proportions discussed herein and approved by the Engineer.

B. Mixing Concrete: The concrete shall be mixed by machine on the job or at a central mixing plant. A batch mixer of any approved type may be used. The method of measuring the materials for the concrete, including water, shall be one which will insure separate and uniform proportions of each of the materials at all times. The mixing shall continue at least 1-1/2 minutes after all ingredients have been emptied before receiving material for the succeeding batch.

   i. A central mixing plant shall not be used until approved by the Engineer and shall be certified by the NCDOT. The concrete from a central plant shall be delivered and deposited at the consistency specified without segregation. The time elapsing from mixing to placing the concrete shall not exceed ninety (90) minutes.

   ii. Concrete shall be mixed only in such quantities as are required for immediate use and all such material shall be used while fresh and before initial set has taken place. Any concrete in which set has begun shall not be used in the work. Retempering of concrete will not be allowed.

C. Subgrade: The subgrade shall be excavated to the required depth below the finished surface in accordance with the plans to the lines and grades established by the Engineer. All soft yielding material or other unsuitable material shall be removed and replaced with suitable material and the subgrade shall be compacted thoroughly and finished to a firm, smooth surface. No curb and gutter, driveways, driveway aprons, wheelchair ramps, sidewalks, or traffic islands shall be poured until the subgrade is approved by the inspector.

D. Forms: The forms shall be of metal and of the necessary dimensions to construct the combined curb and gutters specified in the plans. Wood forms may be used where conditions make the use of metal forms impractical. The use of wood forms must be approved by the Engineer. The forms shall be set true to the line and grade established by the Engineer and held rigidly in position, so as to prevent leakage of mortar and springing out of line when the concrete is placed in them. The forms shall be true in line, free from warping or bending. No concrete shall be placed until the forms and subgrades have been approved by the Inspector.

E. Placing of Concrete: The subgrade shall be moistened and the concrete shall be placed in the forms and tamped sufficiently to bring the mortar to the surface, after which it shall be finished smooth and even by means of a wooden float.

i. The curb and gutter shall be constructed in place in uniform sections ten (10) feet in length. The joints between sections shall be formed by steel templates one-sixth (1/6) inch in thickness and of the width and depth of the curb and gutter. The templates shall be left in place until the concrete has set sufficiently to hold its shape, but shall be removed while the forms are still in place.

ii. Machine poured concrete curb and gutter will be scored at 15 feet intervals with expansion joints located at intervals no greater than 50 feet.

iii. Expansion joints shall be one-half (1/2) inch in width and shall be placed between all rigid objects at a distance of no more than fifty (50) feet apart and shall extend the full depth of the concrete with the top of the filler one-half (1/2) inch below the finished surface.

F. Finishing: The edges of the curb and gutter shall be finished with an approved edging tool of one-half (1/2) inch radius. Joints shall be similarly finished immediately after the templates have been removed.

G. Curing: Contractor may select method of curing provided that the method is approved by the Engineer and that the means and methods of curing conform to standards specified by current AASHTO or ASTM specifications.

H. Removing Forms: Forms shall not be removed from freshly placed concrete until it has set for at least 12 hours. Forms shall be carefully removed in such a manner as to prevent damage to the edges of the concrete. Any honeycombed areas along the sides shall be filled promptly with mortar composed of one part cement and two parts of fine aggregate.

I. Cold Weather and Concrete Placement at Nighttime: Concreting shall be done when weather conditions are favorable unless otherwise directed by the Engineer. Concrete operations shall be discontinued when a temperature of 40° F is reached on a falling thermometer and may be continued when temperature reaches 35° F on a rising thermometer. No concreting shall be attempted when local weather bureau indicates temperature below freezing within the ensuing 24 hours unless proper precautions are made to protect the concrete by covering with straw or other thermal insulation satisfactory to the Engineer. The Contractor shall be responsible for the quality and strength of the concrete laid during cold weather and any concrete damaged by frost action or freezing shall be removed and replaced as directed by the Engineer at the Contractor's expense.

i. The Contractor may be permitted by the Engineer to proceed with concrete operations during cold weather in temperatures of not less than 25° F at placing time provided that the Contractor furnishes an approved admixture and uses an amount per batch not to exceed two percent (2%) by weight of the total amount of cement, and further provided that he takes other precautions deemed necessary by the Engineer to prevent concrete from freezing during curing period.

ii. No more concrete shall be laid than can be properly finished and covered during daylight, unless adequate artificial light satisfactory to the Engineer is provided.

J. Protection of Concrete: Immediately after the forms have been removed and all honeycombed areas repaired, the back of the curb shall be backfilled to prevent underwash. Traffic shall be excluded from crossing the concrete for a period of approximately fourteen (14) days, by erection and maintenance of suitable barricades, unless otherwise specified in the Contract Documents or by the Engineer. Contractor shall be responsible for any damage resulting from traffic or vandalism until accepted by the Engineer, and he shall remove and replace any concrete damaged as directed by the Inspector.

PART 4 - CONSTRUCTION METHODS

A. Areas of concrete to be removed shall be sawcut before removing. The sawcut shall provide a smooth, straight edge approximately two (2) inches deep before breaking away the adjacent concrete. There will be no direct payment for the work covered by this section.

B. Structural concrete shall be placed in accordance with applicable sections of the NCDOT "Standard Specifications for Roads and Structures".

C. Any incidental concrete shall be constructed in accordance with Section 825 of the NCDOT "Standard Specifications for Roads and Structures".

D. Construction of Concrete Endwalls shall be in accordance with applicable NCDOT Standard Drawings and Sections 838 and 840 of the NCDOT Standard Specifications. Precast units, if used, shall be constructed in accordance with Section 840 of NCDOT Standard Specifications and in accordance with manufacturer's instructions.

E. No backfill shall be placed adjacent to the curb & gutter, concrete aprons, or other items until at least 3 curing days have elapsed, as defined in Section 825-9 of the NCDOT "Standard Specifications for Roads and Structures." However, all backfill shall be placed within 4 calendar days after the completion of this 3 curing day time period. Backfill shall be clean earthen material free of all debris and shall be compacted to a degree comparable to the adjacent undisturbed material or as directed by the inspector.

PART 5 – CONCRETE WASHOUT STRUCTURE

A. Concrete washout structures are enclosures above or below grade to contain concrete waste water and associated concrete mix from washing out ready-mix trucks, drums, pumps, or other equipment. Concrete washouts must collect and retain all the concrete washout water and solids, so that this material does not migrate to surface waters or into the ground water. These enclosures are not intended for concrete waste not associated with wash out operations.

The concrete washout structure may include constructed devices above or below ground and or commercially available devices designed specifically to capture

concrete waste water.

B. Materials

Item	Section
Silt Fence	02276-1

Safety Fence shall meet the specifications as provided elsewhere in this contract.

Geomembrane basin liner shall meet the following minimum physical properties for low permeability; it shall consist of a polypropylene or polyethylene 10 mil think geomembrane. If the minimum setback dimensions can be achieved the liner is not required. (5 feet above groundwater, 50 feet from top of bank of perennial stream, other surface water body, or wetland.)

C. Construction Methods

Build an enclosed earthen berm or excavate to form an enclosure in accordance with the details and as directed.

Install temporary silt fence around the perimeter of the enclosure in accordance with the details and as directed if structure is not located in an area where existing erosion and sedimentation control devices are capable to containing any loss of sediment.

Post a sign with the words "Concrete Washout" in close proximity of the concrete washout area, so it is clearly visible to site personnel.

The construction details for the above grade and below grade concrete washout structures can be found on the following web page link:

http://www.ncdot.gov/doh/operations/dp_chief_eng/roadside/soil_water/details/

Alternate details for accommodating concrete washout may be submitted for review and approval.

The alternate details shall include the method used to retain and dispose of the concrete waste water within the project limits and in accordance with the minimum setback requirements. (5 feet above groundwater, 50 feet from top of bank of perennial stream, other surface water body, or wetland.)

D. Maintenance and Removal

Maintain the concrete washout structure(s) to provide adequate holding capacity plus a minimum freeboard of 12 inches. Remove and dispose of hardened concrete and return the structure to a functional condition after reaching 75% capacity.

Inspect concrete washout structures for damage and maintain for effectiveness.

Remove the concrete washout structures and sign upon project completion. Grade the earth material to match the existing contours and permanently seed and mulch area.

E. Measurement and Payment

Concrete Washout Structure will be paid for per each enclosure installed in accordance with the details. If alternate details are approved then those details will also be paid for per each approved and installed device.

Temporary Silt Fence will be measured and paid for in accordance with Item No. 02276-1.

No measurement will be made for other items or for over excavation or stockpiling.

END OF SECTION

SECTION 03600

GROUT

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish all materials, labor, and equipment required to provide all grout used in concrete work and as bearing surfaces for base plates, in accordance with the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Requirements of related work are included in Division 1 and Division 2 of these Specifications.

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1.	CRD-C 621	Corps of Engineers Specification for Non-shrink Grout
2.	ASTM C 109	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch or 50 mm cube Specimens)
3.	ASTM C 531	Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts and Monolithic Surfacings
4.	ASTM C 579	Test Method for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacings
5.	ASTM C 827	Standard Test Method for Early Volume Change of Cementitious Mixtures
6.	ASTM C 144	Standard Specification for Aggregate for Masonry Mortar
7.	ASTM C 1107	Standard Specification for Packaged Dry, Hydraulic Cement Grout (Nonshrink)

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300 - Submittals.

1. Certified test results verifying the compressive strength and shrinkage and expansion requirements specified herein.
2. Manufacturer's literature containing instructions and recommendations on the mixing, handling, placement and appropriate uses for each type of grout used in the work.

1.05 QUALITY ASSURANCE

A. Field Tests

1. Compression test specimens will be taken by the Engineer or its representative during construction from the first placement of each type of grout and at intervals thereafter as selected by the Engineer to insure continued compliance with these Specifications.

a. Compression tests and fabrication of specimens for cement grout and non-shrink grout will be performed as specified in ASTM C 109 at intervals during construction as selected by the Engineer.

1). A set of three specimens will be made for testing at seven days, 28 days and any additional time period as appropriate.

b. Compression tests and fabrication of specimens for epoxy grout will be performed as specified in ASTM C 579, Method B, at intervals during construction as selected by the Engineer.

1). A set of three specimens will be made for testing at seven days and any other time period as appropriate.

2. The cost of all laboratory tests on grout will be borne by the Owner, but the Contractor shall assist the Engineer in obtaining specimens for testing.

a. The Contractor shall be charged for the cost of any additional tests and investigation on work performed which does not meet the specifications.

b. The Contractor shall supply all materials necessary for fabricating the test specimens, at no additional cost to the Owner.

3. All grout, already placed, which fails to meet the requirements of these Specifications, is subject to removal and replacement at no additional cost to the Owner.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Cement Grout

1. Cement grout shall be composed of Portland Cement and sand in the proportion specified in the Contract Documents and the minimum amount of water necessary to obtain the desired consistency.

    a. If no proportion is indicated, cement grout shall consist of one part Portland Cement to three parts sand. Water amount shall be as required to achieve desired consistency without compromising strength requirements.

    b. White portland cement shall be mixed with the Portland Cement as required to match color of adjacent concrete.

2. The minimum compressive strength at 28 days shall be 4000 psi.

3. For beds thicker than 1½ inch and/or where free passage of grout will not be obstructed by coarse aggregate, 1½ parts of coarse aggregate having a top size of 3/8 inch should be added.

4. Sand shall conform to the requirements of ASTM C144.

B. Non-Shrink Grout

1. Non-shrink grout shall conform to CRD-C 621 and ASTM C 1107, Grade B or C when tested at a maximum fluid consistency of 30 seconds per CDC 611/ASTM C939 at temperature extremes of 45°F and 90°F and an extended working time of 15 minutes.

    a. Grout shall have a min. 28-day strength of 7,000 psi.

    b. Non-shrink grout shall be, "Euco N-S" by the Euclid Chemical Company, "Masterflow 713" by Master Builders, "Sikagrout 212" by Sika Corporation, or equal.

C. Epoxy Grout

1. Epoxy grout shall be "Sikadur 32 Hi-Mod" by Sika Corporation, "Duralcrete LV" by Tamms Industries, or "Euco #452" by Euclid Chemical, or equal.

2. Epoxy grout shall be modified as required for each particular application with aggregate per manufacturer's instructions.

2.02 CURING MATERIALS

A. Curing materials shall be as specified in Section 03370, Concrete Curing for cement grout and as recommended by the manufacturer for prepackaged grouts, or an approved equal.

PART 3 -- EXECUTION

3.01 GENERAL

A. The different types of grout shall be used for the applications stated below unless noted otherwise in the Contract Documents.

1. Cement grout shall be used for grout toppings and for patching of fresh concrete.

2. Non-shrink grout shall be used for grouting beneath base plates of equipment and structural metal framing.

3. Epoxy grout shall be used for bonding new concrete to hardened concrete.

4. Where grout is called for in the Contract Documents which does not fall under any of the applications stated heretofore, non-shrink grout shall be used unless another type is specifically referenced.

B. New concrete surfaces to receive cement grout shall be as specified in Section 03350, Concrete Finishes, and shall be cleaned of all dirt, grease and oil-like films.

1. Existing concrete surfaces shall likewise be cleaned of all similar contamination and debris, including chipping or roughening the surface if a laitance or poor concrete is evident.

2. The finish of the grout surface shall match that of the adjacent concrete.

3. Curing and protection of cement grout shall be as specified in Section 03370, Concrete Curing.

C. All mixing, surface preparation, handling, placing, consolidation, and other means of execution for prepackaged grouts shall be done according to the instructions and recommendations of the manufacturer.

D. The Contractor, through the manufacturer of a non-shrink grout and epoxy grout, shall provide on-site technical assistance upon request, at no additional cost to the Owner.

3.02 CONSISTENCY

A. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application.

1. Dry pack consistency is such that the grout is plastic and moldable but will not flow.

3.03 MEASUREMENT OF INGREDIENTS

A. Measurements for cement grout shall be made accurately by volume using containers.

1. Shovel measurement shall not be allowed.

B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

3.04 GROUT INSTALLATION

A. Grout shall be placed quickly and continuously, shall completely fill the space to be grouted and be thoroughly compacted and free of air pockets.

1. The grout may be poured in place, pressure grouted by gravity, or pumped.

2. The use of pneumatic pressure or dry-packed grouting requires approval of the Engineer.

3. For grouting beneath base plates, grout shall be poured form one side only and thence flow across to the open side to avoid air-entrapment.

- END OF SECTION -

SECTION 05010

METAL MATERIALS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Metal materials not otherwise specified shall conform to the requirements of this Section.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Materials for fasteners are included in Section 05050, Metal Fastening.

B. Requirements for specific products made from the materials specified herein are included in other sections of the Specifications. See the section for the specific item in question.

C. Requirements for Pipe Piles shall be in accordance with section 1084 of the North Carolina Department of Transportation Standard Specifications.

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A.	ASTM A572/A572M-94C	Standard Specification for High Strength Low-Alloy Columbium-Vanadium Structural Steel Grade 50
B.	ASTM A47	Standard Specification for Malleable Iron Castings
C.	ASTM A48	Standard Specification for Gray Iron Castings
D.	ASTM A167	Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
E.	ASTM A276	Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes
F.	ASTM A307	Standard Specification for Carbon Steel Externally Threaded Standard Fasteners
G.	ASTM A446	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) quality
H.	ASTM A500	Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

I.	ASTM A501	Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
J.	ASTM A529	Standard Specification for Structural Steel with 42 000 psi (290 Mpa) Minimum Yield Point (½ in. (12.7 mm) Maximum Thickness)
L.	ASTM A536	Standard Specification for Ductile Iron Castings
M.	ASTM A570	Standard Specification for Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality
N.	ASTM A666	Standard Specification for Austenitic Stainless Steel, Sheet, Strip, Plate, and Flat Bar for Structural Applications

1.04 SUBMITTALS

A. Material certifications shall be submitted along with any shop drawings for metal products and fabrications required by other sections of the Specifications.

1.05 QUALITY ASSURANCE

A. Owner may engage the services of a testing agency to test any metal materials for conformance with the material requirements herein.

1. If the material is found to be in conformance with Specifications the cost of testing will be borne by the Owner.

2. If the material does not conform to the Specifications, the cost of testing shall be paid by the Contractor and all materials not in conformance as determined by the Engineer shall be replaced by the Contractor at no additional cost to the Owner.

a. In lieu of replacing materials the Contractor may request further testing to determine conformance, but any such testing shall be paid for by the Contractor regardless of outcome of such testing.

PART 2 -- PRODUCTS

2.01 CARBON AND LOW ALLOY STEEL

A. Material types and ASTM designations shall be as listed below:

1.	Plates and Structural Fabrications	A572 Grade 50
2.	Sheet Steel	A 570 Grade C
3.	Bars and Rods	A 36 or A307 Grade A
4.	Pipe - Structural Use	Shall be in accordance with section 1084 of the North Carolina

		Department of Transportation Standard Specifications
5.	Tubes	A500 Grade B or A501
6.	Cold-Formed Structural Studs and Joists (18-22 gauge) Cold-Formed Structural Studs and Joists (12-16 gauge)	A 446 Grade C A 446 Grade D
7.	Hot Rolled Shapes	A572 Grade 50

2.02 STAINLESS STEEL

A. All stainless steel fabrications exposed to underwater service shall be Type 316.

1. All other stainless steel fabrications shall be Type 304, unless noted otherwise.

B. Material types and ASTM designations are listed below:

1.	Plates and Sheets	ASTM A167 or A666 Grade A
2.	Structural Shapes	ASTM A276

2.03 CAST IRON

A. Material types and ASTM designations are listed below:

1.	Gray	ASTM A48 Class 30B
2.	Malleable	ASTM A47
3.	Ductile	ASTM A536 Grade 60-40-18

2.04 BRONZE

A. Material types and ASTM designations are listed below:

1.	Rods, Bars and Sheets	ASTM B138 - Alloy B Soft

2.05 HASTELLOY

A. All Hastelloy shall be Alloy C-276.

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 05035

GALVANIZING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Where galvanizing is called for in the Contract Documents, the galvanizing shall be performed in accordance with the provisions of this Section unless otherwise noted.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Further requirements for galvanizing specific items may be included in other Sections of the Specifications.

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. North Carolina State Building Code

2. ASTM A123 - Standard Specification for Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip

3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

4. ASTM A386 - Standard Specification for Zinc Coating (Hot-Dip) on Assembled Steel Products

5. ASTM A525 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements

6. ASTM A780 - Standard Practice of Repair of Damaged Hot-Dip Galvanized Coatings

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300, Submittals.

1. Certification that the item(s) are galvanized in accordance with the applicable ASTM standards specified herein.

PART 2 -- PRODUCTS

2.01 GALVANIC COATING

A. Material composition of the galvanic coating shall be in accordance with the applicable ASTM standards specified herein.

PART 3 -- EXECUTION

3.01 FABRICATED PRODUCTS

A. Products fabricated from rolled, pressed, and forged steel shapes, plates, bars, and strips, 0.03 inch thick and heavier which are to be galvanized shall be galvanized in accordance with ASTM A123.

1. Products shall be fabricated into the largest unit which is practicable to galvanize before the galvanizing is done.

2. Fabrication shall include all operations necessary to complete the unit such as shearing, cutting, punching, forming, drilling, milling, bending, and welding.

3. Welds shall be ground smooth, and weld splatter and slag material shall be removed prior to galvanization.

4. Vent holes shall be drilled at 3/8” in diameter, or as otherwise required.

5. Internal holes shall be the full I.D. of the pipe.

6. Vent holes shall be closed with drive caps or plugs after galvanization hammered and filed flush with surrounding surface.

7. Components of bolted or riveted assemblies shall be galvanized separately before assembly.

8. When it is necessary to straighten any sections after galvanizing, such work shall be performed without damage to the coating.

B. Components with partial surface finishes shall be commercial blast cleaned prior to pickling.

3.02 HARDWARE

A. Iron and steel hardware which is to be galvanized shall be galvanized in accordance with ASTM A153.

3.03 ASSEMBLED PRODUCTS

A. Assembled steel products which are to be galvanized shall be galvanized in accordance with ASTM A123 or ASTM A386. All edges of tightly contacting surfaces shall be completely sealed by welding before galvanizing.

3.04 SHEETS

A. Iron or steel sheets which are to be galvanized shall be galvanized in accordance with ASTM A525.

3.05 REPAIR OF GALVANIZING

A. Galvanized surfaces that are abraded or damaged at any time after the application of zinc coating shall be repaired.

1. Repair shall be made by thoroughly wire brushing the to clean the damaged areas by removing all loose and cracked coating.

2. The cleaned areas shall be painted with 2 coats of zinc rich paint meeting the requirements of Federal Specification DOD-P-21035A.

a. Paint shall be thoroughly mixed prior to application.

b. Zinc rich paint shall not be tinted.

c. The total thickness of the 2 coats shall not be less than 6 mils.

3. In lieu of repairing by painting with zinc rich paint, other methods of repairing galvanized surfaces in accordance with ASTM A780 may be used provided the proposed method is acceptable to the Engineer.

4. Excessive damage to galvanized surfaces as determined by the Engineer is cause for rejection. The replacement or re-galvanization of rejected galvanized material shall be at no additional cost to the owner.

- END OF SECTION -

SECTION 05050

METAL FASTENING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish all materials, labor, and equipment required to provide all metal welds and fasteners not otherwise specified, in accordance with the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05010 - Metal Materials

B. Section 05035 - Galvanizing

C. Section 05500 – Metal Fabrications

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1.	North Carolina Building Code	
2.	AISC	Specification for Structural Joints Using ASTM A325 or A490 Bolts.
3.	AISC	Code of Standard Practice
4.	AWS D1.1	Structural Welding Code - Steel
5.	ASTM A572/A572M-94C	Standard Specification for High Strength Low-Alloy Columbium-Vanadium Structural Steel Grade 50
6.	ASTM A307	Standard Specification for Carbon Steel Externally Threaded Standard Fasteners
7.	ASTM A325	Standard Specification for High-Strength Bolts for Structural Steel Joints
8.	ASTM A489	Standard Specification for Eyebolts
9.	ASTM A490	Standard Specification for Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints
10.	ASTM A563	Standard Specifications for Carbon and Alloy Steel Nuts

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300, Submittals.

1. Shop Drawings providing the fastener's manufacturer and type and certification of the fastener's material and capacity.

2. Copy of valid certification for each person who is to perform field welding.

3. Certified weld inspection reports, when required.

4. Welding procedures.

1.05 QUALITY ASSURANCE

A. Fasteners not manufactured in the United States shall be tested and certification provided with respect to specified quality and strength standards.

1. Certifications of origin shall be submitted for all U.S. fasteners supplied on the project.

B. All steel welding shall be performed by welders certified in accordance with AWS D1.1.

1. Certifications of field welders shall be submitted prior to performing any field welds.

C. Welds and high strength bolts used in connections of structural steel will be visually inspected in accordance with Article 3.04.

D. The Owner may engage an independent testing agency to perform testing of welded connections and to prepare test reports in accordance with AWS.

1. Inadequate welds shall be corrected or redone and retested to the satisfaction of the Engineer and/or an acceptable independent testing laboratory, at no additional cost to the Owner.

E. Provide a welding procedure for each type and thickness of weld.

1. For welds that are not prequalified, include a Performance Qualification Report.

2. The welding procedure shall be given to each welder performing the weld.

3. The welding procedure shall follow the format in Annex E of AWS D1.1 with relevant information presented.

PART 2 -- PRODUCTS

2.01 ANCHOR BOLTS

A. Anchor bolts shall conform to ASTM A36 or ASTM A307 Grade A except where other approved anchor bolts are shown on the Drawings.

1. Anchor bolts shall have hexagonal heads and shall be supplied with hexagonal nuts meeting the requirements of ASTM A563 Grade A.

B. Where anchor bolts are used to anchor galvanized steel or are otherwise specified to be galvanized, anchor bolts and nuts shall be hot-dip galvanized in accordance with ASTM A307.

C. Where pipe sleeves around anchor bolts are shown on the Drawings, pipe sleeves shall be cut from Schedule 40 PVC plastic piping meeting the requirements of ASTM D1785.

D. Entire length of anchor bolt shall be threaded.

2.02 HIGH STRENGTH BOLTS

A. High strength bolts and associated nuts and washers shall be in accordance with ASTM A325 or ASTM A490.

1. Bolts, nuts and washers shall meet the requirements of AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts".

B. Where high strength bolts are used to connect galvanized steel or are otherwise specified to be galvanized, bolts, nuts, and washers shall be hot-dip galvanized in accordance with ASTM A325.

2.03 CONCRETE ANCHORS

A. Where concrete anchors are called for on the Drawings, one of the types listed below shall be used; except, where one of the types listed below is specifically called for on the Drawings, only that type shall be used.

1. Unless otherwise noted, all concrete anchors which are submerged, or which are subject to vibration from equipment such as pumps and generators, shall be adhesive anchors.

2. The determination of anchors equivalent to those listed below shall be on the basis of test data performed by a commercial testing laboratory.

3. Provide one of types shown below.

a. Expansion anchors shall be wedge, sleeve, or drop-in mechanical anchors.

b. Adhesive anchors shall be two part injection type.

B. Expansion anchors shall be Kwik Bolt II by Hilti, Inc., or Trubolt Wedge Anchor by ITW Ramset/Redhead, or an approved equal and shall be embedded to the depths shown on the Drawings.

1. If no embedment depth is given, the minimum embedment depth as recommended by the manufacturer shall be used.

C. Adhesive anchors shall consist of all-thread rods anchored with an adhesive system into hardened concrete or grout-filled masonry.

1. The adhesive system shall use a two-component adhesive mix and shall be injected with a static mixing nozzle following manufacturer's instructions.

2. The embedment depth of the rod shall provide a minimum allowable bond strength that is equal to the allowable tensile capacity of the rod/bolt shown in Table 1 unless noted otherwise on the Drawings.

3. The adhesive system shall be "Sikadur Injection Gel" as manufactured by Sika Corporation, "Epcon System" as manufactured by ITW Ramset/Redhead, or "HIT HY-150 Injection Adhesive Anchor System" as manufactured by Hilti, Inc., or an approved equal.

D. Concrete anchors used to anchor steel shall be of A36 steel unless noted otherwise. Where steel to be anchored is galvanized, concrete anchors shall also be galvanized.

TABLE 1

Allowable Tensile Capacity (Kips)

Size	A36 Threaded Rod/Bolt	SST Threaded Rod/Bolt
3/8"	2.1	1.9
1/2"	3.8	3.5
5/8"	5.9	5.6
3/4"	8.4	8.2
7/8"	11.5	11.4
1"	15.0	15.0

2.05 WELDS

A. Electrodes for welding structural steel and all ferrous steel shall comply with AWS Code, using E70 series electrodes for shielded metal arc welding (SMAW), or F7 series electrodes for submerged arc welding (SAW).

2.06 WELDED STUD CONNECTORS

A. Welded stud connectors shall conform to the requirements of AWS D1.1 Type C.

2.07 EYEBOLTS

A. Eyebolts shall conform to ASTM A489 unless noted otherwise.

PART 3 -- EXECUTION

3.01 MEASUREMENTS

A. The Contractor shall verify all dimensions and review the Drawings and shall report any discrepancies to the Engineer for clarification prior to starting fabrication.

3.02 BOLT INSTALLATION

A. Anchor Bolts and Concrete Anchors

1. Anchor bolts shall be installed in accordance with AISC "Code of Standard Practice" by setting in concrete while it is being placed and positioned by means of a rigidly held template.

2. The Contractor shall verify that all concrete anchors have been installed in accordance with the manufacturer's recommendations and that the capacity of the installed anchor meets or exceeds the specified safe holding capacity.

3. Concrete anchors shall not be used in place of anchor bolts without Engineer's approval.

B. High Strength Bolts

1. All bolted connections for structural steel shall use high strength bolts.

a. High strength bolts shall be installed in accordance with AISC "Specification for Structural Joints, using A325 or A490 Bolts."

b. All high strength bolts installed by the "turn-of-nut" method shall have the turned portion marked with reference to the steel being connected after the nut has been made snug and prior to final tightening.

c. These marks will be considered in inspection.

C. Other Bolts

1. All dissimilar metal shall be connected with appropriate fasteners and shall be insulated with a dielectric or approved equal.

a. Unless otherwise specified, where aluminum and steel members are connected together they shall be fastened with Type 304 stainless steel bolts and insulated with micarta, nylon, rubber, or an approved equal.

3.03 WELDING

A. All welding shall comply with AWS Code for procedures, appearance, quality of welds, qualifications of welders and methods used in correcting welded work.

B. Welded stud connectors shall be installed in accordance with AWS D1.1.

- END OF SECTION -

SECTION 05500

METAL FABRICATIONS

PART 1 -- GENERAL

1.01 REQUIREMENT

A. Furnish all materials, labor, and equipment required to provide all metal fabrications not specifically included in other Sections, complete and in accordance with the requirements of the Contract Documents.

B. Work shall include but may not be limited to litter receptacle.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05010 - Metal Materials

B. Section 05050 - Metal Fastening

B. Certain specific items are included in other sections of the Specifications. See the section for the specific item in question.

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of other requirements of the Specifications, all work specified herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. AISC - Specification for Structural Steel Buildings

2. AISI - Specifications for the Design of Cold-Formed Steel Structural Members

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300 - Submittals.

1. Complete fabrication and erection drawings of all metalwork specified herein.

2. Other submittals as required in accordance with Section 05010 - Metal Materials.

PART 2 -- PRODUCTS

2.01 METAL MATERIALS

A. Metal materials used in metal fabrications shall conform to Section 05010 - Metal Materials, unless noted otherwise.

2.02 METAL FASTENING

A. All welds and fasteners used in metal fabrication shall conform to Section 05050 - Metal Fastening, unless noted otherwise.

2.03 GUARDRAIL

A. Except as otherwise provided in the Specifications or on the plans, all work shall be in accordance with the North Carolina Department of Transportation Standard Specifications for Roads and Structures, latest revision, Section 1046, as modified herein.

B. Reference to "NCDOT", "Department" or "Unit" shall mean the "Owner".

C. Concrete shall be as specified in Section 03300.

D. Contractor shall furnish evidence that all guardrail components are manufactured by a manufacturer currently accepted by the North Carolina Department of Transportation.

E. Paragraphs 862-4, 862-5, and 862-6 are deleted.

2.04 HINGED BOLLARD

A. Steel shall be ASTM A36.

B. Steel tube shall be ASTM A500, Grade A.

C. Steel pins shall be ASTM A36.

PART 3 -- EXECUTION

3.01 FABRICATION

A. All fabricated work shall be shop fitted together as much as practicable and delivered to the field complete and ready for erection.

B. All work shall be fabricated and installed in a manner that will provide for expansion and contraction, prevent shearing of bolts, screws, and other fastenings, ensure rigidity, and provide a close fit.

C. Finished members shall conform to the lines, angles, and curves shown on the Drawings and shall be free from distortions of any kind.

D. All shearings shall be neat and accurate, with parts exposed to view neatly finished.

1. Flame cutting is allowed only when performed utilizing a machine.

E. All shop connections shall be welded unless otherwise indicated on the Drawings or specified herein. Bolts and welds shall conform to Section 05050, Metal Fastening.

1. All fastenings shall be concealed where practicable.

F. Unless otherwise specified fabricated items shall be shop painted with manufacturer's standard.

1. When manufacturer offers more than one standard color, color shall be selected by the Owner from a color chart provided by the manufacturer.

3.02 INSTALLATION

A. Assembly and installation of fabricated system components shall be performed in strict accordance with manufacturer's recommendations.

B. All metalwork shall be erected square, plumb and true, accurately fitted, adequately anchored in place, and set at proper elevations and positions.

C. Except as otherwise provided in the Specifications or on the plans, guardrail installation shall be in accordance with the North Carolina Department of Transportation Standard Specifications for Roads and Structures, latest revision, Section 862, as modified herein.
1. Reference to "NCDOT", "Department" or "Unit" shall mean the "Owner".

2. Concrete shall be as specified in Section 03300.

3. Paragraphs 862-4, 862-5, and 862-6 are deleted.

- END OF SECTION -

SECTION 05521

METAL RAILINGS

PART 1 -- GENERAL

1.01 REQUIREMENT

A. Furnish all materials, labor, and equipment required to provide all metal handrails and railings as indicated, complete and in accordance with the requirements of the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03300 – Cast-in-Place Concrete

B. Section 05010 - Metal Materials

C. Section 05035 – Galvanizing

D. Section 05050 – Metal Fastening

E. 05540 – Castings

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of other requirements of the Specifications, all work specified herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. ASTM A36 Specification for Structural Steel
2. ASTM A53 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless
3. ASTM A123 Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
4. ASTM A143 Recommended Practice for Safe- guarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
5. ASTM A153 Specification for Zinc Coating (Hot- Dip) on Iron and Steel Hardware
6. ASTM A307 Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
7. ASTM A384 Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
8. ASTM A385 Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
9. ASTM A449 Specification for Quenched and Tempered Steel Bolts and Studs
10. ASTM A563 Specification for Carbon and Alloy Steel Nuts
11. ASTM A780 Practice for Repair of Damaged Hot- Dip Galvanized Coatings
12. ASTM D2092 Practices for Preparation of Zinc- Coated Galvanized Steel Surfaces for Paint
13. AAMM Pipe Railing Manual, Including Round Tube

14. SSPC SP 1 Solvent Cleaning
15. SSPC SP 3 Power Tool Cleaning
16. SSPC SP 10 Near-White Blast Cleaning
17. SSPC SP 11 Power Tool Cleaning to Bare Metal

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300 - Submittals.

1. Complete fabrication and erection drawings of all metalwork specified herein.

2. Other submittals as required in accordance with Section 05010 - Metal Materials.

PART 2 -- PRODUCTS

2.01 METAL MATERIALS

A. Metal Handrails: Standard Steel Pipe, Architectural Handrail Grade, of diameter and sizes indicated. Exterior metal handrails shall be galvanized. Provide terminal safety returns for all stair handrails. Handrail brackets shall be galvanized malleable iron, manufactured for the purpose, for anchorage to concrete walls. Include all fittings and components, sleeves, hardware, backing plates, and accessories as required for complete
and finished handrail installations.

B. Steel Pipe: Pipe for railings, pipe supports, and pipe sleeves shall be seamless steel pipe, conforming to ASTM A53, Type S, Grade A, of diameters and sizes indicated. Special instructions shall be given the pipe manufacturer to provide Architectural Handrail Grade pipe.

C. Plate: Steel plate for anchor plates shall be standard steel plate, conforming to ASTM A36, weldable quality.

D. Welding Rod/Electrodes – Refer to section 05050 – Metal Fastening:

1. Uncoated electrode should be used wherever possible to prevent flux deposits.

2. If a coated electrode is used, all welding flux residues must be removed by wire brushing, flame cleaning, chipping, grinding, pneumatic needle gun, or abrasive blast cleaning. Welding flux residues are chemically inert in the normal pickling solutions used by galvanizers; their existence will produce rough and incomplete zinc coverage. Flux residue removal is normally the fabricator's responsibility unless other arrangements have been made.

3. A welding process such as metal-inert gas (MIG), tungsten-inert gas (TIG) or C02 shielded arc is recommended when possible since they produce essentially no slag.

4. In the case of heavy weldments, a submerged arc method is recommended.

5. If none of these are available, select a coated rod specifically designed for “selfslagging”, as recommended by welding equipment suppliers.

6. Choose a welding rod providing a deposited weld composition as close as possible to the parent metal. This will help prevent differential acid attack between the weld area and the parent metal during acid cleaning.

7. Welding rods high in silicon may cause excessively thick and/or darkened coatings to form in the welded area.

E. Anchors, Fasteners, and Accessories: Provide all required anchors, fasteners, miscellaneous components, and accessories as required for complete and finished railing installations. Bolts and studs, nuts, and washers shall conform with ASTM A307, A449 and A563, as applicable, and shall be galvanized in accordance with ASTM A153.
   a. Expansion Bolts: Where anchors are not included in the concrete construction, provide galvanized expansion type anchors with matching galvanized steel bolts or studs with nuts, of sizes as indicated or required. Provide washers under all bolt heads and nuts. Expansion bolts require approval of the Engineer before they may be installed in post-tensioned slabs. Expansion bolts will not be permitted for use on concrete curbs or along the edge of concrete or a concrete joint.

F. Paint: Corrosion-inhibitive protective metal primer as herein specified under “Cleaning and Painting”.

G. Grout: Refer to Section 03600 - Grout

2.02 FABRICATION

A. Metal handrails and railings shall be fabricated by firms or shops experienced and skilled in the custom fabrication of architectural metal handrails and railings, and shall meet the quality requirements of NAAMM's Pipe Railing Manual.

B. Bends in rails shall be precision-formed to a smooth continuous radius by skilled workers. Work quality and finish shall be true to detail. Butt joints shall have internal pipe sleeve or dowel.

C. All sections of fabricated pipework should be interconnected with full open tee or with miter joints.

D. Vent holes shall be provided as required by galvanizer. See 05035 for additional information.

E. Steel welded connections shall be made in accordance with applicable codes and requirements. Welding shall be performed in the shop unless otherwise indicated. Welded joints of handrails and railings shall be ground and dressed smooth to match adjacent surfaces and so that the shape and profile of the item welded is maintained.

F. Metal handrails and railings shall be prefabricated and preassembled in the factory or shop as far as practicable.

2.05 GALVANIZING

A. Ferrous metal railings and related items on the exterior of the building, or as otherwise indicated, shall be galvanized, after fabrication, by the hot-dip process in accordance with ASTM A123 and ASTM A385. Weight of zinc coating shall conform with requirements specified under "Weight of Coating" in ASTM A123.

B. Safeguarding against steel embrittlement shall conform to applicable requirements of ASTM A143.

C. Safeguarding against warpage and distortion of steel members shall conform to applicable requirements of ASTM A384.

D. Shop galvanized metalwork necessitating field welding which in any manner removes original galvanizing shall be restored by galvanizing repair in accordance with ASTM A780.

2.06 CLEANING AND PAINTING

A. Cleaning and painting shall conform to like requirements specified in Section 05120 – Structural Steel, and Section 05590 – Miscellaneous Metal.

B. All surfaces of metal handrails and railings shall be cleaned and treated to assure maximum paint adherence, prior to application of the shop prime coat, in accordance with SSPC-SP 1, SSPC-SP 3, SSPC-SP 10, SSPC-SP 11 as applicable for the type of substrate, exposure, and application.

C. Ferrous metalwork shall be given a shop coat of rust inhibitive metal primer as specified in Section 05120 – Structural Steel, or other approved rust-inhibitive metal primer standard with the railing manufacturer. All surfaces of handrails and railings shall be spray-painted.

D. Where galvanized surfaces are indicated to be painted, comply with cleaning and painting requirements of Section 05590 – Miscellaneous Metal.

E. Coordinate with Section 09910 – Paint, for compatibility of the prime coat, finish coats of paint, and galvanization.

PART 3 -- EXECUTION

3.01 INSTALLATION

A. Install metal handrails and railings as indicated and in accordance with the approved Shop Drawings, using workers skilled and experienced in the installation of the type of work involved. Conform with the installation requirements of NAAMM's Pipe Railing Manual, as applicable.

B. Install metal handrails and railings with accessories furnished by the railing fabricator as required for complete and finished railing installations.

C. Installation of handrails and railings shall be in accordance with approved Shop Drawings, true and horizontal, perpendicular, or at the required angle, as the case may

be, level and square, with angles and edges parallel with related lines of the building or structure.

D. Field welding, where required, shall conform with requirements of applicable codes and requirements.

E. Where railing base plates require grouting, conform with requirements of Section 03600 – Grout, and Section 05010 – Metal Materials, as applicable.

3.02 GALVANIZING REPAIR

A. Galvanized surfaces which have become damaged from welding, handling or installation shall be repaired immediately after installation with galvanizing repair material in accordance with ASTM A780.

3.03 FIELD PAINTING

A. After installation, exposed painted surfaces, field welds, and other abraded or damaged primed surfaces shall be prepared as required and touched up with an additional coat of the same primers for ferrous and galvanized surfaces as hereinbefore specified for shop painting.

B. Lightly sand and feather out such damaged surfaces so that paint touch-up becomes invisible. Spray-paint all touch-up work.

C. Finish field painting is specified in Section 09900 – Paint.

- END OF SECTION -

SECTION 05522 (32 31 19)

SAFETY RAIL – TYPE 2

PART 1 - GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the safety rail - type 2 system defined herein. See detail on Sheet 2H.

1.02 RELATED WORK

A. Section 03300 – Cast-in-Place Concrete

B. Section 05010 - Metal Materials

C. Section 05035 – Galvanizing

D. Section 05050 – Metal Fastening

E. Section 05540 – Castings

1.03 SYSTEM DESCRIPTION

The contractor shall supply a total safety rail - type 2. The system shall include all components (i.e., pickets, rails, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

- ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus.
- ASTM D523 - Test Method for Specular Gloss.
- ASTM D714 - Test Method for Evaluating Degree of Blistering in Paint.
- ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
- ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
- ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
- ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.
- ASTM F2408 – Ornamental Fences Employing Galvanized Steel Tubular Pickets.

1.06 SUBMITTAL

The contractor's submittal package shall be provided prior to installation. The contractor shall submit samples, shop drawings, and specs for the system they want to use.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

2.01 MANUFACTURER

The safety rail - type 2 system shall be one of the following systems or an approved equivalent:

- Aegis Plus Ornamental Steel Fence
- Monumental Iron Works Ornamental Fence
- Gilpin Inc. Deco Steel Fence

2.02 MATERIAL

A. Steel material for fence framework (i.e. tubular pickets, rails and posts), when galvanized prior to forming, shall conform to the requirements of ASTM A924/A924M, with a minimum yield strength of 45,000 psi (310 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.60 oz/ft^2 (276 g/m^2), Coating Designation G-60.

B. Material for fence pickets shall be 3/4" square x 17 Ga. tubing. The cross-sectional shape of the rails shall conform to outside cross-section dimensions of 1.50" square and a minimum thickness of 14 Ga. Picket holes in the rail shall be spaced 4.70" o.c. Picket retaining rods shall be 0.125" diameter galvanized steel. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.

2.03 FABRICATION
A. Pickets, rails and posts shall be pre-cut to specified lengths. ForeRunner rails shall be pre-punched to accept pickets.

B. Grommets shall be inserted into the pre-punched holes in the rails and pickets shall be inserted through the grommets so that pre-drilled picket holes align with the internal upper raceway of the rails (Note: This can best be accomplished by using an alignment template). Retaining rods shall be inserted into each rail so that they pass through the pre-drilled holes in each picket, thus completing the panel assembly.

C. The manufactured galvanized framework shall be subjected to the thermal stratification coating process (high-temperature, in-line, multi-stage pretreatment/wash, an electrostatic spray application of any epoxy base, and a separate electrostatic spray application of a polyester finish. The base coast shall be a thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a “no-mar” TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be Black.

D. Completed panels shall be capable of supporting a 400 lb. load (applied at midspan) without permanent deformation. Panels without rings shall be biasable to a 12.5% change in grade.

PART 3 - EXECUTION
3.01 PREPARATION
All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 FENCE INSTALLATION
Fence post shall be spaced according to as per the manufacture specs, plus or minus ½”. For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer. Posts shall be set in concrete footers having a minimum depth of 36” (Note: In some cases, local restrictions of freezing weather conditions may require a greater depth). The “Earthwork” and “Concrete” sections of this specification shall govern material requirements for the concrete footer. Posts setting by other methods such as plated posts or grouted core-drilled footers are permissible only if shown by engineering analysis to be sufficient in strength for the intended application.

3.03 FENCE INSTALLATION MAINTENANCE
When cutting/drilling rails or posts adhere to the following steps to seal the exposed steel surfaces; 1) remove all metal shavings from cut area. 2) Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry. 3) Apply 2 coats of custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1-3 above will negate warranty.

3.05 CLEANING
The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

SECTION 05530

TIMBER GUARDRAIL

This work consists of constructing guardrail systems and modifying, removing, resetting, and raising existing guardrail systems.

a) Guardrail systems are designated as follows:
   a. G1 — Cable guardrail
   b. G2 — W-beam (weak post)
   c. G3 — Box beam
   d. G4 — Blocked-out W beam standard barrier
   e. G9 — Blocked-out thrie beam standard barrier
   f. MB4 — Blocked-out W beam median barrier
   g. SBTA — Steel-backed timber guardrail/timber posts and block-out
   h. SBTB — Steel-backed timber guardrail/timber posts and no block-out
   i. CRT — W-beam guardrail and no blockout
   j. SBLG — Steel-backed log rail

b) Steel guardrail types are designated as follows:
   I — Zinc-coated, 1.80 ounces per square foot
   II — Zinc-coated, 3.60 ounces per square foot
   III — Painted rails
   IV — Corrosion resistant steel

c) Steel guardrail classes are designated as follows:
   A — Metal thickness — 0.105 inches
   B — Metal thickness — 0.135 inches

d) Terminal section types are designated as follows:
   G4-CRT — Cable releasing terminal
   G4-BAT — Back slope anchor terminal
   SBT-FAT-30 — Flared anchor terminal, 30 feet long
   SBT-FAT-20 — Flared anchor terminal, 20 feet long
   SBT-BAT — Back slope anchor terminal
   Flared — Straight or parabolic flared W beam terminal
   Tangent — Tangent W beam terminal

Material

Refer to *2012 Standard Specifications* Division 10

1046-2	Corrosion resistant steel rail
1046-2	Galvanized steel rail
1046-4	Guardrail hardware
1046-3	Guardrail posts
1046-5	Precast concrete anchors
1088-2	Reflector tabs

1088-3	Retroreflective sheeting, type III
1070-3	Wire rope or wire cable
1082-2 & 1082-3	Wood preservative treatment

Steel-backed timber rail

Furnish timber conforming to AASHTO M 168. Fabricate the timber rail, blockouts, and posts from dry, well seasoned, and dressed rough sawn Douglas fir, southern pine, or other species having a stress grade of at least 1,500 pounds per square inch. Treat the timber rail, blockout elements, and posts according to AASHTO M 133.

Fabricate the steel backing elements from 3/8-inch structural steel conforming to ASTM A 242. For fastener hardware, conform to ASTM A 242.

Construction Requirements

Refer to *2012 Standard Specifications* Division 862-3

SECTION 05540

CASTINGS

PART 1 -- GENERAL

1.01 REQUIREMENT

A. Furnish all materials, labor, and equipment required to provide all castings in accordance with the requirements of the Contract Documents. All castings shall be bicycle and pedestrian friendly.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05010 - Metal Materials
B. Section 03600 – Grout

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. North Carolina State Building Code
2. North Carolina Department of Transportation Standard Drawings 2006
3. North Carolina Department of Transportation Standard Specifications for Roads and Structures 2006.
4. City of Asheville Standard Drawings

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300, Submittals.

1. Complete fabrication and erection drawings of all castings specified herein.

2. Other submittals as required in accordance with Section 05010, Metal Materials, and Section 05050, Metal Fastening.

PART 2 -- PRODUCTS

2.01 METAL MATERIALS

A. Metal materials used for castings shall conform to Section 05010, Metal Materials, unless noted otherwise.

2.02 METAL FASTENING

A. All welds and fasteners used for castings shall conform to Section 05050, Metal Fastening, unless noted otherwise.

2.03 IRON CASTINGS

A. Iron castings shall include, but not be limited to frames, covers, and grates for trench drains, manholes, catch basins, and inlets conforming to City of Asheville Standards.

1. Castings shall be of gray iron of uniform quality, free from defects, smooth and well cleaned by shot blasting.

2. Catalog numbers where shown on the Drawings are provided only to show required types and configuration.

3. All covers shall be cast with raised letters as appropriate.

4. Castings shall be as manufactured by Southern Foundry, General Foundries, Inc., Capitol Foundry of Virginia, Inc., Nennah Foundry Co., or an approved equal.

B. Covers and Grates

1. Covers and grates shall be provided with matching frames conforming to City of Asheville Standards.

2. Cover shall fit flush with the surrounding finished surface and shall not rock or rattle when loading is applied.

3. Round covers and frames shall have machined bearing surfaces.

4. Design loadings:

a. Where located within a structure, a minimum design loading of 300 psf shall be used, unless noted otherwise.

b. At all locations not within a structure, the design loading shall be a standard AASHTO H-20 truck loading, unless otherwise noted.

C. Watertight gasketing, bolting, locking devices, patterns, lettering, pick holes, vents, or self-sealing features shall be as detailed on the Drawings.

PART 3 -- EXECUTION

3.01 FABRICATION

A. All measurements and dimensions shall be based on field conditions and shall be verified by the Contractor prior to fabrication.

1. Such verification shall include coordination with adjoining work.

B. All fabricated work shall be shop fitted together as much as practicable, and delivered to the field, complete and ready for erection.

1. All miscellaneous items such as stiffeners, fillets, connections, brackets, and other details necessary for a complete installation shall be provided.

C. Finished members shall conform to the lines, angles, and curves shown on the Drawings and shall be free from distortions of any kind.

3.02 INSTALLATION

A. Assembly and installation of fabricated system components shall be performed in strict accordance with manufacturer's recommendations.

B. All castings shall be erected square, plumb and true, accurately fitted, adequately anchored in place, and set at proper elevations and positions.

- END OF SECTION -

SECTION 07900

JOINT FILLERS, SEALANTS AND CAULKING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish labor, materials, equipment and appliances required for the complete execution of Work shown on the Drawings and specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03300 - Cast-in-Place Concrete

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. ASTM C-920 Elastomeric Joint Sealants

2. ASTM D-1056 Flexible Cellular Materials - Sponge or Expanded Rubber

3. SWRI Sealant and Caulking Guide Specification

4. Federal Specification TT-S-00227 E

1.04 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300 - Submittals, submit the following:

1. Manufacturers literature and installation instructions.

2. Color samples of each type of sealant.

1.05 QUALITY ASSURANCE

A. Applicator shall be a company specializing in the installation of sealants with a minimum of five years experience.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in unopened labeled packages.

B. Store materials in location protected from freezing or damages.

C. Reject and remove from the site materials within broken or damaged packaging.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Sealants:

1. Type 1: Multi-component, non-sag, low-modulus polyurethane rubber sealant meeting ASTM C-920, Type M, Grade NS, Class 25, use NT, M, A, and O.

a. Capable of withstanding 50% in extension or compression such as Sikaflex-2C NS/SL, Sika Corporation Lyndhurst, NY, or Sonolastic SL-1, Sonneborn, Minneapolis, MN.

2. Type 2: Single component polyurethane sealant meeting ASTM C-920, Type S, Grade NS, Class 25, Use NT, M, A, and O.

a. Capable of withstanding 25% in extension or compression such as Sonolastic NP-1, Sonneborn, Minneapolis, MN, or Sikaflex 1A, Sika Corporation, Lyndhurst, NY.

3. Type 3: Single component, low-modulus moisture curing silicone meeting ASTM C-920, Type S, Grade NS, Class 25, Use NT, M, G, and A.

a. Capable of withstanding 50% extension and compression.

4. Type 4: Single component, mildew resistant, moisture-curing silicone meeting ASTM C-920, Type S, Grade NS, Class 25, Use NT, M, G, and A.

5. Type 5: Single component, acrylic latex meeting ASTM C-834.

6. Type 6: High grade butyl sealant meeting Federal Specification TT-S-00-1657.

7. Type 7: Multi-component chemical resistant polysulfide sealant conforming to ASTM C-920, Type M, Grade NS, Class 25 such as Sonolastic Two-part, Sonneborn, Minneapolis, MN, or Hornflex-L, Tamms, Beltsville, MD.

B. Primer: Non-staining primer recommended by sealant manufacturer for the substrates on this project.

C. Backer Rod: Closed cell foam, nonreactive with caulking materials, non-oily, and approved by the sealant manufacturer.

1. Minimum density shall be 3.24 pounds per cubic foot.

2. Use no asphalt or bitumen-impregnated fiber with sealants.

D. Joint Cleaner: Recommended by sealant or caulking compound manufacturer.

E. Bond breaker: Either polyethylene film or plastic tape as recommended by the sealant manufacturer.

PART 3 -- EXECUTION

3.01 QUALITY CONTROL

A. Coordinate work with details shown on approved shop drawings prepared by other trades.

B. Verify conditions in the field.

C. Schedule work to follow closely the installation of other trades.

D. Apply sealants and related items in temperatures and dry conditions recommended by the manufacturers.

3.02 PREPARATION

A. Protect finished surfaces adjoining by using masking tape or other suitable materials.

B. When conditions or manufacturer's recommendations so warrant, clean and prime joints before starting any caulking or sealing work.

C. Thoroughly clean joints and spaces of mortar and other foreign materials.

1. Cleaning agent shall be Xylol or similar non-contaminating solvent to remove any film from metal surfaces.

2. Masonry or concrete surfaces shall be brushed or air jet cleaned.

D. Joint Requirements.

1. All joints and spaces to be sealed in exterior work shall be less than ½-inch deep and not less than ¼-inch wide.

a. If joints in masonry are less than that specified herein, the mortar shall be cut out to the required width and depth.

b. All joints and spaces to receive sealant shall be completely prepared and thoroughly dry before installation of sealant.

2. Unless otherwise specified, joints and spaces which are open to a depth of ½-inch or greater shall be solidly filled with back-up material to within¼-inch of the surface.

a. Back-up material shall be packed tightly and made continuous throughout the length of the joints.

b. Bond breaker shall be applied as required.

c. If joints are less than ¼-inch deep, the back-up material may be omitted, a bond breaker substituted and the joint completely filled with sealant.

d. The back-up material shall not project beyond the ¼-inch depth of the open space in any joint.

e. The following width-to-depth ratio table shall be adhered to, unless otherwise recommended by manufacturer.

Joint Width	Sealant Depth Min.	Maximum
1/4 inch	1/4 inch	1/4 inch
Over 1/4 inch to 1/2 inch	1/4 inch	Equal to width
Over 1/2 inch to 1 inch	1/2 inch	Equal to width
Over 1 inch to 2 inch	1/2 inch	1/2 of width

3.03 APPLICATION

A. Exercise care before, during, and after installation so as not to damage any material by tearing or puncturing.

1. All finished work shall be approved before covering with any other material or construction.

B. Apply sealant by an approved type of gun except where the use of a gun is not practicable, suitable hand tools shall be used.

1. Avoid applying the compound to any surface outside of the joints or spaces to be sealed.

2. Mask areas where required to prevent overlapping of sealant.

C. All joints shall be waterproof and weather tight.

D. Point sealed joints to make a slightly concave joint, the edges of which are flush with the surrounding surfaces.

1. Exposed joints in the interior side of the door and other frames shall be neatly pointed flush or to match adjacent jointing work.

E. Adjacent materials which have been soiled shall be cleaned immediately and the work left in neat and clean condition.

F. Comply with sealant manufacturer's written instructions except where more stringent requirements are shown or specified and except where manufacturer's technical representative directs otherwise.

3.04 ADJUSTMENT AND CLEANING

A. Remove misplaced sealant compounds promptly using methods and materials recommended by the manufacturer, as the work progresses.

B. Allow sealants to cure and remove protective edging, of doors, louvers, saddles windows etc. as directed by the Engineer.

3.05 SCHEDULE

Schedule of Sealants

Application	Sealant	Color
Vertical joints bordered on both sides by concrete, masonry, precast concrete, natural stone or other porous building material.	Type 2	To closely match adjacent surfaces or mortar and as selected by the Owner.
Vertical joints bordered on both sides by painted metals, anodized aluminum, mill finished aluminum, PVC, glass or other non-porous building material.	Type 3	To closely match adjacent surfaces and as selected by the Owner.
Masonry expansion and control joints less than 1 1/4" wide	Type 2	To closely match adjacent surfaces and as selected by the Owner.
Masonry expansion and control joints equal or greater than 1 1/4 inches wide.	Type 1	To closely match adjacent surfaces and as selected by the Owner.
Interior - trim and finish joints.	Type 5	Color to be selected by Owner
Sanitary areas, joints in ceramic tile, around plumbing fixtures, counter tops, and back splashes. See Note 1.	Type 4	To closely match adjacent surfaces and as selected by the Owner.
Perimeter sealing of doors, windows, louvers, piping, ducts, and electrical conduit. See Note 2.	Type 2 OR Type 3	To closely match adjacent surfaces and as selected by the Owner.
Below thresholds	Type 6	Manufacturer's standard
Submerged in non-potable water	Type 7	Manufacturer's standard
Other joints indicated on the drawings or customarily sealed but not listed.	Type recommended by manufacturer	To closely match adjacent surfaces and as selected by the Owner.

Note 1. Sealant for Laboratory Counter top shall be as recommended by counter top manufacturer.

Note 2. Provide UL approved sealants for penetrations thru fire-rated walls and as specified in Section 07270.

Note 3. Concrete joint sealants are specified in Section 03250.

Note 4. Sealants which will come in contact with potable water shall meet the requirements of NSF 61.

- END OF SECTION -

SECTION 09900

PAINTING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish labor, materials, equipment and appliances required for painting of steel components of trail accessories, sealing of wooden components of boardwalks and signs, and painting of existing manholes in complete execution of Work shown on Drawings and Specified herein.

B. Section Includes:

1. Paint Materials

2. Shop Painting

3. Field Painting

a. Surface Preparation

b. Schedule of Colors

1.02 RELATED SECTIONS

A. Section10900 - Trail Accessories

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of these specifications the Work shall conform to the applicable requirements of the following documents:

1. SSPC - Steel Structures Painting Council

a. SSPC-Vis 1 Pictorial Surface Preparation Standards for Painting Steel Structures

b. SSPC-SP2 Hand Tool Cleaning

c. SSPC-SP3 Power Tool Cleaning

d. SSPC-SP5 White Metal Blast Cleaning

e. SSPC-SP6 Commercial Blast Cleaning

f. SSPC-SP10 Near-White Metal Blast

2. NACE - National Association of Corrosion Engineers

3. North Carolina Department of Transportation Standard Specifications for Roads and Structures 2006

1.04 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300 - Submittals, submit the following:

1. Manufacturer's literature and Material Safety Data Sheets for each product.

2. Painting schedule identifying surface preparation and paint systems proposed. Cross-reference with Tables 9-1 and 9-2.

B. Provide the name of the paint manufacturer.

C. Provide name, address, and telephone number of manufacturer's representative who will inspect the work.

D. Submit schedule for approval as soon as possible following the Award of Contract, so approved schedule may be used to identify colors and specify shop paint systems for fabricated items.

1.05 SYSTEM DESCRIPTION

A. Work shall include surface preparation, paint application, inspection of painted surfaces and corrective action required, protection of adjacent surfaces, cleanup, and appurtenant work required for the proper painting of all surfaces to be painted.

1. Surfaces to be painted are designated within the Painting Schedule and include components of trail accessories, wood, miscellaneous metals, and existing concrete pedestrian tunnels and sewer manholes, and greenway trail pavement.

a. Painting of bridge and bridge components is not covered by this section.

B. Perform Work in strict accordance with manufacturer's published recommendations and instructions unless the Engineer stipulates that deviations will be for the benefit of the project.

C. Paint surfaces which are customarily painted, whether indicated to be painted or not, with painting system applied to similar surfaces, areas and environments.

1.06 QUALITY ASSURANCE

A. Painting operations shall be accomplished by skilled craftsman.

1.07 STORAGE AND DELIVERY

A. Bring materials to the job site in the original sealed and labeled containers.

B. Container label shall include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Store paint materials at a minimum ambient temperature of 45° F (7° C) and a maximum of 90° F (32° C), in ventilated area, and as required by manufacturer.

PART 2 -- MATERIALS

2.01 GENERAL INFORMATION

A. The term "paint" shall be defined as both paints and coatings including emulsions, enamels, stains, varnishes, sealers, and other coatings whether organic or inorganic and whether used as prime, intermediate, or finish coats.

B. Purchase paint from an approved manufacturer.

1. Manufacturer shall assign a representative to inspect application of their product in the field.

2. The manufacturer's representative shall submit a report to the Engineer at the completion the Work identifying products used and verifying that surfaces were properly prepared, products were properly applied, and the paint systems were proper for the exposure and service.

C. Provide primers and intermediate coats produced by same manufacturer as finish coat.

1. Use only thinners approved by paint manufacturer and only within manufacturer's recommended limits.

D. Ensure the compatibility of the total paint system for each substrate.

1. Provide an acceptable barrier coat or totally remove shop applied paint system when it is incompatible with the system specified and repaint with specified paint system.

E. Use painting materials suitable for the intended use and recommended by paint manufacturer.

F. Require that personnel perform work in accordance with the latest requirements of OSHA Safety and Health Standards for construction.

1. Meet or exceed requirements of regulatory agencies having jurisdiction and the manufacturer's published instructions and recommendations.

2. Maintain a copy of all Material Safety Data Sheets at the job site for each product being used.

3. Provide and require that personnel use protective and safety equipment in or about the project site.

4. Provide respiratory devices, eye and face protection, ventilation, ear protection, illumination, and other safety devices required to provide a safe work environment.

2.02 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with the Specifications, provide products from one of the following manufacturers:

1. Tnemec Company Inc.

2. Ameron

3. Carboline

4. Paint striping on Greenway Trail, Parking Lots, and Roadways shall be in compliance with NCDOT Standard Specifications

PART 3 -- EXECUTION

3.01 SHOP PAINTING

A. Shop prime fabricated steel with at least one shop coat of prime paint compatible with the finish paint system specified.

1. Prepare the surface to be shop painted in accordance with paint manufacturer's recommendations and as specified.

2. Finish coats may be shop applied when approved by the Engineer.

3. Package, store, and protect shop painted items until they are incorporated into Work.

4. Repair painted surfaces damaged during handling, transporting, storing, or installing to provide a painting system equal to the original painting received at the shop.

B. Identify surface preparation and shop paints on Shop Drawings.

1. Verify compatibility with field applied paints.

2. Shop Drawings indicating shop painting will not be approved until project paint system has been submitted to and approved by the Engineer.

3.02 SURFACE PREPARATION

A. General

1. Surfaces to be painted shall be clean and dry and free of dust, rust, scale, and foreign matter.

a. No solvent cleaning, power, or hand tool cleaning shall be permitted unless specified or approved by the Engineer.

2. Protect or remove hardware and similar items not intended to be painted prior to cleaning and painting.

a. Reposition items removed upon completing painting operations.

3. Examine surfaces to be coated to determine that surfaces are suitable for specified surface preparation and painting.

    a. Report in writing to Engineer surfaces found to be unsuitable.

    b. Do not start surface preparation until unsuitable surfaces have been corrected.

    c. Starting surface preparation precludes subsequent claim that such surfaces were unsuitable for the specified surface preparation or painting.

4. Surface preparation shall be in accordance with these specifications and manufacturer's recommendations.

    a. Provide additional surface preparation and fill coats where manufacturer recommends in addition to the requirements of these specifications.

5. Touch-up shop or field applied paint damaged by surface preparation with same type of shop or field applied paint, even to the extent of applying an entire coat.

    a. Touch-up coats are in addition to and not considered the first field coat.

B. Metal Surface Preparation, Trail Accessories

1. Conform to current SSPC Specifications for metal surface preparation. Use SSPC-Vis-1 pictorial standards or NACE visual standards TM-01-70 or TM-01-75 to determine cleanliness of abrasive blast cleaned steel.

2. Perform blast cleaning operations for metal when the following conditions exist:

    a. Moisture is not present on the surface.

    b. Relative humidity is below 80%.

    c. Ambient and surface temperatures are 5°F or greater than the dew point temperature.

    d. Painting or drying of paint is not being preformed in the area.

    e. Proper ventilation, illumination, and other safety procedures are followed, and proper equipment is provided.

3. Sandblast ferrous metals to be shop primed in accordance with SSPC-SP5, White Metal Blast.

4. Prime cleaned metals immediately after cleaning to prevent rusting.

C. Concrete Surface Preparation

1. High pressure wash concrete to remove contaminants, open bugholes, surface voids, air pockets, and other subsurface irregularities.

2. Do not expose underlying aggregate.

3. Use clean water for washing operations.

4. Allow sufficient drying time before painting.

D. Wood

1. Clean wood surfaces free of all dirt and other foreign matter.

a. Remove sap and resin by scraping and wipe clean with rags dampened with mineral spirits.

b. Seal knots and pitch pockets with sealer recommended by paint manufacturer.

c. Fill nail holes and other surface imperfections with tinted calking compound after sealer has been applied.

2. Saturate end grain, cut wood, knots, and pitch pockets with copper napphenate before priming.

E. Castings

1. Prepare castings for painting by applying a brush or a knife-applied filler.

a. Fillers are not to be used to conceal cracks, gasholes, or excessive porosity.

2. Apply one coat of primer with a minimum thickness of 1-2 mils in addition to coats specified.

a. Allow sufficient drying time before further handling.

F. Masonry

1. Clean masonry surfaces free from all dust, dirt, oil, grease, loose mortar, chalky deposits, efflorescence, and other foreign materials with high pressure water.

F. Asphalt

1. Clean asphalt surfaces free from all dust, dirt, oil, grease, and other foreign materials with high pressure water.

3.03 APPLICATION OF PAINT

A. Apply paint by experienced painters with brushes or other applicators approved by the Engineer and paint manufacturer.

B. Apply paint without runs, sags, thin spots, or unacceptable marks.

C. Apply at a rate specified by the manufacturer to achieve at least the minimum dry mil thickness specified. Apply additional coats if necessary to obtain minimum thickness.

D. Special attention shall be given to nuts, bolts, edges, angles, etc., where insufficient film thicknesses are likely.

1. Stripe paint prior to applying prime coat.

2. Stripe painting shall be in addition to coats specified.

E. Perform thinning in strict accordance with the manufacturer's instructions and with the full knowledge and approval of the Engineer and paint manufacturer.

F. Allow paint to dry a minimum of twenty-four hours between applications of any two coats of paint on a particular surface unless shorter time periods are a requirement by the manufacturer.

1. Longer drying times may be required for abnormal conditions as defined by the Engineer and paint manufacturer.

2. Do not exceed manufacturer's recommended drying time between coats.

G. Suspend painting when any of the following conditions exist:

1. Rainy or excessively damp weather exists.

2. Relative humidity exceeds 85%.

3. General air temperature cannot be maintained at 50°F or above throughout the drying period, except on approval by the Engineer and paint manufacturer.

4. Relative humidity will exceed 85%, or air temperature will drop below 40°F, within 18 hours after application of paint.

5. Surface temperature of item is within 5 degrees of dewpoint.

6. Dew or moisture condensation are anticipated.

7. Surface temperature exceeds the manufacturer's recommendations.

H. Application of greenway trail, parking lot, and roadway paint striping shall be in compliance with NCDOT Standards.

3.04 INSPECTION

A. Each field coat of paint will be inspected and approved by the Engineer or the Owner before succeeding coat is applied.

1. Tint successive coats so that no two coats for a given surface are exactly the same color.

2. Tick-mark surfaces to receive black paint in white between coats.

B. Use magnetic dry film thickness gauges and wet fiber thickness gauges for quality control.
1. Furnish magnetic dry film thickness gauge for use by the Engineer.

C. Paint manufacturer or his representative shall provide services as required by the specifications.

1. Services shall include, but not be limited to, determining the best means of surface preparation, inspecting the painted work, and again inspecting the painted work 11 months after the job is completed.

3.04 SCHEDULE OF COLORS

A. Provide sample colors for each paint system for verification of colors by the Owner.

B. Colors shall match the Pantone Matching System Numbers below.

Color	Pantone Matching System Number	Note
A	391	Green
C	202	Rust
D	451	Taupe
E	White	White
F	139	Orange
H	648	D. Blue

3.05 WORK IN CONFINED SPACES

A. Provide and maintain safe working conditions for all employees.

1. Supply fresh air continuously to confined spaces through the combined use of existing openings, forced-draft fans and temporary ducts to the outside, or direct air supply to individual workers.

2. Exhaust paint fumes to the outside from the lowest level in the contained space. Provide explosion-proof electrical fans, if in contact with fumes.

3. No smoking or open fires will be permitted in, or near, confined spaces where painting is being done.

4. Follow OSHA, state and local regulations at all times.

TABLE 9-1
PAINTING SCHEDULE

Surface	Application	Painting System & No. of Coats	Product Reference (Table 9.2)	Total Min. Dry Film Thickness (Mils)
Metals	Trail accessories, Signing	1 coat epoxy polyamide 1 coat aliphatic polyurethane	101 102	3-5 2-3

TABLE 9-2
PRODUCT LISTING

REF.	SYSTEM	PURPOSE	PRODUCT		
			TNEMEC	AMERON	CARBOLINE
101	Polyamide Epoxy	Primer	66	AMERGUARD 385	893
102	Aliphatic Acrylic Polyurethane	Finish coat	75	AMERCOAT 450 HS	134HG
103	Alkyd Acrylic	Primer	36	335	3358
104	Acrylic Emulsion Acrylic	Finish	6 & 7	335	3359
105	Aliphatic Acrylic Polyurethane	Sealer	76		133 Clear

- END OF SECTION -

SECTION 09910

TUBULAR DELINEATORS

PART 1 -- GENERAL

Provide flexible delineators evaluated by NTPEP.

(B) Retroreflective Sheeting

Use retroreflective sheeting that is a minimum area of 16 sq.in., with a minimum width of 3". The reflective sheeting shall be Grade C retroreflective sheeting or better and shall conform to Article 1092-2.
Use retroreflective sheeting which is yellow, red or crystal, as shown in the plans. Attach the retroreflective sheeting on the front and back of the delineator post as required by the contract.

(C) Post

Design a delineator post that is flexible and made of recycled material. Provide a delineator post that is resistant to impact, ultraviolet light, ozone, hydrocarbons and stiffening with age.
Provide a post that is not seriously affected by exhaust fumes, asphalt or road oils, dirt, vegetation, soil, deicing salts or any other types of air contamination or materials likely to be encountered. Upon weathering, the post shall not exhibit serious discoloration, checking or cracking, peeling or blistering, swelling, shrinking or distortion, or any other detrimental effects. Weathering shall not cause appreciable strength or flexibility loss.
Design a post with a smooth surface that is free from irregularities or defects. The surface of the post shall not soil excessively. If soiling does occur, it shall be easily cleaned using detergent and water, or solvent.
Use posts that have a convex shaped cross-section. The cord distance for the cross section shall be from 3.5" to 4.5" in length.
Design a post such that it can maintain straightness throughout its entire life. Straight is defined as no point along its length any more than 1" away from a perfectly straight edge placed longitudinally along any side of the post.
Provide a post in which both sides of the top of the post accepts, and holds securely, retroreflectorized sheeting.
Design posts that are gray in color.

(D) Base Support

Provide a base support that is hot rolled rail steel or new billet steel meeting Article 1088-5, the physical requirements of ASTM A499 and the chemical requirements of ASTM A1.
Use a base support that is a uniform flanged U-channel post with a nominal weight of 3 lb/ft before holes are punched. Use base support posts that are 18" in length and have sufficient number of 3/8" diameter holes on 1" centers to facilitate attachment of the flexible post.

(E) Anchoring

Design a delineator post for a permanent installation to resist overturning, twisting and

displacement from wind and impact forces.

(F) Temperature

Design flexible delineators that do not bend, warp or distort and remain straight, when stored or installed at temperatures up to + 120°F. Design all components of the flexible delineator, post and reflective sheeting to remain stable and remain fully functional within a temperature range of - 20°F to + 120°F.

(G) Impact Resistance, Wind Resistance

Design flexible delineators that meet the impact and wind resistance of the current evaluation criteria of the NTPEP.

(H) Product Identification

Provide flexible delineator post that are permanently identified, on the rear side, with the manufacturer's name and the month and year of fabrication in order to provide a tracking method for ongoing outdoor evaluation, and specification quality control. The letters shall be at least 1/4" in height and permanently affixed to the rear of the marker.

(I) Material Certification

Furnish a Type 2 and Type 3 material certification in accordance with Article 106-3 for all flexible delineators before use.

(J) Approval

All materials are subject to the approval of the Engineer.

- END OF SECTION -

SECTION 10431

BRANDING SIGN

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Panel signs.
   a. Monument Sign
   b. Kiosk
   c. Interpretive Sign
   d. Regulations & Directional Sign
   e. Regulations Sign
   f. Directional Sign
   g. Wayfinding Post
   h. Mile Marker

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Shop Drawings: Include plans, elevations, sections, details and attachments to other Work.

1. Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.
2. Provide message list for each sign, including large-scale details of wording, lettering, and artwork.

C. Samples: For each sign material indicated that involves color selection or natural weathering.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.2 PANEL SIGNS

A. General: Provide panel signs that comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.

B. Weathered Steel: Provide naturally weathered steel with overall as indicated on the drawings in accordance with:

1. ASTM A588 – Structural shapes, plate and bar
2. ASTM A242 – Plate through one-half inch thickness
3. ASTM A606-4 – Sheet and Coil
4. ASTM A847 – Tube and Pipe

C. Frames: Fabricate frames to profile indicated; comply with the following requirements for materials and corner conditions:

1. Edge Conditions: Exposed edges of sheet steel shall be ground smooth and beveled 1/8”.
2. Corner Condition: Outside exposed corners to be beveled 1/8”.
3. Tube Steel: open steel tube shall be capped with sheet steel welded to tube. Weep holes are to be drilled 2” above finish grade.

D. Brackets: Fabricate brackets and fittings for bracket-mounted signs from weathering steel to suit panel sign construction and mounting conditions indicated.

E. Graphic Content and Style: Provide sign copy that complies with requirements indicated on Drawings and on artwork supplied on electronic media by Owner for size, style, spacing, content, mounting height and location, material, finishes, and colors of signage.

F. Engraved Copy: Machine engrave letters, numbers, symbols, and other graphic devices into panel sign on face indicated to produce precisely formed copy, incised to uniform depth.

2.3 STONE BASE

A. Materials:

1. Stone for bases shall be locally sourced.

2.4 ACCESSORIES

A. Mounting Methods: Use concealed fasteners fabricated from materials that are not corrosive to sign material and mounting surface.

B. Anchors and Inserts: Provide nonferrous-metal fasteners and inserts for exterior installations and elsewhere as required for corrosion resistance. Furnish inserts, as required, to be set into concrete or masonry work.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Locate signs and accessories where indicated, using mounting methods of types described and in compliance with manufacturer's written instructions.

1. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.

2. Construct stone bases to encapsulate sign posts.

END OF SECTION 10431

SECTION 10500

SIGNAGE

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. Furnish labor, materials, equipment and appliances required for complete execution of Work shown on the Drawings and specified herein.

1.02 SUBMITTALS

A. Submit data on signage in conformance with Section 01300 – Submittals.

B. Shop drawings for each sign - Type A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P.

a. Location of sign
b. Dimension of sign
c. Wording / graphic layout of sign
d. Color

PART 2 – PRODUCTS

2.01 PARKING AREA SIGNS

A. Provide parking area signs in conformance with NCDOT Specification 901.

1. Delete paragraph 901-4.

B. Provide “STOP” signs in conformance with NCDOT Specification 901.
1. Delete paragraph 901-4.

C. Provide posts in accordance with NCDOT criteria.

2.02 GREENWAY SIGNS AND MILE MARKERS (Type A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P)

A. Aluminum sheet material shall be as specified in applicable standard drawings.

B. Aluminum channel material shall be as specified in applicable standard drawings.

C. Post material shall be as specified in applicable standard drawings.

D. All fasteners shall be non-corrosive i.e. galvanized or stainless steel, and of size and thickness as specified in applicable standard drawings.

E. Welds shall be ground smooth.

F. Signs shall meet NCDOT and MUTCD requirements.

G. All other materials shall be as specified on applicable standard drawings.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install parking area signs in accordance with NCDOT criteria.
B. Install greenway signs in accordance with Drawings.

END OF SECTION

SECTION 10900

TRAIL ACCESSORIES

PART 1 -- GENERAL

1.01 THE REQUIREMENTS

A. Furnish all labor, materials, equipment and appliances required for the complete execution of the Work as shown on the Drawings and specified herein.

1.02 RELATED WORK ELSEWHERE

A. Section 05010 - Metal Materials

B. Section 05050 - Metal Fastening

C. Section 05500 - Metal Fabrications

D. Section 10500 – Trail Signage

1.03 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300 - Submittals, submit the following:

1. Shop Drawings showing arrangement, dimensions, accessories and installation details.

2. Manufacturer's data and installation instructions.

1.04 DELIVERY, STORAGE AND HANDLING

A. Store accessories in strict accordance of manufacturer’s recommendations. Protect accessories from dents and scratches during delivering, storing and handling.

PART 2 -- PRODUCTS

2.01 HINGED BARRIER BOLLARD

A. Steel plate shall be ASTM 36.

B. Steel tube shall be ASTM A500, Grade A.

C. Steel pins shall be ASTM A36.

D. See detail 4 on sheet D1.0

2.02 Hellen’s Bridge Rail

A. Steel plate shall be ASTM 36.

B. Steel tube shall be ASTM A500, Grade A.

C. See detail 3 on Sheet D1.5

2.03 Black Steel Double Swing Gates (20LF)

A. Steel post shall be SCH 40.

B. Gate tubes shall be SCH 40

C. See detail 6 on Sheet D1.3

2.04 Emergency Call Box

A. Emergency Call Box

B. See detail 6 on Sheet D1.0.

2.05 Timber Wheelstop

A. Wheelstop

B. See detail 7 on sheet D1.3.

2.06 BENCHES

A. Pilot Rock, PCXB/G6 with option of bench boards made of plastic with cedar finish

B. See detail 2 on sheet D1.0

2.07 LITTER RECEPTACLE

A. Can- Best Litter Receptacles, Inc., RTC-1000 color= green, text= Trash, (frame = black powder coated.

B. See detail 1 on sheet D1.0

2.08 BIKE RACK

A. Finish shall be black polyester powder coated

B. Anchor with stainless steel anchor bolts

C. Shape shall be circular instead of U-shaped.

D. See detail 5 on Sheet D1.0

2.09 PET WASTE STATION

A. Corten post with Bevel Cap.

B. See detail 3 on sheet D1.2.

2.10 NATURAL STONE COLUMN

A. Materials and installation for column shall be as shown in plan drawings.

B. See detail 6 on sheet D1.2

2.11 NATURAL STONE SEAT WALL

A. Materials and installation for seat wall shall be as shown in plan drawings.

B. See detail 1 on sheet D1.2

2.12 BOULDERS

A. Boulders excavated from the site or provided by the City of Asheville.

2.13 NATURAL STONE SEAT WALL

A. Materials and installation for seat wall shall be as shown in plan drawings.

B. See detail 1 on sheet D1.2

2.14 SPLIT RAIL FENCE

A. Materials and installation for Split rail fence shall be as shown in plan drawings and as per manufacturer's instructions.
B. See detail 3 on sheet D1.0
C. Fence shall be as supplied by Allied Fence Co., Inc., Carolina Builders Corporation, Home Depot, Qualitybilt Fence co., Inc., or ewual.

2.15 REMOVE EXISTING GATE AND FOOTINGS

A. Remove and haul off existing gate and all footing material as shown in the plans.

2.16 REMOVE EXISTING BOLLARD AND FOOTINGS

A. Remove and haul off existing bollard and all footing material as shown in the plans.

2.17 RELOCATE EXISTISTING MAILBOXES

A. Relocate existing mail boxes as show in the plans

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Verify that prepared bases where applicable are in correct position and configuration.

B. Verify bases and embedded anchors are properly sized.

3.02 PAINTING

A. Provide primers and intermediate coats produced by the same manufacturer as a compatible painting system.

B. Surface to be painted shall be clean and dry, free of rust, dust, scale, and any other foreign matter which would interfere with painting.

C. Sandblast ferrous metals prior to shop priming in accordance with Steel Structures Painting Council-SP5, White Metal Blast.

D. Shop prime metals immediately after sandblasting and cleaning to prevent rust.

E. Provide painting system in accordance with the following:

1. One coat epoxy primer with a total dry film thickness of not less than 5-8-mils.

    a. Tenemec Series 66, International Intergard 475, Ameron Amercoat 385, Carboline 890, or an approved equal.

2. One coat aliphatic polyurethane with a total dry film thickness of not less than 3-4-mils.

    a. Tenemec Series 74 or 75, International Interthane 990, Ameron Amercoat 450HS, Carboline Carbothane 134HS, or an approved equal.

F. Paint color will be selected by the Owner from a color chart provided by the Contractor.

G. Provide primer, enamel, and sealer on all wooden parts prior to and following assembly.

3.03 INSTALLATION

A. Assemble and install in accordance with manufacturer's instructions.

B. Install plumb and square as appropriate.

-END OF SECTION-

SECTION 16000

TRAIL ELECTRICAL

PART 1 -- GENERAL

1.01 THE REQUIREMENTS

A. Furnish all labor, materials, equipment and appliances required for the complete execution of the Work as shown on the Drawings and specified herein.

1.02 RELATED WORK ELSEWHERE

A. Section 05010 - Metal Materials

1.03 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300 - Submittals, submit the following:

1. Shop Drawings showing arrangement, dimensions, accessories and installation details.

2. Manufacturer's data and installation instructions.

1.04 DELIVERY, STORAGE AND HANDLING

A. Store accessories in strict accordance of manufacturer's recommendations. Protect accessories from dents and scratches during delivering, storing and handling.

PART 2 -- PRODUCTS

2.01 2" Sch 80 Elec. Conduit (HDPE)

A. Conduit shall be UL 651A and conform to NEMA TC-2 specs. Conduit must be marked every 10-ft or less with the following information; Material: HDPE; Trade Size: 2"; Conduit Type: Sch 80 or EPEC-B or SDR 13.5; Manufacturer's name or trademark; manufacturer's identity code to identify manufacturing date, facility, etc.; UL symbol or UL listing number.

B. Conduit shall be factory lubricated, low friction with a coefficient of friction of 0.10 or less in accordance with Telcordia GR-356.

C. Boxes must be UL 514A or 514B.

D. Furnish ¾", pre-lubricated, woven polyester tape, pull line with minimum rated tensile strength of 2,500 lb.

E. Provide green insulated number 14 AWG, THWN, stranded copper wire to serve as

tracer wire.

F. Furnish conduit plugs sized in accordance with conduit and ensure plug provides a means to secure a pull line to the end of the plug. Conduit plugs must provide a watertight barrier when installed in conduit.

2.02 Electrical Junction Boxes

A. Provide polymer concrete (PC) boxes which are stackable, have bolted covers and have open bottoms. Ensure vertical extensions of 6” to 12” are available from the junction box manufacturer.

B. Use polymer concrete material made of aggregate consisting of sand and gravel bound together with a polymer and reinforced with glass strands to fabricate box and cover components which are exposed to sunlight. Other thermosetting glass-reinforced materials may be used for components which are not normally exposed to sunlight.

C. Provide certification that the polymer concrete boxes and covers meet Tier 7 requirements of ANSI/SCTE 77 except for boxes that are within Duke Progress Energy Right of Way where they shall be designed for Tier 15. Provide certification that testing methods are compliant with ANSI/SCTE 77

D. Provide the required logo on the cover. Provide at least 2 size 3/8” diameter hex head stainless steel cover bolts to match inserts in the box. Provide pull slot(s) with stainless steel pin(s).

2.03 40mm Triduct Communication Conduit (HDPE)

A. Furnish Dura-Line 40mm Triduct Communication conduit and all connectors, pull line, plugs, etc. Equivalent product may be used with Engineers approval.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Verify that prepared bases where applicable are in correct position and configuration.

B. Verify bases are properly sized.

3.02 INSTALLATION

A. Do not install underground conduit until the area has been brought to final earth grade. Give careful attention to the vertical and horizontal alignment of the conduit to provide the smoothest installation.

B. Locate junction boxes for best routing of conduit to minimize drainage problems. Do not locate boxes in areas where they may be subjected to traffic loadings.

C. Install HDPE conduit for all underground runs. If more than one conduit is required between the same points, install conduit in one common trench. Install non-detectable marker tape.

D. Install longitudinal runs of conduit 6-in from edge of pavement. Maintain a minimum trench depth of 30” (or 12” in areas blocked by rock or impenetrable obstructions) below finished grade. Remove all rock and debris from backfill material. Remove excess material from site and compact area according to sec 02200.

E. Provide protection at all times against the entrance of water or other foreign matter in the conduit. Plug or cap conduit when work is temporarily suspended, including nightly stoppage of work.

F. Avoid short radius bends in conduit to prevent burn-through of the pull line or conductors during pulling operations.

G. Following installation on conduit where cable is not immediately installed or conduit is for future use (spare), seal the ends of the conduit with a conduit plug. Secure a pull line to the conduit plug in such a manner that it will not interfere with installation of the conduit plug and provides a watertight seal.

H. Extend ends of conduit 4” above crushed stone bases.

I. Install tracer wire in all conduits for future use. Where multiple conduits are in the same trench only one tracer wire is required. Where multiple conduits may separate into individual trenches, install a tracer wire in each conduit run. Provide waterproof butt splices where tracer wire is spliced. Splicing will be allowed only in junction boxes and cabinets. Label all tracer wires entering the equipment cabinet.

J. Install junction boxes as shown in the plans and where underground splicing of electrical and/or communications cables is necessary.

K. Install conduits before the polymer concrete (PC) boxes are set in place. Do not rest the bottom of the box directly on conduits or cables.

L. Place the top of the box on the same grade as the surrounding area. Perform backfilling with sufficient care that no part of the junction box or conduit is displaced or moved out of alignment. Backfill beneath and around the box to at least 12” using #67 washed stone aggregates.

3.03 TESTING AND INSPECTION

A. Comply with all local ordinances and regulations. Apply for and obtain all permits and/or licenses required by local regulation.

B. Have all work inspected and approved by the Engineer before concealment. An inspection will be made during the progress and after the work has been completed.

C. After installation of conduits and upon completion on tamping and backfilling, perform a mandrel test on each conduit to ensure no conduit has been damaged. Furnish a non-

metallic mandrel having a diameter of approximately 50% of the inside diameter of the conduit in which it is to be pulled through. If damage has occurred, replace the entire length of conduit.

D. Following installation on conduit where cable is not immediately installed or conduit is for future use (spare), seal the ends of the conduit with a conduit plug. Secure a pull line to the conduit plug in such a manner that it will not interfere with installation of the conduit plug and provides a watertight seal.

B. Install plumb and square as appropriate.

-END OF SECTION-

SECTION 17000

PUBLIC ART

PART 1 -- GENERAL

1.01 THE REQUIREMENTS

A. Furnish all labor, materials, equipment and appliances required for the complete execution of the Work as directed by the Owner and specified herein.

1.02 RELATED WORK ELSEWHERE

A. Section 02207 – Aggregate Materials
B. Section 02274 – Geotextiles and Geogrid
C. Section 03300 – Cast in Place Concrete
D. Section 03600 – Grout
E. Section 05010 – Metal Materials
F. Section 09900 – Painting

1.03 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300 - Submittals, submit the following:

1. Shop Drawings showing arrangement, dimensions, accessories and installation details.

2. Manufacturer's or artist’s data and installation instructions.

1.04 DELIVERY, STORAGE AND HANDLING

A. Store accessories in strict accordance of manufacturer’s or artist’s recommendations. Protect accessories from dents and scratches during delivering, storing and handling.

PART 2 -- PRODUCTS

2.01 The Owner shall decide upon the art to be incorporated into the work according to the amount of allowance in the bid document minus labor and transportation costs. The Owner shall coordinate with the Contractor to obtain art from the artist the Owner decided upon.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Verify that Art where applicable are in correct position and configuration.

3.02 INSTALLATION

A. Do not install art until the area has been brought to final earth grade.

B. Location of Art shall be at the direction of the Owner in the field.

3.03 TESTING AND INSPECTION

A. Comply with all local ordinances and regulations. Apply for and obtain all permits and/or licenses required by local regulation.

B. Install plumb and square as appropriate.

-END OF SECTION-

STEWART

STRONGER BY DESIGN

GEOTECHNICAL ENGINEERING REPORT

BEAUCATCHER GREENWAY

White Fawn Reservoir to Helen's Bridge
Asheville, North Carolina

July 21, 2015

GEOTECHNICAL ENGINEERING REPORT

BEAUCATCHER GREENWAY
White Fawn Reservoir to Helen's Bridge
Asheville, North Carolina

July 21, 2015

Prepared For:

City of Asheville
Parks & Recreation Department
70 Court Plaza
4th Floor
Asheville, NC 28801

Prepared By:

STEWART
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Raleigh, NC 27610

Stewart Project No.: H13002.00

Donald W. Brown Jr., PE, LEED AP
Manager of Construction Services
NC License No. 028422

Stewart Engineering License No. C-1051

TABLE OF CONTENTS

1 PROJECT INFORMATION

1.1 Project Understanding

The information presented in this section was utilized in the geotechnical evaluation. Therefore, if any of the noted information is incorrect or has changed, please inform us so that we may amend the recommendations presented in this report, if appropriate or necessary. As we understand it, the project will consist of the following:

1.1.1 Trail

The greenway trail will consist of a new 10-foot wide trail with 2-foot wide shoulders that connects McCauley Drive and White Fawn Drive on the south end of the project to College Street on the north end of the project. The trail will be paved with asphalt; however, some portions of the trail will utilize concrete paving adjacent to roadways. The trail will generally follow the existing topography with anticipated cuts and fills generally on the order of 2 to 8 feet. The total project length is 1.91 miles.

1.1.2 Retaining Walls

There will be a total of 20 retaining walls constructed along the greenway. Walls will be varying lengths with most retaining 4 feet or less soil to mitigate cut/fill slopes; however, several retaining walls will be taller, up to 15 feet.

1.2 Site Location and Generalized Description

The subject site is located in the northeastern portion of Asheville, North Carolina. The trail extends from McCauley Drive and White Fawn Drive on the south end of the project to College Street on the north end of the project. The trail follows existing road shoulders and an old roadbed that was reportedly used for logging operations in the past.

2 SUBSURFACE EXPLORATION

2.1 Field Testing

The subsurface conditions along the project were evaluated with 18 soil test borings (B-3 thru B-6, B-8 thru B-18, and B-20 thru B-22) and four hand auger borings (B-1, B-2, B-7, and B-19).

The soil test borings were advanced to depths ranging from approximately 4.2 to 24.3 beneath the existing ground surface using a CME-45 drill rig using hollow-stem augers. All boring and sampling operations were conducted in general accordance with ASTM D1586. At predetermined intervals, soil samples were obtained with a split-barrel sampler (standard 2-inch O.D.). The sampler was rested on the bottom of the borehole and driven to a penetration of 18 inches (or fraction thereof) with blows of an automatic 140-pound drop hammer falling 30 inches. Of the 18 inches, the number of hammer blows required to achieve 6 inches of penetration is recorded for three consecutive segments. The sum of the blow counts for the second and third 6-inch segment is termed the Standard Penetration Test (SPT) resistance, or N-value.

The soil samples obtained during the drilling operations were placed in labeled containers and transported to our laboratory where they were visually-manually classified and logged by a Professional Engineer. The soil samples will be stored for two months before discarding.

The hand auger borings were advanced to depths ranging from approximately 1 to 4 feet below the current grades. Beside each of the hand auger borings, the strength of the subgrade was also evaluated using a dual-mass cone penetrometer (DMCP). The DMCP is a testing instrument consisting of a slender rod with a 60-degree conical tip and an interchangeable drop weight (17.6 lb). The DMCP is advanced in a continuous-drive process with blow counts recorded every two inches. The results of the DMCP are typically correlated to in-situ, field-condition California Bearing Ratio (CBR) values, which are used to design pavement.

The Boring Logs, Hand Auger Logs, and DMCP Test Data sheets are included in Appendix B of this report.

2.2 Subsurface Conditions

The following is a subsurface description of a generalized nature, provided to highlight the major soil strata encountered. The stratification of the subgrade materials illustrated on the logs represents the conditions at the actual test locations; therefore, variations should be expected between borings. Stratigraphy boundaries only represent the approximate depth/elevation of a noticed material change but the transition between material types is typically gradual. Also note that the elevations mentioned herein were interpolated from the available topographic data and should be considered approximate.

2.2.1 Ground Cover

Topsoil was encountered in one of the 22 borings, B-22, to an approximate depth of 3 inches. Deeper pockets of topsoil could be encountered in unexplored areas of the project. Please note the term topsoil is used to describe the organic-laden surficial material. No organic or nutrient testing was performed for this exploration; therefore, the topsoil should not be assumed capable of establishing or maintaining vegetation of any kind.

Asphalt was encountered at three of the twenty-two soil test borings (B-14, B-17, and B-20) to depths ranging from approximately 1 to 2 inches thick. The asphalt was underlain by a layer of stone base with a depth ranging from approximately 3 to 6 inches thick. Gravel was encountered in B-21 to a depth of approximately 1 foot.

2.2.2 Fill

Fill soil was encountered beneath the ground cover in 16 of the 22 boring locations (B-1, B-2, B-3, B-4, B-6, B-7, B-8, B-10, B-11, B-13, B-15, B-16, B-18, B-19, B-21, AND B-22) to depths ranging from approximately 1 to 7.5 feet beneath the existing ground surface. The fill at the boring locations generally consist of hard Silty Fat CLAY (CH) with gravel, soft to hard Sandy SILT (ML) and loose to dense Silty SAND (SM). Borings

2.2.3 Residuum

Residual soils, which are the product of in-place physical and/or chemical weathering of the parent bedrock, was encountered underlying the above-mentioned fill and ground cover at 17 of the 22 borings (B-3 thru B-5, B-9, B-11 thru B-15, and B-17 thru B-22). The residuum generally consists of very soft to hard Sandy SILT (ML) with mica and loose to very dense Silty SAND (SM) with mica.

2.2.4 Weathered Rock

Often times a transitional geo-material, generally referred to as Weathered Rock (WR), is encountered between the overlying soil and bedrock or as suspended layers/lenses within a soil mass. To be classified as weathered rock, the material must exhibit a resistance of 50 blows with 6 inches or less penetration during Standard Penetration Testing (SPT). Weathered rock was encountered in nine soil test borings at the approximate depths and elevations noted in Table 1.

Table 1: Weathered Rock Depths and Elevations

Boring	WR Depth (ft)	WR Elevation (ft)
B-6	3	2205
B-8	5.5	2235
B-10	3	2299.5
B-12	5.5	2273.5
B-15	12	2340
B-18	8	2395
B-20	12	2381
B-21	5.5	2414.5
B-22	22	2406

2.2.5 Rock

Material of sufficient hardness to refuse penetration of mechanical augers is typically considered rock. Such material was encountered in two borings at approximate depths/elevations noted in Table 2.

Table 2: Rock Depths and Elevations

Boring	Rock Depth (ft)	Rock Elevation (ft)
B-10	4.2	2298.3
B-18	9	2394

2.2.6 Groundwater

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

3 DESIGN RECOMMENDATIONS

3.1 Trail

3.1.1 Subgrade Preparation

Initially, all topsoil, vegetation, and any other unsatisfactory/deleterious materials should be removed from the proposed areas scheduled for site development for a lateral distance of at least 2 feet beyond the trail edges.

After stripping, the in-situ soil should be scarified, moisture-conditioned to within ±3 percent of the material's optimum water content, and then compacted as required by Section 500 of the NCDOT Standard Specifications for Roads and Structures (SSRS). Fill selection and compaction requirements shall also be in accordance with the SSRS.

The subgrade should also be proofrolled using a tandem-axle dump truck weighing at least 15 tons to verify stability. Proofrolling should occur at three points of trail construction – proofroll existing grade prior to placing fill in low areas; proofroll finished subgrade prior to stone base placement; and then proofroll stone base prior to paving. Proofrolling should be performed in the presence of the owner's testing agency so that recommendations can be provided for areas that perform poorly.

Based on the test data and our observations along the trail corridor, we expect that most of the existing surficial soils will provide a suitable base on which to construct the proposed trail. However, areas of surficial erosion, wet surficial conditions, and/or soft soils may be encountered along isolated segments of the alignment that will require repair prior to paving. We recommend including a contingency buget for repair of 500 linear feet of trail.

For repair of these areas, we recommend budgeting for 18 inches of undercut, backfilled with compacted ABC stone over a layer of geogrid (Tensar TX-160 or equivalent). Where applicable, the depth of undercut can be reduced and/or the geogrid omitted if the conditions warrant and the owner's testing agency deems it acceptable. The undercut of unsuitable subgrade soils should extend a minimum of 2 feet laterally beyond the edge of asphalt.

It should be further noted that at-grade construction is heavily contingent of recent/current weather conditions. As such, construction in the wet season may render the trail's subgrade unsatisfactory for support as compared to the same subgrade in the drier season.

3.1.2 Asphalt Pavement

The flexible pavement design shown in Table 3 is based on the standard 20-year design life and the N.C. Department of Transportation Interim Pavement Design Procedure, 2000 (with 2007 updates). We have assumed that typical loading will consist of 10 maintenance vehicles (pick-up trucks) per week.

Table 3: Asphalt Pavement Section

Layer	Min. Layer Thickness (in.)
Surface Course (S9.5B)	2
Aggregate Base Course (ABC)	6

All materials and workmanship should comply with the SSRS as it pertains to asphalt pavement. We also recommend using the sampling and testing criteria contained the SSRS.

3.1.3 Concrete Pavement

The rigid pavement recommendations listed in Table 4 are based on the above-mentioned traffic loading assumptions and design methodology in ACI 330 Design and Construction of Concrete Parking Lots. This method is considered more applicable to the traffic supported by the trail than typical NCDOT highway methodology.

Table 4: Concrete Pavement Section

Layer	Layer Thickness (in.)
Concrete (4,500 psi*)	4.5
Aggregate Base Course (ABC)	N/A

** Concrete pavement should be air entrained and have the material properties prescribed for "Pavement" class concrete in Table 1000-1 in the SSRS.*

3.2 Retaining Walls

The retaining walls on this project will be designed by others. In doing so, the wall designer shall be responsible for both local and global stability of the wall. The wall designer should also verify that the walls will be settle excessively. We recommend that mechanically-stabilized earthen (MSE) walls be backfilled with material meeting the NCDOT's criteria for select granular material. Furthermore, during wall design, we recommend the material properties shown below.

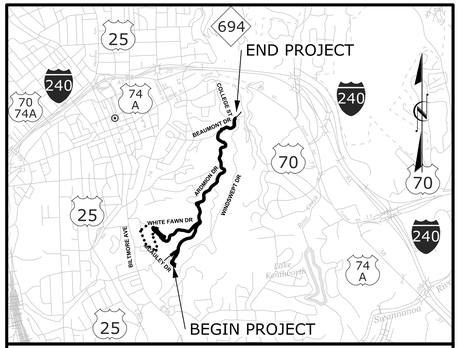
Table 5: Retaining Wall Design Parameters

Parameter	NCDOT Select Granular Material Backfill	Foundation & Retained Soil
Moist Soil Weight (γ), pcf	130	125
Internal Angle of Friction (Φ), deg.	32	28
Cohesion (c), psf	0	0

For retaining walls along the trail, we recommend an allowable soil bearing capacity of 2,500 psf. The footing should bear no less than 24 inches below the surrounding finished grade for bearing considerations and frost protection. All footings should be checked for adequate bearing by the Owner's testing agency prior to placement of reinforcing steel. Soft or otherwise unsuitable soils should be undercut and backfilled with compacted select material meeting the requirements in Sections 410-8 and 1016 of the NCDOT Standard Specifications for Roads and Structures (SSRS).

APPENDIX A

SITE VICINITY MAP
BORING LOCATION DIAGRAMS



VICINITY MAP

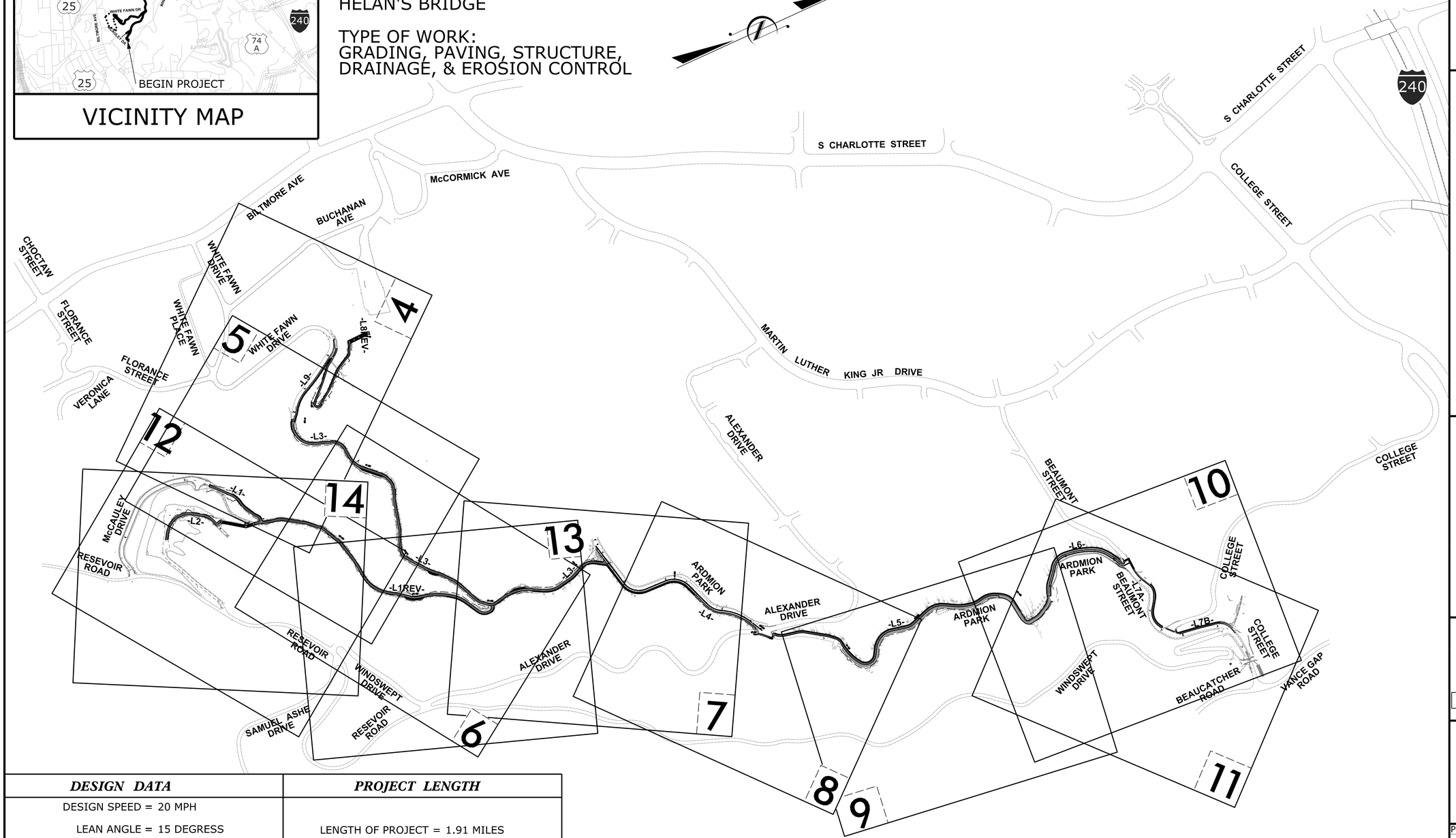
CITY OF ASHEVILLE
NORTH CAROLINA

BEAUCATCHER GREENWAY

LOCATION:
FROM WHITE FWAN RESERVOIR TO HELAN'S BRIDGE

TYPE OF WORK:
GRADING, PAVING, STRUCTURE, DRAINAGE, & EROSION CONTROL

INDEX OF SHEETS



DESIGN DATA	*PROJECT LENGTH*
DESIGN SPEED = 20 MPH LEAN ANGLE = 15 DEGRESS FUNC. CLASSIFICATION = GREENWAY	LENGTH OF PROJECT = 1.91 MILES

GRAPHIC SCALES

50 25 0 50 100 — PLANS
50 25 0 50 100 — PROFILE (HORIZONTAL)
10 5 0 10 20 — PROFILE (VERTICAL)

100% SUBMITTAL

BEAUCATCHER GREENWAY
WHITE FAWN RESERVOIR
TO
HELEN'S BRIDGE

PLANS PREPARED BY:
STEWART
Firm License No.: C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T. 919.380.8750
www.stewartinc.com

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJECT NO.:
H13002.00

1
BEAUCATCHER MOUNTAIN GREENWAY TRAIL

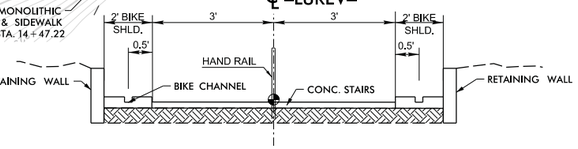
Project No. 298 PR-16-17-001

Geotech-11

ENGINEERING NOTES
–L8REV3– CONNECTION TO BALL PARK AREA
SWITCHBACKS USED TO MITIGATE STEEP GRADE
RETAINING WALLS USED TO MITIGATE CUT AND FILL SLOPES
GREENWAY TIES TO 10' PATH ALONG WHITE FAWN DR

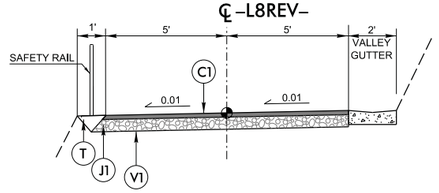
BEGIN SAFETY RAIL –L8REV3– STA. 10+00.00 LT & RT
BEGIN WALL –L8REV3– STA. 10+20.00 LT & RT
PROPOSED STAIRS
END WALL –L8REV3– STA. 11+18.61 LT
CITY OF ASHEVILLE P.B. 5, PG. 14 PIN 964856680600000
CITY OF ASHE P.B. 5, PG. PIN 964856680600000
B-7 (HA)
–L8REV–
END SAFETY RAIL –L8REV3– STA. 14+45.00 LT
BEGIN VALLEY GUTTER –L8REV3– STA. 14+50.00
BEGIN WALL –L8REV3– STA. 11+70.00 RT
END WALL –L8REV3– STA. 13+75.00 RT
B-6
END SAFETY RAIL
END WALL
BEGIN 6' CONCRETE SIDEWALK
BEGIN VALLEY GUTTER –L8REV3– STA. 11+15.00 RT
BEGIN WALL –L8REV3– STA. 16+25.00 LT
BEGIN WALL –L8REV3– STA. 16+50.00 LT
END VALLEY GUTTER –L8REV3– STA. 15+15.00 RT
BEGIN SAFETY RAIL –L8REV3– STA. 15+19.00 RT
B-8
–L9–
END WALL –L3– STA
VALL TTER
END SAFETY RAIL –L9– LT
END VALLEY GUTTER –L8REV3– STA 17+48.44 LT
BEGIN 6' CONCRETE SIDEWALK
BEGIN WALL
BEGIN SAFETY RAIL –L9– STA 10+95.76 LT
END 6' CONCRETE SIDEWALK –L8REV3– STA. 17+48.58
BEGIN 6"x12" CURB –L9– LT
END MONOLITHIC CURB & SIDEWALK –L9– STA. 14+47.22
TYRONE N. GREENLEE
WILLIAM N. GREENLEE
D.B. 6E, PG. 936
P.B. 5, PG. 63
PIN 9648479009000000
VIJAY KAPOOR (ET. AL)
FLORENCE KAPOOR (ET AL)
D.B. 5117, PG. 1734
P.B. 5, PG. 63
PIN 9648469948000000
BUCHANAN PLACE
BUCHANAN AVENUE
WHITE FAWN DRIVE
FLORANCE STREET
R/W

℄ –L8REV–



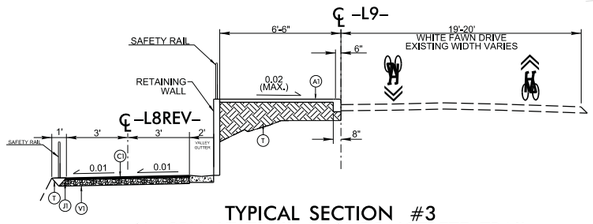
TYPICAL SECTION #1 – 6' STAIRS

℄ –L8REV–

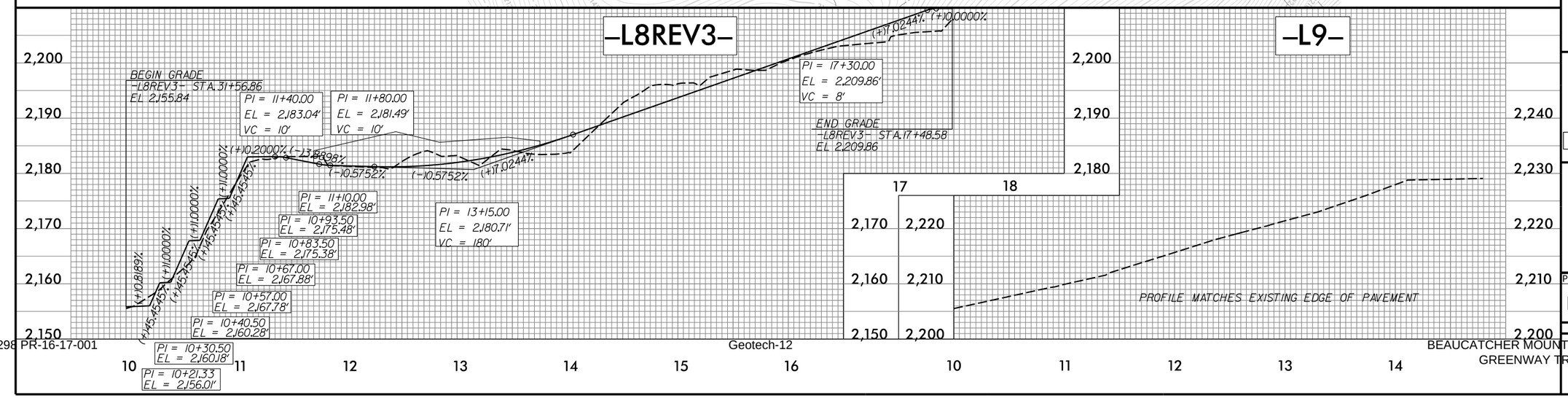


TYPICAL SECTION #2 – 6' ASPHALT TRAIL

℄ –L9–



TYPICAL SECTION #3
6' ASPHALT TRAIL & 6' CONCRETE TRAIL



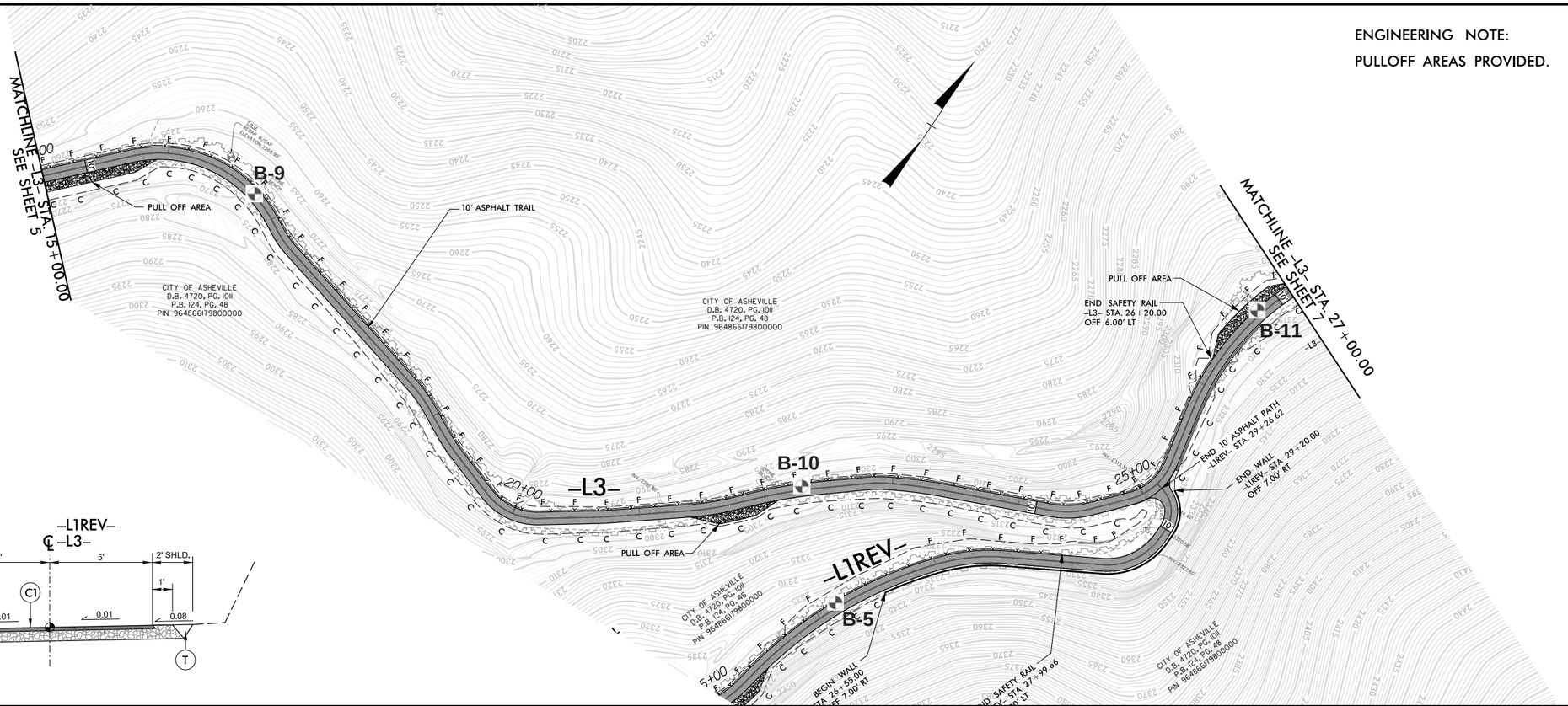
BEAUCATCHER GREENWAY
WHITE FAWN RESERVOIR
TO
HELEN'S BRIDGE

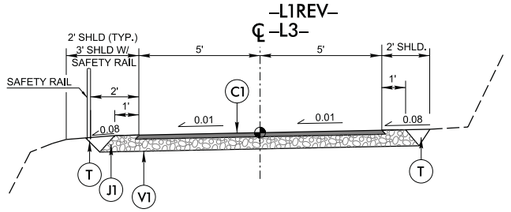
PLANS PREPARED BY:
Firm License No.: C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
p 919.380.8750
www.stewartinc.com
STEWART

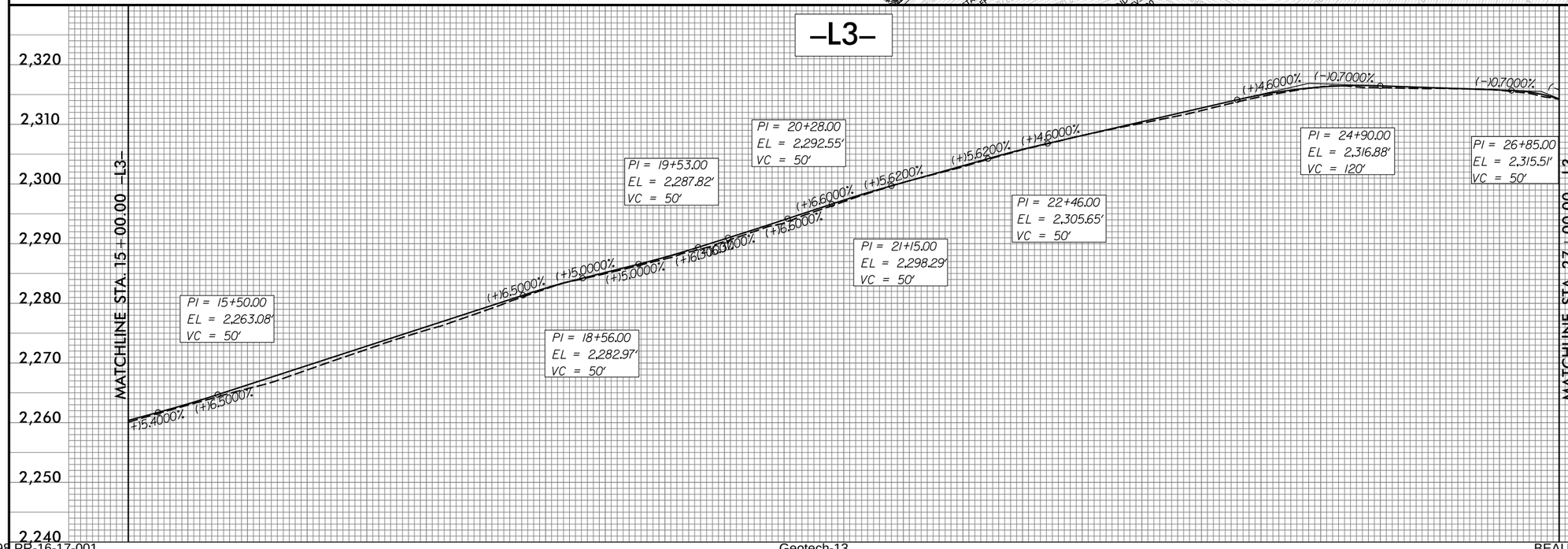
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJECT NO.:
H13002.00

ENGINEERING NOTE:
PULLOFF AREAS PROVIDED.







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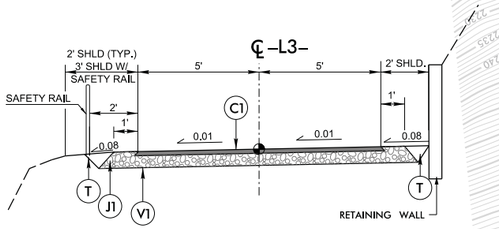
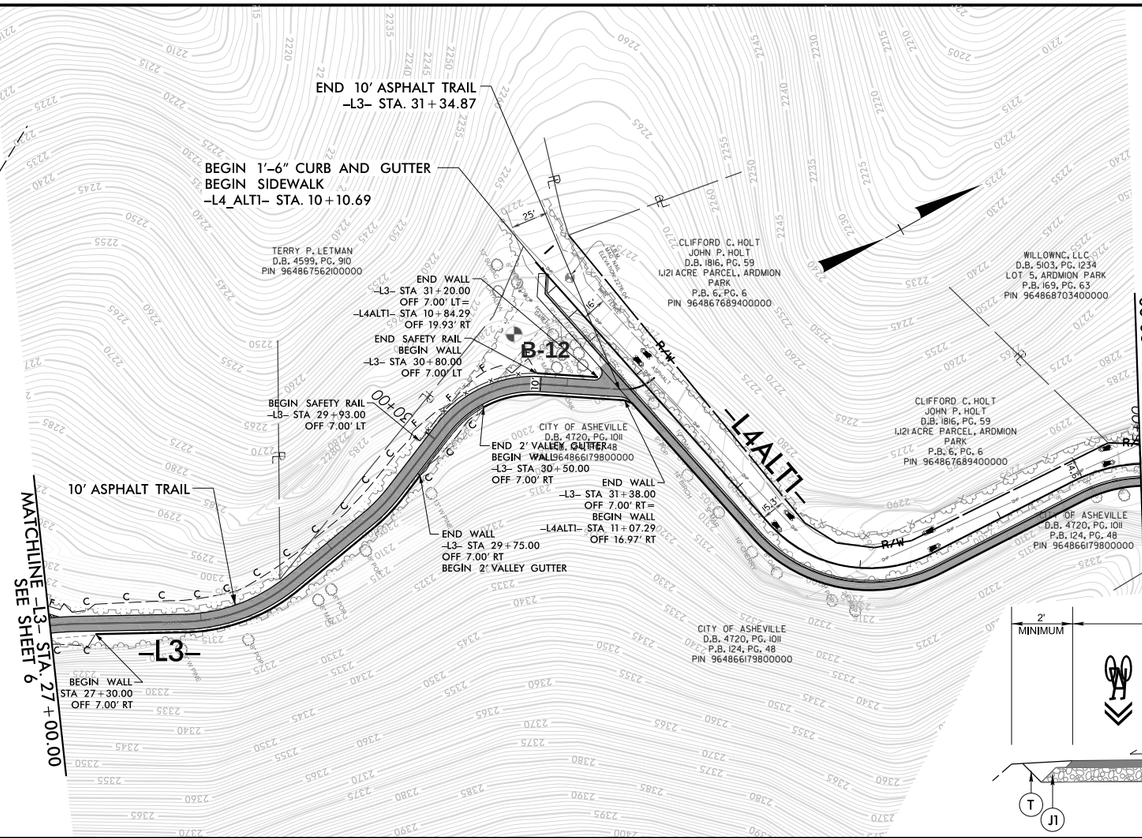
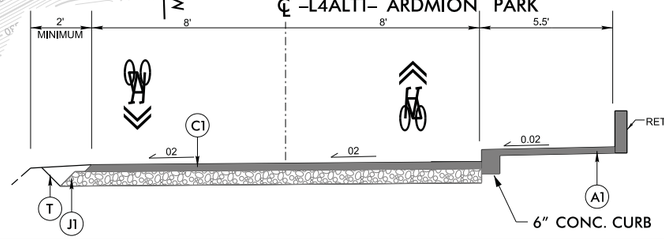


SWITCHBACKS TO ADDDRESS STEEP GRADES. FOOTPRINT OF SWITCHBACK IS LIMITED BY PROPERTY, TOPOGRAPHY, AND PRESENCE OF ROCK.



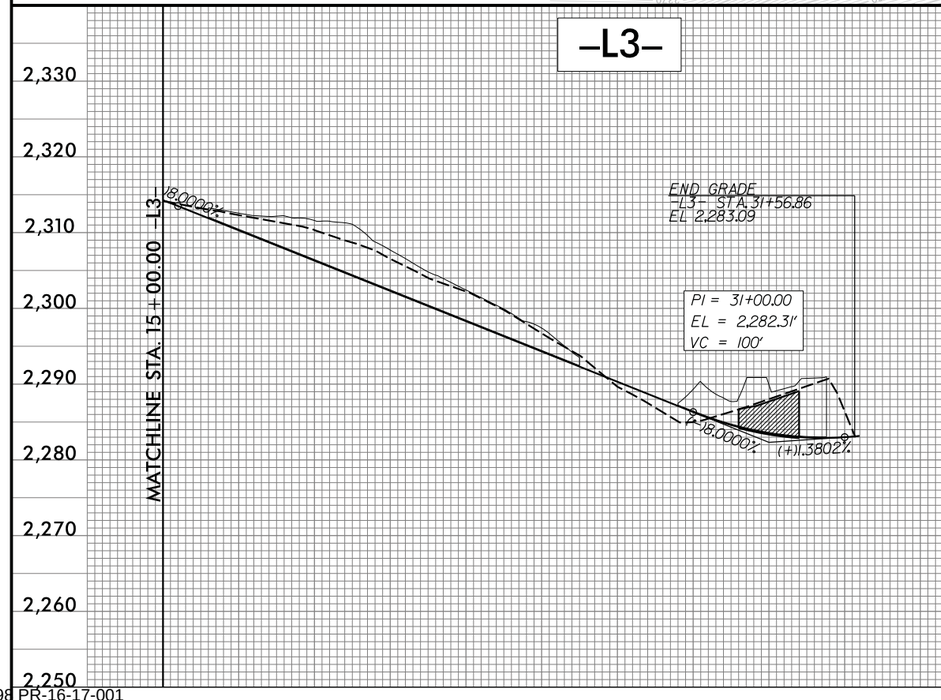


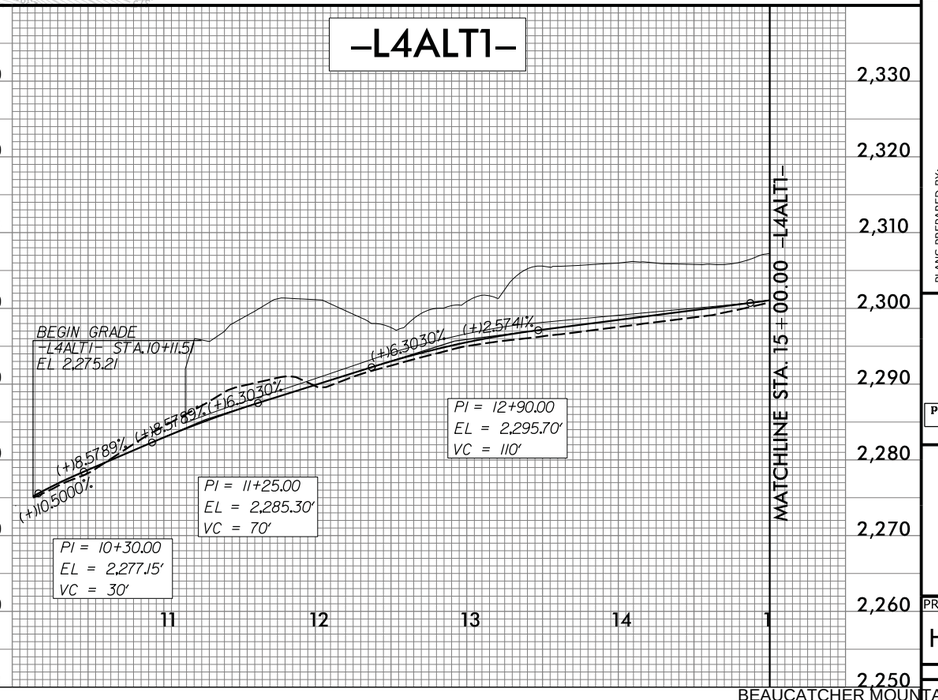
ENGINEERING NOTES:
TO MINIMIZE COSTS TO THE GREENWAY PROJECT

EXISTING PAVEMENT WIDTH ALONG ARDMION PARK WILL BE WIDENED TO 16'. "DOWNHILL" EDGE OF PAVEMENT WILL BE HELD, AND WIDENING WILL OCCUR ON THE UPHILL SIDE SINCE A RETAINING WALL WILL BE REQUIRED FOR THE SIDEWALK

18' OF WIDENING WILL REQUIRE TALLER WALLS, AND INCREASE THE LIKELYHOOD OF HITTING ROCK.

CURBING WILL BE INSTALLED WITH INTEGRATED SIDEWALK.





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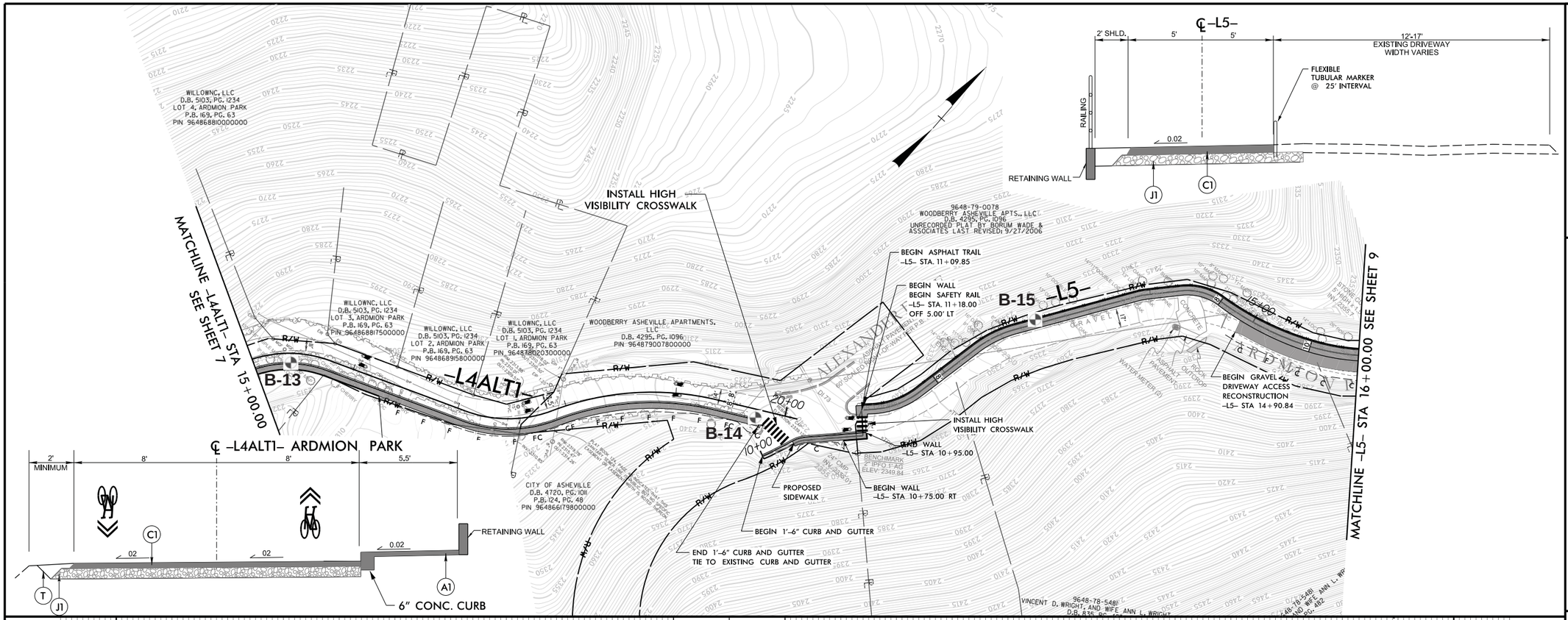

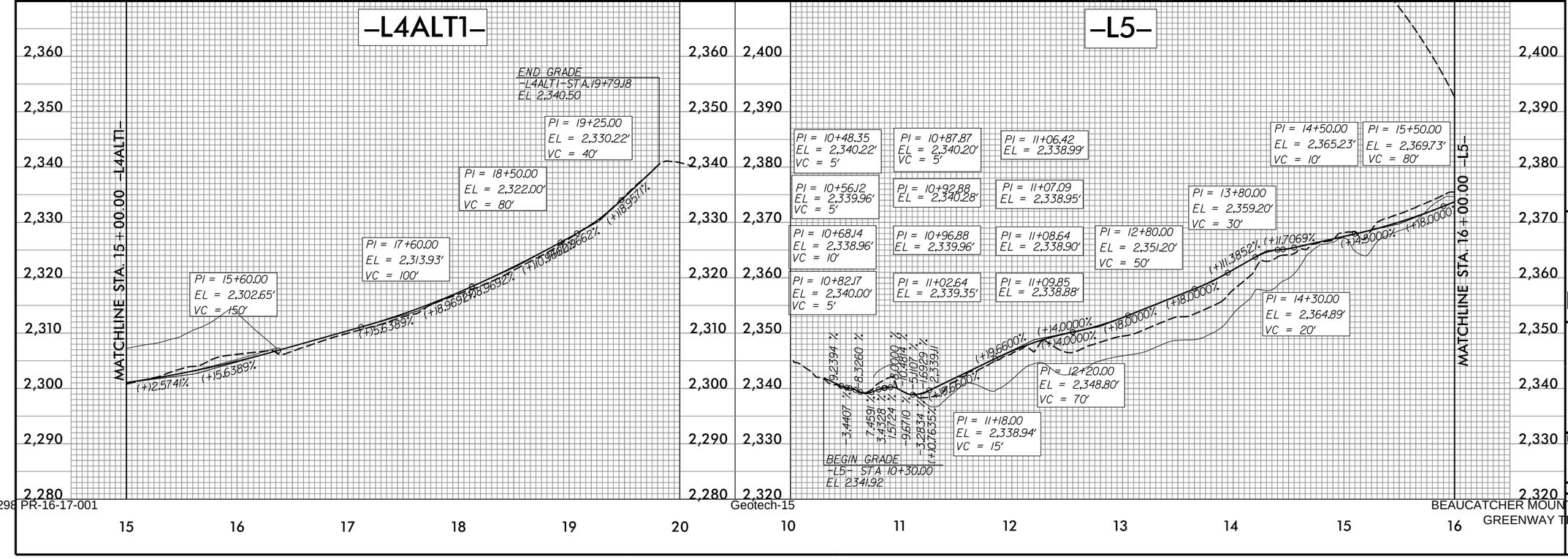

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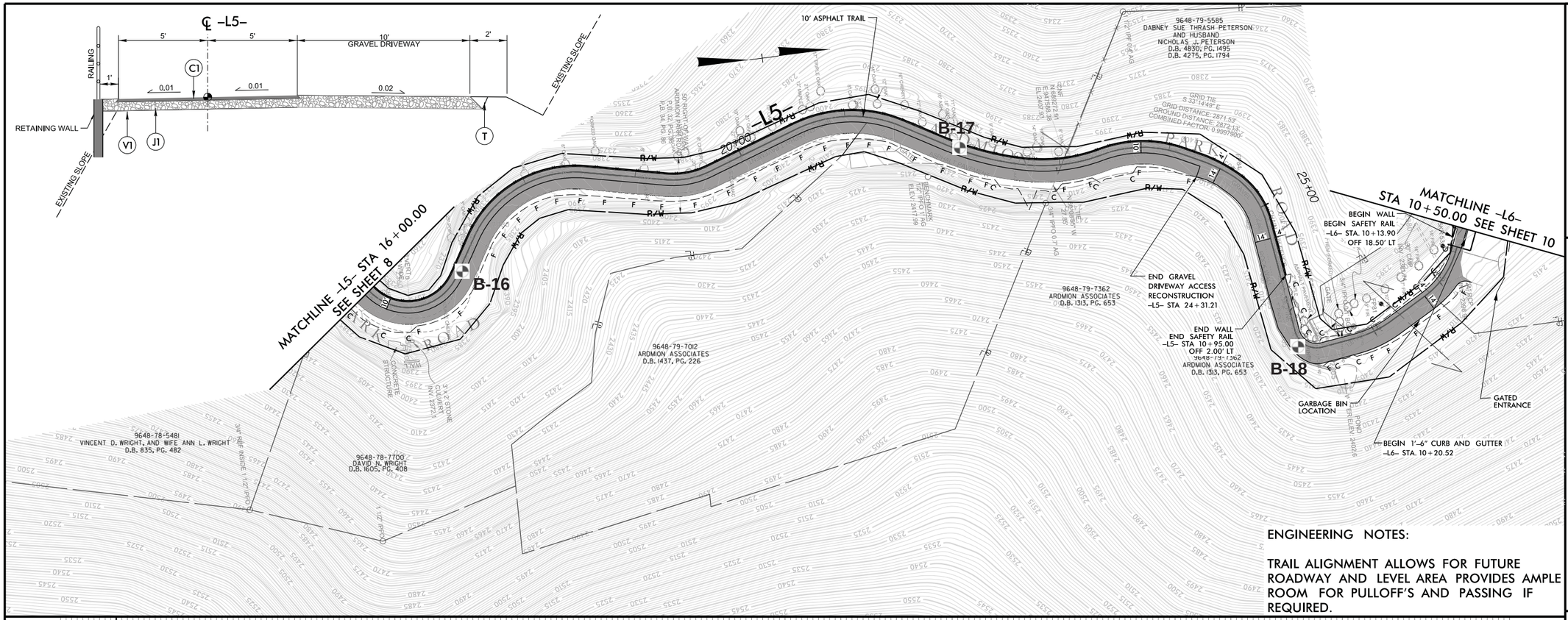

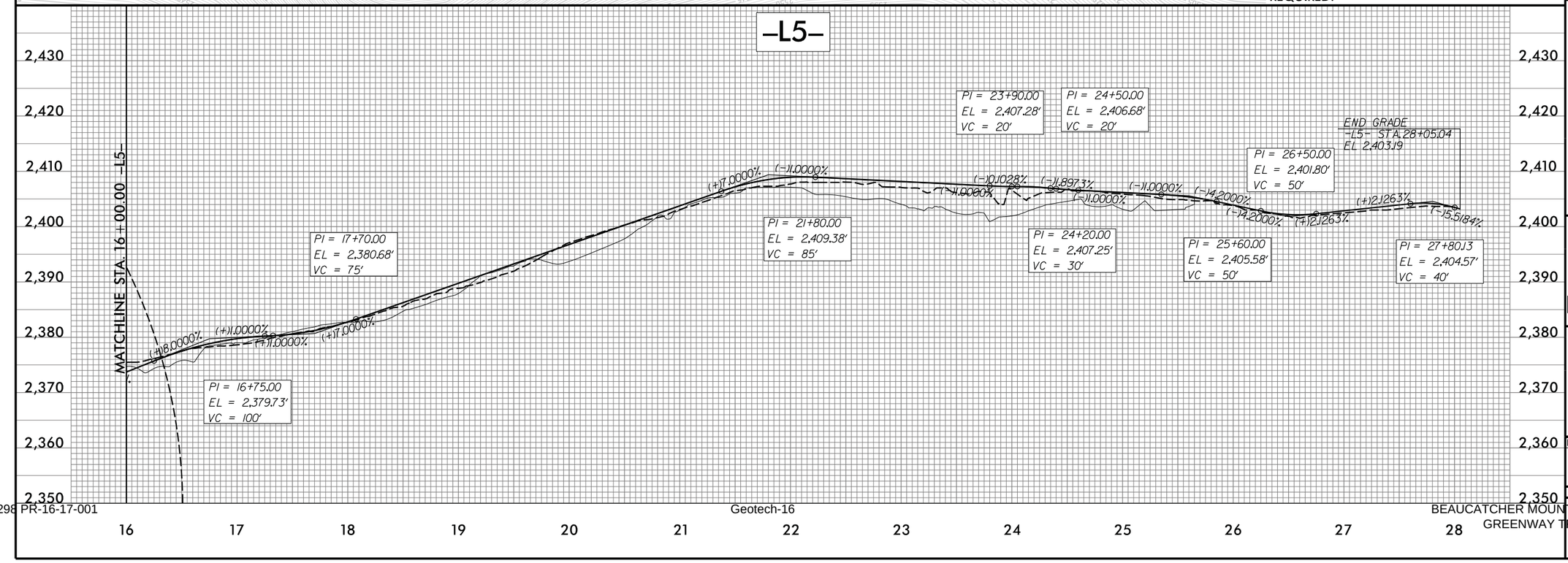

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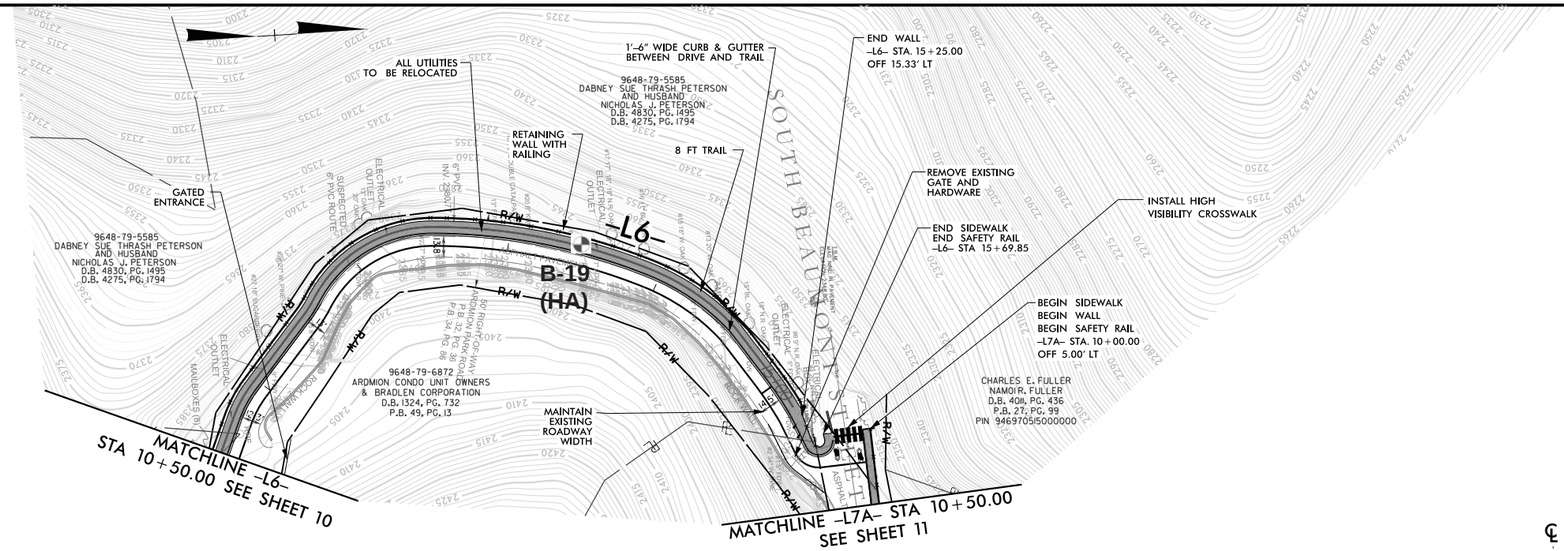

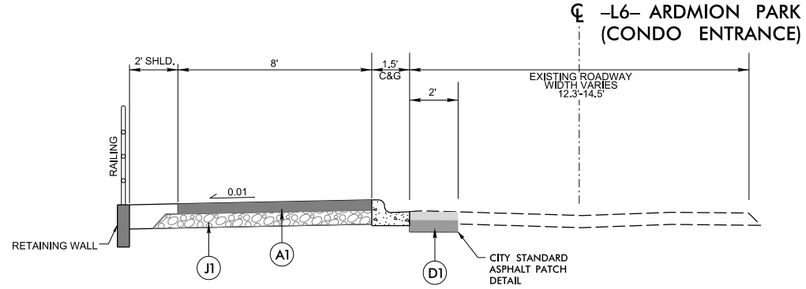

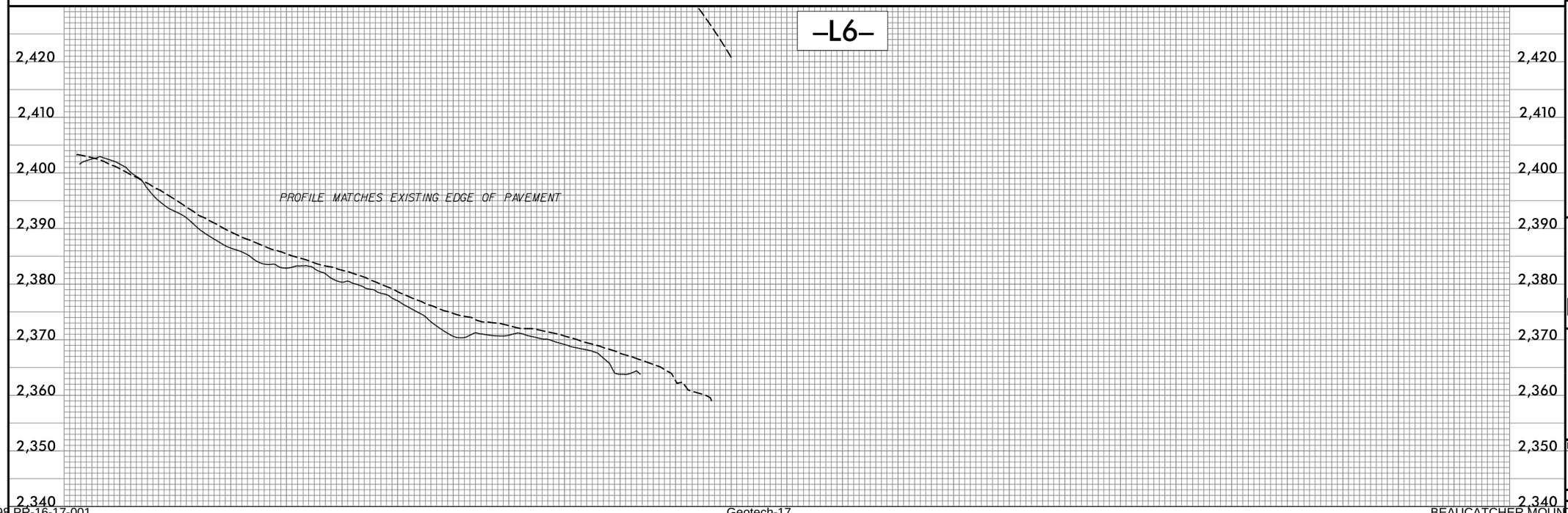

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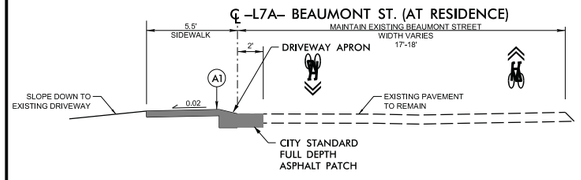


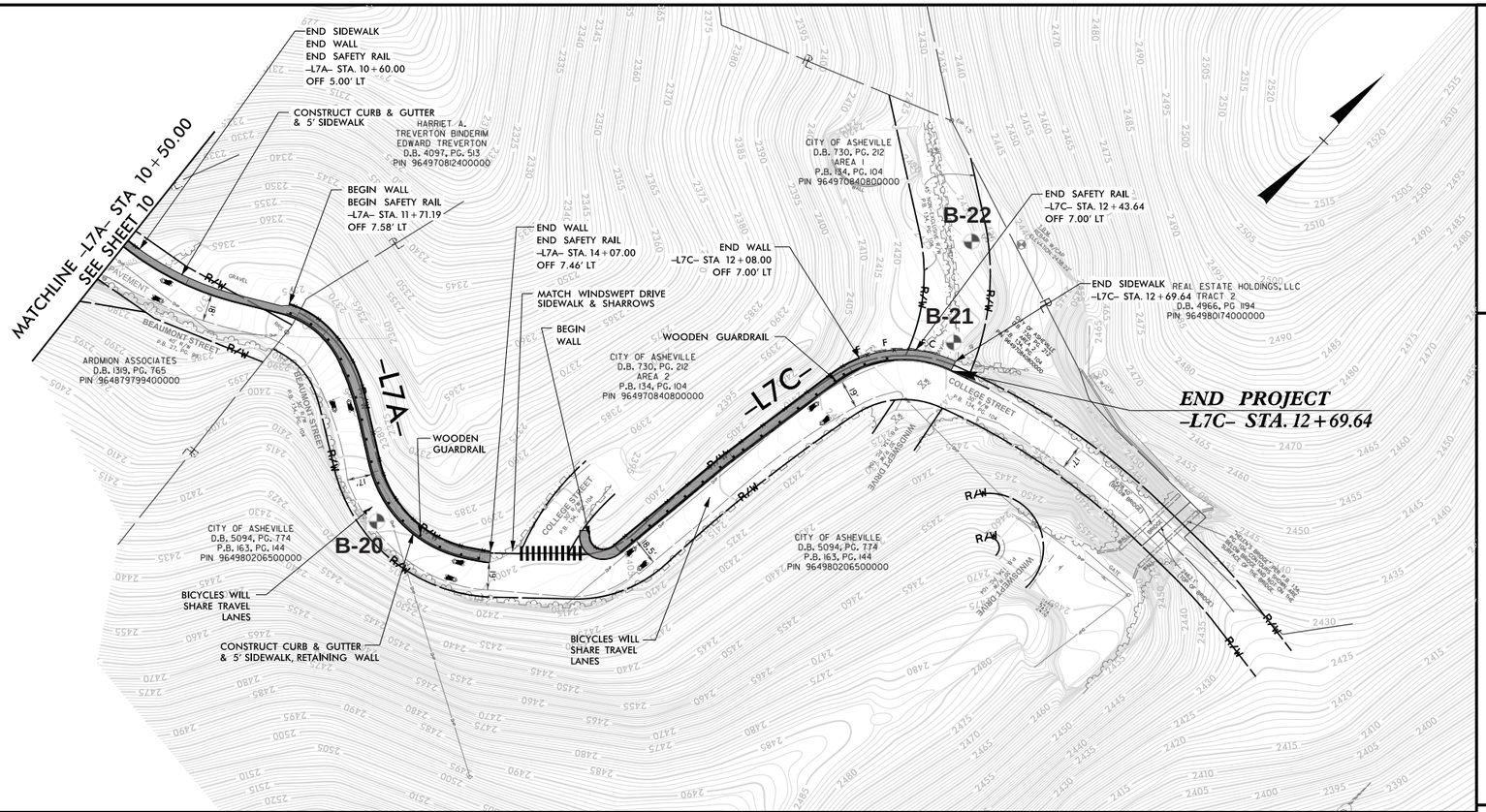
ENGINEERING NOTES:

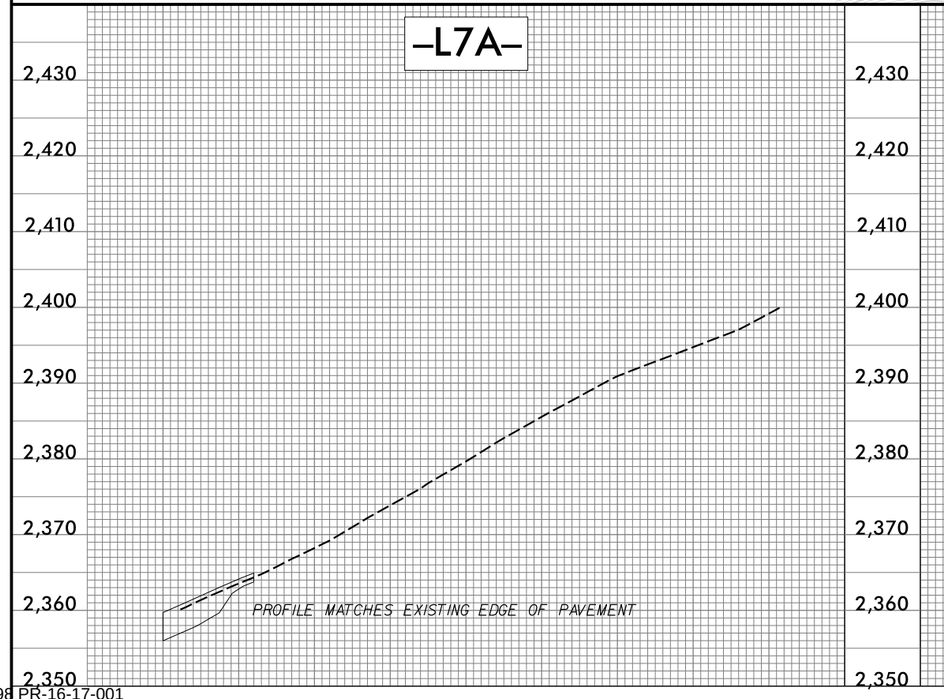
EXISTING PAVEMENT WIDTH WILL REMAIN.

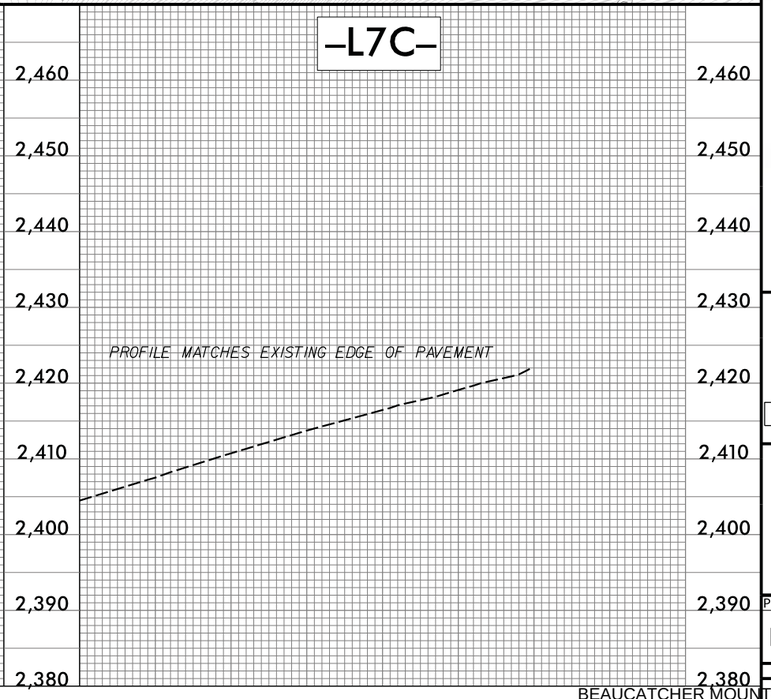
INTEGRATED CURB AND SIDEWALK WILL BE ADDED ON THE "DOWNHILL" SIDE OF THE STREETS.

WOODEN GUARDRAIL WILL BE INSTALLED ALONG THIS SEGMENT TO PROTECT VEHICLES AND PEDESTRIANS.

"DOWNHILL" SIDE OF COLLEGE STREET WAS SELECTED FOR WIDENING TO REDUCE POTENTIAL CONFLICTS WITH ROCK, UNDERMINING THE ROADWAY ABOVE THE PROPOSED WALL, AND TO REDUCE THE STREET CROSSINGS BY ONE.







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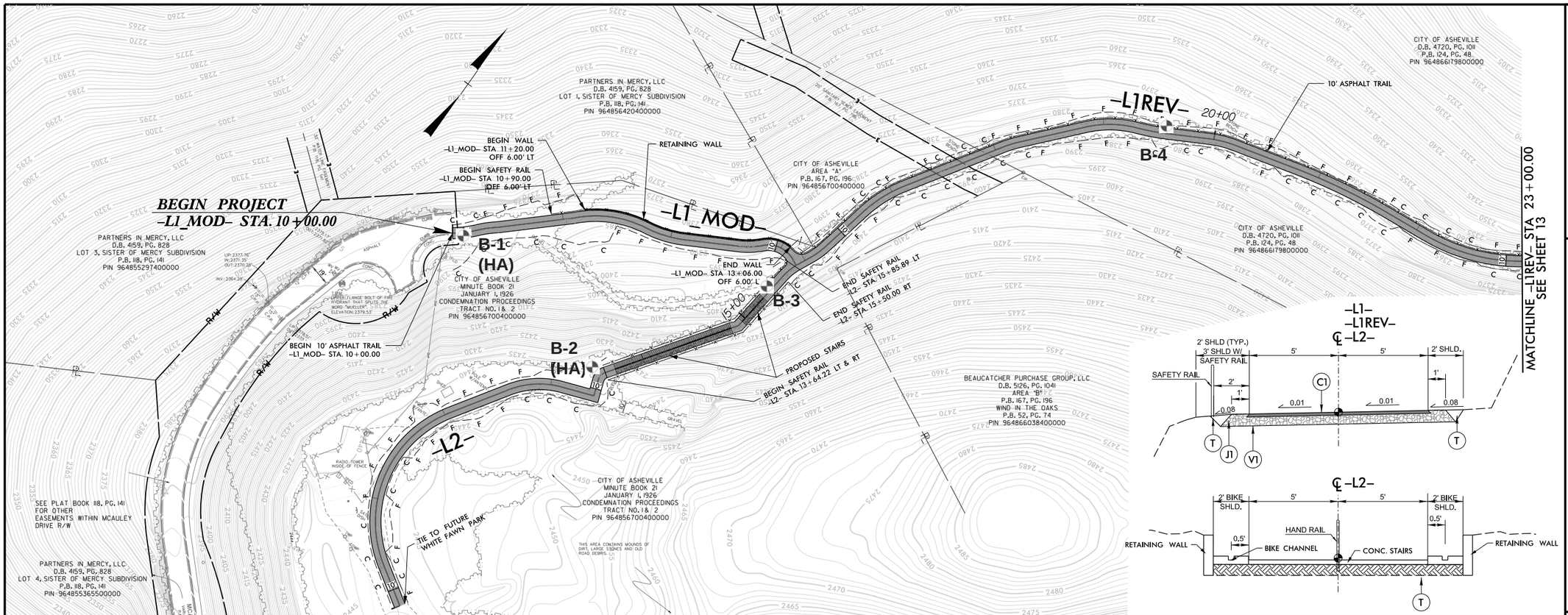

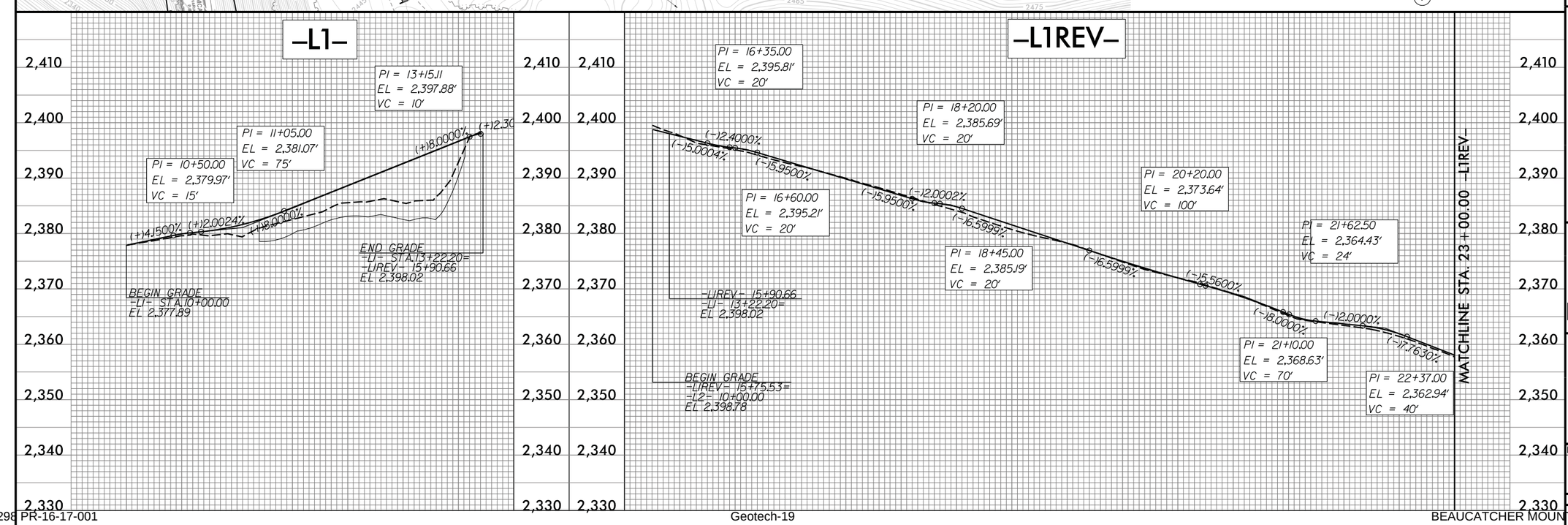

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ENGINEERING NOTE:

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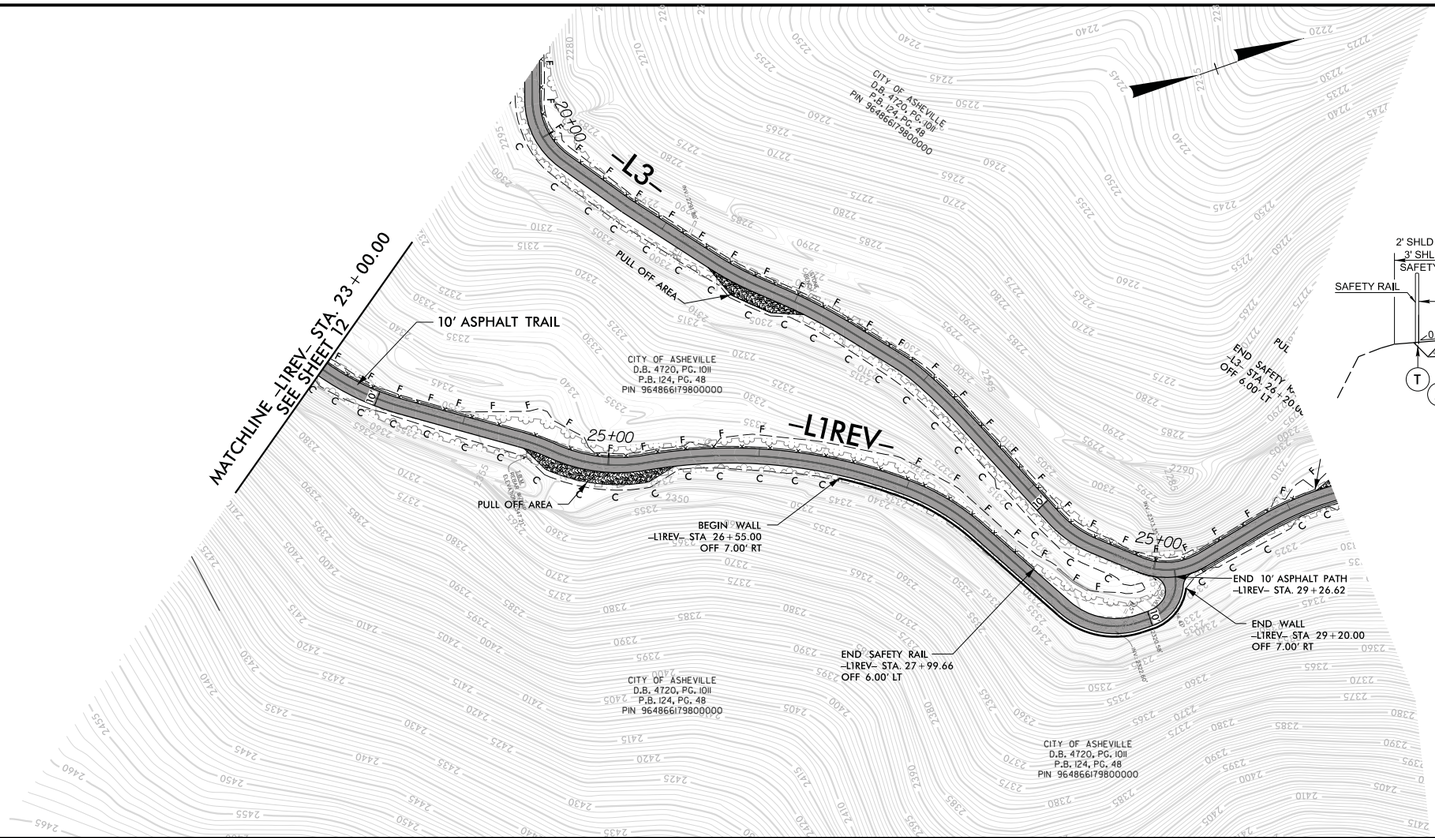

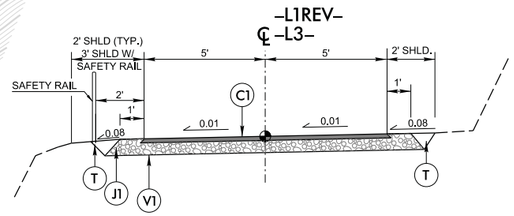

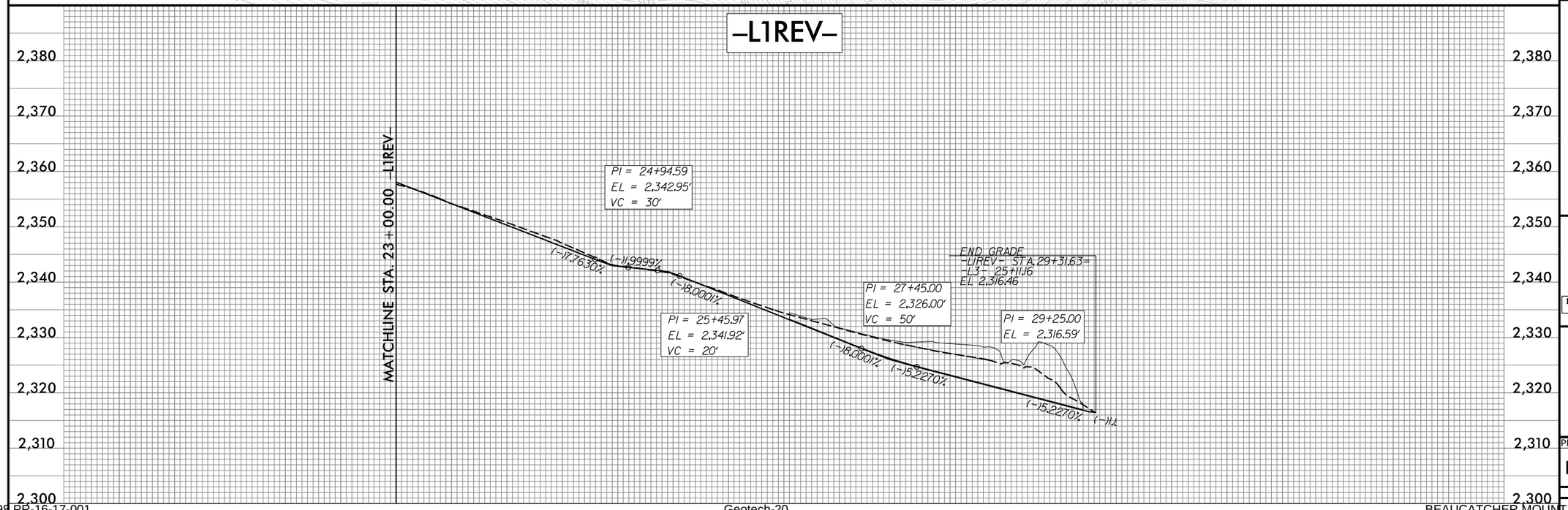

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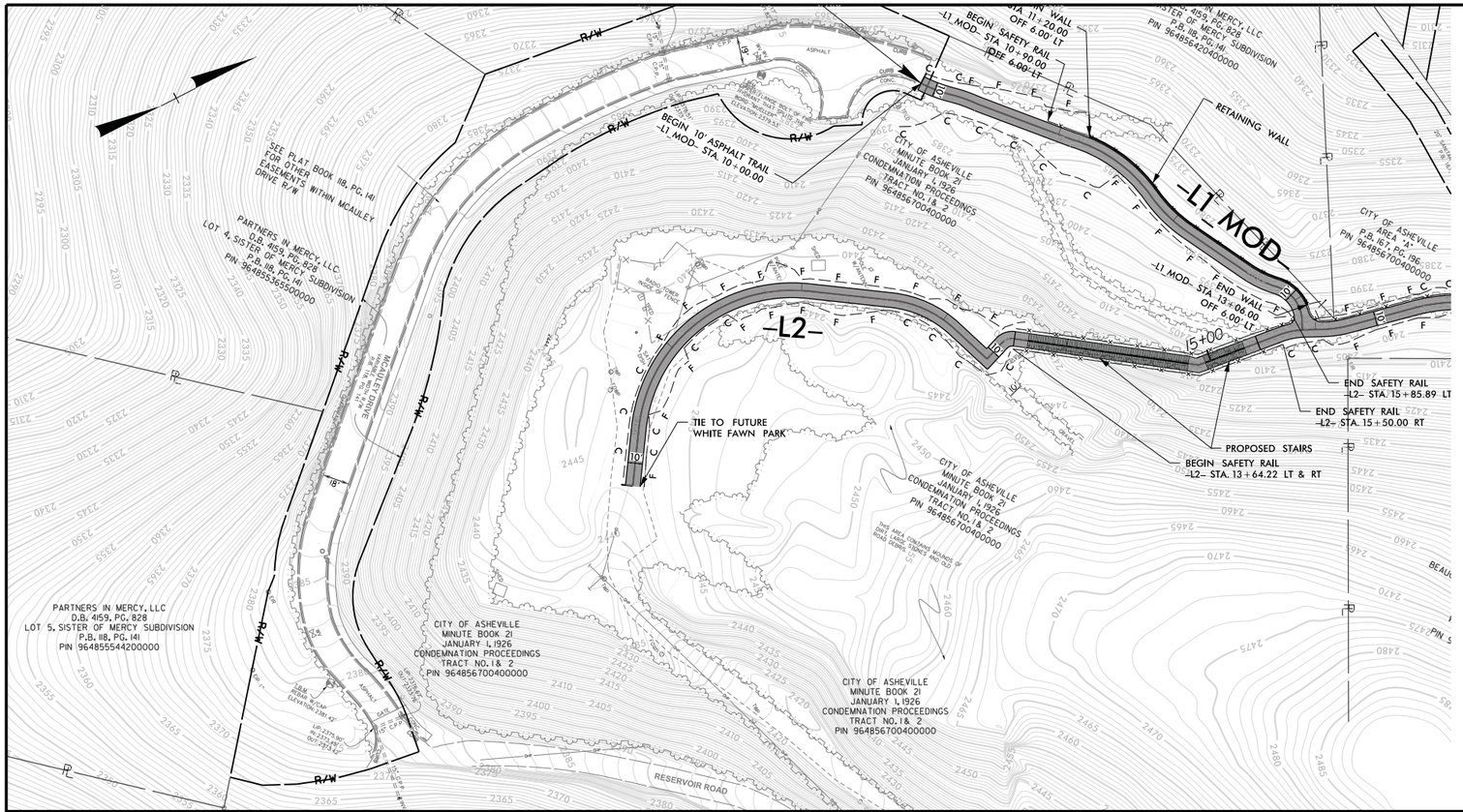

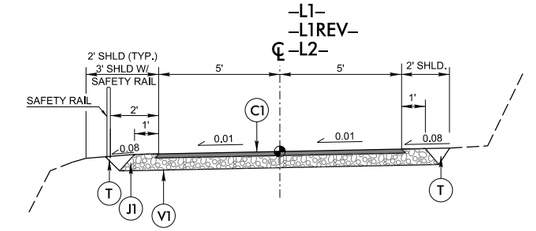

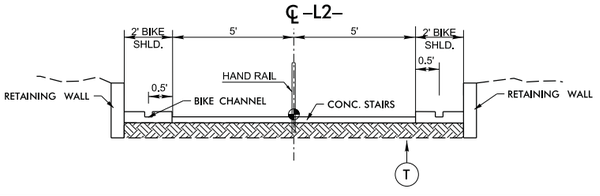

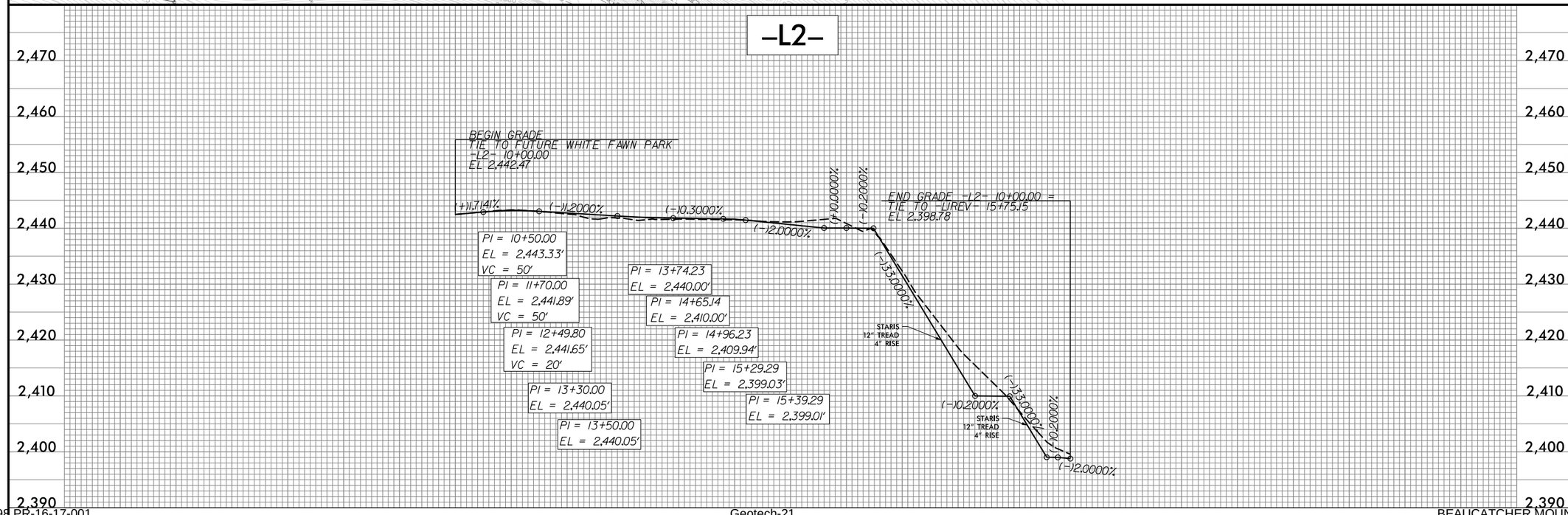

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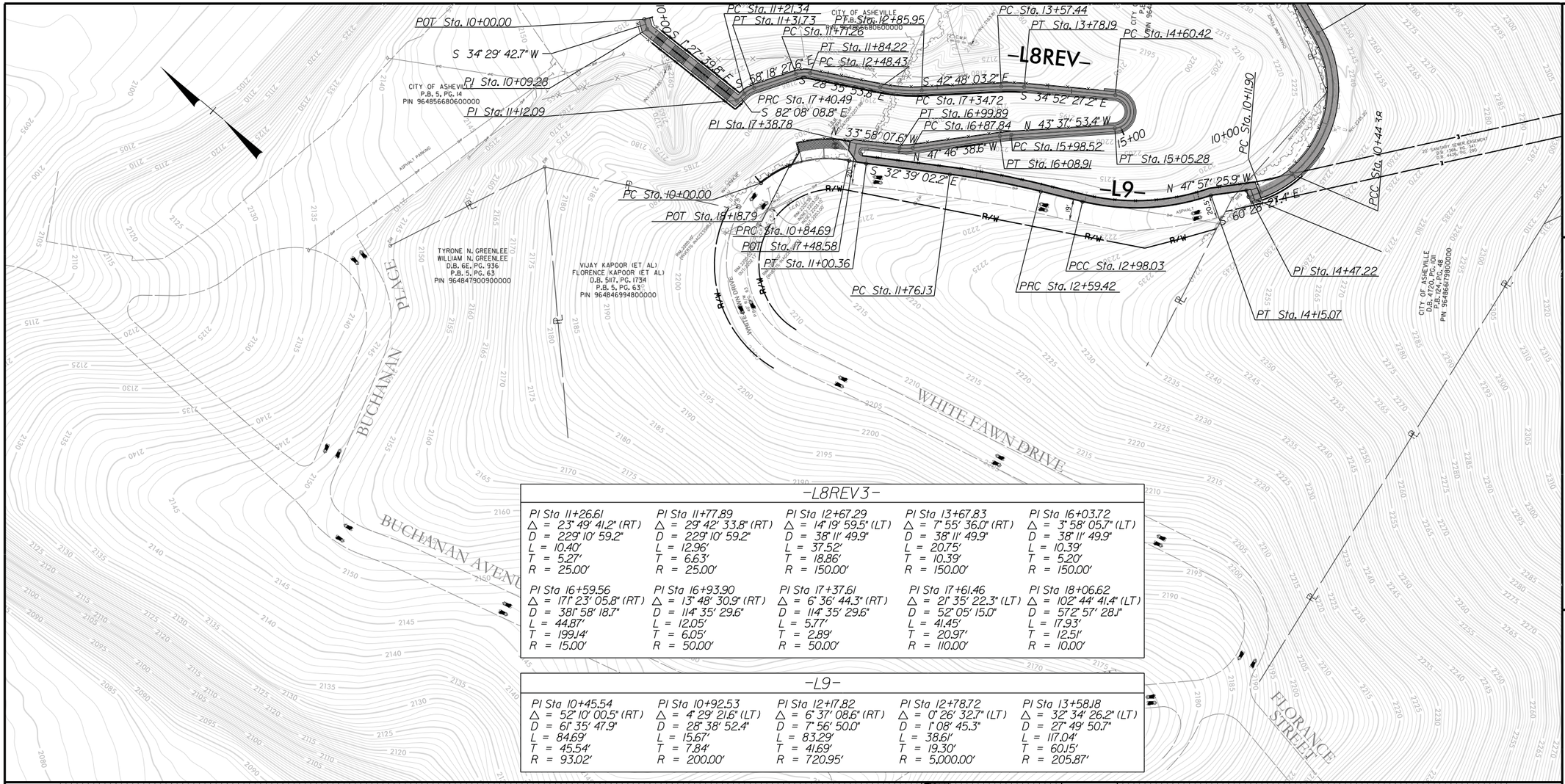
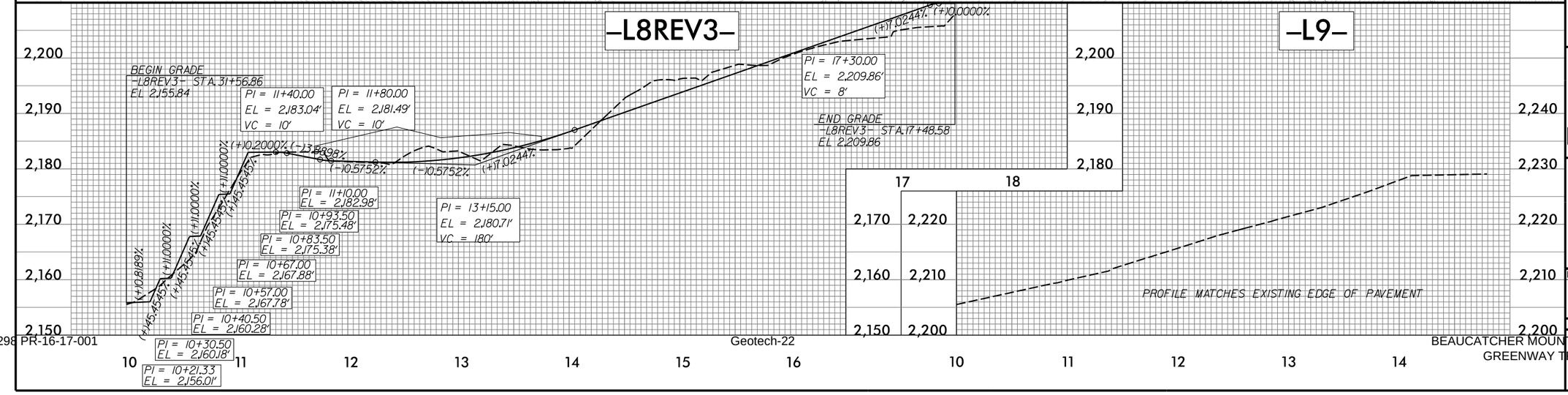


-L8REV3-

PI Sta 11+26.61 △ = 23° 49' 41.2" (RT) D = 229° 10' 59.2" L = 10.40' T = 5.27' R = 25.00'	PI Sta 11+77.89 △ = 29° 42' 33.8" (RT) D = 229° 10' 59.2" L = 12.96' T = 6.63' R = 25.00'	PI Sta 12+67.29 △ = 14° 19' 59.5" (LT) D = 38° 11' 49.9" L = 37.52' T = 18.86' R = 150.00'	PI Sta 13+67.83 △ = 7° 55' 36.0" (RT) D = 38° 11' 49.9" L = 20.75' T = 10.39' R = 150.00'	PI Sta 16+03.72 △ = 3° 58' 05.7" (LT) D = 38° 11' 49.9" L = 10.39' T = 5.20' R = 150.00'
PI Sta 16+59.56 △ = 171° 23' 05.8" (RT) D = 381° 58' 18.7" L = 44.87' T = 199.14' R = 15.00'	PI Sta 16+93.90 △ = 13° 48' 30.9" (RT) D = 114° 35' 29.6" L = 12.05' T = 6.05' R = 50.00'	PI Sta 17+37.61 △ = 6° 36' 44.3" (RT) D = 114° 35' 29.6" L = 5.77' T = 2.89' R = 50.00'	PI Sta 17+61.46 △ = 21° 35' 22.3" (LT) D = 52° 05' 15.0" L = 41.45' T = 20.97' R = 110.00'	PI Sta 18+06.62 △ = 102° 44' 41.4" (LT) D = 572° 57' 28.1" L = 17.93' T = 12.51' R = 10.00'

-L9-

PI Sta 10+45.54 △ = 52° 10' 00.5" (RT) D = 61° 35' 47.9" L = 84.69' T = 45.54' R = 93.02'	PI Sta 10+92.53 △ = 4° 29' 21.6" (LT) D = 28° 38' 52.4" L = 15.67' T = 7.84' R = 200.00'	PI Sta 12+17.82 △ = 6° 37' 08.6" (RT) D = 7° 56' 50.0" L = 83.29' T = 41.69' R = 720.95'	PI Sta 12+78.72 △ = 0° 26' 32.7" (LT) D = 1° 08' 45.3" L = 38.61' T = 19.30' R = 5,000.00'	PI Sta 13+58.18 △ = 32° 34' 26.2" (LT) D = 27° 49' 50.7" L = 117.04' T = 60.15' R = 205.87'



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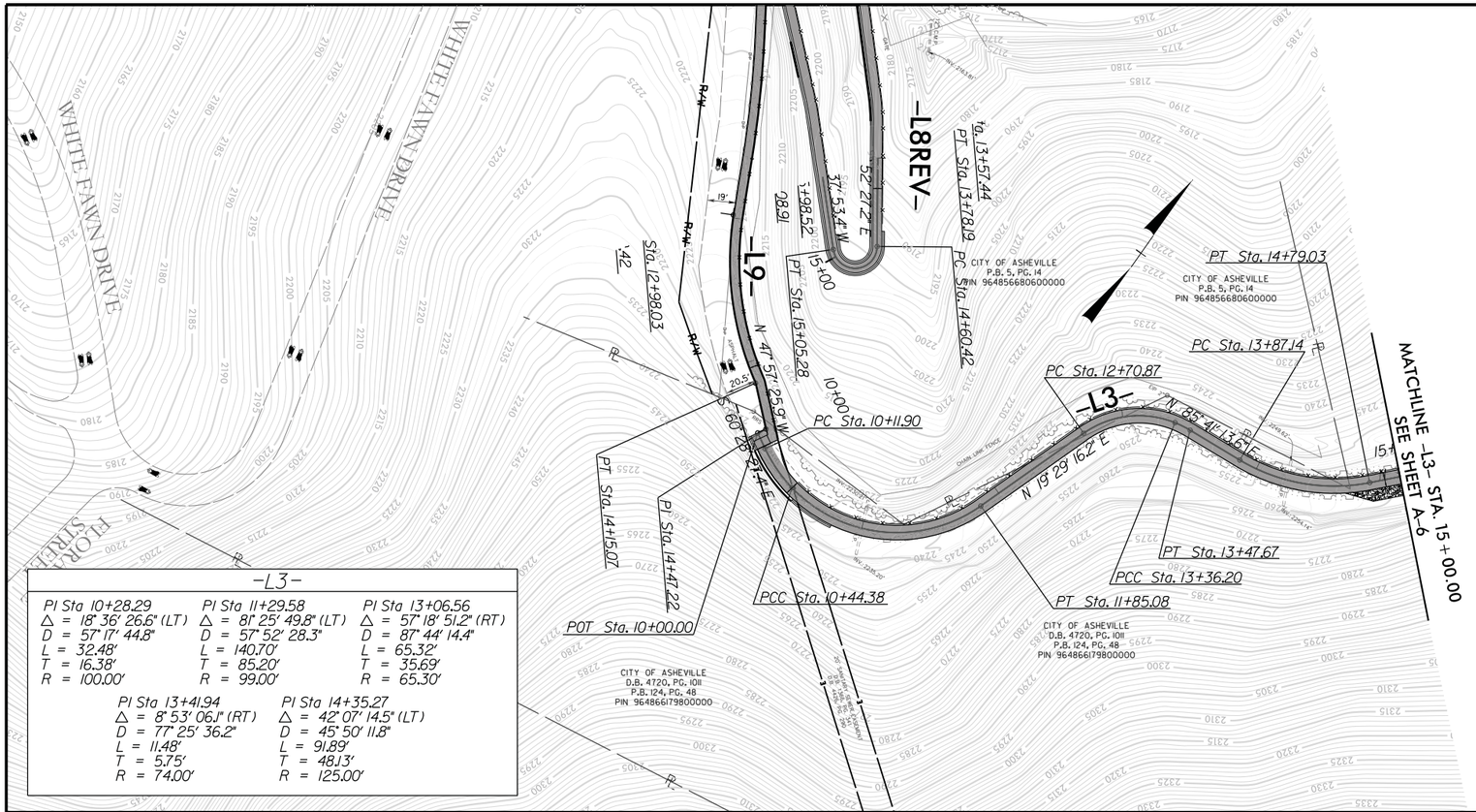
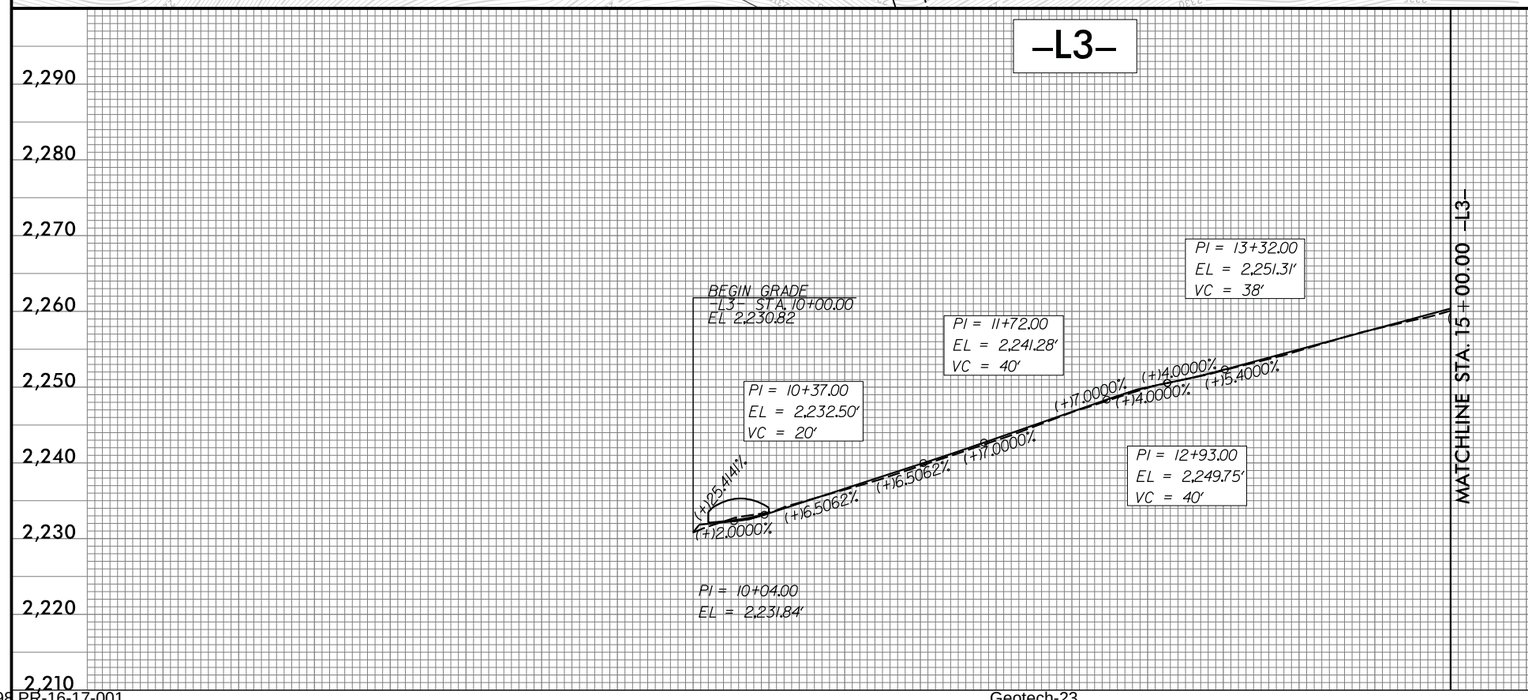


–L3–

PI Sta 10+28.29	PI Sta 11+29.58	PI Sta 13+06.56
△ = 18° 36' 26.6" (LT)	△ = 81° 25' 49.8" (LT)	△ = 57° 18' 51.2" (RT)
D = 57° 17' 44.8"	D = 57° 52' 28.3"	D = 87° 44' 14.4"
L = 32.48'	L = 140.70'	L = 65.32'
T = 16.38'	T = 85.20'	T = 35.69'
R = 100.00'	R = 99.00'	R = 65.30'

PI Sta 13+41.94	PI Sta 14+35.27
△ = 8° 53' 06.1" (RT)	△ = 42° 07' 14.5" (LT)
D = 77° 25' 36.2"	D = 45° 50' 11.8"
L = 11.48'	L = 91.89'
T = 5.75'	T = 48.13'
R = 74.00'	R = 125.00'



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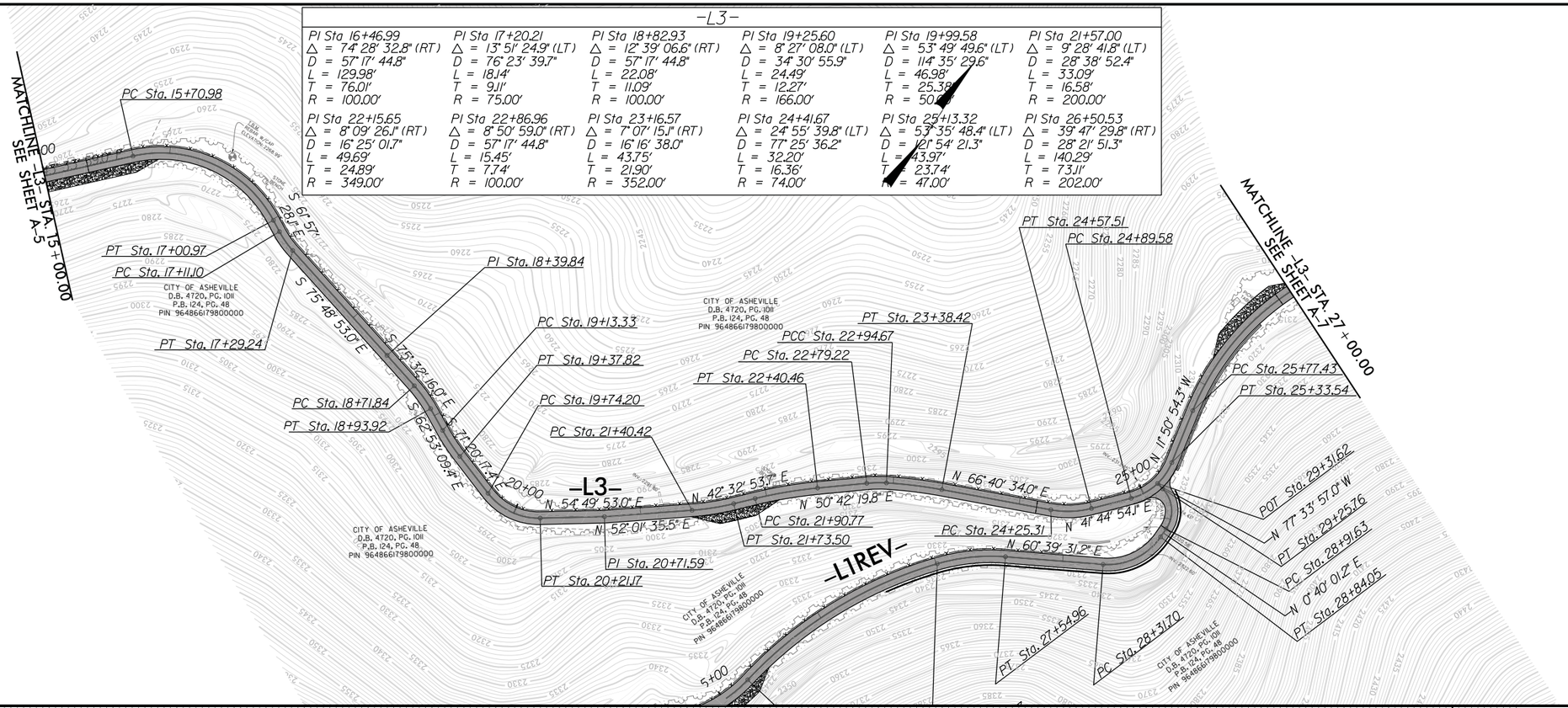
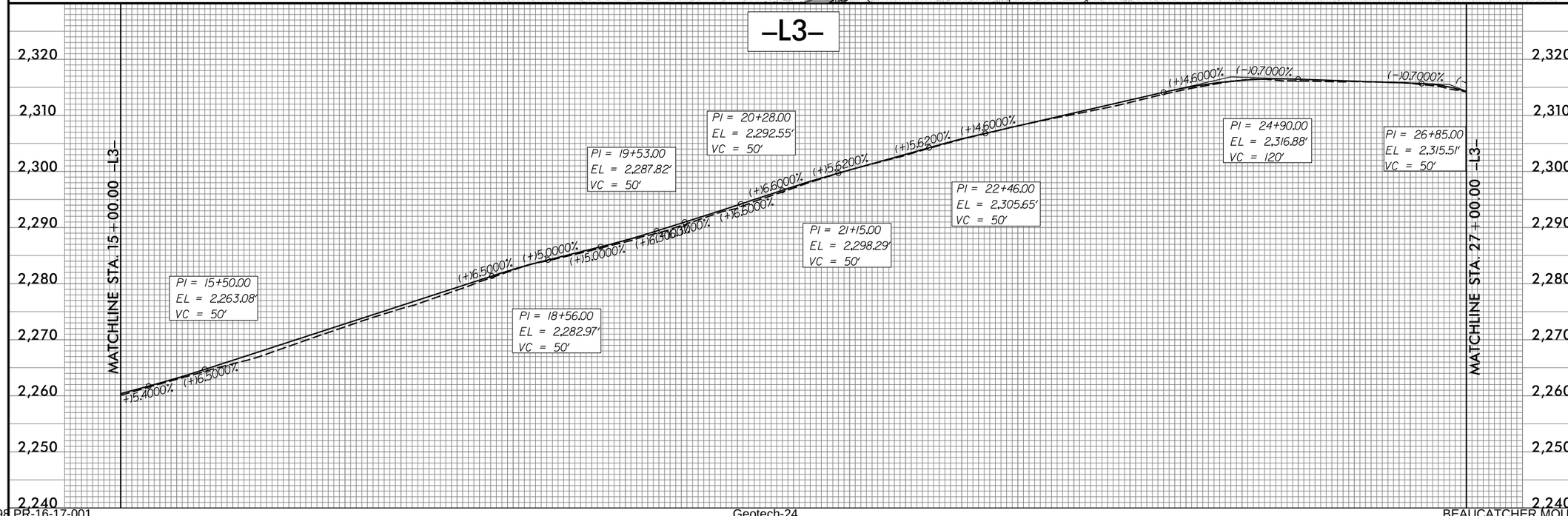
–L3–

PI Sta 16+46.99 △ = 74° 28' 32.8" (RT) D = 57° 17' 44.8" L = 129.98' T = 76.01' R = 100.00'	PI Sta 17+20.21 △ = 13° 51' 24.9" (LT) D = 76° 23' 39.7" L = 18.14' T = 9.11' R = 75.00'	PI Sta 18+82.93 △ = 12° 39' 06.6" (RT) D = 57° 17' 44.8" L = 22.08' T = 11.09' R = 100.00'	PI Sta 19+25.60 △ = 8° 27' 08.0" (LT) D = 34° 30' 55.9" L = 24.49' T = 12.27' R = 166.00'	PI Sta 19+99.58 △ = 53° 49' 49.6" (LT) D = 114° 35' 29.6" L = 46.98' T = 25.38' R = 50.00'	PI Sta 21+57.00 △ = 9° 28' 41.8" (LT) D = 28° 38' 52.4" L = 33.09' T = 16.58' R = 200.00'
PI Sta 22+15.65 △ = 8° 09' 26.1" (RT) D = 16° 25' 01.7" L = 49.69' T = 24.89' R = 349.00'	PI Sta 22+86.96 △ = 8° 50' 59.0" (RT) D = 57° 17' 44.8" L = 15.45' T = 7.74' R = 100.00'	PI Sta 23+16.57 △ = 7° 07' 15.1" (RT) D = 16° 16' 38.0" L = 43.75' T = 21.90' R = 352.00'	PI Sta 24+41.67 △ = 24° 55' 39.8" (LT) D = 77° 25' 36.2" L = 32.20' T = 16.36' R = 74.00'	PI Sta 25+13.32 △ = 53° 35' 48.4" (LT) D = 121° 54' 21.3" L = 43.97' T = 23.74' R = 47.00'	PI Sta 26+50.53 △ = 39° 47' 29.8" (RT) D = 28° 21' 51.3" L = 140.29' T = 73.11' R = 202.00'





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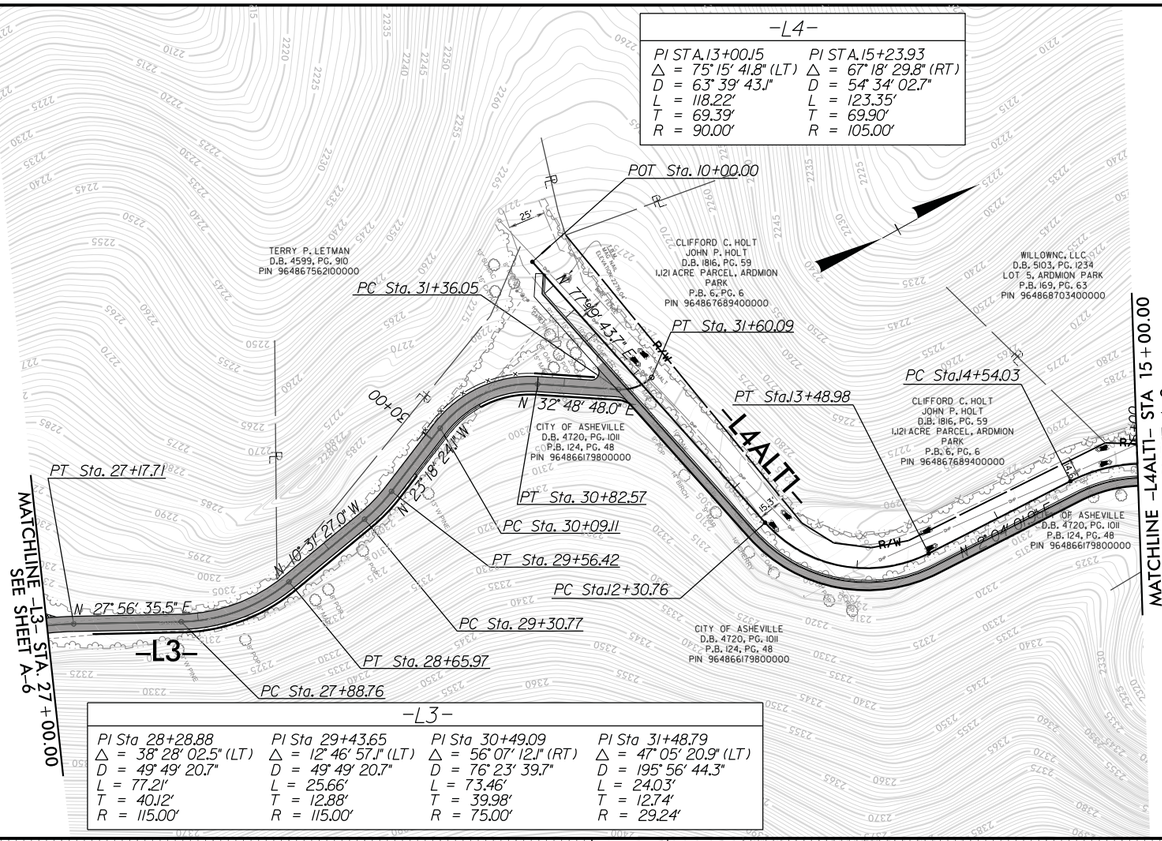


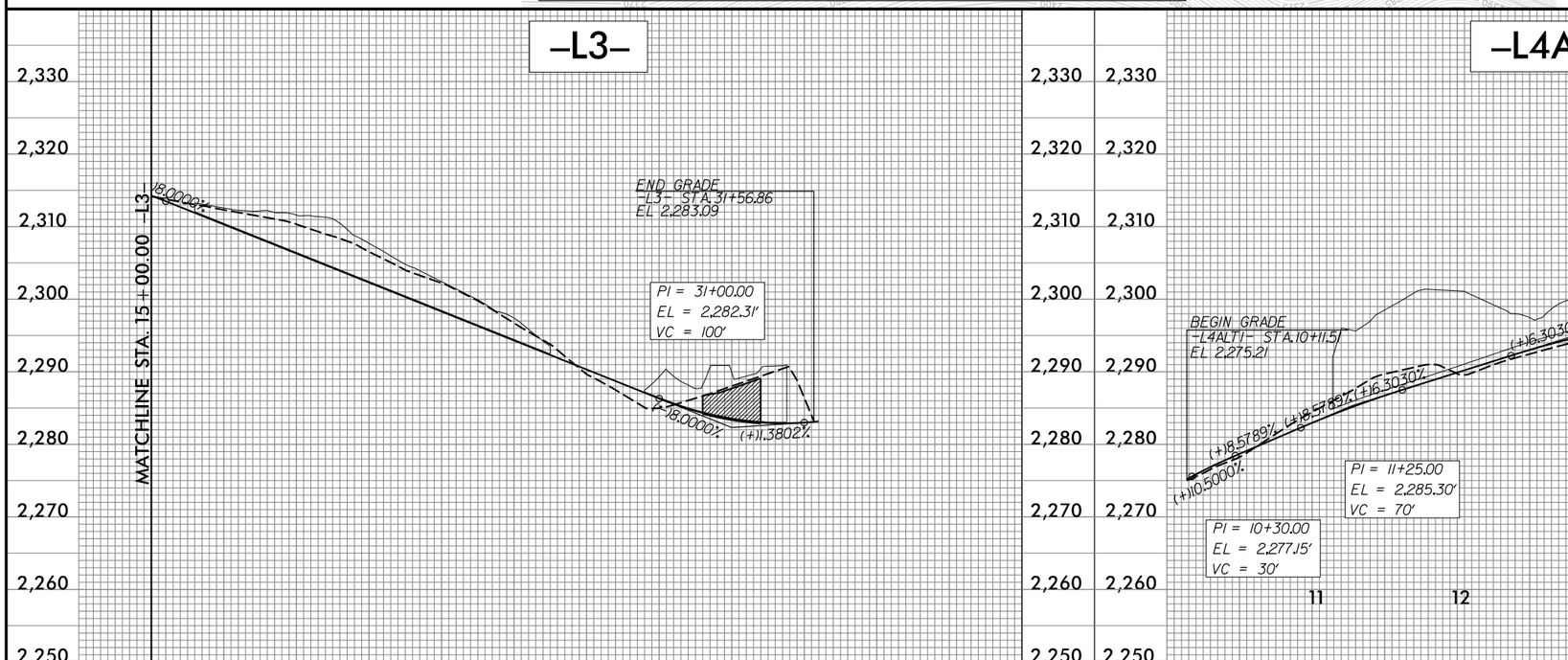
–L3–

PI Sta 28+28.88
△ = 38° 28' 02.5" (LT)
D = 49° 49' 20.7"
L = 77.21'
T = 40.12'
R = 115.00'

PI Sta 29+43.65
△ = 12° 46' 57.1" (LT)
D = 49° 49' 20.7"
L = 25.66'
T = 12.88'
R = 115.00'

PI Sta 30+49.09
△ = 56° 07' 12.1" (RT)
D = 76° 23' 39.7"
L = 73.46'
T = 39.98'
R = 75.00'

PI Sta 31+48.79
△ = 47° 05' 20.9" (LT)
D = 195° 56' 44.3"
L = 24.03'
T = 12.74'
R = 29.24'



BEAUCATCHER GREENWAY
WHITE FAWN RESERVOIR
TO
HELEN'S BRIDGE

PLANS PREPARED BY:
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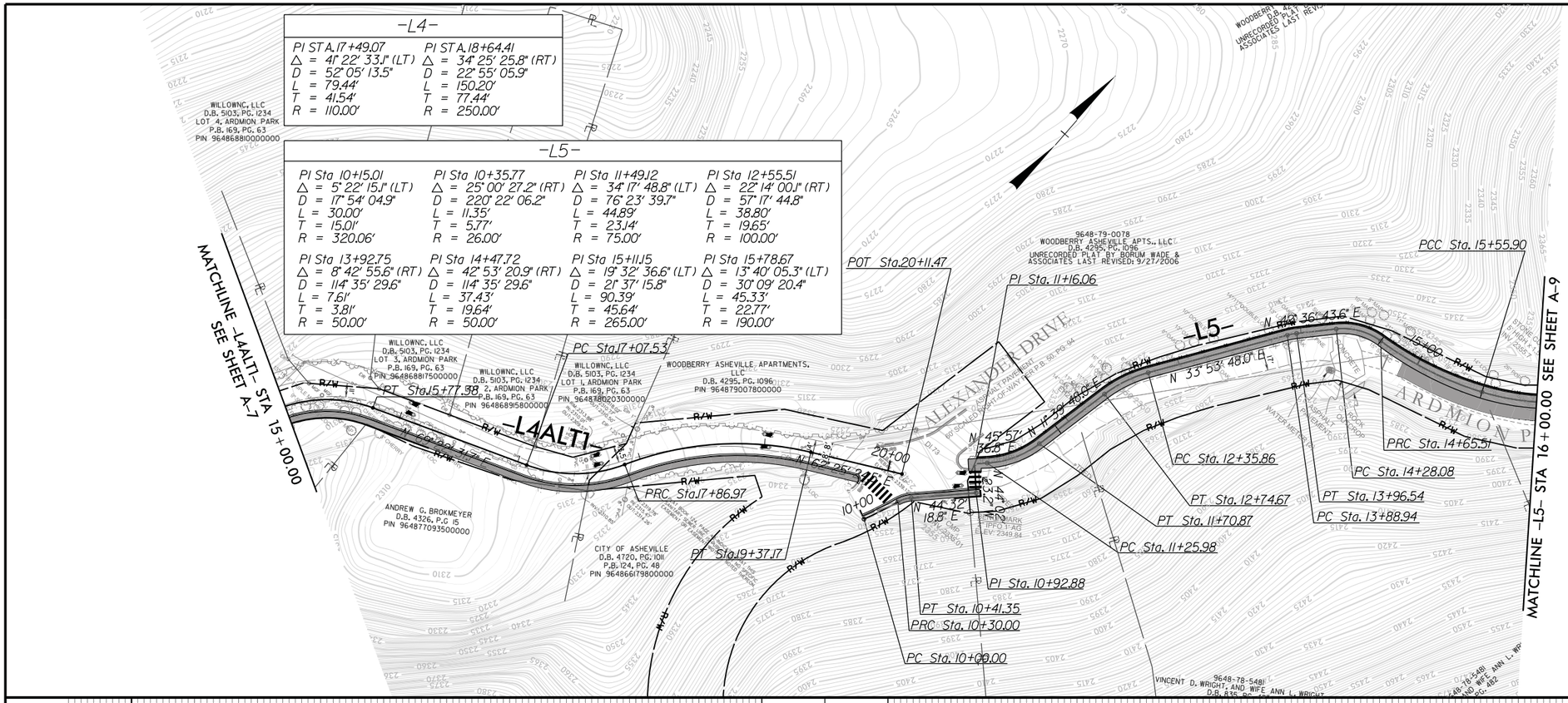

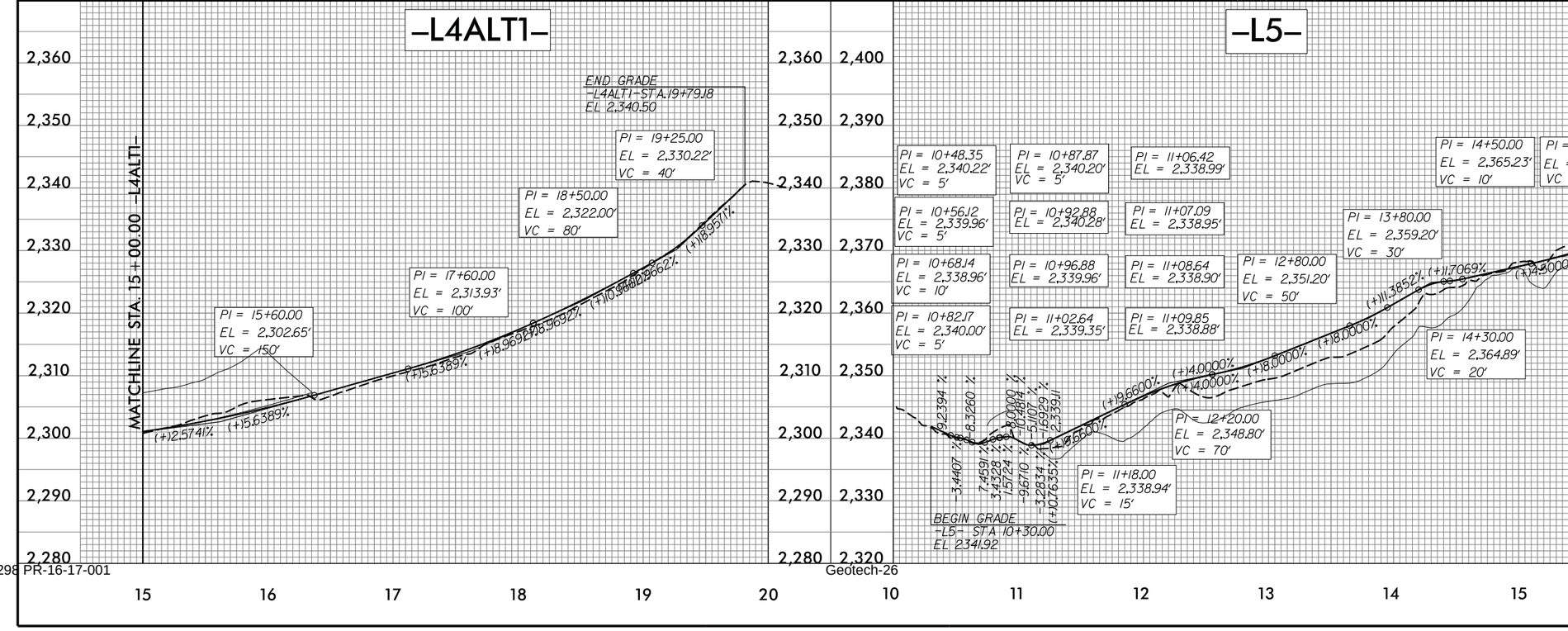

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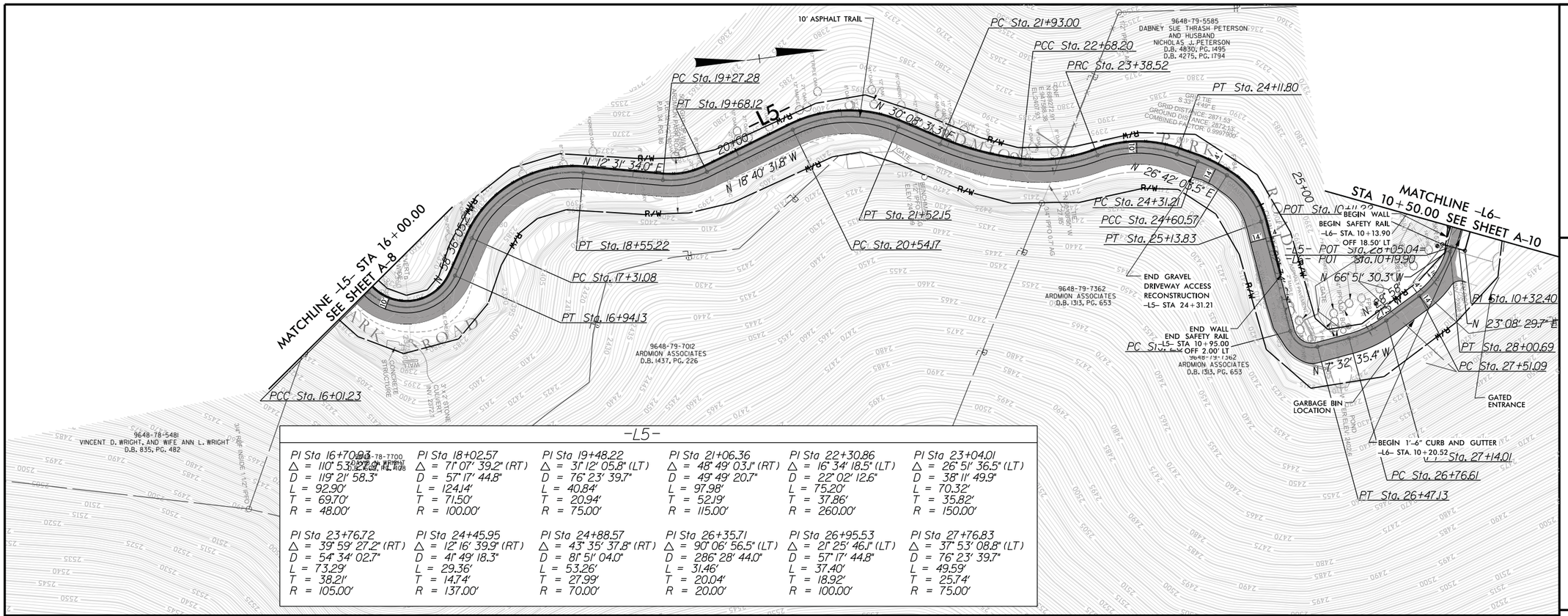
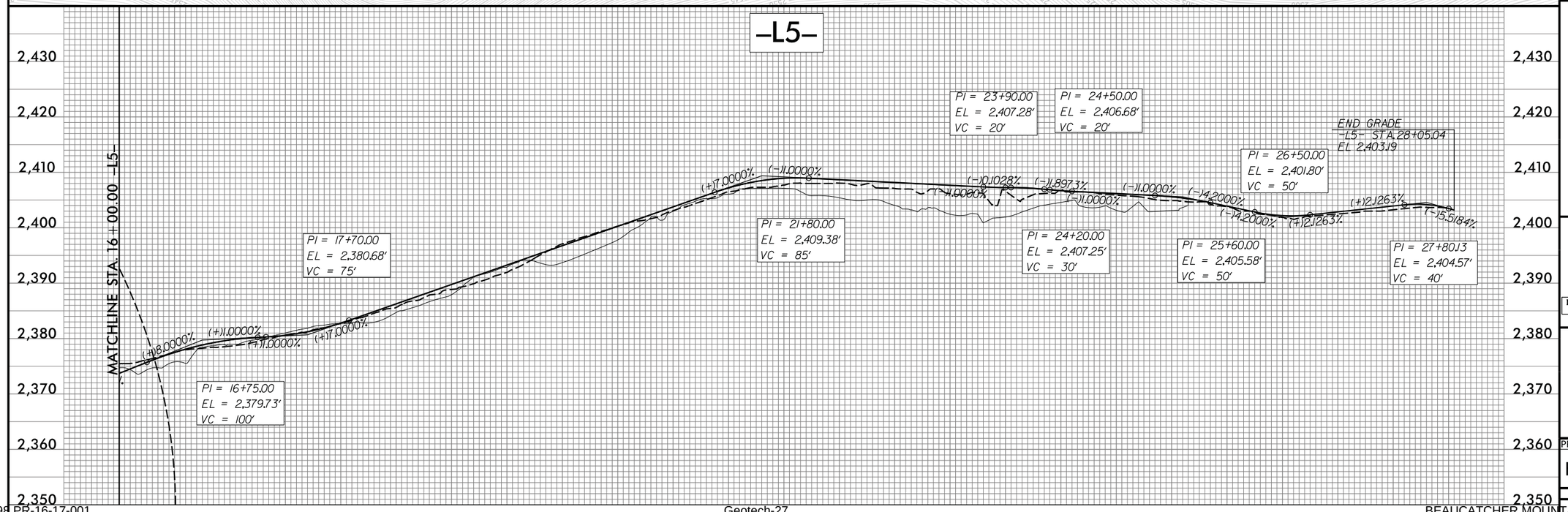
A-8



-L5-

PI Sta 16+70.93	PI Sta 18+02.57	PI Sta 19+48.22	PI Sta 21+06.36	PI Sta 22+30.86	PI Sta 23+04.01
△ = 110° 53' 23.2" (RT)	△ = 71° 07' 39.2" (RT)	△ = 31° 12' 05.8" (LT)	△ = 48° 49' 03.1" (RT)	△ = 16° 34' 18.5" (LT)	△ = 26° 51' 36.5" (LT)
D = 119° 21' 58.3"	D = 57° 17' 44.8"	D = 76° 23' 39.7"	D = 49° 49' 20.7"	D = 22° 02' 12.6"	D = 38° 11' 49.9"
L = 92.90'	L = 124.14'	L = 40.84'	L = 97.98'	L = 75.20'	L = 70.32'
T = 69.70'	T = 71.50'	T = 20.94'	T = 52.19'	T = 37.86'	T = 35.82'
R = 48.00'	R = 100.00'	R = 75.00'	R = 115.00'	R = 260.00'	R = 150.00'
PI Sta 23+76.72	PI Sta 24+45.95	PI Sta 24+88.57	PI Sta 26+35.71	PI Sta 26+95.53	PI Sta 27+76.83
△ = 39° 59' 27.2" (RT)	△ = 12° 16' 39.9" (RT)	△ = 43° 35' 37.8" (RT)	△ = 90° 06' 56.5" (LT)	△ = 21° 25' 46.1" (LT)	△ = 37° 53' 08.8" (LT)
D = 54° 34' 02.7"	D = 41° 49' 18.3"	D = 81° 51' 04.0"	D = 286° 28' 44.0"	D = 57° 17' 44.8"	D = 76° 23' 39.7"
L = 73.29'	L = 29.36'	L = 53.26'	L = 31.46'	L = 37.40'	L = 49.59'
T = 38.21'	T = 14.74'	T = 27.99'	T = 20.04'	T = 18.92'	T = 25.74'
R = 105.00'	R = 137.00'	R = 70.00'	R = 20.00'	R = 100.00'	R = 75.00'



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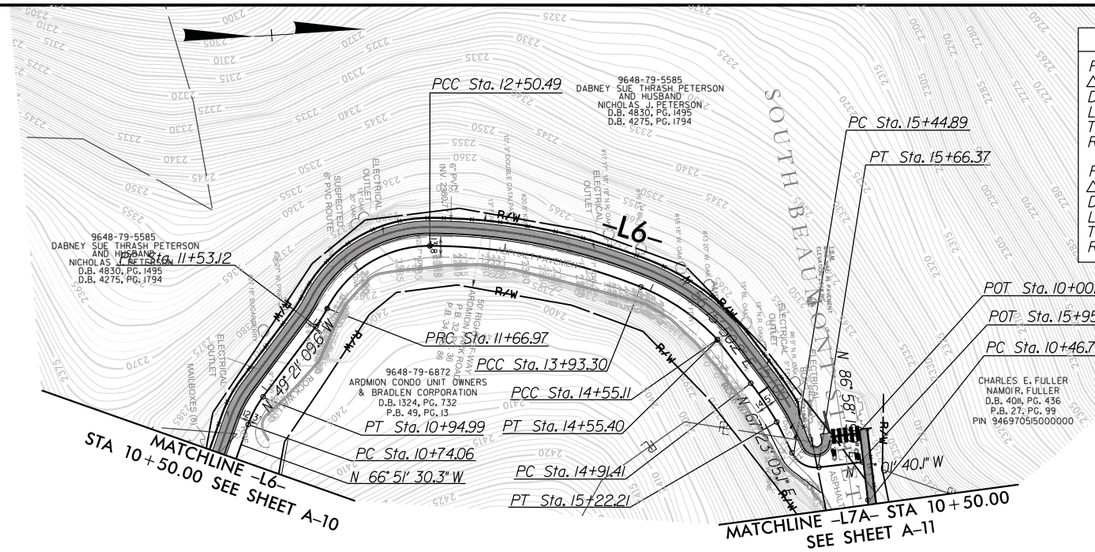
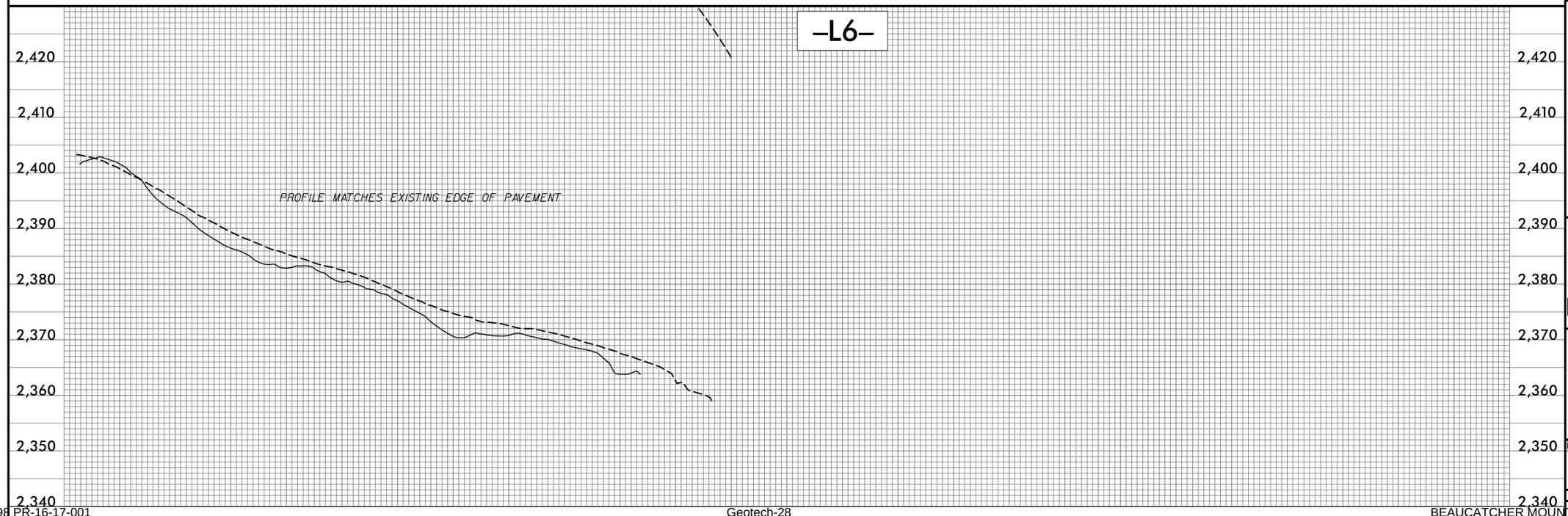


-L6-			
PI Sta 10+84.61 △ = 17° 30' 20.8" (RT) D = 83° 38' 36.5" L = 20.93' T = 10.55' R = 68.50'	PI Sta 11+60.06 △ = 9° 48' 04.8" (LT) D = 70° 44' 07.9" L = 13.86' T = 6.95' R = 81.00'	PI Sta 12+13.51 △ = 62° 57' 56.5" (RT) D = 75° 23' 21.1" L = 83.52' T = 46.54' R = 76.00'	PI Sta 13+22.78 △ = 21° 50' 49.8" (RT) D = 15° 17' 52.1" L = 142.81' T = 72.28' R = 374.54'
PI Sta 14+24.71 △ = 25° 06' 28.3" (RT) D = 40° 37' 25.6" L = 61.81' T = 31.41' R = 141.04'	PI Sta 14+55.25 △ = 5° 29' 49.9" (RT) D = 1909° 51' 33.6" L = 0.29' T = 0.14' R = 3.00'	PI Sta 15+06.83 △ = 7° 15' 45.5" (RT) D = 23° 34' 42.6" L = 30.80' T = 15.42' R = 243.00'	PI Sta 15+57.22 △ = 70° 24' 45.2" (LT) D = 327° 47' 22.1" L = 21.48' T = 12.33' R = 17.48'



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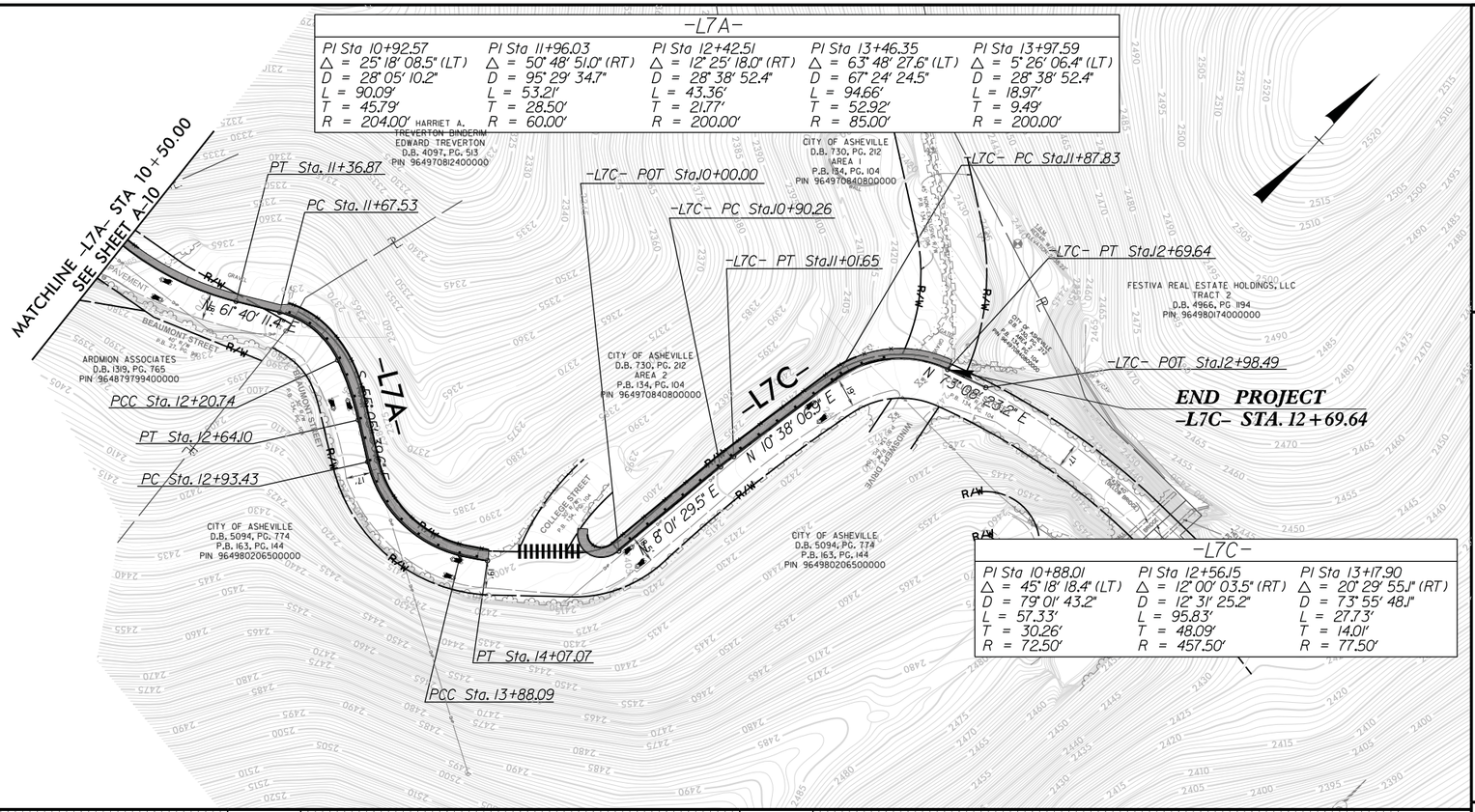

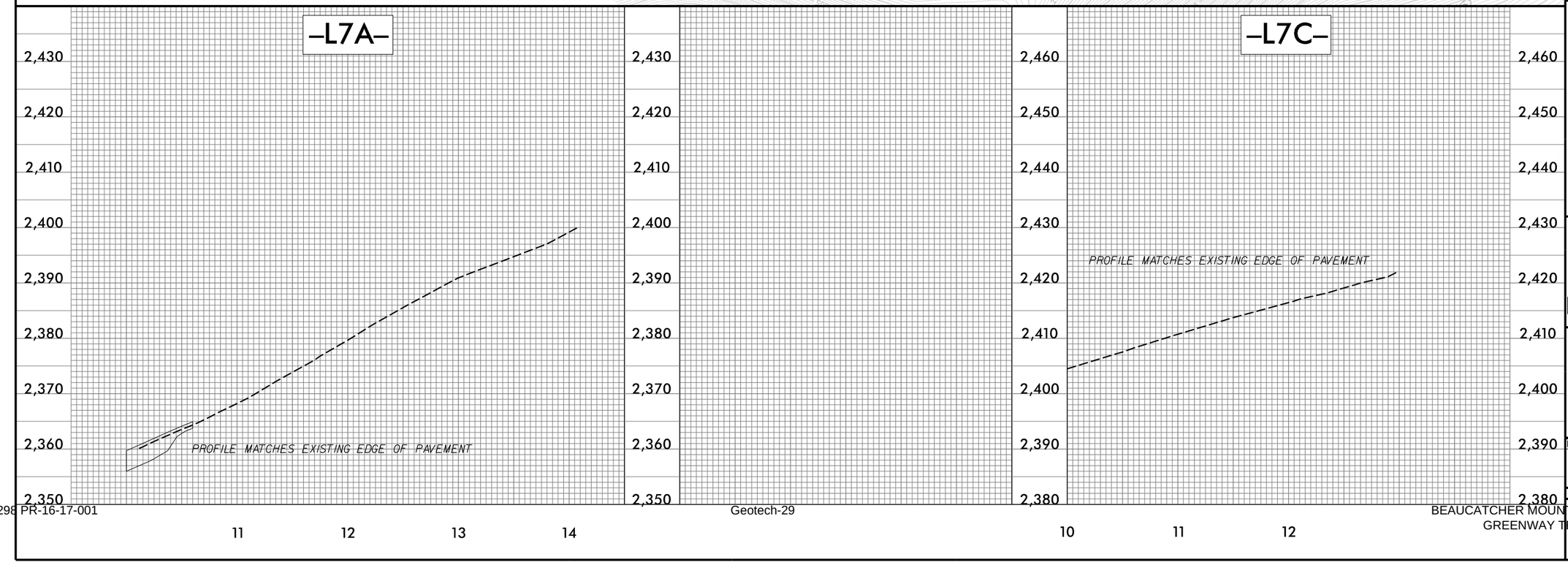

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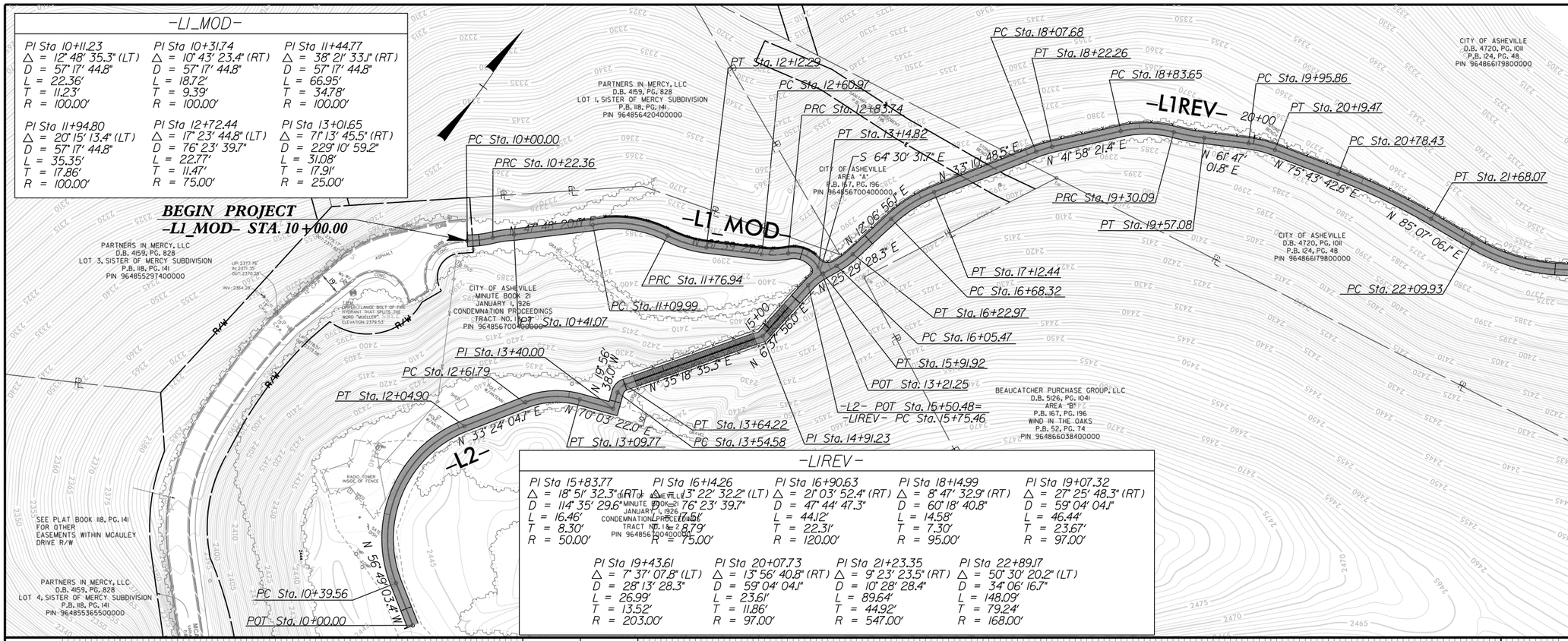
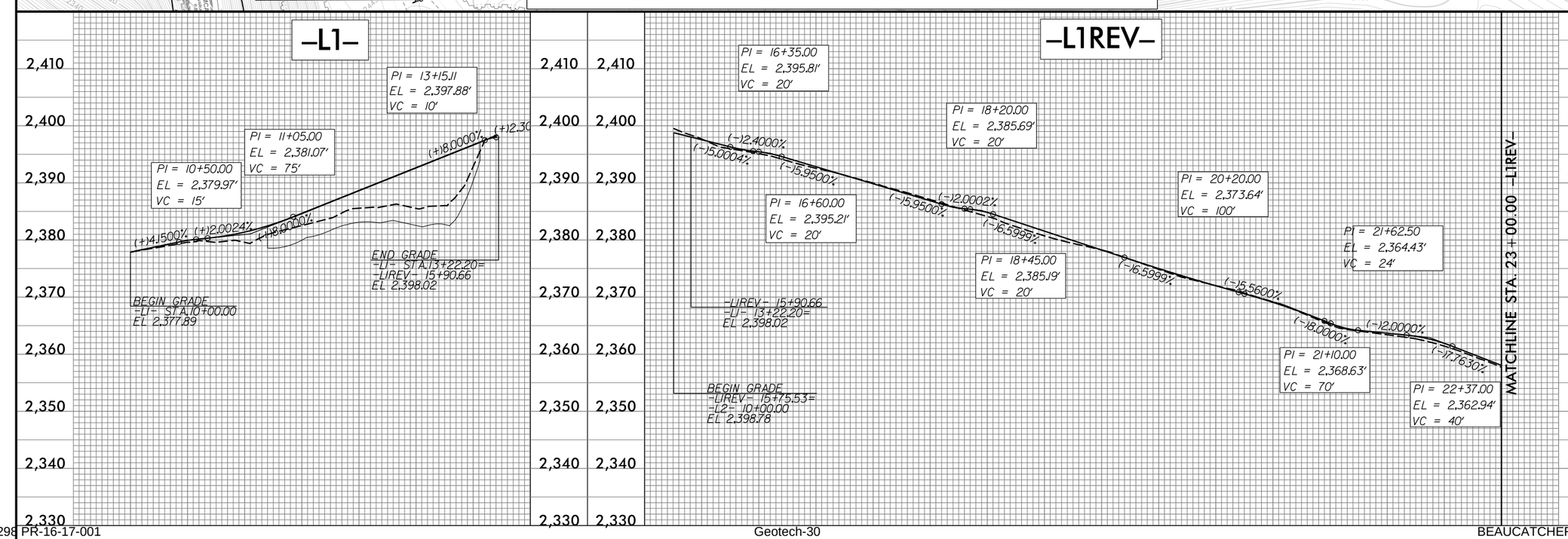
-L1_MOD-

PI Sta 10+11.23 △ = 12° 48' 35.3" (LT) D = 57° 17' 44.8" L = 22.36' T = 11.23' R = 100.00'	PI Sta 10+31.74 △ = 10° 43' 23.4" (RT) D = 57° 17' 44.8" L = 18.72' T = 9.39' R = 100.00'	PI Sta 11+44.77 △ = 38° 21' 33.1" (RT) D = 57° 17' 44.8" L = 66.95' T = 34.78' R = 100.00'
PI Sta 11+94.80 △ = 20° 15' 13.4" (LT) D = 57° 17' 44.8" L = 35.35' T = 17.86' R = 100.00'	PI Sta 12+72.44 △ = 17° 23' 44.8" (LT) D = 76° 23' 39.7" L = 22.77' T = 11.47' R = 75.00'	PI Sta 13+01.65 △ = 71° 13' 45.5" (RT) D = 229° 10' 59.2" L = 31.08' T = 17.91' R = 25.00'

-LIREV-

PI Sta 15+83.77 △ = 18° 51' 32.3" (RT) D = 114° 35' 29.6" L = 16.46' T = 8.30' R = 50.00'	PI Sta 16+14.26 △ = 13° 22' 32.2" (LT) D = 76° 23' 39.7" L = 17.51' T = 8.79' R = 75.00'	PI Sta 16+90.63 △ = 21° 03' 52.4" (RT) D = 47° 44' 47.3" L = 44.12' T = 22.31' R = 120.00'	PI Sta 18+14.99 △ = 8° 47' 32.9" (RT) D = 60° 18' 40.8" L = 14.58' T = 7.30' R = 95.00'	PI Sta 19+07.32 △ = 27° 25' 48.3" (RT) D = 59° 04' 04.1" L = 46.44' T = 23.67' R = 97.00'
PI Sta 19+43.61 △ = 7° 37' 07.8" (LT) D = 28° 13' 28.3" L = 26.99' T = 13.52' R = 203.00'	PI Sta 20+07.73 △ = 13° 56' 40.8" (RT) D = 59° 04' 04.1" L = 23.61' T = 11.86' R = 97.00'	PI Sta 21+23.35 △ = 9° 23' 23.5" (RT) D = 10° 28' 28.4" L = 89.64' T = 44.92' R = 547.00'	PI Sta 22+89.17 △ = 50° 30' 20.2" (LT) D = 34° 06' 16.7" L = 148.09' T = 79.24' R = 168.00'	





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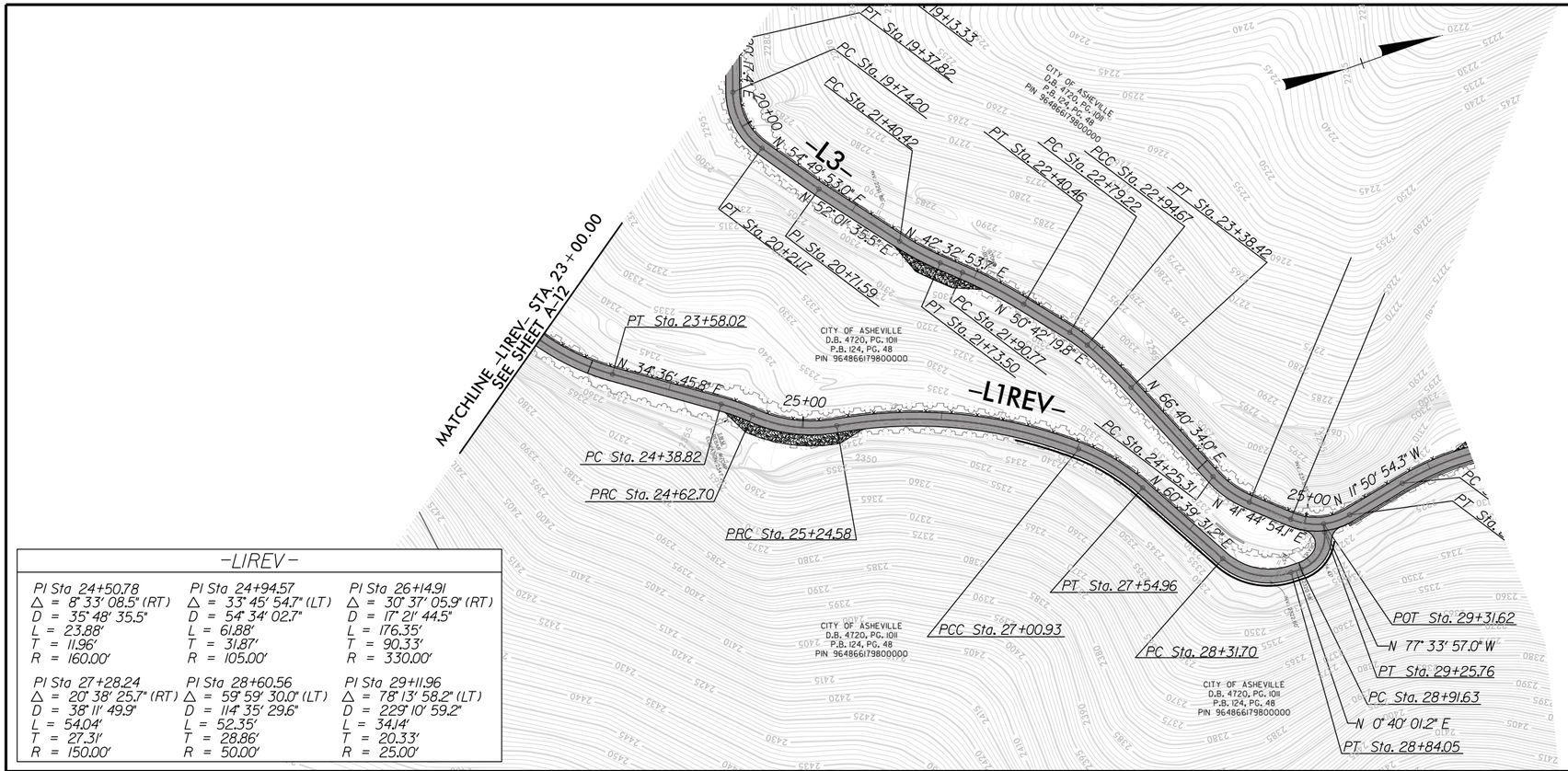
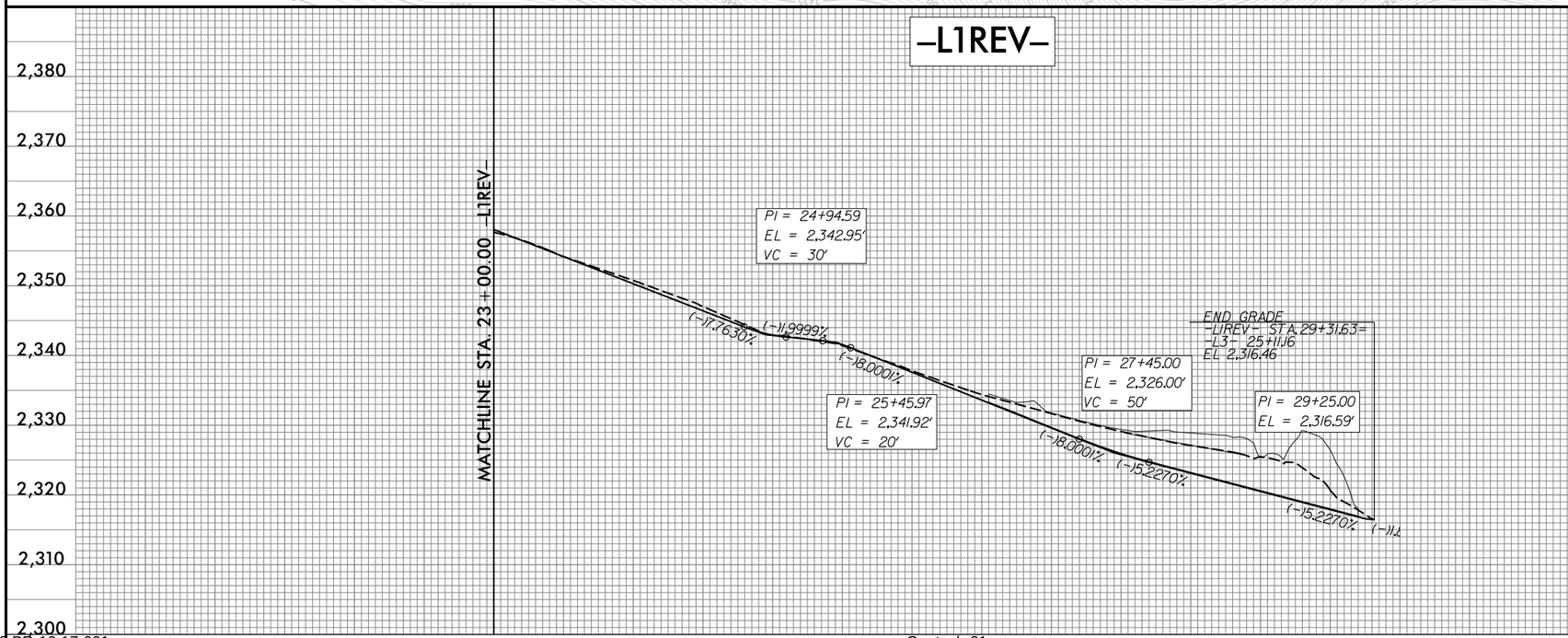
A-12



-LIREV-

PI Sta 24+50.78	PI Sta 24+94.57	PI Sta 26+14.91
△ = 8° 33' 08.5" (RT)	△ = 33° 45' 54.7" (LT)	△ = 30° 37' 05.9" (RT)
D = 35° 48' 35.5"	D = 54° 34' 02.7"	D = 17° 21' 44.5"
L = 23.88'	L = 61.88'	L = 176.35'
T = 11.96'	T = 31.87'	T = 90.33'
R = 160.00'	R = 105.00'	R = 330.00'
PI Sta 27+28.24	PI Sta 28+60.56	PI Sta 29+11.96
△ = 20° 38' 25.7" (RT)	△ = 59° 59' 30.0" (LT)	△ = 78° 13' 58.2" (LT)
D = 38° 11' 49.9"	D = 114° 35' 29.6"	D = 229° 10' 59.2"
L = 54.04'	L = 52.35'	L = 34.14'
T = 27.31'	T = 28.86'	T = 20.33'
R = 150.00'	R = 50.00'	R = 25.00'



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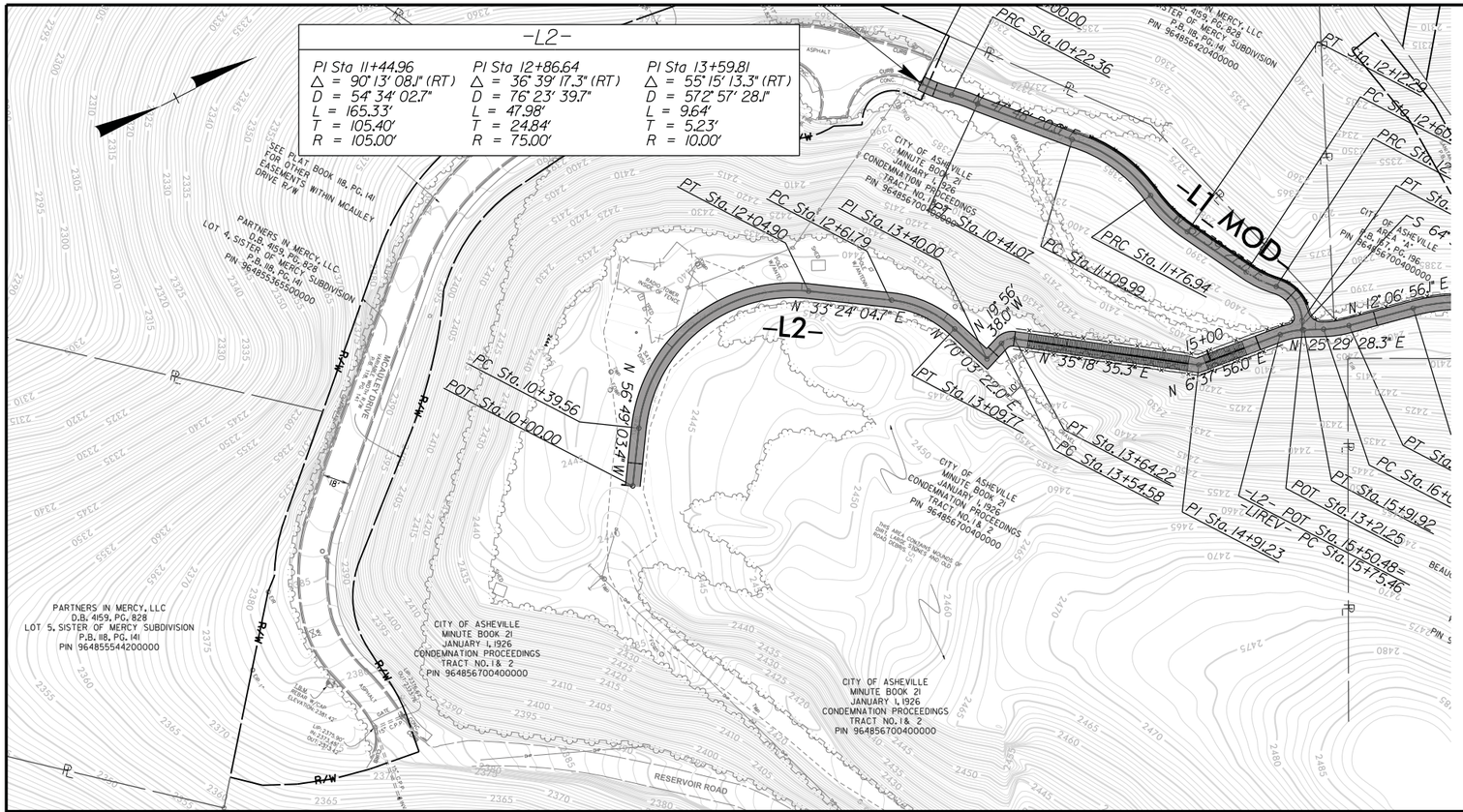
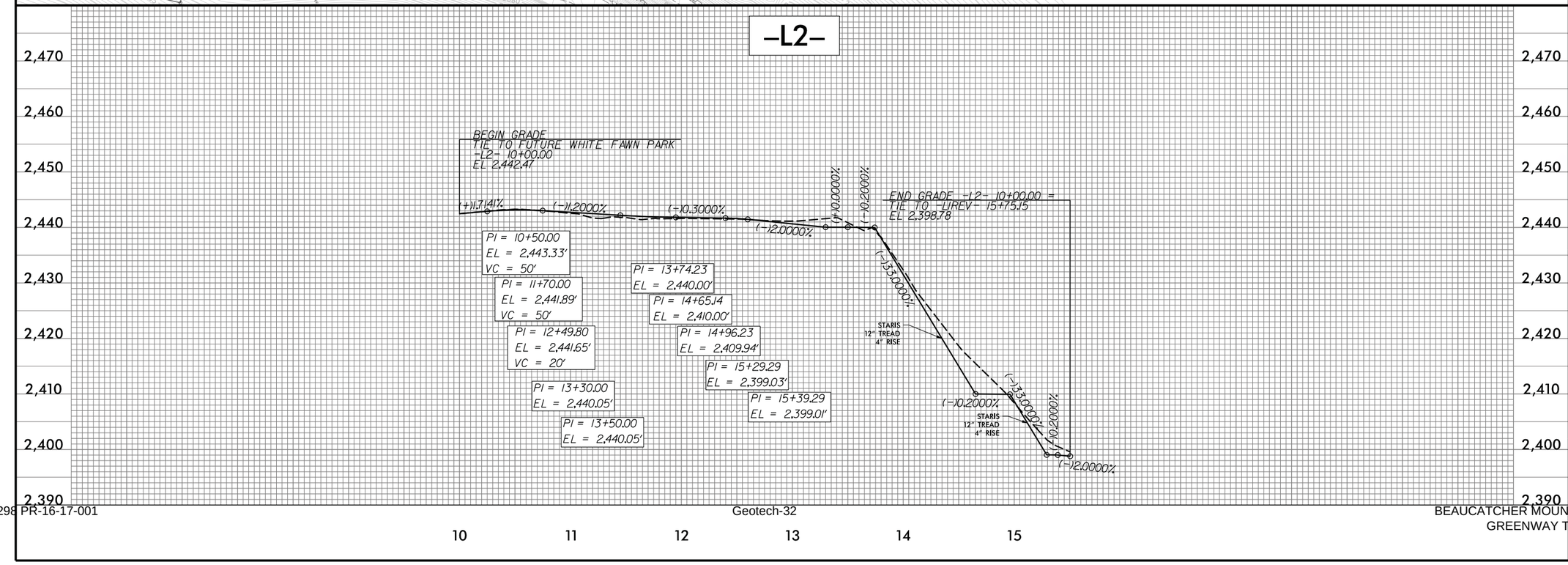
A-13





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APPENDIX B

BORING LOGS
HAND AUGER LOGS
LEGEND TO SOIL DESCRIPTIONS
DMCP TEST DATA

HAND AUGER BORING LOG: B - 1 (HA)

STEWART

PROJECT BEAUCATCHER GREENWAY **CLIENT** CITY OF ASHEVILLE

PROJECT NUMBER H13002.00 **LOCATION** ASHEVILLE, NC

DATE 09/10/14 **LOGGED BY** J MUESSEN

GROUND ELEVATION 2378.5 ft **BORING DEPTH** 1 ft

0-HR GWL DRY **STAB. GWL** DRY

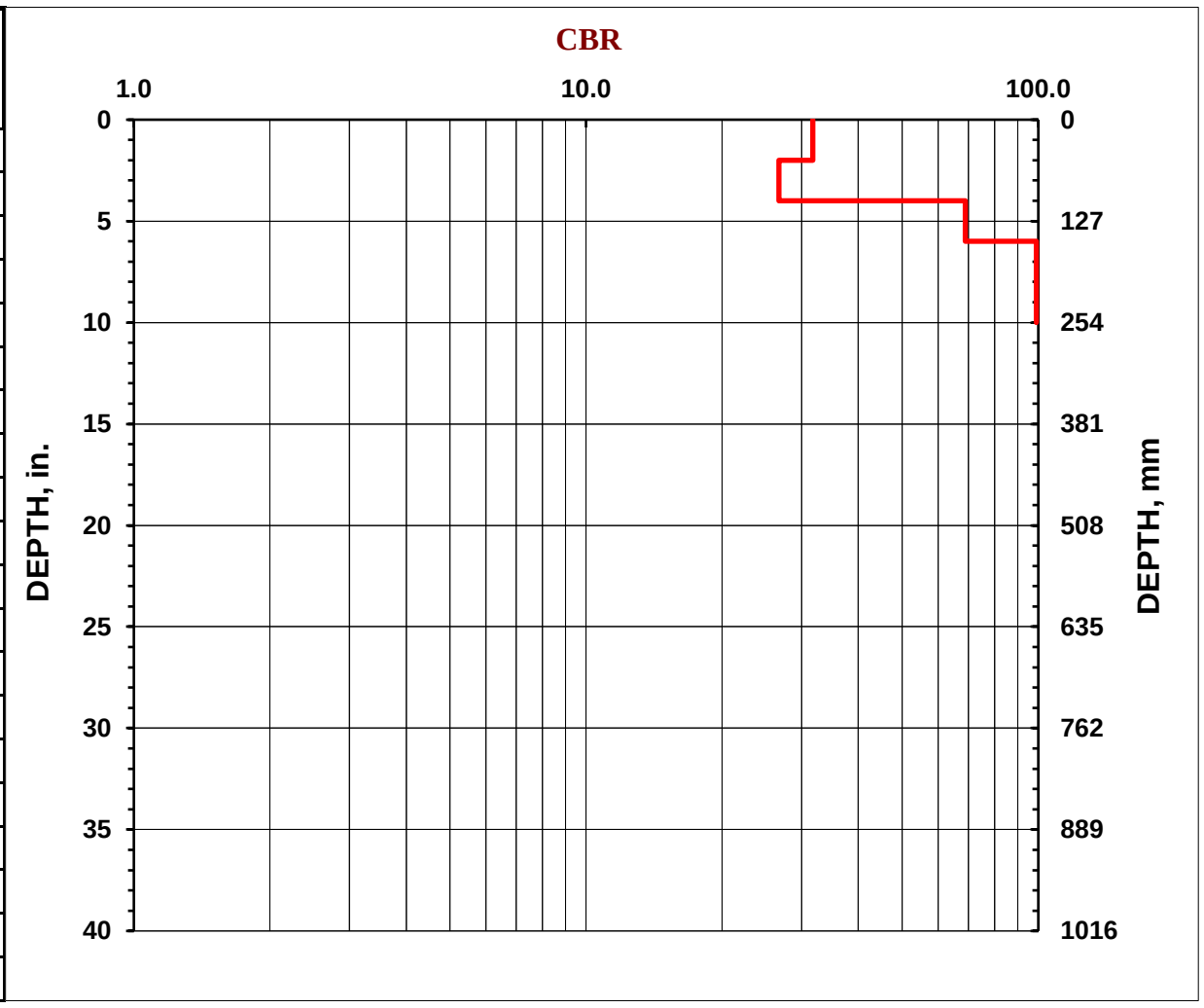
NOTES:
GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONISDERED APPROXIMATE
HAND AUGER WAS OFFSET TWO TIMES DUE TO SHALLOW REFUSAL AND RECEIVED THE SAME RESULTS

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL (ft)	MOISTURE CONTENT(%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT(%)
1.0	SM	**FILL** - BROWN, SILTY SAND WITH MICA AND GRAVEL - MOIST	2377.5					
		HAND AUGER REFUSAL						

DUAL MASS CONE PENETROMETER (DMCP) TEST DATA

Project:	**Beaucatcher Greenway**	**Test ID:**	**B-1**
Location:	**Asheville, NC**	**Station:**	
Client:	**City of Asheville**	**Date:**	**9/10/2014**

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
5	0	1
7	50.8	1
6	101.6	1
14	152.4	1
22	203.2	1
50	254	2



Hammer Type:
1 = 17.6 lb
2 = 10.1 lb

Depth (ft)		Classification
0	1	FILL - BROWN, SILTY SAND WITH MICA AND GRAVEL - MOIST
1		HAND AUGER REFUSAL

HAND AUGER BORING LOG: B - 2 (HA)

STEWART

PROJECT BEAUCATCHER GREENWAY **CLIENT** CITY OF ASHEVILLE

PROJECT NUMBER H13002.00 **LOCATION** ASHEVILLE, NC

DATE 09/10/14 **LOGGED BY** J MUESSEN

GROUND ELEVATION 2439 ft **BORING DEPTH** 4 ft

0-HR GWL DRY **STAB. GWL** DRY

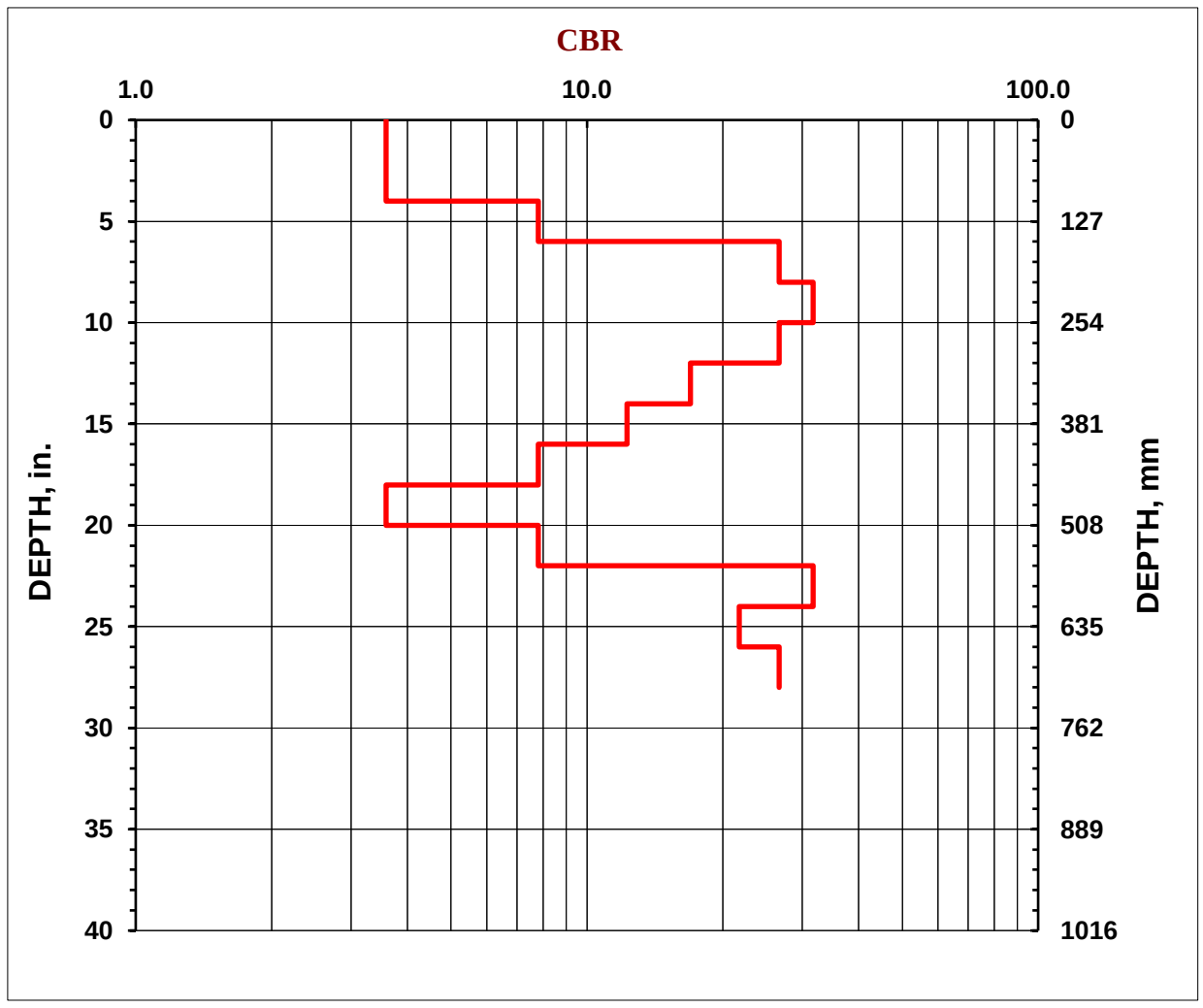
NOTES:
GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL (ft)	MOISTURE CONTENT(%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT(%)
1.0	ML	**FILL** - BLACK, SANDY SILT WITH MICA AND GRAVEL - MOIST	2438.0					
	SM	**RESIDUUM** - TAN, SILTY SAND WITH MICA - MOIST						
4.0			2435.0					
		HAND AUGER TERMINATED						

DUAL MASS CONE PENETROMETER (DMCP) TEST DATA

Project:	**Beaucatcher Greenway**	**Test ID:**	**B-2**
Location:	**Asheville, NC**	**Station:**	
Client:	**City of Asheville**	**Date:**	**9/10/2014**

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
1	0	1
1	50.8	1
1	101.6	1
2	152.4	1
6	203.2	1
7	254	1
6	304.8	1
4	355.6	1
3	406.4	1
2	457.2	1
1	508	1
2	558.8	1
7	609.6	1
5	660.4	1
6	711.2	1



Hammer Type:
1 = 17.6 lb
2 = 10.1 lb

Depth (ft)		Classification
0	1	FILL - BLACK, SANDY SILT WITH MICA AND GRAVEL - MOIST
1	4	RESIDUUM - TAN, SILTY SAND WITH MICA - MOIST
4		HAND AUGER REFUSAL

STEWART

BORING LOG: B - 3

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/11/14 **COMPLETED** 09/11/14
GROUND ELEVATION 2400.5 ft **BORING DEPTH** 7.5 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 6 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0	SM	**FILL** - LOOSE, BLACK, SILTY SAND - MOIST	2399.0		1.0	SS	1	3 3 3	6
1.5	ML	**RESIDUUM** - FIRM TO STIFF, BROWN, SANDY SILT WITH MICA - MOIST		2394.5	3.5	SS	2	3 4 5	9
					6.0	SS	3	3 5 7	12
7.5		BORING TERMINATED	2393.0		7.5				

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

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

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BORING LOG: B - 4

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/11/14 **COMPLETED** 09/11/14
GROUND ELEVATION 2371.5 ft **BORING DEPTH** 7.5 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 5 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0	SM	**FILL** - LOOSE, BLACK, SILTY SAND - MOIST	2370.0		1.0	SS	1	3 3 6	9
1.5	ML	**RESIDUUM** - STIFF, BROWN, SANDY SILT WITH MICA - MOIST		2366.5	3.5	SS	2	3 5 7	12
					6.0	SS	3	3 4 8	12
7.5		BORING TERMINATED	2364.0		7.5				

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

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

BORING LOG: B - 5

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PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/11/14 **COMPLETED** 09/11/14
GROUND ELEVATION 2340 ft **BORING DEPTH** 7.5 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 5 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
	SM	**RESIDUUM** - MEDIUM DENSE, BROWN, SILTY SAND WITH MICA - MOIST			1.0	SS	1	5 8 9	17
3.0			2337.0		2.5				
	ML	STIFF, BROWN, SANDY SILT WITH MICA - MOIST		2335	3.5	SS	2	3 5 6	11
					5.0				
					6.0	SS	3	4 5 6	11
7.5		BORING TERMINATED	2332.5		7.5				

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

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

BORING LOG: B - 6

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/10/14 **COMPLETED** 09/10/14
GROUND ELEVATION 2208 ft **BORING DEPTH** 6.1 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 5 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
DRILL RIG CME 45 **HAMMER TYPE** AUTO
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
	SM	**FILL** - LOOSE, TAN, SILTY SAND WITH GRAVEL - MOIST			1.0 2.5	SS 1	3 3 3	6
3.0	WR	**WEATHERED ROCK** - SAMPLED AS TAN, SILTY SAND - MOIST	2205.0	2203	3.5 4.9	SS 2	9 18 50/5"	50/5"
6.1		AUGER REFUSAL	2201.9		6.0 6.1	SS 3	50/1"	50/1"

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

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

HAND AUGER BORING LOG: B - 7 (HA)

STEWART

PROJECT BEAUCATCHER GREENWAY **CLIENT** CITY OF ASHEVILLE

PROJECT NUMBER H13002.00 **LOCATION** ASHEVILLE, NC

DATE 09/12/14 **LOGGED BY** J MUESSEN

GROUND ELEVATION 2180 ft **BORING DEPTH** 1 ft

0-HR GWL DRY **STAB. GWL** DRY

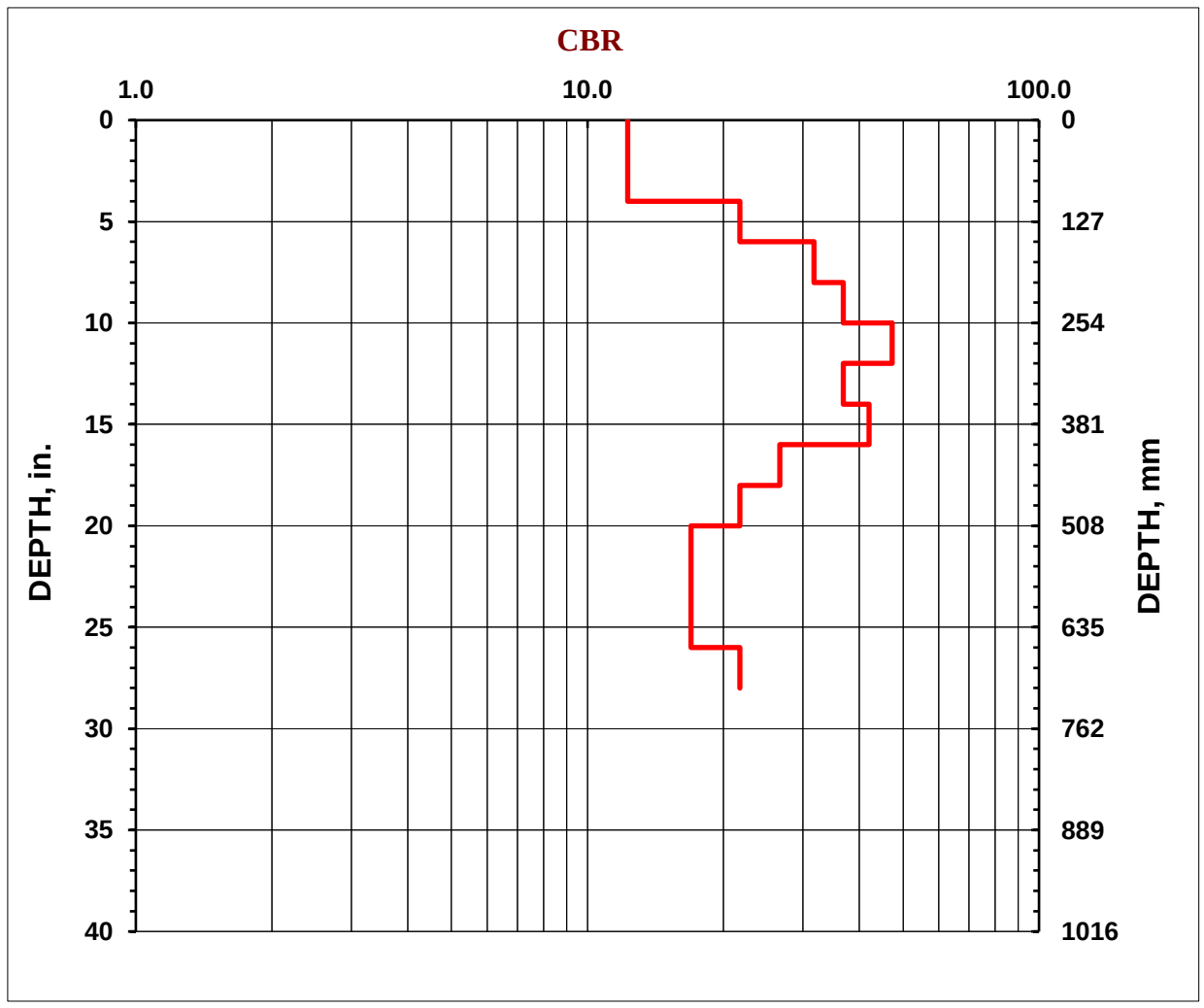
NOTES:
GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONISDERED APPROXIMATE
HAND AUGER WAS OFFSET TWO TIMES DUE TO SHALLOW REFUSAL AND RECEIVED THE SAME RESULTS

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL (ft)	MOISTURE CONTENT(%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT(%)
1.0	SM	**FILL** - BLACK, SILTY SAND - MOIST	2179.0					
		HAND AUGER REFUSAL						

DUAL MASS CONE PENETROMETER (DMCP) TEST DATA

Project:	**Beaucatcher Greenway**	**Test ID:**	**B-7**
Location:	**Asheville, NC**	**Station:**	
Client:	**City of Asheville**	**Date:**	**9/10/2014**

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
1	0	1
3	50.8	1
3	101.6	1
5	152.4	1
7	203.2	1
8	254	1
10	304.8	1
8	355.6	1
9	406.4	1
6	457.2	1
5	508	1
4	558.8	1
4	609.6	1
4	660.4	1
5	711.2	1



Hammer Type:
1 = 17.6 lb
2 = 10.1 lb

Depth (ft)		Classification
0	1	FILL - BLACK, SILTY SAND - MOIST
1		HAND AUGER REFUSAL

BORING LOG: B - 8

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/10/14 **COMPLETED** 09/10/14
GROUND ELEVATION 2240.5 ft **BORING DEPTH** 6.7 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 5.5 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
	SM	**FILL** - LOOSE, BROWN, SILTY SAND - MOIST			1.0	SS 1	4 3 3	6
					2.5			
					3.5	SS 2	3 3 3	6
5.5			2235.0	2235	5.0			
	WR	**WEATHERED ROCK** - SAMPLED AS GRAY, SILTY SAND WITH ROCK FRAGMENTS - MOIST			6.0	SS 3	40 50/3"	50/3"
6.7			2233.8		6.7			
		BORING TERMINATED						

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

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

BORING LOG: B - 9

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/10/14 **COMPLETED** 09/10/14
GROUND ELEVATION 2271 ft **BORING DEPTH** 7.5 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 5 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
3.0	SM	**RESIDUUM** - MEDIUM DENSE, BROWN, SILTY SAND WITH MICA - MOIST	2268.0		1.0 – 2.5	SS	1	8 10 10	**20**
5.5	ML	STIFF, BROWN, SANDY SILT WITH MICA - MOIST	2265.5	2266	3.5 – 5.0	SS	2	3 6 7	**13**
7.5	SM	DENSE, GRAY, SILTY SAND WITH MICA - MOIST	2263.5		6.0 – 7.5	SS	3	5 15 16	**31**
		BORING TERMINATED							

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

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

BORING LOG: B-10

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/10/14 **COMPLETED** 09/10/14
GROUND ELEVATION 2302.5 ft **BORING DEPTH** 4.2 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 3 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
	SM	**FILL** - MEDIUM DENSE, BROWN, SILTY SAND WITH GRAVEL - MOIST			1.0	SS	1	3 5 10	**15**
3.0			2299.5	2299.5	2.5				
	WR	**WEATHERED ROCK** - SAMPLED AS GRAY, SILTY SAND			3.5	SS	2	28 50/2	**50/2**
4.2		AUGER REFUSAL	2298.3		4.2				

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

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

BORING LOG: B-11

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/11/14 **COMPLETED** 09/11/14
GROUND ELEVATION 2315 ft **BORING DEPTH** 7.5 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 5.5 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0	CH	**FILL** - HARD, RED, SILTY FAT CLAY WITH GRAVEL - MOIST	2313.5		1.0	SS	1	11 16 24	40
1.5	SM	**RESIDUUM** - DENSE TO MEDIUM DENSE, GRAY, SILTY SAND WITH MICA - MOIST		2309.5	3.5	SS	2	10 10 12	22
					6.0	SS	3	6 8 10	18
7.5		BORING TERMINATED	2307.5		7.5				

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

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

STEWART

BORING LOG: B-12

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/11/14 **COMPLETED** 09/11/14
GROUND ELEVATION 2279 ft **BORING DEPTH** 6.8 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 5.5 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
	SM	**RESIDUUM** - MEDIUM DENSE TO VERY DENSE, TAN TO WHITE, SILTY SAND WITH MICA - MOIST			1.0 2.5	SS 1	6 10 10	**20**
					3.5 5.0	SS 2	7 24 30	**54**
5.5			2273.5	2273.5				
	WR	**WEATHERED ROCK** - SAMPLED AS WHITE, SILTY SAND			6.0 6.8	SS 3	34 50/3	**50/3**
6.8		BORING TERMINATED	2272.2					

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

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

BORING LOG: B-13

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/10/14 **COMPLETED** 09/10/14
GROUND ELEVATION 2302 ft **BORING DEPTH** 7.5 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN**
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
DRILL RIG CME 45 **HAMMER TYPE** AUTO
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
	SM	**FILL** - MEDIUM DENSE, BROWN, SILTY SAND - MOIST			1.0	SS	1	7 14 7	21
3.0			2299.0		2.5				
	SM	**RESIDUUM** - MEDIUM DENSE, TAN, SILTY SAND WITH MICA - MOIST			3.5	SS	2	3 7 9	16
					5.0				
					6.0	SS	3	7 13 15	28
7.5		BORING TERMINATED	2294.5		7.5				

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

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

BORING LOG: B-14

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/12/14 **COMPLETED** 09/12/14
GROUND ELEVATION 2339 ft **BORING DEPTH** 7.5 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 5 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.1		**ASPHALT**	2338.9						
0.5		**STONE BASE**	2338.5						
	ML	**RESIDUUM** - FIRM, BLACK, SANDY SILT WITH MICA AND ROCK FRAGMENTS - MOIST			1.0	SS	1	2 3 3	6
					2.5				
					3.5	SS	2	3 4 5	9
5.5			2333.5	2334	5.0				
	SM	VERY DENSE, BROWN, SILTY SAND WITH MICA - MOIST			6.0	SS	3	8 24 37	61
7.5			2331.5		7.5				
		BORING TERMINATED							

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

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

BORING LOG: B-15

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/11/14 **COMPLETED** 09/11/14
GROUND ELEVATION 2352 ft **BORING DEPTH** 14.4 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 13 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
	SM	**FILL** - LOOSE, BROWN, SILTY SAND WITH ROOTLETS AND GRAVEL - MOIST			1.0	SS	1	4 5 5	10
2.0			2350.0		2.5				
	SM	**RESIDUUM** - LOOSE TO MEDIUM DENSE, TAN, SILTY SAND - MOIST			3.5	SS	2	4 5 6	11
					5.0				
					6.0	SS	3	7 7 7	14
					7.5				
					8.5	SS	4	6 12 13	25
12.0			2340.0		10.0				
	WR	**WEATHERED ROCK** - SAMPLED AS TAN, SILTY FINE SAND WITH MICA		2339	13.5	SS	5	24 50/5"	50/5"
14.4			2337.6		14.4				
		BORING TERMINATED							

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

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

BORING LOG: B-16

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/11/14 **COMPLETED** 09/11/14
GROUND ELEVATION 2378 ft **BORING DEPTH** 7.5 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 6 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
	SM	**FILL** - MEDIUM DENSE, GRAY, SILTY SAND WITH MICA AND GRAVEL - MOIST			1.0	SS	1	17 8 3	**11**
3.0			2375.0		2.5				
	SM	**FILL** - MEDIUM DENSE, BROWN, SILTY SAND WITH GRAVEL - MOIST			3.5	SS	2	4 3 12	**15**
4.5			2373.5		5.0				
	ML	**FILL** - STIFF TO VERY STIFF, BROWN, SANDY SILT WITH MICA - MOIST		2372	6.0	SS	3	7 10 10	**20**
7.5			2370.5		7.5				
		BORING TERMINATED							

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

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

STEWART

BORING LOG: B-17

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/11/14 **COMPLETED** 09/11/14
GROUND ELEVATION 2407 ft **BORING DEPTH** 7.5 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 5.5 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.1		**ASPHALT**	2406.9					
0.6		**STONE BASE**	2406.4					
	ML	**RESIDUUM** - STIFF, BROWN, SANDY SILT WITH MICA - MOIST			1.0 2.5	SS 1	5 7 8	**15**
3.0			2404.0					
	SM	MEDIUM DENSE TO DENSE, BROWN, SILTY SAND WITH MICA - MOIST		2401.5	3.5 5.0	SS 2	12 13 16	**29**
		WITH FAT CLAY VEINS BENEATH ~ 6 FEET			6.0 7.5	SS 3	17 21 27	**48**
7.5		BORING TERMINATED	2399.5					

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

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

BORING LOG: B-18

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/12/14 **COMPLETED** 09/12/14
GROUND ELEVATION 2403 ft **BORING DEPTH** 9 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 8.5 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
DRILL RIG CME 45 **HAMMER TYPE** AUTO
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
3.0	ML	**FILL** - DENSE, BROWN, SILTY SAND WITH MICA AND GRAVEL - MOIST	2400.0		1.0 2.5	SS	1	5 7 24	**31**
5.5	SM	**FILL** - DENSE, BROWN, SILTY SAND WITH MICA AND GRAVEL - MOIST	2397.5		3.5 5.0	SS	2	21 23 16	**39**
8.0	ML	**RESIDUUM** - STIFF, BROWN, SANDY SILT WITH MICA - MOIST	2395.0		6.0 7.5	SS	3	3 4 10	**14**
9.0	WR	**WEATHERED ROCK** - SAMPLED AS TAN, SILTY SAND	2394.0	2394.5	8.5 8.7 9.0	SS SS	4 5	50/2" 10/0"	**50/2"** **10/0"**
		AUGER REFUSAL							

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

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

HAND AUGER BORING LOG: B-19 (HA)

STEWART

PROJECT BEAUCATCHER GREENWAY **CLIENT** CITY OF ASHEVILLE

PROJECT NUMBER H13002.00 **LOCATION** ASHEVILLE, NC

DATE 09/12/14 **LOGGED BY** J MUESSEN

GROUND ELEVATION 2374 ft **BORING DEPTH** 4 ft

0-HR GWL DRY **STAB. GWL** DRY

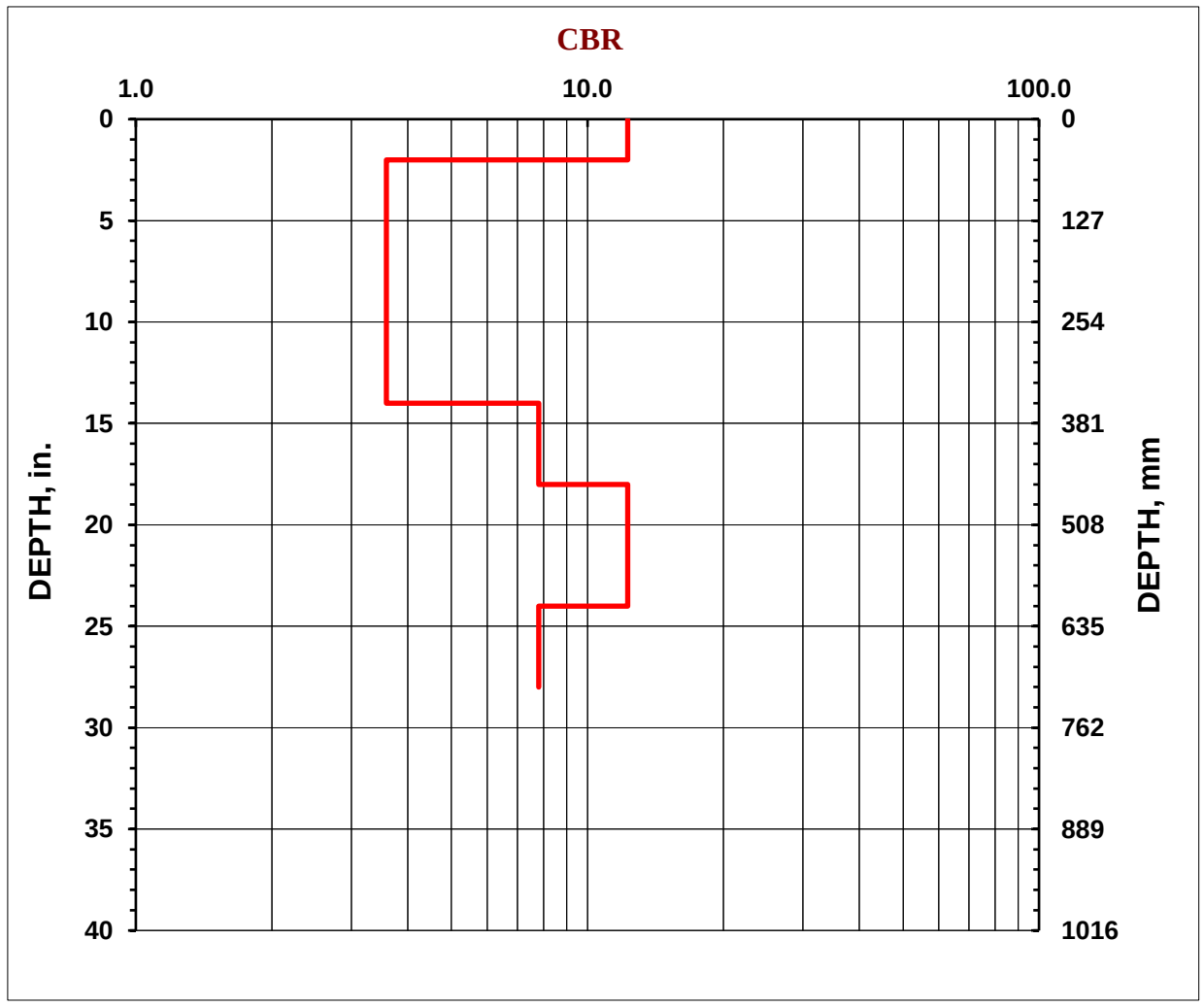
NOTES:
GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL (ft)	MOISTURE CONTENT(%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT(%)
1.0	ML	**FILL** - BLACK, SANDY SILT - MOIST	2373.0					
4.0	ML	**RESIDUUM** - TAN, SANDY SILT WITH MICA - MOIST	2370.0					
		HAND AUGER TERMINATED						

DUAL MASS CONE PENETROMETER (DMCP) TEST DATA

Project:	**Beaucatcher Greenway**	**Test ID:**	**B-19**
Location:	**Asheville, NC**	**Station:**	
Client:	**City of Asheville**	**Date:**	**9/10/2014**

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
1	0	1
3	50.8	1
1	101.6	1
1	152.4	1
1	203.2	1
0	254	1
1	304.8	1
1	355.6	1
2	406.4	1
2	457.2	1
3	508	1
3	558.8	1
3	609.6	1
2	660.4	1
2	711.2	1



Hammer Type:
1 = 17.6 lb
2 = 10.1 lb

Depth (ft)		Classification
0	1	FILL - BLACK, SANDY SILT - MOIST
1	4	RESIDUUM - TAN, SANDY SILT WITH MICA - MOIST
4		HAND AUGER REFUSAL

BORING LOG: B-20

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/10/14 **COMPLETED** 09/10/14
GROUND ELEVATION 2393 ft **BORING DEPTH** 24.3 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 22 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.1		**ASPHALT**	2392.9						
0.4		**GRAVEL**	2392.6						
	ML	**RESIDUUM** - FIRM TO VERY SOFT, BROWN, SANDY SILT WITH MICA - MOIST			1.0 2.5	SS	1	3 3 3	6
					3.5 5.0	SS	2	WOH 1 1	2
5.5			2387.5						
	SM	MEDIUM DENSE, GRAY, SILTY SAND WITH MICA - MOIST			6.0 7.5	SS	3	2 5 7	12
					8.5 10.0	SS	4	7 14 16	30
12.0			2381.0						
	WR	**WEATHERED ROCK** - SAMPLED AS GRAY TO WHITE, SILTY SAND			13.5 14.2	SS	5	38 50/2"	50/2"
					18.5 19.8	SS	6	10 33 50/3"	50/3"
22.0			2371.0	2371					
	WR	**WEATHERED ROCK** - SAMPLED AS GRAY, SANDY SILT			23.5 24.3	SS	7	26 50/4"	50/4"
24.3			2368.7						

BORING TERMINATED

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

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

BORING LOG: B-21

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/10/14 **COMPLETED** 09/10/14
GROUND ELEVATION 2420 ft **BORING DEPTH** 6.8 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 6 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
1.0		**CRUSHED STONE**	2419.0						
3.0	ML	**FILL** - VERY STIFF, BROWN, SANDY SILT WITH GRAVEL - MOIST	2417.0		1.0 – 2.5	SS	1	10 10 12	**22**
5.5	SM	**RESIDUUM** - MEDIUM DENSE, GRAY, SILTY SAND WITH MICA - MOIST	2414.5		3.5 – 5.0	SS	2	6 7 14	**21**
6.8	WR	**WEATHERED ROCK** - SAMPLED AS WHITE, SILTY SAND	2413.2	2413	6.0 – 6.7	SS	3	36 50/3"	**50/3"**

BORING TERMINATED

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

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

BORING LOG: B-22

STEWART

PROJECT NAME BEAUCATCHER GREENWAY
CLIENT CITY OF ASHEVILLE
PROJECT NUMBER H13002.00
LOCATION ASHEVILLE, NC
DATE STARTED 09/10/14 **COMPLETED** 09/10/14
GROUND ELEVATION 2428 ft **BORING DEPTH** 23.8 ft
DRILLING CONTRACTOR GEONETICS-TECHDRILL
0 HR GWL DRY **24+ HR GWL** DRY **CAVE-IN** 22 ft
DRILLING METHOD H.S. AUGER **AUGER SIZE** 2.25-INCH
NOTES: GROUND SURFACE ELEVATION INTERPOLATED FROM PROVIDED TOPOGRAPHIC MAP AND SHOULD BE CONSIDERED APPROXIMATE
DRILL RIG CME 45 **HAMMER TYPE** AUTO
LOGGED BY J MUESSEN

DEPTH (ft)	USCS SYMBOL	MATERIAL DESCRIPTION	ELEVATION (ft)	GWL/CAVE-IN (ft)	SAMPLE DEPTH (ft)	SAMPLE TYPE	SAMPLE ID NUMBER	SPT BLOW COUNTS	N-VALUE (bpf)
0.3		**TOPSOIL**	2427.7						
1.5	ML	**FILL** - SOFT, GRAY, SANDY SILT WITH MICA - MOIST	2426.5		1.0 2.5	SS	1	2 2 2	4
	ML	**RESIDUUM** - SOFT TO HARD, BROWN TO GRAY, SANDY SILT WITH MICA - MOIST			3.5 5.0	SS	2	5 9 10	19
					6.0 7.5	SS	3	7 21 21	42
					8.5 10.0	SS	4	4 12 16	28
					13.5 15.0	SS	5	11 12 15	27
					18.5 20.0	SS	6	7 21 22	43
22.0			2406.0	2406					
23.8	WR	**WEATHERED ROCK** - SAMPLED AS WHITE, SILTY SAND - MOIST	2404.2		23.5 23.8	SS	7	50/3"	50/3"
		BORING TERMINATED							

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

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

UNIFIED SOIL CLASSIFICATION (ASTM D-2487)

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

MATERIAL TYPES ENCOUNTERED ONSITE

- Asphalt
- Gravel
- Silty Sand (SM)
- Weathered Rock
- Fill
- Silt (ML)
- Topsoil / Organic Layer

SAMPLE TYPES

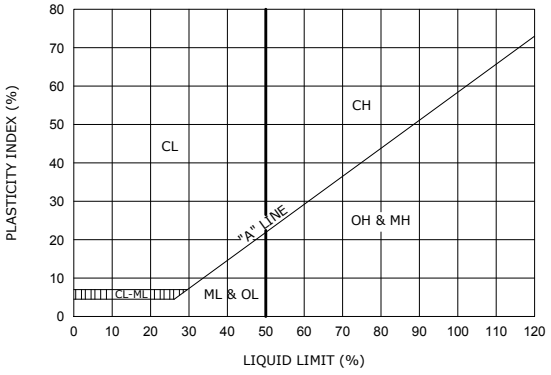
- Split Spoon

ADDITIONAL ABBREVIATIONS, TERMS, & SYMBOLS

SPT	STANDARD PENETRATION TEST	DRY	REQUIRES WETTING TO REACH OPTIMUM
BPF	BLOWS PER FOOT	MOIST	AT OR NEAR OPTIMUM
PL	PLASTIC LIMIT	WET	REQUIRES DRYING TO REACH OPTIMUM
LL	LIQUID LIMIT	SAT	SATURATED, NEARLY LIQUID
MC	MOISTURE CONTENT	TRACE	< 5%
SS	SPLIT SPOON	FEW	5 - 10%
GWL	GROUNDWATER LEVEL	LITTLE	15 - 25%
USCS	UNIFIED SOIL CLASSIFICATION SYSTEM	SOME	30 - 45%
WOH	WEIGHT OF HAMMER		
WOR	WEIGHT OF RODS		
FIAD	FILLED-IN AFTER DRILLING		

- O-HR GROUNDWATER LEVEL
- STABILIZED GROUNDWATER LEVEL
- CAVE-IN LEVEL (AT LAST GWL READING)

PLASTICITY CHART



PENETRATION RESISTANCE
(RECORDED AS BLOWS PER 6 IN.)

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

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

LEGEND TO SOIL DESCRIPTIONS