CITY OF
WOODSTOCK
GEORGIA

12453 Highway 92, Woodstock, GA 30188
770-592-6000 · www.woodstockga.gov

REQUEST FOR BIDS
For
ELM STREET PLAYGROUND CONSTRUCTION

RFB NUMBER
2020 – 05

RELEASED:

August 22, 2019

DUE:

September 24, 2019 2:00 P.M. EST

For all questions about this RFB contact:

Amber Tucker
Purchasing Coordinator
770-592-6000 Ext 1205
https://vrapp.vendorregistry.com/Vendor/Register/Index/woodstock-city-ga-vendor-registration

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1.0 PURPOSE OF SOLICITATION

1.1 Purpose of Bid

The City of Woodstock, Georgia, herein referred to as the City, is accepting bids from qualified contractors for the purpose of providing services for the construction of the Elm Street Playground located at Market Street and Maple Street in Woodstock, Georgia.

1.2 RFB Submission

Interested parties must submit proposals electronically through Vendor Registry to the City of Woodstock, Georgia by the due date for their proposals to be considered. Vendor Registry can be found directly at https://vrapp.vendorregistry.com/Vendor/Register/Index/woodstock-city-ga-vendor-registration or by visiting the City of Woodstock's website.

Fax and e-mail responses are not acceptable.

Responses to this RFB will be accepted until 2:00 p.m. (EST) on September 24, 2019 through Vendor Registry.

The City of Woodstock, Georgia reserves the right to reject any and all responses resulting from this RFB. Late responses will not be accepted. If company response is sent or routed to City offices, the submission requirement has not been met and any such response will not be evaluated and will be disqualified from consideration.

1.3 Schedule Overview

This Request for Bids is scheduled as follows:

August 22, 2019	Release of RFB
September 10, 2019, 10:00 A.M.	Mandatory Pre-Bid Meeting
September 17, 2019, 3:00 P.M.	Written Question Deadline
September 24, 2019, 2:00 P.M.	Bids Due Date
September 24, 2019, 2:01 P.M.	Public Opening
October 2019	RFB and Contract Award

1.4 RFB Costs

All costs incurred in the preparation and presentation of responses to the RFB shall be completely absorbed by the RFB respondent. All documents submitted as part of the RFB will become property of the City. Requests for specific material to be returned will be considered. Any material submitted that is confidential must be clearly marked as such.

1.5 RFB Questions/Communications

All questions about this RFB and submission requirements must be submitted in writing through Vendor Registry. The City's representative listed in this section will serve as the primary contact for this RFB.

Amber Tucker
Purchasing Coordinator
12453 Highway 92
Woodstock, Georgia 30188
770-592-6000 ext. 1205
https://vrapp.vendorregistry.com/Vendor/Register/Index/woodstock-city-ga-vendor-registration

The deadline for written questions is September 17, 2019, 3:00 P.M. EST.

Any unauthorized contact shall not be responded to and may result in the disqualification of the responder's submittal. Answers to questions submitted via Vendor Registry will be communicated to respondents via Vendor Registry.

Communications by companies, its agents, employees, and/or representatives regarding its bids or intention to submit a bid in response to this RFB with any employee, agent, or representative of the City of Woodstock, other than the representative listed in Section 1.5, may be considered inappropriate communications.

If any such inappropriate communications are deemed to hinder, influence and/or alter the competitive bid process, the City, in an effort to ensure a fair and equitable review and selection process, reserves the right to decline consideration of the offender's sealed bid.

1.6 RFB Amendments

It is the responsibility of respondents to check Vendor Registry or the Georgia Procurement Registry for RFB information and addendums.

1.7 Non-Collusion Affidavit

By submitting a bid, the respondent represents and warrants that no official or employee of the City has an interest, directly or indirectly, in the bid or in the final contract award. The respondent further understands bids will be rejected if there is any evidence of collusion with another respondent.

Respondent certifies that this qualification, offer, or bid is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a qualification, offer, or bid for the same materials, supplies, services, or equipment and is in all respects fair and

without collusion or fraud. Respondent understands collusive bidding is a violation of state and federal law and can result in fines, prison sentences, and civil damage awards. Respondent agrees to abide by all conditions of this qualification, offer, or bid.

Furthermore, the respondent certifies that the firm has not divulged to, discussed or compared his bid with other respondents and has not colluded with any other respondent or parties to this bid whatsoever. Also, respondent certifies, and in the case of a joint bid each party thereto certifies as to his/her own organization, that in connection with this bid:

- Any prices and/or cost data submitted have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices and or cost data, with any other respondent or with any competitor;

- Any prices and/or cost data quoted for this bid have not been knowingly disclosed by the respondent and shall not knowingly be disclosed by the respondent prior to the scheduled opening directly or indirectly to any other respondent or to any competitor;

- No attempt has been made or shall be made by the qualifier to induce any other person or firm to submit a bid for the purpose of restricting competition;

- The only person or persons interested in this bid, principal/principals is/are named therein and that no person other than therein mentioned has any interest in his bid or in the contract to be entered into; and

- No person or agency has employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or established commercial agencies maintained by the Purchaser for the purpose of doing business

1.8 Compliance with Laws

Respondents agree to be bound by applicable Federal, State and Local laws, regulations and directives.

1.9 Bid & Award Basis

The City reserves the right to accept or reject any and all bids or any or parts of a bid wherein its judgment, it will be in the best interest of the City; waive any technicalities/informalities in the RFB document and bid process; and to qualify and award any or all of this contract in any manner in which the City, acting in the sole and exclusive exercise of its discretion, deems to be in the City's best interest. If no acceptable bid is received, the City also reserves the right to re-solicit bids, at its sole discretion.

1.10 Evaluation Criteria

The City will appoint an RFB review committee which will conduct a review of all documentation submitted by the respondent and the feedback from their respective client references.

The City will review and evaluate all bids submitted in response to this RFB. The City will conduct an evaluation of all bids on the basis of the information provided as well as compliance with the minimum qualifications set forth in this RFB. Failure to comply with any requirement may disqualify a bid.

Qualifications and bids of all firms that respond to this solicitation, including any subcontractors to be used, will be evaluated using the selection criteria found in Section 3. (Maximum points among categories of selection criteria is noted.)

1.11 Required Bonds and Insurance

No bid may be withdrawn for a period of one hundred and twenty (120) days after time has been called on the date of opening.

All bids must be accompanied by a certified check or bid bond of a reputable bonding company authorized to do business in the State of Georgia, in an amount equal to at least five percent (5%) of the total amount of the bid.

Upon the award of this RFB, the contractor shall provide the City with:

- A 100% project value performance and payment bonds pursuant to O.C.G.A. § 36-91-70 and 90.

- Worker's Compensation – Statutory (for the State of Georgia and the State of domicile of the Contractor).

- Manufacturers' and Contractor's Liability, covering operations performed by or for the Contractor, with limits of not less than Bodily Injury – $500,000/$1,000,000. Property Damage - $500,000.

- Contractor Liability, covering liability of others assumed by the Contractor elsewhere in the contract under "Hold Harmless" Agreements or similar assumptions of liability.

Evidence of required bonds and insurance shall be presented prior to the execution of the Contract. The Bonding Company must be licensed to do business in the State of Georgia, licensed to do business by the Georgia Secretary of State, authorized to do business in Georgia by the Georgia Insurance Department, listed in the Department of the Treasury's Publication of Companies Holding Certificates of Authority as Acceptable Surety of Federal Bonds and as

Acceptable Reinsuring Companies and have an A.M. Best rating of A-, Class VI or Higher. Insurance policies to be carried under the agreement shall not be changed or canceled without prior written notification to the City of Woodstock, Georgia.

The awarded bidder will be required to submit Maintenance Bond valid for 12 months in the amount of the total bid.

1.12 Time of Completion and Liquidated Damages

Bidder hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" of the City and to fully complete the project within one hundred and twenty (120) consecutive calendar days; bidder further agrees to pay as liquidated damages the sum of $500 per each consecutive calendar day that the Contractor shall be in default after the date stipulated in the Contract for completing work.

1.13 Taxes, Fees, Code Compliance and Licensing

The firm shall be responsible for the payment of any required taxes or fees associated with the execution of this contract. The firm shall also be responsible for compliance with all applicable codes and statutes.

1.14 References and Proprietary Information

Submission of a bid authorizes the City to make inquiries concerning the respondent and its officers to any persons or firms deemed appropriate by the City. Any proprietary information that the respondent does not want disclosed to the public shall be so identified on each page in which it is found. Data or information so identified will be used by the City solely for the purpose of evaluation and contract negotiations only.

1.15 Illegal Immigration Reform and Enforcement Act of 2011

By providing a qualification or bid, qualifier/bidder certifies that he/she is in compliance with O.C.G.A. § 13-10-90 and 91, et seq. No qualification or bid will be considered by the City unless it is accompanied with a signed, notarized affidavit (**EXHIBIT B**) from the qualifier/bidder attesting to the following:

a) The affiant has registered with and is authorized to use and uses the federal work authorization program

b) The user identification number and date of authorization for the affiant; and

c) The affiant will continue to use the federal work authorization program throughout the contract period; and

The affiant will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the same information required in subparagraphs (a), (b) and (c) of this paragraph.

1.16 Anti-Boycott of Israel

By signing and submitting this bid and pursuant to O.C.G.A. § 50-5-85, respondent/bidder certifies that it is not currently engaged in, and agrees that for the duration of this agreement, it will not engage in a boycott of Israel.

2.0 SCOPE OF WORK

2.1 Type of Good/Service and Objectives:

The City of Woodstock, Georgia, herein referred to as the City, is accepting bids from qualified contractors for the purpose of providing services for the construction of the Elm Street Playground located at Market Street and Maple Street in Woodstock, Georgia.

Goods and services shall meet or exceed the following guidelines:

- Demolition of Existing Facilities
- Clearing and Grubbing
- Site Erosion Control & Grading
- Site Hardscape, Landscape & Irrigation
- Wooden Boardwalk & Entry Plaza
- Play Equipment, Safety Surface & Required CPSI Inspections
- All Other Work Necessary for the Completion of the Project

- Work is expected to begin within 15 days after the notice to proceed has been issued and all work must be completed within 120 calendar days.

- The contractor is responsible for calling for utility locations prior to the start of each phase of work. It shall be the contractor's responsibility to coordinate the work with any utility owner whom may be in conflict with the work. No claims will be considered for extra compensation.

- Any item which must be removed during the construction work shall be removed by the contractor. All costs shall be included in the bid. No claims will be considered for extra compensation.

- All traffic control shall be provided by the contractor in accordance with GDOT's "shelf"

Special Provision 150. Assistance from police officers will not be provided by the City. Post mounted traffic control signs are not required.

- Upon the completion of each work, any excess items which might be left over from the construction related work shall be removed and disposed of properly by the Contractor. The cost for such removal and disposal of such items will be included in the bid. No claims will be considered for extra compensation.

- Working hours are limited to Monday to Friday, 7:30 AM to 7:30 PM. Lane closures on non-neighborhood streets will only be permissible between the hours of 9 a.m. and 4 p.m.

- Contractor shall have all vehicles marked with their company name.

- The Contractor will attend, at the City Annex, one (1) overall contract pre-construction meeting after award of the contract.

- The City of Woodstock will not provide on-site restroom facilities for the contractor's use during construction.

- The Contractor shall perform project housekeeping/clean-up on a daily basis. A 24-hour contact must be provided to the City of Woodstock for all issues as needed in regards to the project for any safety, signage, or other emergency as needed.

- The Contractor shall obtain permission from any private property owner on whose property construction equipment may be parked. Failure to obtain permission from property owners may result in citations.

- The awarded bidder will be required to submit Maintenance Bond valid for 12 months in the amount of the total bid.

Please refer to Exhibit E for plans and specifications. Bid Form and Bidder Qualifications Form in Exhibit C and D will need to be completed and returned with bid submittal.

The contractor shall be responsible for furnishing all materials, equipment, tools, transportation, supplies, labor, etc. to complete the project and shall coordinate construction dates and times with the City of Woodstock, Georgia Economic Development Director. Please note the Kompan Playground Equipment is being purchased and installed separate from this RFB. Please see Exhibit F for the list of the playground equipment purchased by the City.

Pricing shall be valid for a period of 120 days after the RFB submittal date.

All work must be approved prior to the release of payment. All work is expected to be completed within 120 days after a notice to proceed has been issued, pending any unnatural weather occurrence.

Utility conflicts and or traffic signals in road loops shall be the responsibility of the contractor if damaged.

2.2 Mandatory Pre-Bid Meeting

A mandatory pre-bid meeting will begin at the City of Woodstock Chambers located at 8534 Main St., Woodstock, GA 30188 at 10:00 A.M., September 10, 2019. The meeting will include a site visit, as well.

2.3 Delivery Time

This is a time sensitive project. *All projects must be completed within 120 days from notice to proceed date, pending any unnatural weather occurrence.*

2.4 Award and Pricing Information

The Contract will be awarded to the lowest, responsive, responsible Bidder as determined by the review committee and as approved by City Council. The City may award the entire project or portions of the project to a single or multiple Contractor(s). They City reserves the option to negotiate terms, conditions and pricing with the lowest, responsive, responsible bidder(s) at its discretion.

RFBs and pricing shall be valid for a period of 120 days after submission date.

3.0 SELECTION CRITERIA

Bids of all contractors that respond to this solicitation, including any subcontractors to be used, will be evaluated using the following selection criteria. (Points weighing among categories of selection criteria is noted.)

Item	Possible Points
Experience with coordinating the installation of Kompan Playground Equipment	30
On-Site Superintendent's/Project Manager experience with coordinating the installation of Kompan Playground Equipment	30
Experience with the installation of earthen playground berms, tunnels and rock scrambles	20
Experience with installation of wooden boardwalks	10
Price	10
Total Possible Points	**100**

3.1 Experience with Coordinating the Installation of Kompan Playground Equipment (30 Points Maximum)

Bidder should have experience coordinating the installation of Kompan Playground Equipment during the past three years.

3.2 On-Site Superintendent's/Project Manager Experience with Coordinating the Installation of Kompan Playground Equipment (30 Points Maximum)

Bidder should provide an On-Site Superintendent and/or Project Manager that has experience coordinating the installation of Kompan Playground Equipment during the past three years.

3.3 Experience with the Installation of Earthen Playground Berms, Tunnels and Rock Scrambles (20 Points Maximum)

Bidder should have experience with the installation of earthen playground berms, tunnels and rock scrambles during the past three years.

3.4 Experience with Installation of Wooden Boardwalks (10 Points Maximum)

Bidder should have experience with the installation of wooden boardwalks.

3.5 Pricing (10 Points Maximum)

Although cost is a significant factor, it will not be the dominant factor.

4.0 BID FORMAT

1. Exhibit A: Contractor Information Sheet - If the firm has branch offices, state the office that will have management responsibility for the work to be carried out.

2. Completed Exhibit B: E-Verify Affidavit with Instructions.

3. **Bid Form in Exhibit C will need to be completed and returned with bid submittal.**

4. **Bidder Qualifications Form in Exhibit D will need to be completed and returned with the bid submittal.**

5. A copy of the firm's Public Liability Insurance, Workers' Compensation and Commercial General Liability Insurance.

6. Bid bonds (5% of total bid amount)

    a. 100% project value performance and payment bond (pending contract award)
    b. The awarded bidder will be required to submit Maintenance Bond valid for 12 months in the amount of the total bid.

A clear, concise bid in the specified bid format is requested with all the necessary information included. Responses to this RFB will be accepted until **2:00 p.m. (EST) on September 24, 2019** through Vendor Registry.

Bids will be publicly opened and read aloud on September 24, 2019, 2:01 P.M. at the City of Woodstock Annex located at 12453 Highway 92, Woodstock, GA 30188**.**

5.0 OTHER ITEMS

5.1 Terms and Conditions

1. The City of Woodstock, Georgia hereby requests bids for the goods and services inclusive of the services requested in the RFB.

2. City of Woodstock, Georgia reserves the right to evaluate the firm's bids. Only those firms who, in the opinion of the City, meet the minimum necessary bids will have their price and contract/agreement evaluated.

3. All bids, fee schedules and other documents furnished to the City of Woodstock, Georgia are subject to the Georgia Open Records Act.

4. Termination: The contract will be subject to the terms and conditions included in the Service Agreement. The City of Woodstock, Georgia reserves the right to cancel the agreement with cause, due to nonperformance and/or violation of contract terms.

5.2 Rejection of Bids/Cancellation of RFB

The City of Woodstock, Georgia reserves the right to reject any or all bids, to waive any irregularity or informality in a bid, and to accept or reject any item or combination of items, when to do so would be to the advantage of the City.

It is also within the right of the City to reject bids **that do not contain all elements and information requested in this document**. The City reserves the right to cancel this RFB at any

time. The City will not be liable for any cost/losses incurred by the Offerors throughout this process.

5.3 Bid Withdrawal

A submitted bid may be withdrawn prior to the due date by a written request to the City representative listed in Section 1.5. A request to withdraw a bid must be signed by an authorized individual of the submitting company.

5.4 Miscellaneous

This RFB and any agreements related thereto must comply, inter alia, with all City laws and charters and are subject to all requisite City approvals including, but not limited to, City Management and City Council.

The City reserves the right to release modifications to this RFB or supplements to it from time to time. Firms are responsible for periodically checking Vendor Registry or the Georgia Procurement Registry for such modifications or supplements.

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EXHIBIT A CONTRACTOR INFORMATION FORM

See following page(s).

City of Woodstock

CONTRACTOR INFORMATION

Firm Name: _____

Contact Person: _____

Firm Address: _____

_____

Phone: _____

Fax: _____

Email: _____

With this packet, please also provide a W-9 and Certificate of Insurance for the company/firm.

_____ _____

Signature – Authorized Officer or Agent Date

EXHIBIT B E-VERIFY AFFIDAVIT WITH INSTRUCTIONS

See following page(s).

City of Woodstock

INSTRUCTIONS

CONTRACTOR AFFIDAVIT AND AGREEMENT

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm, or corporation which is contracting with the City of Woodstock, Georgia (the "City") has registered with and is participating in a federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontract who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

E-Verify/Company ID Issued by the E-Verify Program
_____
Federal Work Authorization User Identification Number

Date E-Verify/Company ID was issued by E-Verify
_____
Date of Authorization

Contractor's Company/Firm Name
_____
Name of Contractor

Name of project or type of service provided
_____
Name of Project

City of Woodstock, Georgia
_____
Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.
Executed on _____, 201____ in _____ (city), _____ (state).

_____
Signature of Authorized Officer or Agent

_____
Printed Name and Title of Authorized Officer or Agent

Subscribed and Sworn before me this the_____ day of _____, 201____,

_____ _____
Notary Public My Commission Expires

INSTRUCTIONS ONLY - COMPLETE FOLLOWING PAGE

City of Woodstock

CONTRACTOR AFFIDAVIT AND AGREEMENT

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm, or corporation which is contracting with the City of Woodstock, Georgia (the "City") has registered with and is participating in a federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontract who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

_____
Federal Work Authorization User Identification Number

_____
Date of Authorization

_____
Name of Contractor

2020 - 05 Elm Street Playground Construction
_____
Name of Project

City of Woodstock, Georgia
_____
Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, 201____ in _____ (city), _____ (state).

_____
Signature of Authorized Officer or Agent

_____
Printed Name and Title of Authorized Officer or Agent

Subscribed and Sworn before me this the_____ day of _____, 201____,

_____ _____
Notary Public My Commission Expires

EXHIBIT C BID FORM

See following page(s).

BID FORM

Project: **Elm Street Playground**

To: City of Woodstock
Woodstock, Georgia

Submitted Date: _____, **2019**

By:_____
(Bidder's Name)

1. Undersigned Bidder offers and agrees to enter into Agreement with City of Woodstock, in accordance with the instructions, requirements and forms included in Bid Document Package (including the NOTICE OF BID, Instructions to Bidders Package), and to complete all Work for the Bid Price and within required calendar days, all in accordance with the Bid Document Package.

2. Bidder accepts terms and conditions contained in Bid Document Package including without limitation those dealing with the City of Woodstock's time for accepting Bid and disposition of Bid Security.

3. In submitting this Bid, Bidder makes representations required by Instructions to Bidders and further warrants and represents:

   a. Bidder has examined Bid Document Package, including NOTICE of BID and Instructions to Bidders, and following Addenda:

   No._____Dated_____ No._____Dated_____
   No._____Dated_____ No._____Dated_____
   No._____Dated_____ No._____Dated_____
   No._____Dated_____ No._____Dated_____

   b. Bidder has examined the site and locality where the Work is to be performed and legal requirements (federal, state and local laws, ordinances, rules and regulations) and conditions affecting Work cost, difficulty, progress or performance and has made independent investigations as Bidder deems necessary.

   c. Bidder has carefully studied reports and drawings indicating subsurface conditions and drawings depicting physical conditions as identified in the Contract Documents and accepts the determinations concerning technical data contained in reports and drawings on which Bidder is entitled to rely.

   d. Bidder has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) examinations, investigations, tests, and studies (in addition to or to supplement those referred to in "c." above) pertaining to subsurface or physical conditions at site or otherwise affecting cost, progress, performance, or similar information or data are or will be required by Bidder.

Company Name:_____

Bidder's Signature:_____

e. Furnishing Work as Bidder considers necessary for performing or furnishing Work at Contract Price, within Contract Time, and in accordance with terms and conditions contained in the Bid Document Package, and no additional examinations, investigations, explorations, tests, reports, or similar information or data are or will be required by Bidder.

f. Bidder has reviewed and checked Plans and data shown or indicated on the Bid Document Package with respect to existing underground facilities at or contiguous to the site and assumes responsibility for accurately locating underground facilities.

g. Bidder has correlated results from observations, examinations, investigations, explorations, tests, reports, and studies with terms and conditions contained in the Bid Document Package.

h. Bidder has given Owner written notice concerning conflicts, errors, or discrepancies discovered in the Bid Document Package and written resolution by Owner is acceptable to Bidder.

i. The Bid is genuine and not made in the interest of, or for any undisclosed person, firm or corporation. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm, or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.

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Elm Street Playground

Company Name:_____

Bidder's Signature:_____

4. Bidder submits the following Bid Prices:

Bidder acknowledges and agrees that the Work is set out in the Bid Documents as a Lump Sum Agreement. The LUMP SUM costs for each individual portion of the Work as set out herein shall be inclusive of all costs for each.

Part 1 – Base Bid – Elm Street Playground

Item No.	Item Description	Estimated Quantity	Total Price in Figures
A.		LS	$

Total – Base Bid Price $ _____

Total – Base Bid Price (in words) _____

Amount – Base Bid – shall be shown in both figures and words. In case of a discrepancy, the amount shown in words shall govern. In the event of a discrepancy between the sum of the extended amounts and the total Bid, the sum of the extended amounts shall govern.

Elm Street Playground

Company Name:_____

Bidder's Signature:_____

Part 1A – Additive Alternate –Elm Street Playground

Item No.		Item	Unit	Unit Price
ALT 1		**Earthen Mound (includes items below)**	**LS**	**$** _____
1	a)	Mound (includes earthwork, compaction)	LS	
1	b)	Artificial Turf	SF	
1	c)	Rock Scrambles	SF	
1	d)	36" PVC Tunnel	LS	
1	e)	60" PVC Tunnel	LS	
1	f)	Wood Tunnel Walk Surface	LS	
1	g)	EWF Mulch Path	LS	

Total – Elm Street Playground – Additive Alternate (item 1, in Numbers)

$_____

Total – Elm Street Playground – Additive Alternate (item 1, in Words)

$_____

Amount of "Additive Alternate" shall be shown in both numbers and words. In case of a discrepancy between the numbers and the words used, the amount shown in words shall govern. In the event of a discrepancy between the sum of the extended amounts and the bid total, the sum of the extended amounts shall govern.

Elm Street Playground

Company Name: _____

Bidder's Signature: _____

Time to Final Completion: 120 Calendar Days from Notice To Proceed

Prices include all labor, materials, bailing, shoring, removal, overhead (direct and indirect), profit, insurance, bonds, and other costs, to cover all finished Work.

5. Bidder agrees this Bid shall be good and may not be withdrawn for a period of 120 calendar days after scheduled closing time for receiving bids.

6. This is enclosed herewith a certified or cashier's check or a Bid Bond to the order of City of Woodstock in the sum of _____ Dollars. Check or Bid Bond shall be equal to, not less than, the amount stipulated in the NOTICE TO BID and it is understood and agreed that said check or Bid Bond shall be subject to the terms and conditions stipulated in Bid Document Package.

7. Undersigned Bidder hereby agrees to each and every stipulation in the Bid Document Package pertaining to the submission of Bids and further, if awarded the Contract, Bidder duly agrees to execute and secure the required agreement documents and Bid Document Package within fifteen (15) days from service of Notice of Award and deliver a surety bond or bonds as required by General Conditions. The name and business address of Bidder to which all formal Notices shall be sent:

_____

_____

_____

8. Undersigned Bidder states the names and address of persons interested as principals in this Bid as are follows: (write name in full, no initials)

_____

_____

_____

9. Bidder shall state on line below, if a corporation, the name of State in which incorporated and the date of said incorporation:

_____

Elm Street Playground

Company Name: _____

Bidder's Signature: _____

10. Undersigned Bidder states (he/she/they) (is/are) citizen(s) of the United States and all partners, associates, or principals interested herein are citizens of the United States, except: (give full names and addresses)

_____

_____

_____

11. Undersigned Bidder submitting this Bid certifies and affirms that such Bid is genuine and not collusive or sham; that said Bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with a Bidder or person, to put in a sham Bid, or that such other person shall refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication, or conference, with any person to fix the Bid Price of affiant or any other Bidder , or to fix any overhead, profit, or cost element of said Bid Price, or of that of any other Bidder, or to secure an advantage against City of Woodstock or any other person interested in the proposed Contract; and that all statements contained in said Bid are true, and further, that such Bidder has not directly or indirectly submitted this Bid, or contents thereof, or divulged information or data thereof; and, that no member or Owner or other officers or employees of said Owner is interested directly or indirectly in the Bid or in any portion of the Bid nor the Contract or any part of the Contract which may be awarded the undersigned Bidder on the basis of such Bid.

12. The undersigned bidder acknowledges the requirements of the Plans and Specifications for the Elm Street Playground. It is further understood that the above quantities are approximate, are solely for the purpose of comparing proposals, and are not represented by the Owner as an accurate statement for the actual work to be performed.

13. The Bidder agrees to complete the Contract awarded within **120 Calendar Days (final completion)** for completion from the date of "Notice to Proceed." Bidder further agrees that the Owner may retain from the monies which may become due the amount of **$500.00 dollars/day (past final)** for each and every day that the completion of the work may be delayed.

Elm Street Playground

Company Name:_____

Bidder's Signature:_____

Signature:_____ Date:_____
(President, Vice President or Corporate Officer)

Printed Name:_____ Title:_____

Attested by:_____ Date:_____
(Secretary of Corporation)

Printed Name_____ Title:_____

SEAL

(Corporate Seal required if Bidder is Corporation)

Company Name:_____

Address:_____

City:_____ State:_____ Zip:_____

Telephone Number:_____

Elm Street Playground

Company Name:_____

Bidder's Signature:_____

Appendix A – Unit Price Schedule

Submit unit price amount for the following items. For each item, provide a unit price for one (1) unit as listed.

Unit price includes labor, material, equipment, and overhead necessary to completed installation of the items and are to be used as a basis for pricing Change Orders to the Contract.

Unit prices shall include all components indicated on Plan Drawings and in Specifications necessary to provide a completed unit or product.

	Item No.	Item	Unit	Unit Price
(A) SITE DEMOLITION				
A	1	Removal of Rock (Open Excavation)	CY	$ _____
A	2	Removal of Rock (Trench Excavation)	CY	$ _____
A	3	Excavation of unsatisfactory materials and replacement with suitable soil material	CY	$ _____
A	4	Excavation of unsatisfactory materials and replacement with #57 crushed stone	CY	$ _____
A	5	Excavation of unsatisfactory materials and replacement with surge stone	CY	$ _____
A	6	Clearing Undergrowth and Exotic Vegetation	AC	$
A	7	Tree Removal	EA	$
A	8	Sawcut and Remove Existing Sidewalk	SY	$
A	9	Removal of Concrete Paving	SY	$
A	10	Installation of Tree Protection Tape	LF	$
A	11	Installation of Construction Fence	LF	$

Elm Street Playground

Company Name:_____

Bidder's Signature:_____

	Item No.	Item	Unit	Unit Price
(B) SITE				
B	1	6" Thick Concrete Sidewalk	SF	$
B	2	Concrete Seat Wall	LF	$
B	3	6' Width Wooden Boardwalk	LF	$
B	4	8"x18" Concrete Playground Curbing	LF	$
B	5	Rock Scrambles	SF	$
B	6	EWF Playground Surface (Outside Fall Zone)	SF	$
B	7	Chalkboard Wall	LS	$
B	8	Balsa Construction Area	LS	$
B	9	Musical Equipment (Provide & Install)	LS	$
B	10	Aluminum Signs	EA	$
B	11	EWF Mulch Path		
B	12	CPSI Playground Inspection	LS	$
(C) GRADING AND DRAINAGE				
C	1	Cut (includes undercut for pavement/slab)	CY	$
C	2	Fill (includes undercut for pavement/slab, excludes shrinkage)	CY	$
C	3	Imported Fill (delivered and spread)	CY	$
C	4	Haul off (excludes topsoil, assumes 15% shrinkage)	CY	$
C	5	Topsoil stripping	CY	$
C	6	4" PVC Storm Pipe	LF	$
C	7	Playground Subdrain (includes 4" Perf. PVC, Stone, Fabric)	LF	$
C	8	Playground Subdrain (includes 4" Corr. Perf. Pipe, Stone, Fabric)	LF	$

Elm Street Playground

Company Name:_____

Bidder's Signature:_____

	Item No.	Item	Unit	Unit Price
(D) EROSION AND SEDIMENTATION CONTROL				
D	1	Stabilized Construction Exit (Co)	EA	$
D	2	Concrete Wash-Out Area	EA	$
D	3	Compost Filter Sock (Sd1-NS)	LF	$
D	4	Straw Bale Check Dam (Cd-HB)	LF	$
D	7	Dust Control (Du)	AC	$
D	8	Mulching (Ds1)	CY	$
D	9	Temporary Seeding (Ds2)	AC	$
(E) PLANT MATERIAL				
E	1	Mondo Grass (1 gal.)	EA	$
E	2	'Meyer' Zoysia Sod	SF	$
(F) LANDSCAPE MULCH MATERIAL				
F	1	Shredded Hardwood Mulch @ 3" depth (for disturbed areas)	CY	$
F	2	Pinestraw @ 3" depth (for disturbed steep areas)	BALE	$
(G) IRRIGATION				
G	1	Irrigation	LS	$

EXHIBIT D BIDDER QUALIFICATIONS FORM

See following page(s).

BIDDER QUALIFICATIONS FORM

Bidders must include the following information in addition to the requirements identified in the Bid Form:

Qualification:

1. Bidder should have experience coordinating the installation of Kompan Playground Equipment during the past three years. Provide the follow representative project information.

A. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

B. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

C. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

2. Bidder must provide an On-Site Superintendent and/or Project Manager that has experience coordinating the installation of Kompan Playground Equipment during the past three years. Provide the follow information.

A. On-Site Superintendent / Project Manager Name:

B. A. On-Site Superintendent Relevant Project Experience:

I. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

II. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

III. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

3. Bidder should have experience with the installation of earthen playground berms, tunnels and rock scrambles during the past three years. Provide the follow representative project information.

A. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

B. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

C. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

4. Bidder should have experience with the installation of wooden boardwalks and be capable of providing signed and sealed shop drawings and calculations by a Georgia Licensed Structural Engineer. Provide the following information for this project.

A. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

B. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

C. Project Name:

Project Location:
Project Reference Contact:
Project Reference Email:
Project Reference Phone Number:

D. Georgia Licensed Structural Engineer Name:
Georgia Licensed Structural Engineer License Number:
Georgia Licensed Structural Engineer License Expiration Date:

5. Qualifications listed above for Items 1, 3 and 4 may be performed by a Sub-Contractor. Bidder shall provide the required information listed above and below for each Sub-Contractor.

6. If Bidder is not-self performing the work required to complete any task associated with this project, Bidder must provide the following documentation for each project task that the Bidder will be sub-contracting. (Note: Bidder must add as many entries below as need to comply with this qualification requirement.)

1. Task Name:

A. Task(s) to be performed by Sub-Contractor:

B. Sub-Contractor Company Name:

C. Sub-Contractor Location:

D. Sub-Contractor On-Site Superintendent and/or Project Manager:

E. Georgia Business License Number & Number of Years in Business:

F. Three (3) Trade References

The City will evaluate the Bid's based on the following criteria:

1. Experience with coordinating the installation of Kompan Playground Equipment – 30 Points Maximum

2. On-Site Superintendent's / Project Manager experience with coordinating the installation of Kompan Playground Equipment – 30 Points Maximum

3. Experience with the installation of earthen playground berms, tunnels and rock scrambles – 20 Points Maximum

4. Experience with the installation of wooden boardwalks – 10 Points Maximum

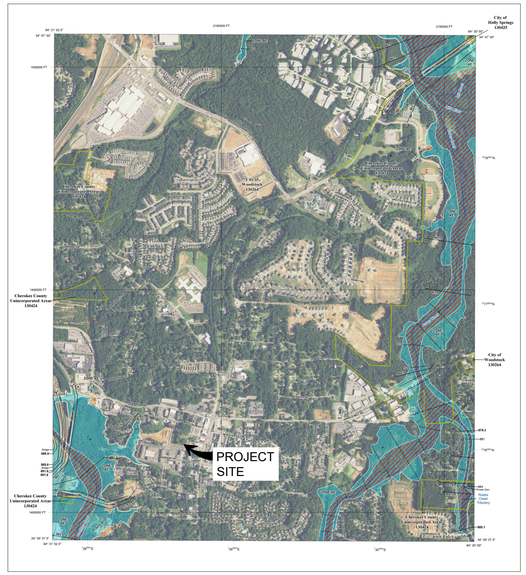
5. Bid Price - 10 Points Maximum

Bid Price

Although cost is a significant factor, it will not be the dominant factor. Any bid which does not include all the required statements and affirmations called for in this RFB may be rejected as not being responsive.

EXHIBIT E Woodstock Elm Street Playground Drawings and Specifications

See following page(s).



FEMA FIRM MAP

N.T.S.

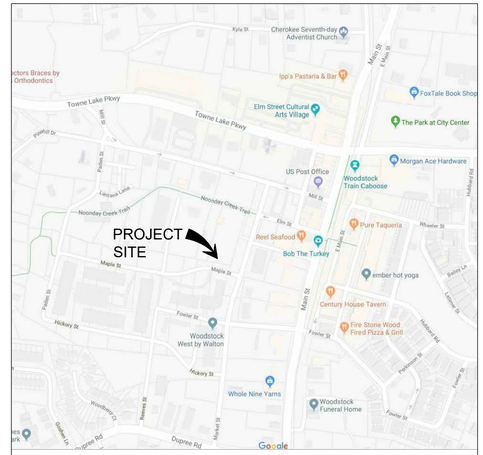
PER FEMA FIRM MAP 13057C0332E, UPDATED JUNE 7, 2019 , THE SITE IS LOCATED IN ZONE X (UNSHADED), WHICH IS AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

CITY OF

WOODSTOCK - GA

CITY PLAYGROUND AT ELM STREET CULTURAL ARTS VILLAGE

MARKET STREET AND MAPLE STREET
CITY OF WOODSTOCK
GEORGIA, 30188
L.L. 1068, 15TH DISTRICT- DB 11317 PG 91
TAX PARCEL ID 15-1068-0016
ZONED: DT-CBD



LOCATION MAP
(N.T.S)

UTILITY PROVIDERS:

THE FOLLOWING UTILITY PROVIDER WERE IDENTIFIED ON THE PROJECT SURVEY PROVIDED BY MITCHELL SURVEYING AND CONSULTING DATED 04/19/2018:

ATLANTA GAS LIGHT
JERRY BARRETT
(404)-569-2507

AT&T TELECOM
ANGELO HINES
(404)-784-3972

CHARTER COMMUNICATIONS TELECOM USIC LOCATING
800-778-9140

CHEROKEE COUNTY WATER
ANNETTE GABLE
(770)-479-1813

GEORGIA POWER CABLE LOCATING
(404)-506-6539

CITY OF WOODSTOCK WATER AND SEWER
OPIE MULL
(678)-522-9210

ZAYO FIBER SOLUTIONS TELECOM
DEWAYNE BEGLEY
(470)-249-5124

Sheet Index

CONTACTS:

CITY FIRE MARSHAL
DAVE SOUMAS
225 ARNOLD MILL ROAD
WOODSTOCK, GA 30188
TEL: (770) 926-2302
EMAIL: DSOUMAS@WOODSTOCKGA.GOV

CITY WATER/SEWER DIRECTOR
PAT FLOOD
12453 HWY 92
WOODSTOCK, GA 30188
TEL: (770) 592-6000
EMAIL: PFLOOD@WOODSTOCKGA.GOV

CITY COMMUNITY DEVELOPMENT DIRECTOR
BRANTLEY E. DAY
12453 HWY 92
WOODSTOCK, GA 30188
TEL: (770) 592-6050
EMAIL: BDAY@WOODSTOCKGA.GOV

CITY PUBLIC WORKS DIRECTOR
ROB HOGAN
12453 HWY 92
WOODSTOCK, GA 30188
TEL: (770) 592-6000
EMAIL: RHOGAN@WOODSTOCKGA.GOV

CITY ECONOMIC DEVELOPMENT DIRECTOR
BRIAN STOCKTON
1 INNOVATION WAY
WOODSTOCK, GA 30188
TEL: (770) 345-0600
EMAIL: BSTOCKTON@WOODSTOCKGA.GOV

OWNER/DEVELOPER:

CITY OF WOODSTOCK
PARKS & RECREATION DEPARTMENT
108 ARNOLD MILL ROAD, SUITE C
WOODSTOCK, GA 30188
(770) 592-6000

ENGINEER/LANDSCAPE ARCHITECT:

GreenbergFarrow
CONTACT: PATRICK WAYLOR
1430 WEST PEACHTREE STREET, #200
ATLANTA, GA 30309
(404) 601-4000

SITE INFORMATION	
TOTAL SITE ACREAGE:	2.78 AC
TOTAL DISTURBED ACREAGE:	16,227 SF (.37 AC)
EXISTING IMPERVIOUS SURFACE:	8,071 SF (.19 AC)
PROPOSED IMPERVIOUS SURFACE:	422 SF (.01 AC)
TOTAL IMPERVIOUS SURFACE:	8,493 SF (.20 AC)

*IMPERVIOUS FOR FUTURE PHASES = 546 SF

SURVEYOR

BOUNDARY, TOPO & UTILITY SURVEY BY:

MITCHELL SURVEYING AND CONSULTING
CONTACT: CHARLES R. MITCHELL
3201 SOUTH CHEROKEE LANE STE. 310
WOODSTOCK, GA 30188
(770) 924-2955

24-HOUR EMERGENCY CONTACT:

MICHAEL HUFFSTETLER, DIRECTOR
PARKS AND RECREATION DEPARTMENT
108 ARNOLD MILL ROAD, SUITE C
WOODSTOCK, GA 30189
770-592-6000 X.1953

811 Know what's below. Call before you dig.

ISSUED FOR BID

JOB NO. 20180300.0 DATE: 08/22/2019

This box reserved for the Clerk of Superior Court

LEGEND

MEASUREMENT NOTE

DIMENSIONS ENCLOSED BY "( )" ARE RECORD AND NOTED IN THE "RECORD DOCUMENT INDEX." ALL OTHER DIMENSIONS ARE ACTUAL BASED ON FIELD MEASUREMENTS.

EXAMPLE: (135.28') - RECORD DIMENSION

ABBREVIATIONS

AC = ACRE
ASPH = ASPHALT
B/L = BUILDING LINE
BOC = BACK OF CURB
CB = CHORD BEARING
CH = CHORD
CONC = CONCRETE
CMP = CORRUGATED METAL PIPE
DB = DEED BOOK
DE = DRAINAGE EASEMENT
DIP = DUCTILE IRON PIPE
ELEV = ELEVATION
ESMT = EASEMENT
FC = FENCE
FFE = FINISHED FLOOR ELEVATION
HWM = HIGH WATER MARK
IE = INVERT ELEVATION
L = ARC LENGTH
HC = HANDICAPPED
N/F = NOW OR FORMERLY
OTP = OPEN TOP PIPE
PB = PLAT BOOK
PG = PAGE
PID=TAX PARCEL IDENTIFICATION NUMBER
POC = POINT OF COMMENCEMENT
POB = POINT OF BEGINNING
PVC = POLYVINYL CHLORIDE PIPE
R = RADIUS
RCP = REINFORCED CONCRETE PIPE
R/W = RIGHT-OF-WAY
SF = SQUARE FEET
SPG =STATE PLANE GRID
SSE = SANITARY SEWER EASEMENT
WE = WATER EASEMENT
ELEVATIONS: + 608.17 - SPOT ELEVATION

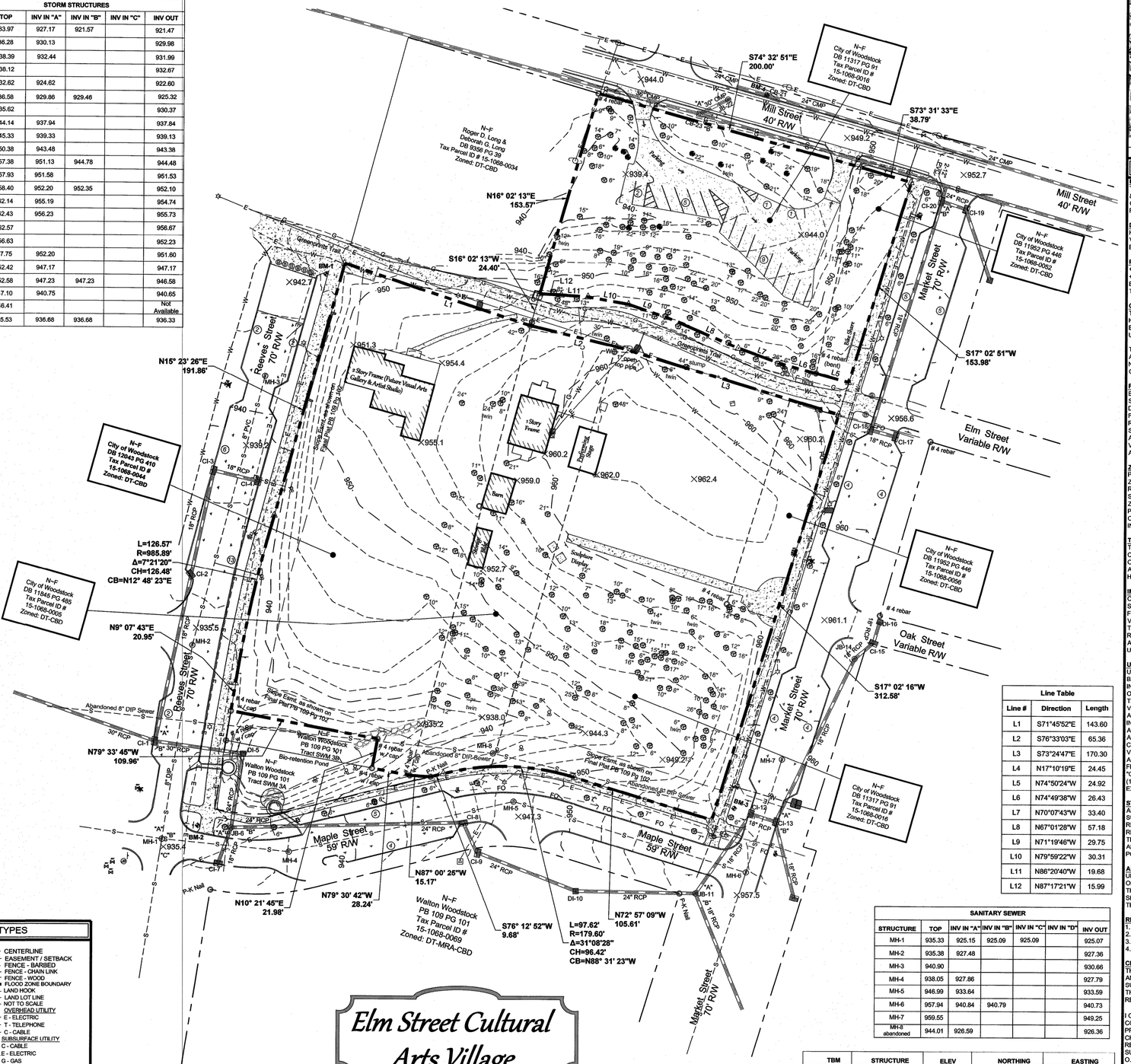
SYMBOL KEY

- Ⓑ - BOLLARD
- Ⓒ - CABLE TV PEDESTAL
- △ - CALCULATED POINT
- CI - CATCH BASIN (SINGLE WING)
- CI - CATCH BASIN (DOUBLE WING)
- △ - CENTRAL ANGLE (DELTA)
- ✺ - CONIFEROUS TREE
- ▭ - CURB INLET
- ✿ - DECIDUOUS TREE
- ▤ - DROP INLET
- Ⓔ - ELECTRICAL MANHOLE
- ⊠ - ELECTRIC METER
- △ - ELECTRICAL TRANSFORMER
- FH - FIRE HYDRANT
- ⊠ - GAS VALVE
- G - GAS METER
- Ⓖ - GAS PEDESTAL
- ⟵ - GUY ANCHOR WIRE
- ♿ - HANDICAP
- ⟷ - HEADWALL
- JB - JUNCTION BOX
- 15 - LAND LOT NUMBER
- ☼ - LIGHT POLE
- 12 - LOT NUMBER
- ✉ - MAIL BOX
- ● - CAPPED RE-BAR SET MSC
- ○ - MONUMENT FOUND
- ⊡ - CONCRETE MONUMENT FOUND
- ▣ - PULL BOX
- Ⓢ - SANITARY SEWER CLEANOUT
- Ⓢ - SANITARY SEWER MANHOLE
- ⊖ - SHRUB OR BUSH
- ⟜ - SIGN (ONE POLE)
- ⟜ - SIGN (TWO POLES)
- ◆ - SITE BENCHMARK
- 2831 - STREET ADDRESS
- Ⓣ - TELEPHONE BOX
- Ⓣ - TELEPHONE MANHOLE
- ✱ - TRAFFIC POLE
- ⟜ - UTILITY POLE
- ▨ - WATER METER
- ⊠ - WATER VALVE
- ■ - YARD/GRATE INLET

LINETYPES

- CENTERLINE
- EASEMENT / SETBACK
- FENCE - BARBED
- FENCE - CHAIN LINK
- FENCE - WOOD
- FLOOD ZONE BOUNDARY
- LAND HOOK
- LAND LOT LINE
- NOT TO SCALE
- OVERHEAD UTILITY
- E - ELECTRIC
- T - TELEPHONE
- C - CABLE
- SUBSURFACE UTILITY
- C - C - CABLE
- E - E - ELECTRIC
- G - G - GAS
- S - S- SANITARY
- T - T - TELEPHONE
- W - W - WATER
- POLITICAL BOUNDARY
- RIGHT-OF-WAY
- STORM PIPES
- TREE / BRUSH LINE
- NATURAL DRAINAGE SWALE

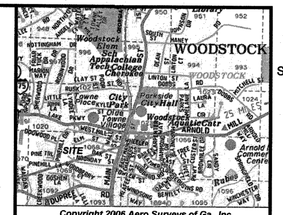
STORM STRUCTURES					
STRUCTURE	TOP	INV IN "A"	INV IN "B"	INV IN "C"	INV OUT
CI-1	933.97	927.17	921.57		921.47
CI-2	936.28	930.13			929.98
CI-3	938.39	932.44			931.99
CI-4	938.12				932.67
DI-5	932.62	924.62			922.60
JB-6	936.58	929.86	929.46		925.32
CI-7	935.62				930.37
CI-8	944.14	937.94			937.84
CI-9	945.33	939.33			939.13
DI-10	950.38	943.48			943.38
JB-11	957.38	951.13	944.78		944.48
CI-12	957.93	951.58			951.53
CI-13	958.40	952.20	952.35		952.10
JB-14	962.14	955.19			954.74
CI-15	962.43	956.23			955.73
DI-16	962.57				956.67
CI-17	956.63				952.23
CI-18	957.75	952.20			951.60
CI-19	952.42	947.17			947.17
CI-20	952.58	947.23	947.23		946.58
CB-21	947.10	940.75			940.65
JB-22	946.41				Not Available
CB-23	945.53	936.68	936.68		936.33



Line Table		
Line #	Direction	Length
L1	S71°45'52"E	143.60
L2	S76°33'03"E	65.36
L3	S73°24'47"E	170.30
L4	N17°10'19"E	24.45
L5	N74°50'24"W	24.92
L6	N74°49'38"W	26.43
L7	N70°07'43"W	33.40
L8	N67°01'28"W	57.18
L9	N71°19'46"W	29.75
L10	N79°59'22"W	30.31
L11	N86°20'40"W	19.68
L12	N87°17'21"W	15.99

SANITARY SEWER						
STRUCTURE	TOP	INV IN "A"	INV IN "B"	INV IN "C"	INV IN "D"	INV OUT
MH-1	935.33	925.15	925.09	925.09		925.07
MH-2	935.38	927.48				927.36
MH-3	940.90					930.66
MH-4	938.05	927.86				927.79
MH-5	946.99	933.64				933.59
MH-6	957.94	940.84	940.79			940.73
MH-7	959.55					949.25
MH-8 abandoned	944.01	926.59				926.36

TBM	STRUCTURE	ELEV	NORTHING	EASTING
BM-1	TRAV-NAIL 106	944.45	1491856.993	2188912.538
BM-2	TRAV-NAIL 104	935.54	1491451.408	2188820.080
BM-3	TRAV-NAIL 102	958.69	1491466.172	2189214.407
BM-4	TOP CATCH BASIN LID	947.10	1491990.526	2189235.895



SURVEYOR'S NOTES

EQUIPMENT AND FIELD SURVEY STATEMENT
TYPE OF EQUIPMENT: TOPCON GTS-233W TOTAL STATION, & SPECTRA PRECISION EPOCH 50 DUAL BAND GPS RECEIVER ON THE eGPS NETWORK.
FIELD SURVEY COMPLETED: 04/02/2018

DATUM
HORIZONTAL: STATE PLANE GRID (NAD83 - GA WEST)
VERTICAL: MEAN SEA LEVEL (NAVD 88 - GEOID 12A)
ESTABLISHED BY GPS OBSERVATIONS.

PREDICTED POSITIONAL ERROR
+/- (0.03 + 1:10,000) HORIZONTAL
+/- (0.08 + 1:10,000) VERTICAL
BASED ON A COMBINATION OF GPS AND CONVENTIONAL TOTAL STATION ERROR ESTIMATES.

CLOSURE STATEMENT
THE FIELD DATA UPON WHICH THIS MAP OR PLAT IS BASED HAS A CLOSURE PRECISION OF **1:308,784** AND AN ANGULAR ERROR OF **00"00'01"** PER ANGLE POINT, AND WAS ADJUSTED USING THE COMPASS RULE

THIS MAP OR PLAT HAS BEEN CALCULATED FOR CLOSURE AND IS FOUND TO BE ACCURATE WITHIN:
NORTH TRACT - 1:73,753 - SOUTH TRACT - 1:457,737 - GREENPRINTS TRAIL - 1:125,416.

FLOOD ZONE
BASED ON GRAPHICAL INTERPRETATION THIS PROPERTY IS SITUATED IN UNSHADED FLOOD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN) AS DEPICTED ON THE NFIP FLOOD INSURANCE RATE MAP NO. 13057C0332 D, HAVING AN EFFECTIVE DATE OF SEPTEMBER 29, 2006. USER OF THIS MAP IS CAUTIONED THAT A MORE PRECISE FLOOD DELINEATION MAY BE NEEDED TO VERIFY THIS INFORMATION. (F.E.M.A MAP REVISIONS, IF ANY, ARE NOT ADDRESSED AS PART OF THIS SURVEY)

ZONING
PROPERTY ZONED DT-CBD (Downtown - Central Business District); ZONING SHOWN HEREON IS BASED ON CURRENT TAX RECORDS AND IS SHOWN FOR INFORMATION ONLY. SURVEYOR MAKES NO WARRANTY AS TO THE EFFECT OF ZONING TO THE CURRENT OR FUTURE USE OF THE SUBJECT PROPERTY. USER OF THIS MAP IS HEREBY CAUTIONED TO CONSULT THE APPROPRIATE GOVERNING BODY FOR FINAL INTERPRETATION CONCERNING ZONING.

TITLE
THIS SURVEY WAS MADE WITHOUT THE BENEFIT OF A CURRENT ABSTRACT OF TITLE. THEREFORE THERE MAY BE OTHER RESTRICTIONS, EASEMENTS, SETBACKS, AGREEMENTS, OR OTHER SIMILAR MATTERS NOT SHOWN HEREON. ALL MATTERS OF TITLE ARE EXCEPTED.

IMPROVEMENTS
ONLY NON-MOBILE AND SUBSTANTIAL "MAN MADE" SURFACE STRUCTURAL IMPROVEMENTS ARE SHOWN HEREON. FEATURES SUCH AS STREAMS, DRAINAGE COURSES, OR VEGETATION ARE NOT SHOWN UNLESS THEY FORM PART OF THE BOUNDARY LIMITS. CAUTION - FEATURES SHOWN INSIDE ROAD RIGHT-OF-WAY LIMITS ARE FOR INFORMATION ONLY AND MAY OR MAY NOT COMPRISE ALL IMPROVEMENTS OR UTILITIES.

UTILITIES
UNDERGROUND UTILITIES THAT ARE SHOWN HEREON ARE BASED UPON A PRIVATE UTILITY LOCATE BY RHD SERVICES, INC. MARKED ON 03/27/2018 ALONG WITH FIELD SURFACE OBSERVATIONS AND AVAILABLE INFORMATION ON HAND AT THE TIME OF THE SURVEY, ONLY UTILITIES THAT WERE VISIBLE AND ACCESSIBLE WERE MEASURED. DUE TO STATE AND FEDERAL RULES REGULATING CONFINED SPACES, THE INFORMATION SHOWN WITH REGARD TO INVERT ELEVATIONS AND PIPE SIZES WAS OBTAINED FROM MEASUREMENTS MADE AT THE SURFACE. THESE MEASUREMENTS SHOULD BE CONSIDERED APPROXIMATE AND SUBJECT TO CONTRACTOR VERIFICATION. SITE EXCAVATION WAS NOT PERFORMED IN ANY WAY TO MEASURE ANY SUBSURFACE UTILITY OR FEATURE OF ANY TYPE. NOTICE IS HEREBY GIVEN THAT "GEORGIA ONE CALL" UTILITY LOCATION SERVICE (1-800-282-7411) SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION OF THE SITE.

STREAMS, BODIES OF WATER, & WETLANDS
ALL STREAMS, BODIES OF WATER, AND WETLANDS MAY BE SUBJECT TO STATE, COUNTY, AND LOCAL BUFFERS OR RESTRICTIONS. SURVEYOR MAKES NO INTERPRETATION REGARDING THESE BUFFERS OR RESTRICTIONS. USER OF THIS MAP IS CAUTIONED TO CONSULT WITH THE APPROPRIATE GOVERNING AUTHORITIES CONCERNING POSSIBLE BUFFERS OR RESTRICTIONS.

ARCHAEOLOGICAL & HISTORIC
UNLESS SHOWN HEREON, NO CEMETERIES, ARCHEOLOGICAL, OR ARCHITECTURAL LANDMARKS ARE KNOW TO EXIST ON THIS SITE. HOWEVER, SURVEYOR HAS NOT EXCAVATED THE SITE OR CONSULTED WITH A QUALIFIED PROFESSIONAL IN THIS FIELD FOR ABSOLUTE CONFORMATION.

REFERENCE INFORMATION
1. DB 12043 PG 410 - DB 11553 PG 303 - DB 11845 PG 485
2. DB 11317 PG 91 - DB 11952 PG 446 - DB 9356 PG 39
3. DB 12189 PG 253
4. PB 6 PG 33 - PB 109 PG 101

CERTIFICATION
THIS SURVEY IS INVALID WITHOUT ORIGINAL SIGNATURE OR IF ANY ALTERATIONS HAVE BEEN MADE BY OTHER THAN THE SURVEYOR. IN ADDITION, THIS SURVEY WAS PREPARED FOR THE EXCLUSIVE USE FOR THE CLIENT NAMED HEREON AND REPRESENTS A SPECIFIC SCOPE OF SERVICES.

I CERTIFY THAT THIS SURVEY WAS PREPARED IN CONFORMITY WITH THE TECHNICAL STANDARDS FOR PROPERTY SURVEYS IN GEORGIA AS SET FORTH IN CHAPTER 180-7 OF THE RULES OF THE GEORGIA BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS AND AS SET FORTH IN THE GEORGIA PLAT ACT O.C.G.A. 15-6-67 AS AMENDED BY HB 1004 (2016). IN THAT WHERE A CONFLICT EXISTS BETWEEN THOSE TWO SETS OF SPECIFICATIONS, THE REQUIREMENTS OF LAW PREVAIL .

AREA
NORTH TRACT - 0.82 ACRES - 35,536 FT²
SOUTH TRACT - 2.78 ACRES - 121,119 FT²
TOTAL AREA - 3.60 ACRES - 156,655 FT²

MITCHELL SURVEYING & CONSULTING, LLC
Surveying ● Construction Layout ● Consulting
3201 South Cherokee Lane ● Suite 310
Woodstock, GA 30188
Tel. 770-924-2955 Fax: 770-485-9073
Email: cmitchell@msc-survey.com

BOUNDARY SURVEY

SITUATED IN
LAND LOT 1068
15TH DISTRICT -2ND SECTION
CITY OF WOODSTOCK
CHEROKEE COUNTY, GEORGIA

PREPARED FOR

Elm Street Cultural Arts Village

STATE PLANE GRID

GA WEST
NORTH ARROW

GRAPHIC SCALE

40 0 20 40 80

1 inch = 40 ft.

BAR BELOW IS 1" LONG FOR SCALE SHOWN ON THIS SHEET. IF NOT 1" LONG ON THIS SHEET. ADJUST SCALE ACCORDINGLY

GEORGIA REGISTERED NO. 3080 LAND SURVEYOR CHARLES R. MITCHELL
4/19/2018

SHEET RECORD

DATE	DESCRIPTION
04/19/2018	Issued

DRAWING INFORMATION
CAD FILE: 18017-BNDY-1.DWG
DRAWN BY: CRM CHECKED BY: CRM

SHEET NAME:

Boundary - Topographic Survey

PROJECT: 18017.00 SHEET 1 OF 1

V-001

11/30/2017 4:08:07 PM PWAYLOR

GENERAL NOTES:

1. THE PURPOSE OF THIS PROJECT IS TO INSTALL A NEW PLAYGROUND, WHICH IS TO INCLUDE A WOODEN BOARDWALK, CONCRETE SIDEWALK, ROCK SCRAMBLE, CONCRETE CURBING, ENGINEERED WOOD FIBER MULCH, AND PLAYGROUND ELEMENTS.

2.

SITE INFORMATION	
TOTAL SITE ACREAGE:	2.78 AC
TOTAL DISTURBED ACREAGE:	16,227 SF (.37 AC)
EXISTING IMPERVIOUS SURFACE:	8,071 SF (.19 AC)
PROPOSED IMPERVIOUS SURFACE:	422 SF (.01 AC)
TOTAL IMPERVIOUS SURFACE:	8,493 SF (.20 AC)

*IMPERVIOUS FOR FUTURE PHASES = 546 SF

3. NO PORTION OF THE PROPERTY IS LOCATED WITHIN ZONE AE PER FEMA FIRM MAP 13057C0332E UPDATED JUNE 7, 2019 FOR CHEROKEE COUNTY, GEORGIA. FLOOD ZONE AE IS DEFINED AS SPECIAL FLOOD AREA HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOR WITH BASE FLOOD ELEVATIONS DETERMINED, THE PROJECT SITE WITH PROPOSED IMPROVEMENTS IS OUTSIDE FLOOD ZONE AE.

4. THE SITE IS ZONED DT-CBD (CENTRAL BUSINESS DISTRICT)

5. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CITY OF WOODSTOCK STANDARDS AND SPECIFICATIONS AND ALL CONSTRUCTION METHODS SHALL ADHERE TO O.S.H.A. REGULATIONS.

6. CONTRACTOR SHALL VERIFY EXISTING SITE CONDITIONS AND NOTIFY PROJECT LANDSCAPE ARCHITECT AND THE OWNER OF ANY DISCREPANCIES IMMEDIATELY.

7. PROPOSED CONTOURS AND SPOT ELEVATIONS REPRESENT FINAL GRADE ELEVATIONS. PROPOSED GRADE ELEVATIONS SHOWN WITHIN PAVED AREA REPRESENT TOP OF PAVEMENT ELEVATIONS. CONTRACTOR SHALL ALLOW FOR PAVEMENT THICKNESS, TOPSOIL, BASE COURSE, SLABS, ETC. WHEN GRADING TO SUBGRADE ELEVATIONS.

8. THE LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO BEGINNING CONSTRUCTION. IF UNCHARTED UTILITIES ARE ENCOUNTERED DURING EXCAVATION OPERATIONS, THE CONTRACTOR SHALL NOTIFY THE PROJECT LANDSCAPE ARCHITECT AND THE OWNER IMMEDIATELY FOR INSTRUCTIONS. ANY DAMAGE OR INTERRUPTION OF EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED PROMPTLY AT THE CONTRACTOR'S EXPENSE.

9. NAME AND ADDRESS OF OWNER:
   MICHAEL HUFFSTETLER, DIRECTOR
   CITY OF WOODSTOCK
   PARKS AND RECREATION DEPARTMENT
   108 ARNOLD MILL ROAD, SUITE C
   WOODSTOCK, GA 30189
   770-592-6000 X.1953

10. NAME AND ADDRESS OF PROJECT LANDSCAPE ARCHITECT/ENGINEER:
    GREENBERGFARROW
    1430 WEST PEACTHREE ST SUITE #200
    ATLANTA, GEORGIA 30309
    CONTACT: PATRICK WAYLOR
    (404) 601 4000

11. PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY, THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH STAKES, RIBBONS, OR OTHER APPROPRIATE MEANS. THE LOCATION AND EXTENT OF ALL AUTHORIZED DISTURBANCE SHALL BE DEMARCATED FOR THE DURATION OF THE CONSTRUCTION ACTIVITY. NO DISTURBANCE SHALL OCCUR OUTSIDE THE LIMITS INDICATED ON THE DRAWINGS WITHOUT WRITTEN APPROVAL FROM THE PROJECT LANDSCAPE ARCHITECT AND THE OWNER.

12. THROUGHOUT CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN NECESSARY BARRICADES, SUFFICIENT LIGHTS, SIGNS AND OTHER TRAFFIC CONTROL METHODS AS NECESSARY FOR THE PROTECTION AND SAFETY OF THE PUBLIC.

13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LAYOUT OF ALL CONSTRUCTION ELEMENTS, WITH SOME FIELD ADJUSTMENTS AS NECESSARY BY THE PROJECT LANDSCAPE ARCHITECT AND THE OWNER. IN ADDITION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL SITE AMENITY CONSTRUCTION COMPLIES WITH ADA HANDICAPPED ACCESSIBILITY REQUIREMENTS, PARTICULARLY WITH RESPECT TO CROSS-SLOPES AND GRADIENTS.

14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY AND PERMANENT GROUNDWATER CONTROL DURING CONSTRUCTION, AS WELL AS PROVISIONS FOR CONTROLLING SURFACE WATER RUN-OFF, IN ORDER TO PREVENT PONDING IN OPEN EXCAVATIONS AND POTENTIAL UNDERMINING OF PERMANENT CONSTRUCTION FEATURES.

15. EARTHWORK OPERATIONS AND SOIL COMPACTION SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND DRAWINGS. CONSTRUCTION ACTIVITIES SHALL BE MONITORED BY AN OWNER PROVIDED GEOTECHNICAL ENGINEER TO VERIFY THAT EARTHWORK AND OTHER OPERATIONS CONFORM WITH THE CONTRACT DOCUMENTS.

16. THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT. STAKING AND LAYOUT MUST BE PERFORMED BY A GEORGIA REGISTERED SURVEYOR.

17. DEMOLITION DEBRIS SHALL BECOME PROPERTY OF THE CONTRACTOR AND WASTE SOILS, VEGETATION, AND OTHER DELETERIOUS MATERIALS SHALL BE HAULED OFF-SITE AND BE DISPOSED OF AT AN APPROVED LOCATION IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS. BURNING WILL NOT BE ALLOWED ON THE PROJECT SITE UNLESS APPROVED IN WRITING BY THE CITY OF WOODSTOCK.

18. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL COMPLY WITH PROJECT SPECIFICATIONS, ALONG WITH APPLICABLE CITY OF WOODSTOCK AND GEORGIA DEPARTMENT OF TRANSPORTATION REQUIREMENTS AND STANDARDS.

19. ALL TREE SAVE AREAS SHALL BE CLEARLY IDENTIFIED WITH FENCING AND TREE SAVE TAPE PRIOR TO COMMENCEMENT OF ANY LAND DISTURBANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING EARTHWORK OPERATIONS SO THAT NO DAMAGE TO EXISTING TREES AND ROOT SYSTEMS OCCURS. TREE PROTECTION MEASURES SHALL BE COORDINATED WITH THE PROJECT LANDSCAPE ARCHITECT AND THE OWNER.

22. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. ANY OFF-SITE AREAS DISTURBED OR DAMAGED SHALL BE RETURNED TO A CONDITION EQUAL TO OR BETTER THAN THE EXISTING CONDITION AT NO ADDITIONAL COST TO THE OWNER.

23. THE DESIGNS REPRESENTED IN THESE PLANS ARE IN ACCORDANCE WITH ESTABLISHED PRACTICES OF LANDSCAPE ARCHITECTURE AND CIVIL ENGINEERING FOR THE DESIGN FUNCTIONS AND USES INTENDED BY THE OWNER AT THIS TIME. HOWEVER, THE PROJECT LANDSCAPE ARCHITECT NOR ITS PERSONNEL CAN OR DO WARRANT THESE DESIGNS OR PLANS AS CONSTRUCTED EXCEPT IN THE SPECIFIC CASES WHERE THE PROJECT LANDSCAPE ARCHITECT INSPECTS THE PHYSICAL CONSTRUCTION ON A CONTINUOUS BASIS AT THE SITE.

24. IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. ANY CONSTRUCTION OBSERVATION BY THE PROJECT LANDSCAPE ARCHITECT AND THE OWNER OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, IN, ON OR NEAR THE CONSTRUCTION SITE.

25. THE CONTRACTOR SHALL PROVIDE THE PROJECT LANDSCAPE ARCHITECT AND THE OWNER OF RECORD WITH THE DATE WHEN THE CONSTRUCTION IS TO BEGIN.

26. ANY DEVELOPMENT, EXCAVATION, CONSTRUCTION, OR FILLING IN A U.S. ARMY CORPS OF ENGINEERS DESIGNATED WETLAND IS SUBJECT TO LOCAL, STATE AND FEDERAL APPROVALS. THE CONTRACTOR SHALL COMPLY WITH ALL PERMIT REQUIREMENTS AND/OR RESTRICTIONS AND ANY VIOLATION WILL BE SUBJECT TO FEDERAL PENALTY. THE CONTRACTOR SHALL HOLD THE OWNER/, PROJECT LANDSCAPE ARCHITECT AND THE LOCAL GOVERNING AGENCIES HARMLESS AGAINST SUCH VIOLATION.

27. ADA ACCESSIBLE AREAS AND ROUTES INDICATED ON THIS SHEET HAVE BEEN DESIGNED TO MEET 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN. CONTRACTOR SHALL PAY CAREFUL ATTENTION TO ENSURE THAT THESE AREAS ARE CONSTRUCTED TO MEET THE SAME STANDARDS.

ADA STANDARDS FOR ACCESSIBLE DESIGN:
- 27.1. ALL ACCESSIBLE SPACES ARE TO HAVE 98" VERTICAL CLEARANCE.
- 27.2. CROSS SLOPES OF ACCESSIBLE ROUTES, ACCESSIBLE PARKING SPACES, PASSENGER LOADING ZONES AND OTHER ACCESSIBLE FEATURES SHALL BE NO MORE THAN 2% WITH CHANGES IN LEVEL 1/2" WITH A BEVEL, OR LESS.
- 27.3. MINIMUM HEIGHT AT PASSENGER LOADING ZONES AND DRIVE-THRUS IS 13'-6".
- 27.4. RAMPS SHALL HAVE A SLOPE NO GREATER THAN 1:12. WHERE CURB RAMPS ARE FLARED, FLARES SHALL BE A SLOPE NO GREATER THAN 1:14.
- 27.5. STEEPEST RUNNING SLOPE OF ACCESSIBLE ROUTES NOT TO EXCEED 5%.
- 27.6. OPENINGS IN ANY GRATING ALONG ACCESSIBLE ROUTES SHALL NOT BE MORE THAN 1/2" WIDE.
- 27.7. ALL PEDESTRIAN APPROACHES TO THE PLAYGROUND SHALL BE FREE OF PROTRUDING OBJECTS.

PLAYGROUND NOTES

1. PLAYGROUND EQUIPMENT, SUBSURFACE DRAINAGE AND FIBER ENGINEERED WOOD FIBER (EWF) SHALL BE INSTALLED BY A CERTIFIED RECREATION SPECIALIST (RISC) AND INSPECTED BY A CERTIFIED PLAYGROUND SAFETY INSPECTOR (CPSI).

2. SITE TO BE CLOSED TO PUBLIC THROUGHOUT CONSTRUCTION. CONTRACTOR TO TAKE ALL NECESSARY MEASURES TO SECURE SITE.

3. PLAYGROUND EWF NOTES:

   A. EWF KID-SAFE PLAYGROUND MATERIAL SHALL BE 12" THICK.

   B. CONTRACTOR SHALL SUBMIT EWF SAMPLE TO PROJECT LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.

   C. 4" PERFORATED PVC PIPE INVERT SHALL BE MINIMUM 2'-0" FROM FINISHED GRADE TO TOP OF EWF. PIPE SHALL DRAIN TO OUTFALL AT A MINIMUM OF 1% SLOPE, (TYP.)

EROSION CONTROL NOTES:

1. PRIOR TO ANY OTHER CONSTRUCTION, A STABILIZED CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT EACH ENTRY TO OR EXIT FROM THE SITE.

2. THE CONSTRUCTION EXIT(S) SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ON TO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH STONE, AS CONDITIONS DEMANDS, AND REPAIR AND/OR CLEAN-OUT OF ANY STRUCTURES USED TO TRAP SEDIMENT. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLE ONTO PUBLIC ROADWAY OR INTO STORM DRAIN MUST BE REMOVED.

3. PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY, THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH STAKES, RIBBONS, OR OTHER APPROPRIATE MEANS. THE LOCATION AND EXTENT OF ALL AUTHORIZED LAND DISTURBANCE SHALL OCCUR WITHIN THE APPROVED LIMITS INDICATED ON THE APPROVED PLANS.

4. IMMEDIATELY AFTER THE ESTABLISHMENT OF CONSTRUCTION ENTRANCE/EXIT(S), ALL PERIMETER EROSION CONTROL DEVICES AND STORMWATER MANAGEMENT DEVICES SHALL BE INSTALLED PRIOR TO ANY OTHER CONSTRUCTION.

5. THE CONTRACTOR SHALL FURNISH AND MAINTAIN ALL NECESSARY BARRICADES WHILE ROADWAY FRONTAGE IMPROVEMENTS ARE BEING MADE.

6. THE CONSTRUCTION OF THE SITE WILL INITIATE WITH THE INSTALLATION OF EROSION CONTROL MEASURES SUFFICIENT TO CONTROL SEDIMENT DEPOSITS AND EROSION. ALL SEDIMENT CONTROL WILL BE MAINTAINED UNTIL ALL UPSTREAM GROUND WITHIN THE CONSTRUCTION AREA HAS BEEN COMPLETELY STABILIZED WITH PERMANENT MULCH.

7. FAILURE TO INSTALL, OPERATE OR MAINTAIN ALL EROSION CONTROL MEASURES WILL RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB SITE UNTIL SUCH MEASURES ARE CORRECTED CONSISTENT WITH THE CITY OF WOODSTOCK EROSION CONTROL ORDINANCE.

8. A COPY OF THE APPROVED LAND DISTURBANCE PLAN AND PERMIT SHALL BE PRESENT ON THE SITE WHENEVER LAND DISTURBANCE ACTIVITY IS IN PROGRESS.

9. ALL SEWER EASEMENTS DISTURBED MUST BE DRESSED AND GRASSED/MULCHED TO CONTROL EROSION.

10. IF FULL IMPLEMENTATION OF THE APPROVED PLANS DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE AS NECESSARY.

11. ANY DISTURBED AREA LEFT EXPOSED SHALL BE TEMPORARILY STABILIZED WITH MULCH OR TEMPORARY SEEDING AS SOON AS POSSIBLE AFTER ROUGH GRADING IS COMPLETED BUT WITHIN 14 DAYS AFTER DISTURBANCE. PERMANENT VEGETATION SHALL BE PLANTED IF THE AREA IS TO BE LEFT UNDISTURBED FOR GREATER THAN 6 MONTHS.

12. IF A CONCRETE WORK IS DONE ON SITE, THEN A CONCRETE WASHDOWN BMP SHALL BE PROVIDED OR A NOTE "CONCRETE WASHDOWN IS NOT ALLOWED ON SITE." THE CONCRETE WASHDOWN AREA, IF ALLOWED SHALL BE FOR THE TOOLS, CONCRETE MIXER CHUTES, HOPPERS AND THE REAR OF VEHICLES. WASHOUT OF THE DRUM AT THE CONSTRUCTION SITE IS PROHIBITED.

ENVIRONMENTAL NOTES

1. TREES WITHIN THE LIMITS OF DISTURBANCE HAVE BEEN DESIGNATED FOR PROTECTION WITHIN TREE SAVE AREAS. ANY TREES DESIGNATED FOR PROTECTION THAT ARE REMOVED OR DAMAGED SHALL REQUIRE REPLACEMENT BY THE CONTRACTOR AT NO COST TO THE OWNER. REQUIRED REPLACEMENT SHALL MEET THE SATISFACTION OF THE CITY OF WOODSTOCK AND THE PROJECT LANDSCAPE ARCHITECT. REFER TO TECHNICAL SPECIFICATION 31 00 00 TREE PROTECTION & SELECTIVE TRIMMING FOR ADDITIONAL INFORMATION.

2. CONTRACTOR IS TO MAINTAIN CONSTRUCTION RELATED ACTIVITIES WITHIN THE DESIGNATED LIMITS SHOWN ON THE DRAWINGS.

3. CONSTRUCTION SITE STAGING AND STORAGE SHALL NOT INFRINGE UPON, DAMAGE OR DESTROY ANY TREE SAVE AREAS AND SHALL BE LIMITED TO THE AREA DESIGNATED BY THE LIMIT OF CONSTRUCTION BOUNDARY.

4. EXISTING INVASIVE SPECIES TO BE REMOVED BY CONTRACTOR. CONTRACTOR TO PROVIDE PLAN FOR INVASIVE SPECIES REMOVAL TO CITY ARBORIST FOR REVIEW AND APPROVAL.

Know what's **below.**
Call before you dig.

GreenbergFarrow
1430 W. Peachtree St. NW
Suite 200
Atlanta, GA 30309
t: 404 601 4000 f: 404 601 3970

PROJECT TEAM

ISSUE/REVISION RECORD

DATE	DESCRIPTION
08/22/19	ISSUED FOR BID

PROFESSIONAL SEAL

PROFESSIONAL IN CHARGE
JOHN NOURZAD
PROFESSIONAL ENGINEER
LICENSE NO. 23430

PROJECT MANAGER
PATRICK WAYLOR

QUALITY CONTROL
LIZ COLE

DRAWN BY
THOMAS HARGRETT

PROJECT NAME

ELM STREET PLAYGROUND

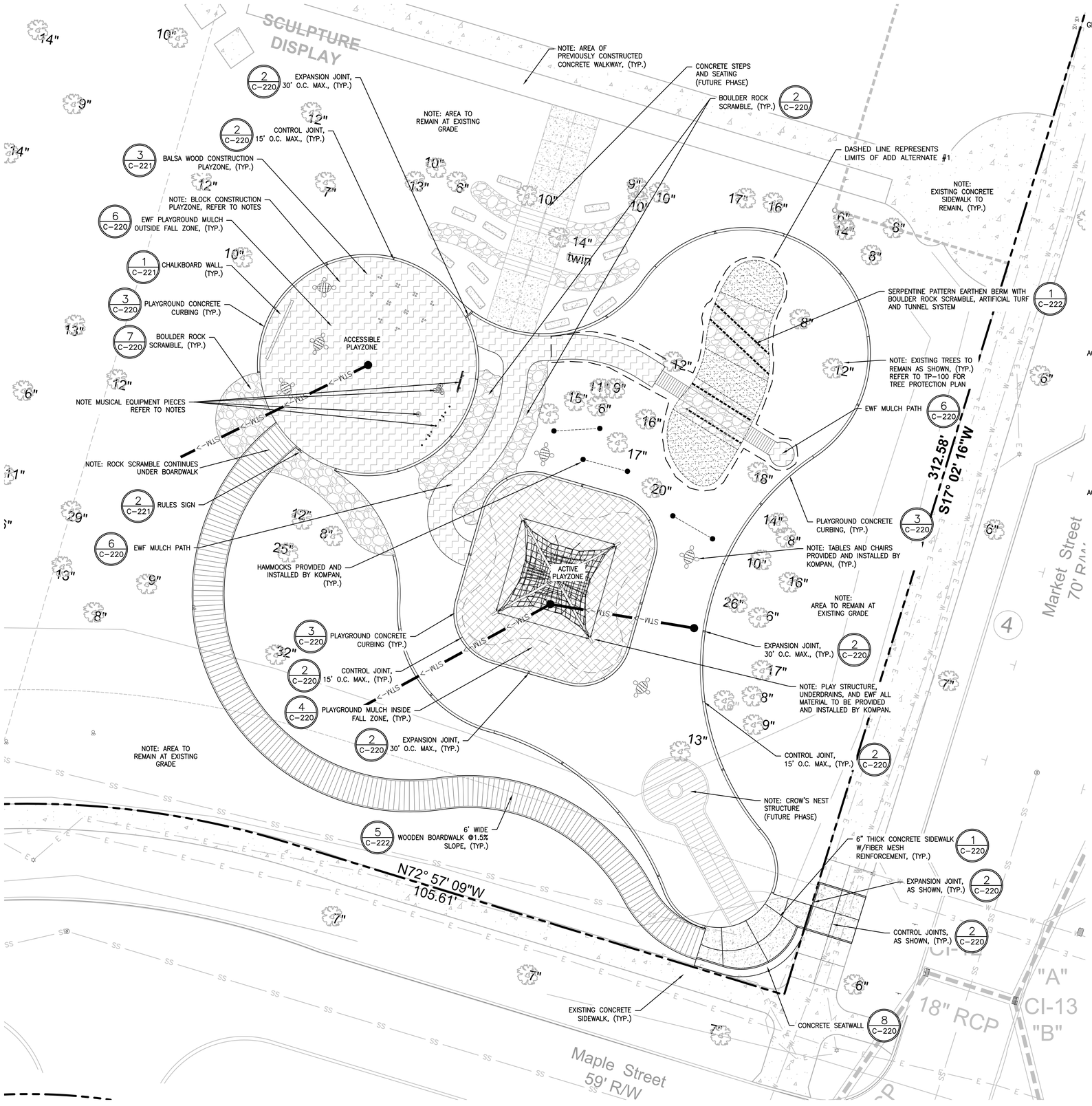
WOODSTOCK GEORGIA

MARKET STREET AND MAPLE STREET
WOODSTOCK, GA 30189
CHEROKEE COUNTY

PROJECT NUMBER
20180300.0

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
C-001



PLAYGROUND NOTES

GENERAL NOTES:

1. PLAYGROUND EQUIPMENT, SUBSURFACE DRAINAGE AND ENGINEERED WOOD FIBER (EWF) SHALL BE INSTALLED BY A CERTIFIED RECREATION SPECIALIST (RISC) AND INSPECTED BY A CERTIFIED PLAYGROUND SAFETY INSPECTOR (CPSI).
2. PLAYGROUND MULCH:
   A. EWF KID-SAFE PLAYGROUND MULCH EWF BE 12" THICK
   B. CONTRACTOR SHALL SUBMIT EWF SAMPLE TO PROJECT LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
   C. 4" PERFORATED PVC PIPE INVERT SHALL BE MINIMUM 2'-0" FROM FINISHED GRADE TO TOP OF EWF. PIPE SHALL DRAIN TO OUTFALL AT A MINIMUM OF 1% SLOPE, (TYP.)
3. HAMMOCKS, BENCHES, TABLES & CHAIRS:
   A. HAMMOCKS, BENCHES, TABLES & CHAIRS TO BE PROVIDED AND INSTALLED BY KOMPAN AND PAID FOR BY OWNER UNDER SEPARATE CONTRACT.
   B. CONTRACTOR SHALL COORDINATE INSTALLATION WITH KOMPAN.
4. CONTRACTOR SHALL HAVE ALL PLAY AREAS INSPECTED BY A CERTIFIED PLAYGROUND SAFETY INSPECTOR (CPSI) PRIOR TO FINAL ACCEPTANCE.
   OUTFALL AT A MINIMUM OF 1% SLOPE, (TYP.)

ACTIVE PLAYZONE NOTES:

1. PLAY EQUIPMENT, UNDERDRAINS AND EWF TO BE PROVIDED AND INSTALLED BY KOMPAN AND PAID FOR BY OWNER UNDER SEPARATE CONTRACT.
2. CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF PLAYGROUND CURBING, DRAIN TRUNK LINE AND PREPARATION OF BASE GRADE.
3. CONTRACTOR SHALL COORDINATE INSTALLATION WITH KOMPAN.
4. CONTRACTOR SHALL VERIFY DRAIN INLET, TRUNKLINE DEPTH AND PLACEMENT WITH KOMPAN PRIOR TO INSTALLATION.

ACCESSIBLE PLAYZONE NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING THE PLAY EQUIPMENT, DRAINAGE TRUNK LINE, CATCHBASIN, UNDERDRAINS, EWF AND CURBING IDENTIFIED IN THIS PLAY ZONE.
2. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR DRAINAGE TRUNK LINE, CATCHBASIN AND UNDERDRAINS TO PROJECT LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
3. THE LOCATION OF PLAY EQUIPMENT IS SCHEMATIC. FINAL LOCATIONS AND MOUNTING HEIGHTS SHALL BE FIELD REVIEWED AND APPROVED BY THE PROJECT LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
4. PREFABRICATED PLAY EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. MOUNTING SHALL BE "IN-GROUND".
5. CONTRACTOR SHALL PROVIDE AND INSTALL THE FOLLOWING EQUIPMENT IN THE ACCESSIBLE PLAY ZONE.
   A. MUSICAL EQUIPMENT AS MANUFACTURED BY FREENOTES HARMONY PARK OR APPROVED EQUAL.
      I. CONTRABASS CHIMES QTY. 1
      II. LILYPAD CYMBALS QTY. 1
      III. PAGODA BELLS QTY. 1
      IV. SWIRL QTY. 1
   B. CONSTRUCTION BLOCKS 105 PIECE 'BIG BLUE BLOCKS' SET AS MANUFACTURED BY 'IMAGINATION PLAYGROUND OR APPROVED EQUAL.
      INCLUDING:
      I. PRIMARY BLOCKS QTY. 8
      II. BLOCKS W/ HOLES QTY. 10
      III. LONG BLOCKS QTY. 8
      IV. SQUEAKY HINGES QTY. 4
      V. CHANNEL STRAIGHTS QTY. 4
      VI. CHUTES QTY. 2
      VII. PLUGS QTY. 8
      VIII. NICKELS QTY. 5
      IX. PLAYBALLS QTY. 15
      X. CHANNEL BENDS QTY. 4
      XI. SMALL PLUGS QTY. 5
      XII. ARCH CHUTES QTY. 2
      XIII. SQUARE BLOCKS QTY. 10
      XIV. LIL' CHEESE QTY. 5
      XV. CLOVER GEARS QTY. 2
      XVI. PLUS GEARS QTY. 2
      XV. LONG NOODLES QTY. 15
   C. CUSTOM BALSA CONSTRUCTION AREA – REFER TO DETAIL 3/SHEET C-221.
   D. CUSTOM CHALKBOARD WALL – REFER TO DETAIL 1/SHEET C-221.
   E. TABLES AND CHAIRS SHOWN IN THIS PLAY AREA PROVIDED AND INSTALLED BY KOMPAN.

PLAYGROUND LEGEND

- PROPOSED CONCRETE PLAZA
- EWF PLAY ZONE (INSIDE FALL ZONE)
- EWF PLAY AREA (OUTSIDE FALL ZONE)
- BOULDER ROCK SCRAMBLE
- 6' WIDE BOARDWALK
- ARTIFICIAL TURF
- CONCRETE PLAYGROUND CURBING
- MUSIC EQUIPMENT
- CHALKBOARD WALL
- BALSA WOOD CONSTRUCTION PLAYZONE
- HAMMOCKS
- TABLES AND CHAIRS
- CATCHBASIN
- STM-> DRAIN TRUNK LINE

SYMBOL KEY

- BOLLARD
- CABLE TV PEDESTAL
- CALCULATED POINT
- CATCH BASIN (SINGLE WING)
- CATCH BASIN (DOUBLE WING)
- CENTRAL ANGLE (DELTA)
- CONIFEROUS TREE
- CURB INLET
- DECIDUOUS TREE
- DROP INLET
- ELECTRICAL MANHOLE
- ELECTRIC METER
- ELECTRICAL TRANSFORMER
- FIRE HYDRANT
- GAS VALVE
- GAS METER
- GAS PEDESTAL
- GUY ANCHOR WIRE
- HANDICAP
- HEADWALL
- JUNCTION BOX
- LAND LOT NUMBER
- LIGHT POLE
- LOT NUMBER
- MAIL BOX
- CAPPED RE-BAR SET MSC
- MONUMENT FOUND
- CONCRETE MONUMENT FOUND
- PULL BOX
- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- SHRUB OR BUSH
- SIGN (ONE POLE)
- SIGN (TWO POLES)
- SITE BENCHMARK
- 0041 STREET ADDRESS
- TELEPHONE BOX
- TELEPHONE MANHOLE
- TRAFFIC POLE
- UTILITY POLE
- WATER METER
- WATER VALVE
- YARD/GRATE INLET

LINETYPES

- CENTERLINE
- EASEMENT / SETBACK
- FENCE - BARBED
- FENCE - CHAIN LINK
- FENCE - WOOD
- FLOOD ZONE BOUNDARY
- LAND HOOK
- LAND LOT LINE
- NOT TO SCALE
- OVERHEAD UTILITY
- E - ELECTRIC
- T - TELEPHONE
- C - CABLE
- SUBSURFACE UTILITY
- C - C - CABLE
- E - E - ELECTRIC
- G - G - GAS
- S - S - SANITARY
- T - T - TELEPHONE
- W - W - WATER
- POLITICAL BOUNDARY
- RIGHT-OF-WAY
- STORM PIPES
- TREE / BRUSH LINE
- NATURAL DRAINAGE SWALE

Know what's below. Call before you dig. 811

0 5 10 20 40
SCALE: 1"= 10'

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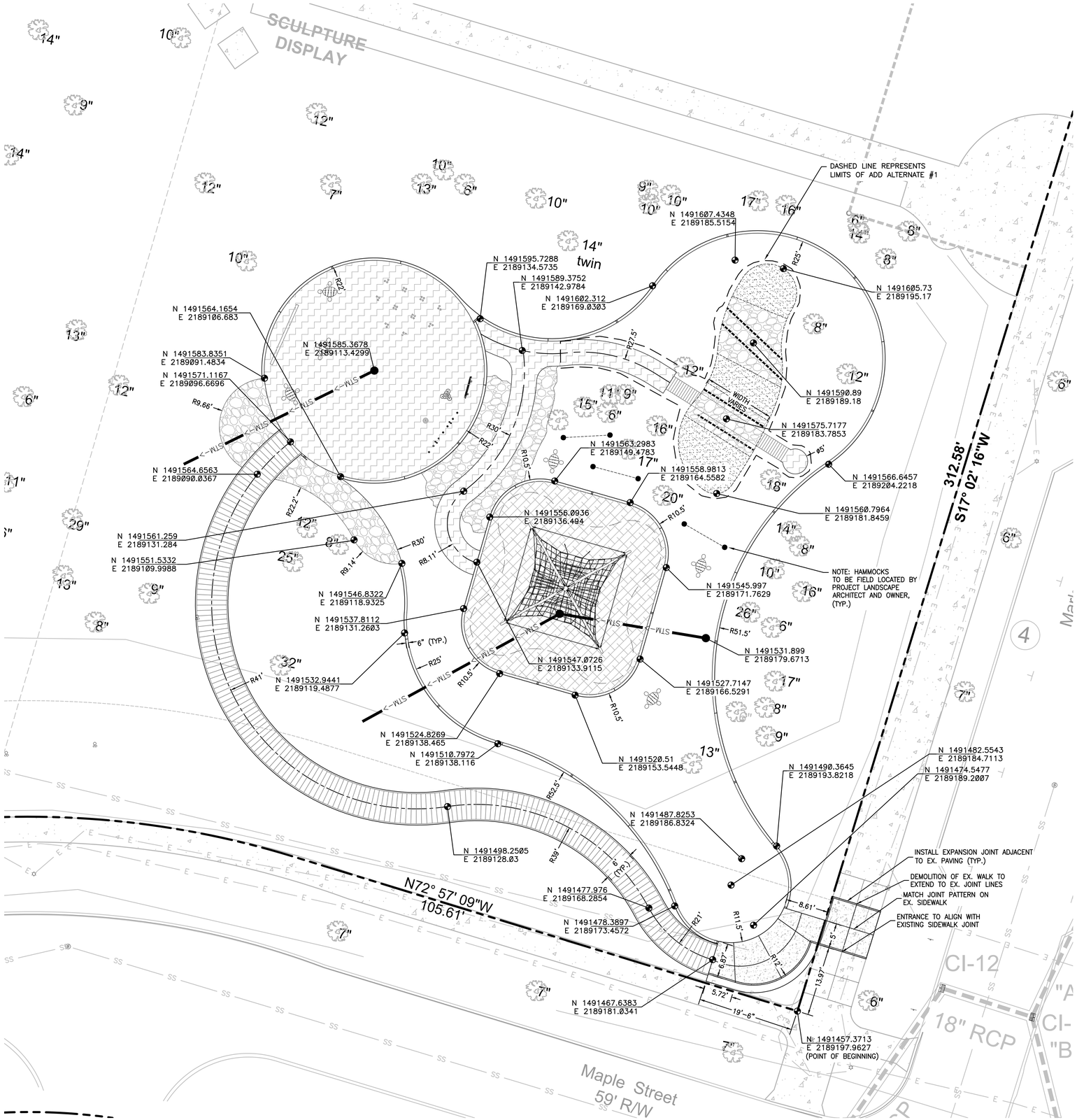
SHEET TITLE

SITE PLAN

SHEET NUMBER

C-200



SITE NOTES:

1. REFER TO C-001 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. ALL DIMENSIONS ARE TO FACE OF CURB, EDGE OF PAVEMENT, CENTERLINE OF BOARDWALK, CENTER OF PLAY AREA, ETC.

GENERAL NOTES:

1. PROJECT LANDSCAPE ARCHITECT AND OWNER TO APPROVE STAKING AND LAYOUT PRIOR TO COMMENCING EARTHWORK ACTIVITIES.
2. SET 3' TALL STAKE WITH ORANGE FLAG AT EACH NOTHING & EASTING COORDINATE AS SHOWN ON PLANS SHEET C-201.
3. WRITE STAKE ID NO. ON EACH STAKE. CENTERLINE IS STAKED.
4. CONTRACTOR SHALL STAKE THE LOCATION OF ALL PROJECT ELEMENTS. AFTER STAKES ARE SET, PROJECT LANDSCAPE ARCHITECT AND OWNER MUST BE NOTIFIED 24 HOURS IN ADVANCE TO INSPECT THE STAKING LOCATION. THE CONTRACTOR MUST WALK THE SITE WITH THE CONSTRUCTION SUPERINTENDENT, SURVEYOR, KOMPAN REPRESENTATIVE, PROJECT LANDSCAPE ARCHITECT AND OWNER FOR FINAL STAKING APPROVAL AND MAKE ANY NECESSARY ADJUSTMENTS AS NEEDED PRIOR TO COMMENCING WITH EARTHWORK ACTIVITIES.
5. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL REVIEW ALL CITY OF WOODSTOCK AND ADA REQUIREMENTS.
6. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE CONSTRUCTION SCHEDULE WITH THE CITY OF WOODSTOCK, THE PROJECT LANDSCAPE ARCHITECT AND KOMPAN REPRESENTATIVE.
7. REFER TO GENERAL NOTES LOCATED ON SHEET C-001.

PLAYGROUND LEGEND

- PROPOSED CONCRETE PLAZA
- EWF PLAY ZONE (INSIDE FALL ZONE)
- EWF PLAY AREA (OUTSIDE FALL ZONE)
- BOULDER ROCK SCRAMBLE
- 6' WIDE BOARDWALK
- ARTIFICIAL TURF
- CONCRETE PLAYGROUND CURBING
- MUSIC EQUIPMENT
- CHALKBOARD WALL
- BALSA WOOD CONSTRUCTION PLAYZONE
- HAMMOCKS
- TABLES AND CHAIRS
- CATCHBASIN
- STM--> DRAIN TRUNK LINE

SYMBOL KEY

- BOLLARD
- CABLE TV PEDESTAL
- CALCULATED POINT
- CATCH BASIN (SINGLE WING)
- CATCH BASIN (DOUBLE WING)
- CENTRAL ANGLE (DELTA)
- CONIFEROUS TREE
- CURB INLET
- DECIDUOUS TREE
- DROP INLET
- ELECTRICAL MANHOLE
- ELECTRIC METER
- ELECTRICAL TRANSFORMER
- FIRE HYDRANT
- GAS VALVE
- GAS METER
- GAS PEDESTAL
- GUY ANCHOR WIRE
- HANDICAP
- HEADWALL
- JUNCTION BOX
- LAND LOT NUMBER
- LIGHT POLE
- LOT NUMBER
- MAIL BOX
- CAPPED RE-BAR SET MSC
- MONUMENT FOUND
- CONCRETE MONUMENT FOUND
- PULL BOX
- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- SHRUB OR BUSH
- SIGN (ONE POLE)
- SIGN (TWO POLES)
- SITE BENCHMARK
- STREET ADDRESS
- TELEPHONE BOX
- TELEPHONE MANHOLE
- TRAFFIC POLE
- UTILITY POLE
- WATER METER
- WATER VALVE
- YARD/GRATE INLET

LINETYPES

- CENTERLINE
- EASEMENT / SETBACK
- FENCE - BARBED
- FENCE - CHAIN LINK
- FENCE - WOOD
- FLOOD ZONE BOUNDARY
- LAND HOOK
- LAND LOT LINE
- NOT TO SCALE
- OVERHEAD UTILITY
- E - ELECTRIC
- T - TELEPHONE
- C - CABLE
- SUBSURFACE UTILITY
- C - CABLE
- E - ELECTRIC
- G - GAS
- S - SANITARY
- T - TELEPHONE
- W - WATER
- POLITICAL BOUNDARY
- RIGHT-OF-WAY
- STORM PIPES
- TREE / BRUSH LINE
- NATURAL DRAINAGE SWALE

Know what's **below.**
Call before you dig.

0 5 10 20 40
SCALE: 1"= 10'

GA WEST ZONE 1401

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1430 W. Peachtree St. NW
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PROJECT TEAM

ISSUE/REVISION RECORD

DATE	DESCRIPTION
08/22/19	ISSUED FOR BID

PROFESSIONAL SEAL

PROFESSIONAL IN CHARGE
JOHN NOURZAD
PROFESSIONAL ENGINEER
LICENSE NO. 23430
PROJECT MANAGER
PATRICK WAYLOR
QUALITY CONTROL
LIZ COLE
DRAWN BY
THOMAS HARGRETT

PROJECT NAME

ELM STREET PLAYGROUND

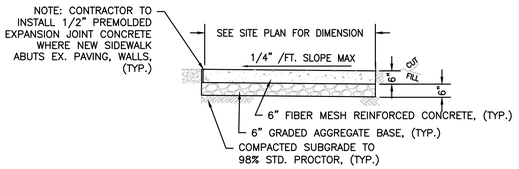
WOODSTOCK GEORGIA

MARKET STREET AND MAPLE STREET
WOODSTOCK, GA 30189
CHEROKEE COUNTY

PROJECT NUMBER
20180300.0

SHEET TITLE
SITE STAKING PLAN

SHEET NUMBER
C-201

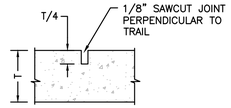


NOTES:
1. CONCRETE – 4,000 PSI @ 28 DAYS.
2. INSTALL CONTROL JOINTS AT INTERVALS SHOWN ON SITE PLAN
3. INSTALL ½" PREMOLDED EXPANSION JOINT AT INTERVALS SHOWN ON SITE PLAN.
4. MEDIUM BROOM FINISH PERPENDICULAR TO DIRECTION OF TRAVEL, (TYP.).
5. JOINT PLACEMENT TO BE REVIEWED AND APPROVED IN THE FIELD BY PROJECT LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION. CONTRACTOR TO PROVIDE 24 HOUR NOTICE PRIOR TO JOINT PLACEMENT REVIEW.

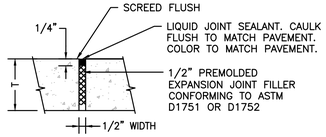
1 CONCRETE SIDEWALK

SCALE: N.T.S.

JOINT NOTES: JOINT PLACEMENT TO BE REVIEWED AND APPROVED IN THE FIELD BY PROJECT LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION. CONTRACTOR TO PROVIDE 24 HOUR NOTICE PRIOR TO JOINT PLACEMENT REVIEW.



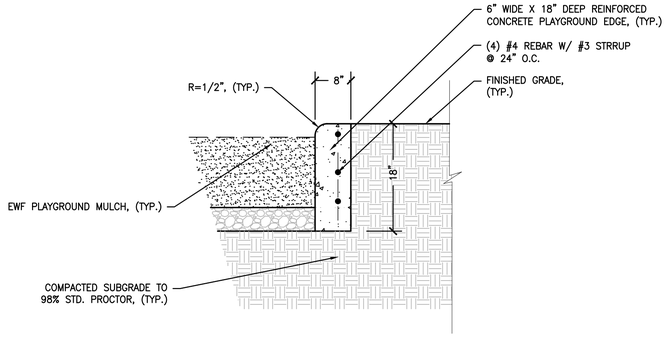
CONTROL JOINT



EXPANSION JOINT

2 CONCRETE JOINTS

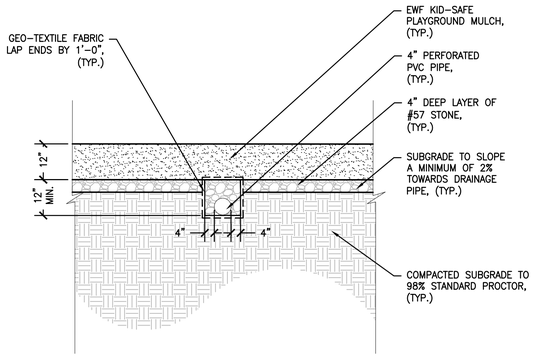
SCALE: N.T.S.



NOTES:
1. PROVIDE EXPANSION JOINTS AT 30' O.C. MIN. AND CONTROL JOINTS AT 15' O.C. MIN.
2. JOINT PLACEMENT TO BE REVIEWED AND APPROVED IN THE FIELD BY PROJECT LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION. CONTRACTOR TO PROVIDE 24 HOUR NOTICE PRIOR TO JOINT PLACEMENT REVIEW.

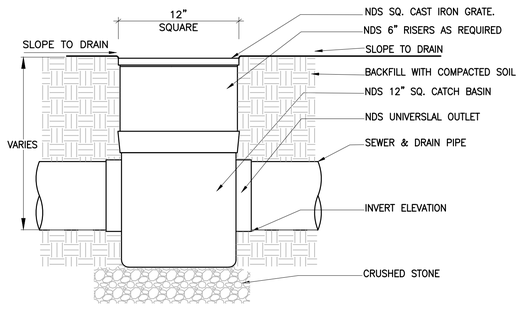
3 PLAYGROUND CONCRETE CURBING DETAIL

SCALE: N.T.S.



PLAYGROUND EWF NOTES:

1. EWF KID-SAFE PLAYGROUND MULCH SHALL BE 12" THICK
2. CONTRACTOR SHALL SUBMIT EWF SAMPLE TO PROJECT LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
3. 4" PERFORATED PVC PIPE INVERT SHALL BE MINIMUM 2'-0" FROM FINISHED GRADE TO TOP OF EWF. PIPE SHALL DRAIN TO OUTFALL AT A MINIMUM OF 1% SLOPE, (TYP.)



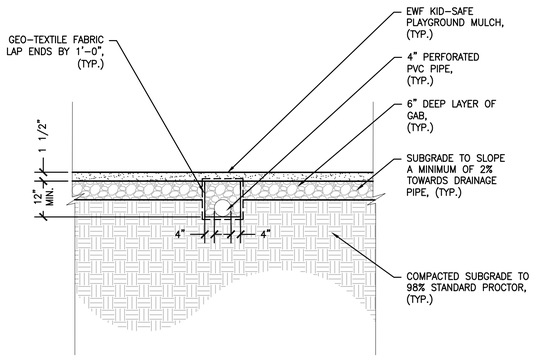
NOTE:
- RIM ELEVATION OF BASIN SHALL BE AT BOTTOM OF MULCH ELEVATION IN PLAY AREAS.
- WHEN DRAIN IS LOCATED UNDER PLAY AREA MULCH, SECURE SOIL SEPARATOR FABRIC BETWEEN GRADE AND DRAIN.

4 EWF PLAYGROUND MULCH (INSIDE FALL ZONE)

SCALE: N.T.S.

5 CATCHBASIN DETAIL

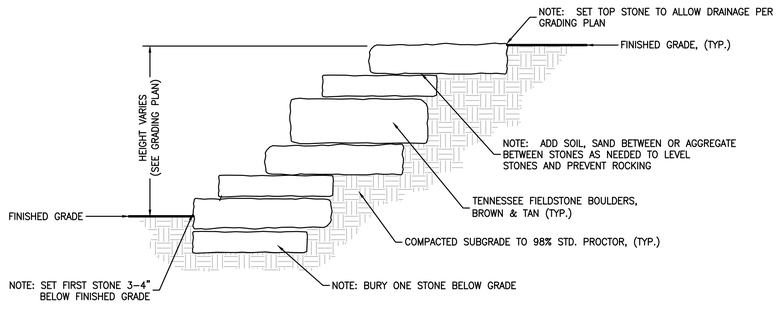
SCALE: N.T.S.



NOTE:
1. EWF HEIGHT INDICATED IS TO BE OBTAINED POST-COMPACTION. COMPACT WET EWF WITH TREADED EQUIPMENT, VIBRATORY PLATE COMPACTOR AND/OR HAND TAMPER AS NEEDED TO FULLY COMPACT.
2. GAB BASE TO BE SLOPED TO DRAIN (SEE GRADING PLAN).

6 EWF PLAYGROUND MULCH (OUTSIDE FALL ZONE)

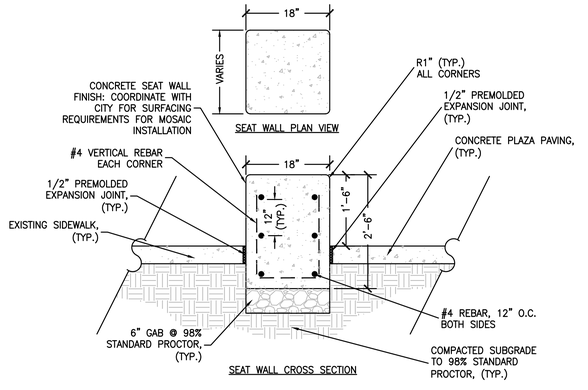
SCALE: N.T.S.



NOTE:
1. SUBMIT PHOTOGRAPHS OF SAMPLE STONES FOR APPROVAL PRIOR TO INSTALLATION.
2. STONES TO VARY IN SIZE BETWEEN 6"-12" HEIGHT AND WITH EACH LEVEL SET BACK 6"-12" FROM STONE BELOW.
3. REMOVE ALL LOOSE PIECES OF STONE PRIOR UPON COMPLETION.
4. FILL ALL EXPOSED SOIL AND GAPS WITH EWF MULCH TO MATCH PLAY AREAS.

7 BOULDER ROCK SCRAMBLE DETAIL

SCALE: N.T.S.



NOTE:
1. CONCRETE SEAT WALL SHALL BE CAST-IN-PLACE, NON-COLORED GRAY CONCRETE.
2. KEEP ALL REINFORCING MATERIAL 3" CLEAR FROM EDGES OF CONCRETE.
3. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS/LOCATIONS WITH PROJECT LANDSCAPE ARCHITECT AND OWNER.

8 CONCRETE SEAT WALL

SCALE: N.T.S.

811 Know what's below. Call before you dig.

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1430 W. Peachtree St. NW
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Atlanta, GA 30309
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PROJECT TEAM

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PROFESSIONAL IN CHARGE
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PROFESSIONAL ENGINEER
LICENSE NO. 23430

PROJECT MANAGER
PATRICK WAYLOR

QUALITY CONTROL
LIZ COLE

DRAWN BY
THOMAS HARGRETT

PROJECT NAME

ELM STREET PLAYGROUND

WOODSTOCK GEORGIA

MARKET STREET AND MAPLE STREET
WOODSTOCK, GA 30189
CHEROKEE COUNTY

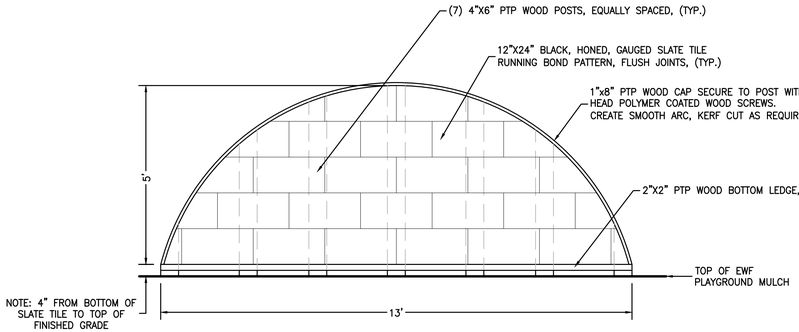
PROJECT NUMBER
20180300.0

SHEET TITLE

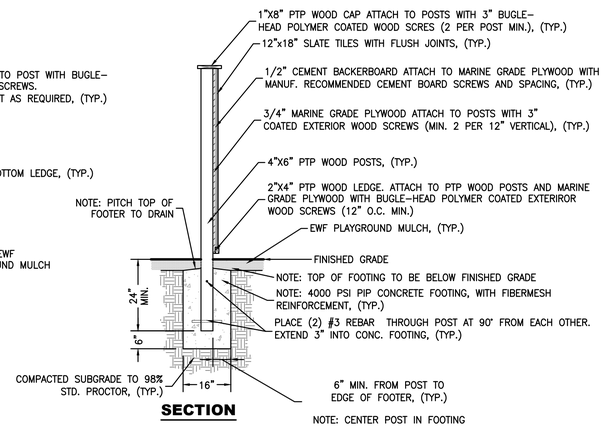
SITE DETAILS

SHEET NUMBER

C-220



ELEVATION

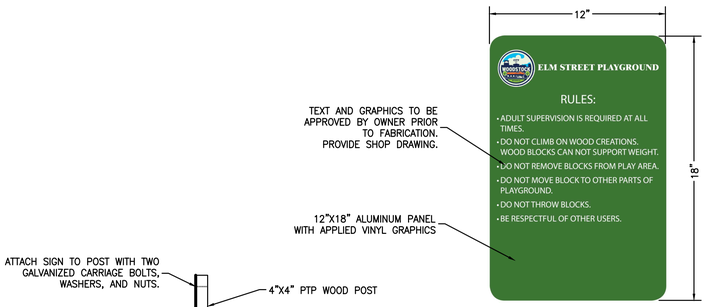


SECTION

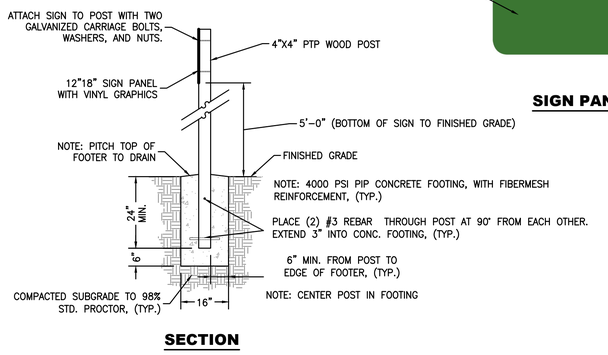
NOTE:
1. ALL DIMENSIONAL LUMBER TO BE PRESSURE TREATED SOUTHERN YELLOW PINE.
2. ALL EXPOSED WOOD TO BE TREATED WITH BENJAMIN MOORE 'BRIGHTEN BRIGHTENER & NEUTRALIZER (317)' THEN STAIN WITH BENJAMIN MOORE 'ARBORCOAT WATERBORNE EXTERIOR STAIN SOLID COLOR 640'. COLOR 'BARN RED'. APPLY PER MANUFACTURER'S SPECIFICATIONS. SUBMIT SAMPLE OF STAINED WOOD FOR APPROVAL PRIOR TO INSTALLATION.
3. SUBMIT SAMPLE OF SLATE TILE FOR APPROVAL PRIOR TO INSTALLATION.
4. APPLY CUSTOM BUILDING PRODUCTS 'REDGARD' TO CEMENT BACKBOARD PRIOR TO TILE INSTALLTION PER MANUFACTURER'S SPECIFICATIONS.
5. USE CUSTOM BUILDING PRODUCTS 'MEGALITE RS RAPID SETTING THIN SET MORTAR' TO ADHERE TILE TO CEMENT BOARD. INSTALL PER MANUFACTURER'S SPECIFICATIONS.

1 CHALKBOARD WALL

SCALE: NTS



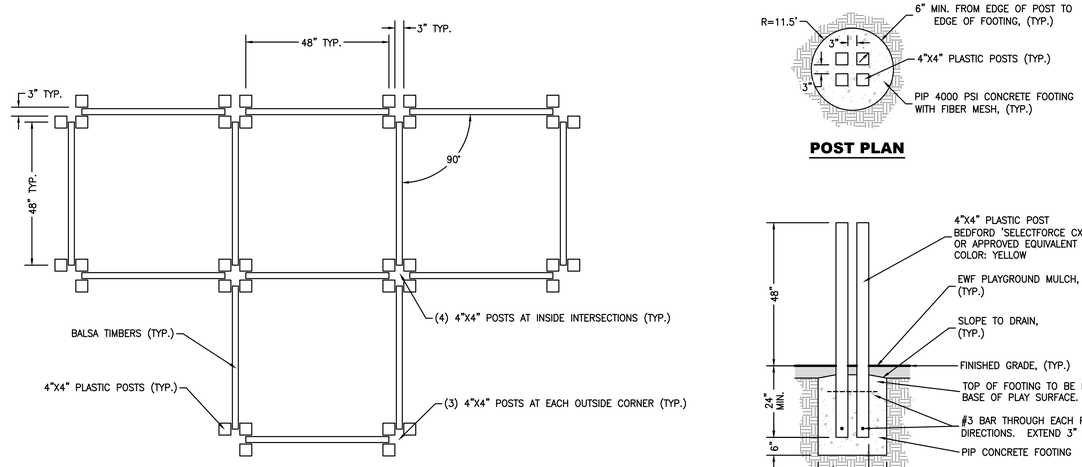
SIGN PANEL



SECTION

2 RULES SIGN

SCALE: N.T.S.



PLAN

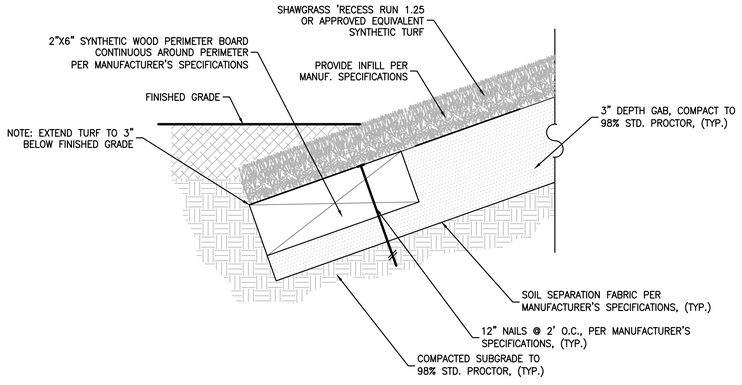
POST PLAN

POST SECTION

NOTE:
1. LAYOUT OF POSTS TO BE REVIEWED IN FIELD WITH PROJECT LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION. PROVIDE 48 HRS. NOTICE.
2. CONTRACTOR TO PROVIDE BALSA WOOD LUMBER IN THE FOLLOWING QUANTITIES: (108) 2"X4"X48" & (108) 2"X4"X15".
3. BALSA WOOD TO BE TREATED WITH BENJAMIN MOORE 'BRIGHTEN BRIGHTENER & NEUTRALIZER (317)' THEN STAIN WITH BENJAMIN MOORE 'ARBORCOAT WATERBORNE EXTERIOR STAIN SOLID COLOR 640'. COLOR 'SALAMANDER'. APPLY PER MANUFACTURER'S SPECIFICATIONS. SUBMIT SAMPLE OF STAINED WOOD FOR APPROVAL PRIOR TO INSTALLATION.

3 BALSA CONSTRUCTION AREA

SCALE: NTS



4 SYTHETIC TURF AT EARTHEN MOUND

SCALE: N.T.S.

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GreenbergFarrow
1430 W. Peachtree St. NW
Suite 200
Atlanta, GA 30309
t: 404 601 4000 f: 404 601 3970

PROJECT TEAM

ISSUE/REVISION RECORD

DATE	DESCRIPTION
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PROFESSIONAL SEAL

PROFESSIONAL IN CHARGE
JOHN NOURZAD
PROFESSIONAL ENGINEER
LICENSE NO. 23430
PROJECT MANAGER
PATRICK WAYLOR
QUALITY CONTROL
LIZ COLE
DRAWN BY
THOMAS HARGRETT

PROJECT NAME

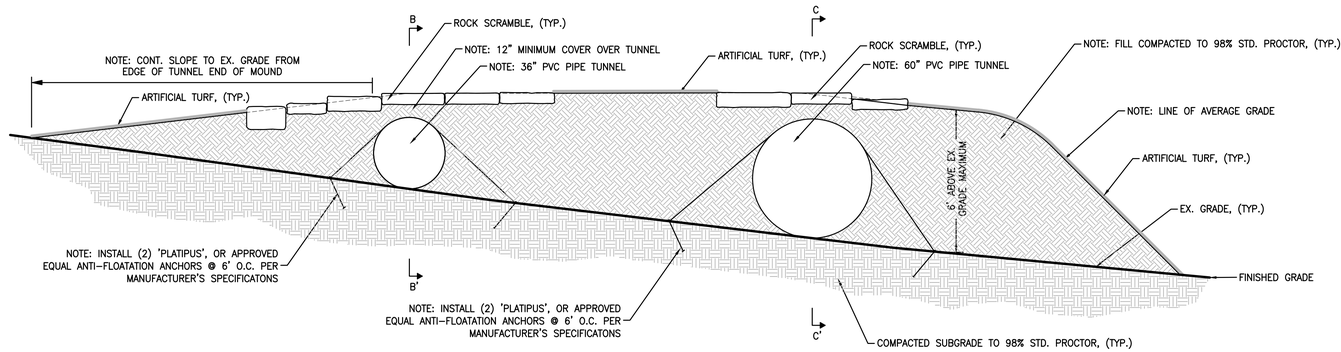
ELM STREET PLAYGROUND

WOODSTOCK GEORGIA
MARKET STREET AND MAPLE STREET
WOODSTOCK, GA 30189
CHEROKEE COUNTY

PROJECT NUMBER
20180300.0

SHEET TITLE
SITE DETAILS

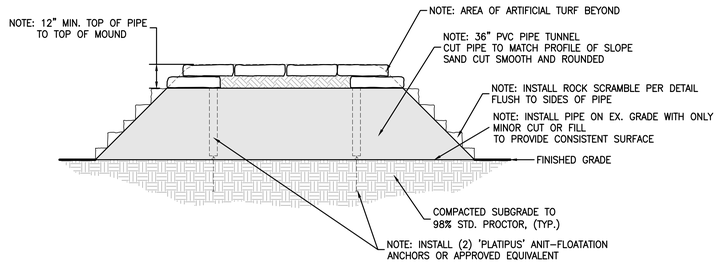
SHEET NUMBER
C-221



NOTE:
1. REFER TO SITE PLAN, SITE STAKING PLAN, SITE LAYOUT PLAN, AND SITE GRADING PLAN FOR ADDITIONAL INFORMATION.
2. PROJECT LANDSCAPE ARCHITECT AND OWNER TO APPROVE LAYOUT IN FIELD PRIOR TO CONSTRUCTION. PROVIDE 48 PRIOR NOTICE.
3. PROTECT ADJACENT TREES AT ALL TIMES.

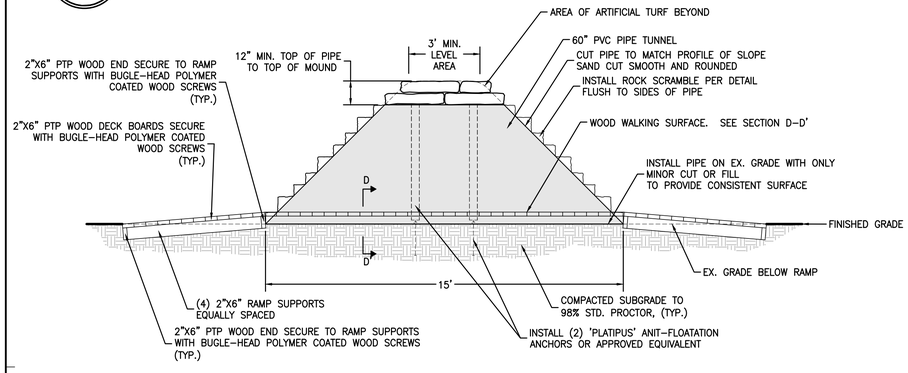
1 EARTHEN MOUND & TUNNEL LONGITUDINAL SECTION A-A' (ADD ALT. #1)

SCALE: NTS



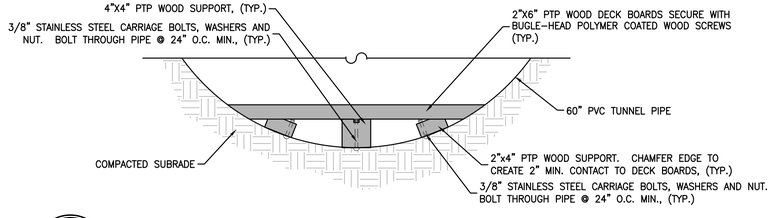
2 EARTHEN MOUND & TUNNEL CROSS SECTION B-B' (ADD ALT. #1)

SCALE: NTS



3 EARTHEN MOUND & TUNNEL CROSS SECTION C-C' (ADD ALT. #1)

SCALE: NTS



4 WOOD TUNNEL WALK SURFACE SECTION D-D' (ADD ALT. #1)

SCALE: NTS

BOARDWALK SPECIFICATIONS

A. GENERAL REQUIREMENTS
1. ALL CONSTRUCTION SHALL CONFORM TO INTERNATIONAL BUILDING CODE (IBC) 2012 WITH STATE OF GEORGIA AMENDMENTS. REFERENCE TO OTHER STANDARD SPECIFICATIONS OR CODES SHALL MEAN THE LATEST STANDARD OR CODE ADOPTED AND PUBLISHED.
2. ALL BOARDWALK CONSTRUCTION SHALL CONFORM TO AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIAL (AASHTO) GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES.
3. VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS BEFORE STARTING THE WORK. NOTIFY THE PROJECT LANDSCAPE ARCHITECT AND THE OWNER IN WRITING OF CONDITIONS ENCOUNTERED IN THE FIELD CONTRADICTORY TO THOSE SHOWN ON THE CONTRACT DOCUMENTS.
4. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, ADEQUACY, AND SAFETY OF ERECTION BRACING, SHORING, TEMPORARY SUPPORTS, ETC.
5. REVIEW OF SUBMITTALS AND/OR SHOP DRAWINGS BY THE PROJECT LANDSCAPE ARCHITECT DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO REVIEW AND CHECK SHOP DRAWINGS BEFORE SUBMITTAL TO THE PROJECT LANDSCAPE. THE CONTRACTOR REMAINS SOLELY RESPONSIBLE FOR ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF SHOP DRAWINGS AS THEY PERTAIN TO MEMBER SIZES, DETAILS, AND DIMENSIONS SPECIFIED IN THE CONTRACT DOCUMENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES OF CONSTRUCTION.
6. BOARDWALK CONTRACTOR WILL CLEAN UP BOARDWALK WORK SITE DAILY, AND PROVIDE THE APPROPRIATE DUMPSTER FOR MATERIAL REMOVAL.
7. CONTRACTOR TO PROVIDE ENGINEERING CALCULATIONS TO VERIFY STRUCTURAL INTEGRITY AND LOADING CAPACITY OF DESIGN(S). A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF GEORGIA WILL SEAL ALL DRAWINGS AND CALCULATIONS TO SUPPORT DESIGN FOR SIZING OF STRUCTURAL COMPONENTS AND REQUIRED LOAD HANDLING.
8. CONTRACTOR IS TO PROVIDE TO THE PROJECT LANDSCAPE ARCHITECT AND OWNER HIS OR HER COMPANY'S WORK HISTORY SHOWING A MINIMUM OF FIVE YEARS MINIMUM EXPERIENCE OF TIMBER BOARDWALK DESIGN AND CONSTRUCTION.
9. BOARDWALK MUST BE CONSTRUCTED ON SITE.
10. CONCRETE ABUTMENTS ARE PROHIBITED.
11. HAND AUGURING AND JETTING ARE NOT APPROVED PILE INSTALLATION METHODS.
12. PILES ARE REQUIRED TO BE DRIVEN.

B. STRUCTURAL REQUIREMENTS
1. BOARDWALK SHALL BE DESIGNED IN ACCORDANCE WITH AASHTO LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES (AASHTO PED).
2. WIND PRESSURE SHALL BE DESIGNED IN ACCORDANCE WITH AASHTO LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES (AASHTO PED).
3. BOARDWALK SHALL BE DESIGNED FOR A MINIMUM UNIFORM LIVE LOAD OF 100 POUNDS PER SQUARE FOOT. PROVIDE SHOP DRAWINGS.
4. BOARDWALK SHALL BE DESIGNED TO ACCOMMODATE OWNER MAINTENANCE VEHICLE (JOHN DEERE GATOR TH 6X4 DIESEL, TOTAL WEIGHT 2,800 POUNDS WITH PAYLOAD).

C. TREATMENT
1. ALL LUMBER, TIMBERS AND PILES SHALL BE PRESSURE TREATED WITH ALKALINE COPPER QUATERNARY (ACQ) TYPE CA IN ACCORDANCE WITH THE AMERICAN WOOD PRESERVERS ASSOCIATION (AWPA) STANDARD P5-90 AND A2-88. ALL LUMBER AND TIMBERS SHALL BE PRESSURE IMPREGNATED UNDER AWPA STANDARDS C1-90, C2-90, C14-90, AND C18-90 WHERE APPLICABLE. WHERE PRACTICAL, LUMBER AND TIMBERS SHALL BE KILN DRIED AFTER TREATMENT TO A 19% OR LESS MOISTURE CONTENT. ALL PILING SHALL BE PRESSURE IMPREGNATED UNDER AWPA STANDARDS C1-90, C3-90, C14-90 AND C18-90 WHERE APPLICABLE.
2. MINIMUM RETENTION AND PENETRATION FOR LUMBER AND TIMBER:

APPLICATION	RETENTION (LB. OXIDE/CU/FT.)	PENETRATION
ABOVE GROUND	.40	2.5" OR 85% OF SAPWOOD
SOIL CONTACT	.60	2.5" OR 85% OF SAPWOOD
FRESH WATER	.60	2.5" OR 85% OF SAPWOOD

3. MINIMUM RETENTION AND PENETRATION FOR PILINGS:

APPLICATION	RETENTION (LB. OXIDE/CU/FT.)	PENETRATION
LAND	.60	3.0" OR 90% OF SAPWOOD
FRESH WATER	.80	3.5" OR 90% OF SAPWOOD

D. LUMBER
1. ALL LUMBER SHALL BE SOUTHERN YELLOW PINE AND GRADED UNDER THE SOUTHERN PINE INSPECTION BUREAU (SPIB) RULES. ALL BENTS AND STRINGERS SHALL BE S4S (SURFACED FOUR SIDES), NO. 2 AND SHALL HAVE THE APPROPRIATE GRADE STAMP. ALL DECKING SHALL BE S4S, NO. 2 GRADE AND BETTER, AND SHALL HAVE THE APPROPRIATE GRADE STAMP.
2. ALL HANDRAIL RAILS AND CAP TO BE KILN DRIED AFTER TREATMENT TO A 19% OR LESS MOISTURE CONTENT, NO. 1 OR BETTER, AND SHALL HAVE THE APPROPRIATE GRADE STAMP.

E. WOOD DECKING
1. DECK TO BE FASTENED WITH STAINLESS STEEL SCREWS. ALL SCREWS WILL BE RECESSED A MINIMUM OF ⅛" BELOW DECK SURFACE. DECK SIZING TO BE DETERMINED BY GENERAL CONTRACTORS BRIDGE DESIGNER.

F. TIMBER PILINGS
1. ALL PILINGS SHALL MEET THE REQUIREMENTS AS SET FORTH BY THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) UNDER THE PROVISIONS OF D25 (LATEST EDITION), STANDARD SPECIFICATIONS FOR ROUND TIMBER PILES.
2. PILE SIZING TO BE DETERMINED BY BOARDWALK DESIGNER.
3. JETTING OF PILINGS WILL NOT BE PERMITTED.
4. ALL BOARDWALK PILINGS SHALL BE DRIVEN, TO THE REQUIRED DEPTH TO MEET THE CAPACITY FOR "BOARDWALK/CART" BRIDGES.
5. UPON ENCOUNTERING DENSE SOIL OR OTHER SIMILAR SOIL CONDITIONS THAT PREVENT DRIVING PILING, THE AUGURING METHOD MAY BE UTILIZED TO ASSIST WITH PILE DRIVING EQUIPMENT.
6. IF REFUSAL IS MET IN LESS THAN 6' DEEP, A CONCRETE FOOTER MAY BE ADDED TO STABILIZE PILING. THE SIZE OF THE FOOTER REQUIRED WILL VARY, DEPENDING ON APPLICATION AND TERRAIN, AND MUST BE SIZED ACCORDINGLY. CONCRETE FOOTERS CONSIST OF CONCRETE RATED 3,500-PSI AT MINIMUM 28 DAYS AND ARE REINFORCED WITH NUMBER 5 REBAR. FORMS FOR FOOTERS ARE TO BE A TEMPORARY STRUCTURE, CONSTRUCTED WITH PLYWOOD AND ALL FORMS AND SCRAPS ARE TO BE PROPERLY DISCARDED AFTER FOOTER CONSTRUCTION. WHEN NECESSARY, FOOTERS WILL BE PINNED TO EXPOSED ROCK FORMATIONS WITH EPOXY-COATED REBAR.
7. IF PROPER BEARING CAPACITY IS NOT MET AT THE MINIMUM PILE DEPTH, PILINGS MAY BE SPLICED AND DRIVEN UNTIL PROPER BEARING IS ACHIEVED.

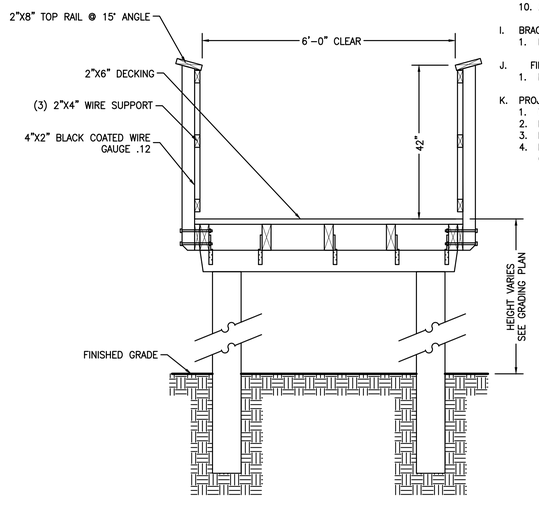
G. STRUCTURAL STEEL AND MISCELLANEOUS METALS
1. ALL STRUCTURAL BOLTS AND ALL ASSOCIATED WASHERS AND NUTS ON PILINGS SHALL BE HOT DIPPED GALVANIZED PER A.A.S.H.T.O. SPECIFICATION #M-232.
2. SIMPSON CLIPS OR APPROVED EQUAL SHALL BE USED FOR STRINGER TO BEAM CONNECTION.
3. AFTER FABRICATION, ALL STEEL SHAPES SHALL BE HOT DIP GALVANIZED PER A.A.S.H.T.O. SPECIFICATION #M-111.
4. ALL WELDING TO BE PER A.W.S. SPECIFICATIONS.
5. STAINLESS STEEL HARDWARE SHALL BE USED WHEN APPROPRIATE DUE TO SITE CONDITIONS. BOARDWALK DESIGNER TO DETERMINE APPROPRIATE USE OF STAINLESS HARDWARE, AND SHALL PROVIDE ENGINEERED CALCULATIONS TO VERIFY.

H. HANDRAIL
8. ALL HANDRAIL POSTS SHOULD BE SECURED TO THE BOARDWALK STRUCTURE WITH HOT DIP GALVANIZED HEX BOLTS. CAP AND RAILS SHALL BE FASTENED TO POST WITH STAINLESS SCREWS.
9. HANDRAILS SHOULD WITHSTAND A LATERAL FORCE OF 50 PLF, APPLIED AT THE TOP OF THE RAIL.
10. ALL EXPOSED EDGES OF THE HANDRAIL CAP SHALL BE ROUTERED.

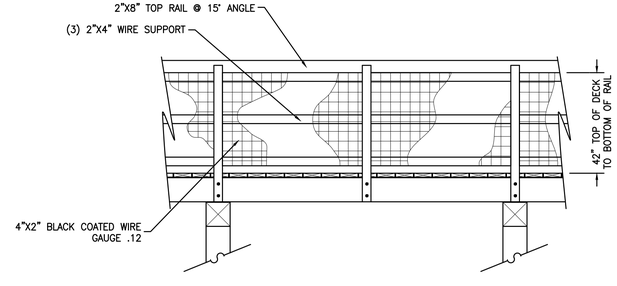
I. BRACING
1. BRACING OF PILES SHALL BE PROVIDED AS NEEDED AND INDICATED ON REQUIRED SHOP DRAWINGS.

J. FILTER FABRIC
1. MIRAFIL 40NC NEEDLE PUNCHED, NON-WOVEN GEO-TEXTILE, OR EQUAL.

K. PROJECT SUBMITTALS
1. WOOD PRESERVATIVE TREATMENT CERTIFICATION FROM THE TREATING FACILITY.
2. ENGINEERING SPECIFICATIONS, DETAILS & DESIGN CALCULATIONS SHALL BE PROVIDED BY A PROFESSIONAL ENGINEER WHO IS REGISTERED IN THE STATE OF GEORGIA.
3. PILE DRIVING SPECIFICATIONS.
4. FIVE OR MORE REFERENCES OF SIMILAR COMPLETED PROJECTS, WITH SIMILAR CONSTRUCTION METHODS, A GENERAL CONTRACTOR'S LICENSE, AND DESIGN BUILD CAPABILITIES.



SECTION



ELEVATION

5 BOARDWALK DETAILS AND SPECIFICATIONS

SCALE: NTS

Know what's below. Call before you dig.

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PROJECT TEAM

ISSUE/REVISION RECORD

DATE	DESCRIPTION
8/22/19	ISSUED FOR BID

PROFESSIONAL SEAL

PROFESSIONAL IN CHARGE
JOHN NOURZAD
PROFESSIONAL ENGINEER
LICENSE NO. 23430
PROJECT MANAGER
PATRICK WAYLOR
QUALITY CONTROL
LIZ COLE
DRAWN BY
THOMAS HARGRETT

PROJECT NAME

ELM STREET PLAYGROUND

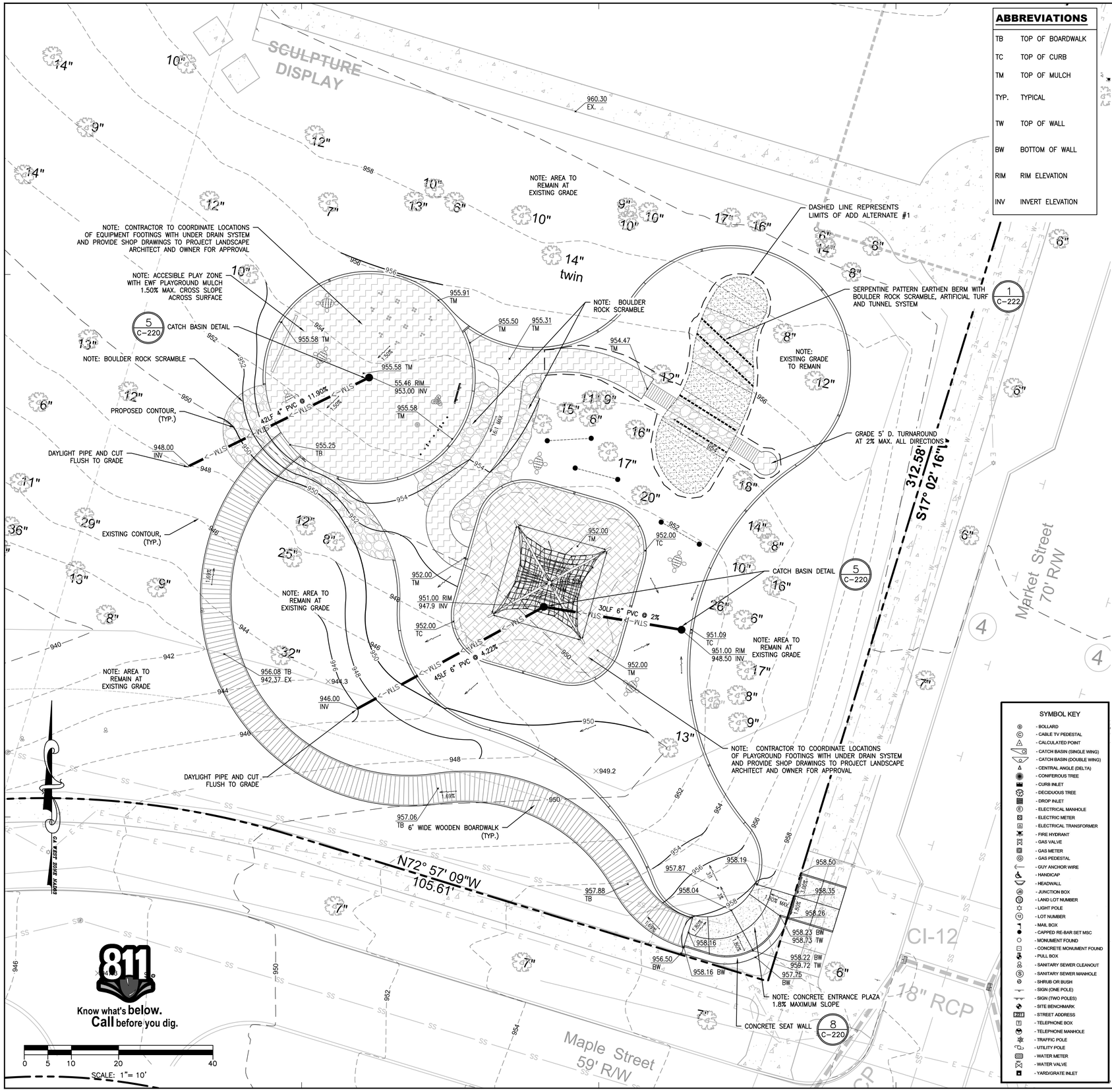
WOODSTOCK GEORGIA

MARKET STREET AND
MAPLE STREET
WOODSTOCK, GA 30189
CHEROKEE COUNTY

PROJECT NUMBER
20180300.0

SHEET TITLE
SITE DETAILS

SHEET NUMBER
C-222



ABBREVIATIONS

TB	TOP OF BOARDWALK
TC	TOP OF CURB
TM	TOP OF MULCH
TYP.	TYPICAL
TW	TOP OF WALL
BW	BOTTOM OF WALL
RIM	RIM ELEVATION
INV	INVERT ELEVATION

GRADING NOTES:

1. ALL IMPORTED FILL AND BORROW SOILS SHALL BE CLEAN AND FREE OF DEBRIS, ORGANICS AND DELETRIOUS MATERIAL. SUITABLE FILL SHALL HAVE PLASTICITY INDEX LESS THAN 25, MAXIMUM PARTICLE SIZE OF FOUR INCHES WITH NOT MORE THAN 30% GREATER THAN 3/4 INCH. FILL SHALL BE PLACED IN THIN LIFTS NOT TO EXCEED 8 INCH LOOSE THICKNESS, AND COMPACTED. FILL WITHIN TOP TWO FEET SHALL BE COMPACTED TO AT LEAST 98% STANDARD PROCTOR (ASTM D698) MAXIMUM DRY DENSITY.
2. ALL SPOT ELEVATIONS ARE TO TOP OF PAVEMENT, TOP OF CURB, TOP OF TOPSOIL ETC. CONTRACTOR TO ADJUST SUBGRADE ELEVATION AS NECESSARY ACCORDING TO PAVEMENT/SLAB THICKNESS.
3. POSITIVE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES TO PREVENT SATURATION OF EXPOSED SOILS. ALL DRAINAGE SHALL BE AWAY FROM STRUCTURES.
4. ALL LANDSCAPED AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH AND FOUR INCHES OF TOPSOIL APPLIED. IF ADEQUATE TOPSOIL IS NOT AVAILABLE ON SITE, THE CONTRACTOR SHALL PROVIDE TOPSOIL AS NEEDED AND AS APPROVED BY PROJECT LANDSCAPE ARCHITECT AND OWNER. THESE AREAS SHALL BE SODDED, FERTILIZED, MULCHED, WATERED AND MAINTAINED UNTIL HARDY GRASS GROWTH IS ESTABLISHED IN ALL AREAS.
5. EXISTING UTILITIES SHOWN ON THESE PLANS MAY NOT BE EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANY AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO VERIFY EXACT FIELD LOCATION OF UTILITIES. CONTRACTOR IS RESPONSIBLE FOR HIRING PRIVATE LOCATOR AS NECESSARY TO LOCATE EXISTING UTILITIES.
6. CONTRACTOR TO FIELD VERIFY ELEVATIONS OF ALL TIE–IN POINTS AND NOTIFY PROJECT LANDSCAPE ARCHITECT AND THE OWNER OF RECORD OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.
7. ALL EXISTING UTILITY BOXES, METER BOXES AND VALVE BOXES THAT ARE TO REMAIN SHALL BE SET TO FLUSH WITH PROPOSED GRADE.
8. ALL HARD SURFACE ROUTES DESIGNATED AS ADA ACCESSIBLE SHALL HAVE MAXIMUM RUNNING SLOPE OF 4.9% AND MAXIMUM CROSS SLOPE OF 2%.
9. TRENCH FOR UNDERGROUND PIPE INSTALLATION MUST BE DRY FOR PROPER PLACEMENT AND EMBEDMENT OF PIPE. GROUND WATER SHALL NOT BE PERMITTED TO RISE ABOVE THE TRENCH BOTTOM UNTIL AFTER THE INSTALLED PIPE IS FULLY BEDDED AND ENOUGH FILL IS IN PLACE TO PREVENT FLOTATION.
10. CONTRACTOR SHALL ADHERE TO PROPER DEWATERING PRACTICES IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS. ONLY UNCONTAMINATED GROUNDWATER CAN BE DISCHARGED FROM THE SITE, AS ALLOWED BY AND IN ACCORDANCE WITH APPLICABLE LOCAL GROUNDWATER DEWATERING PERMITS/REGULATIONS. ALL DISCHARGE POINTS SHALL BE MONITORED TO ENSURE IT DOES NOT CAUSE UNCONTROLLED EROSION OF THE SOIL DURING DISCHARGE.

DRAINAGE NOTES:

1. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR THE PLAYGROUND SUBSURFACE DRAINAGE SYSTEM TO PROJECT LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL.
2. THE PROPOSED SITE, WITH THE EXCEPTION OF ANY SUB–SURFACE DRAINAGE TO BE DESIGNED AND INSTALLED BY THE CONTRACTOR, SHALL SHEET FLOW TO EXISTING NATURAL DRAINAGE BASIN. ANY SUB–SURFACE DRAINAGE SHOP DRAWINGS SUBMITTED BY THE CONTRACTOR SHALL INDICATE DRAINAGE LINES TO DAYLIGHT INTO THE EXISTING DRAINAGE BASIN.
3. CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF APPROPRIATE EROSION CONTROL MEASURES TO PREVENT SOIL EROSION PER THE "GSWCC MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA" AT THE OUTFALL OF THE PLAYGROUND SUB–SURFACE DRAINAGE SYSTEM.

ADA ACCESSIBILITY NOTES:

1. ADA ACCESSIBLE AREAS AND ROUTES INDICATED ON THIS SHEET HAVE BEEN DESIGNED TO MEET 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN. CONTRACTOR SHALL PAY CAREFUL ATTENTION TO ENSURE THAT THESE AREAS ARE CONSTRUCTED TO MEET THE SAME STANDARDS.

ADA STANDARDS FOR ACCESSIBLE DESIGN:

1.1. ALL ACCESSIBLE SPACES ARE TO HAVE 98" VERTICAL CLEARANCE.
1.2. CROSS SLOPES OF ACCESSIBLE ROUTES, ACCESSIBLE PARKING SPACES, PASSENGER LOADING ZONES AND OTHER ACCESSIBLE FEATURES SHALL BE NO MORE THAN 2% WITH CHANGES IN LEVEL 1/2" WITH A BEVEL, OR LESS.
1.3. MINIMUM HEIGHT AT PASSENGER LOADING ZONES AND DRIVE–THRUS IS 13'–6".
1.4. RAMPS SHALL HAVE A SLOPE NO GREATER THAN 1:12. WHERE CURB RAMPS ARE FLARED, FLARES SHALL BE A SLOPE NO GREATER THAN 1:14.
1.5. STEEPEST RUNNING SLOPE OF ACCESSIBLE ROUTES NOT TO EXCEED 5%.
1.6. OPENINGS IN ANY GRATING ALONG ACCESSIBLE ROUTES SHALL NOT BE MORE THAN 1/2" WIDE.
1.7. ALL PEDESTRIAN APPROACHES TO THE PLAYGROUND SHALL BE FREE OF PROTRUDING OBJECTS.

SYMBOL KEY

- BOLLARD
- CABLE TV PEDESTAL
- CALCULATED POINT
- CATCH BASIN (SINGLE WING)
- CATCH BASIN (DOUBLE WING)
- CENTRAL ANGLE (DELTA)
- CONIFEROUS TREE
- CURB INLET
- DECIDUOUS TREE
- DROP INLET
- ELECTRICAL MANHOLE
- ELECTRIC METER
- ELECTRICAL TRANSFORMER
- FIRE HYDRANT
- GAS VALVE
- GAS METER
- GAS PEDESTAL
- GUY ANCHOR WIRE
- HANDICAP
- HEADWALL
- JUNCTION BOX
- LAND LOT NUMBER
- LIGHT POLE
- LOT NUMBER
- MAIL BOX
- CAPPED RE-BAR SET MSC
- MONUMENT FOUND
- CONCRETE MONUMENT FOUND
- PULL BOX
- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- SHRUB OR BUSH
- SIGN (ONE POLE)
- SIGN (TWO POLES)
- SITE BENCHMARK
- STREET ADDRESS
- TELEPHONE BOX
- TELEPHONE MANHOLE
- TRAFFIC POLE
- UTILITY POLE
- WATER METER
- WATER VALVE
- YARD/GRATE INLET

PLAYGROUND LEGEND

- PROPOSED CONCRETE PLAZA
- EWF PLAY ZONE (INSIDE FALL ZONE)
- EWF PLAY AREA (OUTSIDE FALL ZONE)
- BOULDER ROCK SCRAMBLE
- 6" WIDE BOARDWALK
- ARTIFICIAL TURF
- CONCRETE PLAYGROUND CURBING
- MUSIC EQUIPMENT
- CHALKBOARD WALL
- BALSA WOOD CONSTRUCTION PLAYZONE
- HAMMOCKS
- TABLES AND CHAIRS
- CATCHBASIN
- DRAIN TRUNK LINE (STM—>)

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WOODSTOCK, GA 30189
CHEROKEE COUNTY

PROJECT NUMBER
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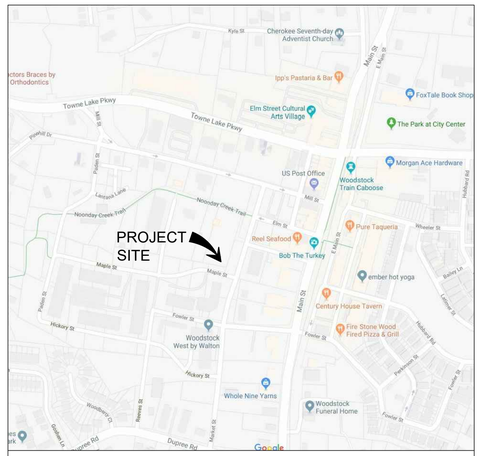
SHEET TITLE

GRADING AND DRAINAGE PLAN

SHEET NUMBER

C-300



LOCATION MAP
(N.T.S)

EROSION CONTROL NOTES:

1. PRIOR TO ANY OTHER CONSTRUCTION, A STABILIZED CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT EACH ENTRY TO OR EXIT FROM THE SITE.
2. THE CONSTRUCTION EXIT(S) SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ON TO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH STONE, AS CONDITIONS DEMANDS, AND REPAIR AND/OR CLEAN-OUT OF ANY STRUCTURES USED TO TRAP SEDIMENT. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLE ONTO PUBLIC ROADWAY OR INTO STORM DRAIN MUST BE REMOVED.
3. PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY, THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH STAKES, RIBBONS, OR OTHER APPROPRIATE MEANS. THE LOCATION AND EXTENT OF ALL AUTHORIZED LAND DISTURBANCE SHALL OCCUR WITHIN THE APPROVED LIMITS INDICATED ON THE APPROVED PLANS.
4. IMMEDIATELY AFTER THE ESTABLISHMENT OF CONSTRUCTION ENTRANCE/EXIT(S), ALL PERIMETER EROSION CONTROL DEVICES AND STORMWATER MANAGEMENT DEVICES SHALL BE INSTALLED PRIOR TO ANY OTHER CONSTRUCTION.
5. THE CONTRACTOR SHALL FURNISH AND MAINTAIN ALL NECESSARY BARRICADES WHILE ROADWAY FRONTAGE IMPROVEMENTS ARE BEING MADE.
6. THE CONSTRUCTION OF THE SITE WILL INITIATE WITH THE INSTALLATION OF EROSION CONTROL MEASURES SUFFICIENT TO CONTROL SEDIMENT DEPOSITS AND EROSION. ALL SEDIMENT CONTROL WILL BE MAINTAINED UNTIL ALL UPSTREAM GROUND WITHIN THE CONSTRUCTION AREA HAS BEEN COMPLETELY STABILIZED WITH PERMANENT VEGETATION AND ALL ROADS/DRIVEWAYS HAVE BEEN PAVED.
7. FAILURE TO INSTALL, OPERATE OR MAINTAIN ALL EROSION CONTROL MEASURES WILL RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB SITE UNTIL SUCH MEASURES ARE CORRECTED CONSISTENT WITH THE CITY OF WOODSTOCK EROSION CONTROL ORDINANCE.
8. A COPY OF THE APPROVED LAND DISTURBANCE PLAN AND PERMIT SHALL BE PRESENT ON THE SITE WHENEVER LAND DISTURBANCE ACTIVITY IS IN PROGRESS.
9. ALL SEWER EASEMENTS DISTURBED MUST BE DRESSED AND GRASSED/MULCHED TO CONTROL EROSION.
10. IF FULL IMPLEMENTATION OF THE APPROVED PLANS DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE AS NECESSARY.
11. ANY DISTURBED AREA LEFT EXPOSED SHALL BE TEMPORARILY STABILIZED WITH MULCH OR TEMPORARY SEEDING AS SOON AS POSSIBLE AFTER ROUGH GRADING IS COMPLETED BUT WITHIN 14 DAYS AFTER DISTURBANCE. PERMANENT VEGETATION SHALL BE PLANTED IF THE AREA IS TO BE LEFT UNDISTURBED FOR GREATER THAN 6 MONTHS.
12. IF A CONCRETE WORK IS DONE ON SITE, THEN A CONCRETE WASHDOWN BMP SHALL BE PROVIDED OR A NOTE "CONCRETE WASHDOWN IS NOT ALLOWED ON SITE." THE CONCRETE WASHDOWN AREA, IF ALLOWED SHALL BE FOR THE TOOLS, CONCRETE MIXER CHUTES, HOPPERS AND THE REAR OF VEHICLES. WASHOUT OF THE DRUM AT THE CONSTRUCTION SITE IS PROHIBITED.

SOILS LEGEND

MAP UNIT SYMBOL	MAP UNIT NAME	HSG
PuE	Pacolet-URBAN LAND COMPLEX, 10 to 25 PERCENT SLOPES	B

ESC NOTES:

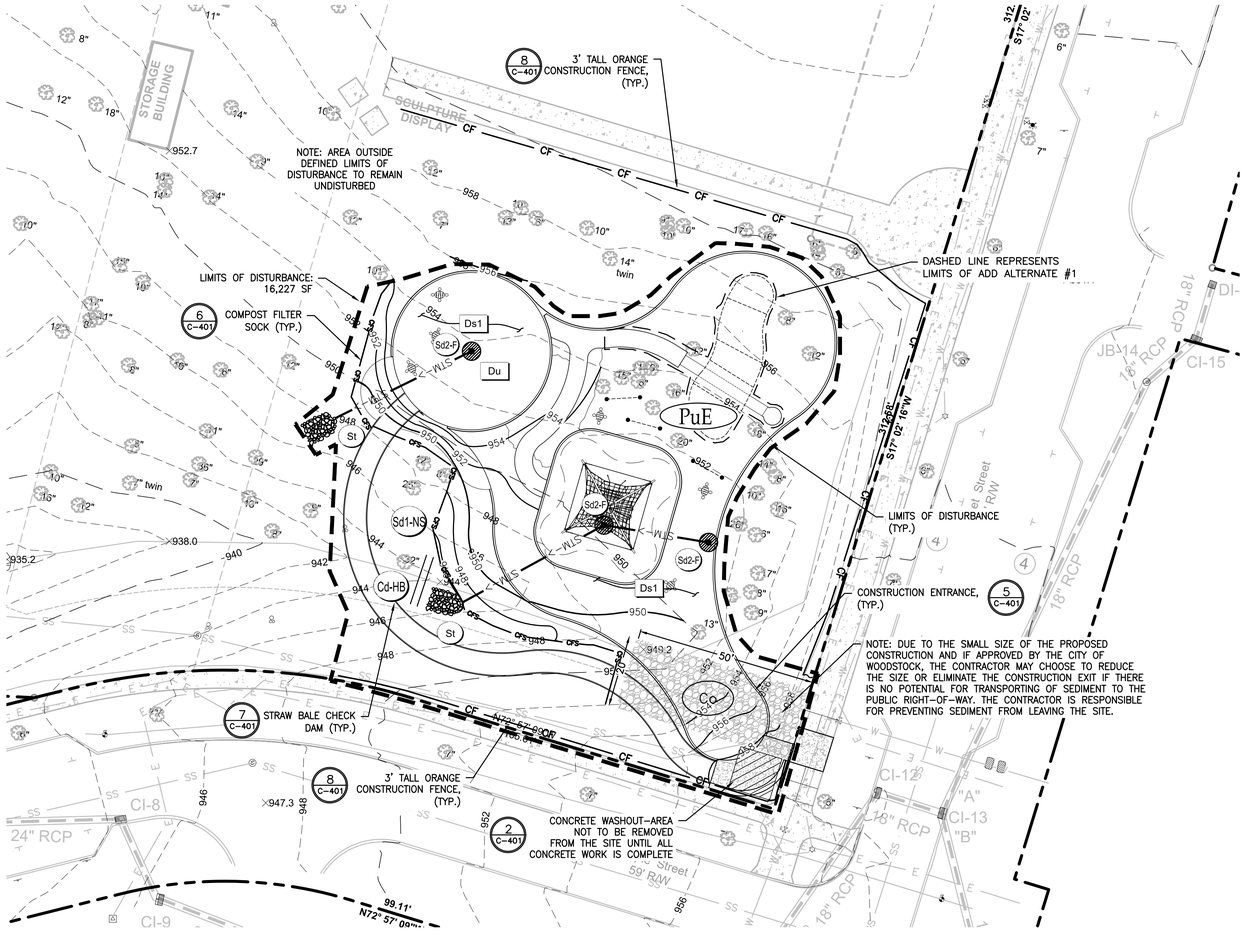
1. SEE SHEET C-001 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. SEE SHEET SHEET C-401 FOR EROSION CONTROL DETAILS AND LEGEND.
3. STORM STRUCTURES MAY EXIST THAT ARE NOT SHOWN ON PLANS. ALL EXISTING STORM STRUCTURES LOCATED IN THE FIELD WITHIN AND ADJACENT TO LIMITS OF DISTURBANCE SHALL HAVE FILTER FABRIC INLET PROTECTION.
4. CONCRETE WASHOUT WILL NOT BE REMOVED UNTIL ALL CONCRETE WORK IS COMPLETE.

ESC PHASING NOTES:

1. DISTURBED AREA IN INITIAL EROSION CONTROL PLAN (C-300):
   - 16,227 SF (.37 AC)
2. WORK TO BE COMPLETED/IMPLEMENTED IN THE INITIAL EROSION CONTROL PHASE (C-300):
   - 2.1. CONSTRUCTION ENTRANCE
   - 2.2. CONCRETE WASH-OUT AREA
   - 2.3. CONSTRUCTION FENCE (3' TALL ORANGE FENCE)
   - 2.4. TREE PROTECTION FENCE
   - 2.5. COMPOST FILTER SOCK
   - 2.6. STRAW BALE CHECK DAM
   - 2.7. STORM DRAIN OUTLET PROTECTION
   - 2.8. FILTER FABRIC WITH SUPPORTING FRAME

EROSION CONTROL BMP LEGEND

- Du — DUST CONTROL ON DISTURBED AREAS
- Ds1 — DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)
- Sd1-NS — COMPOST FILTER SOCK
- Co — CONSTRUCTION EXIT
- Cd-HB — STRAW BALE CHECK DAM
- St — STORM DRAIN OUTLET PROTECTION
- Sd2-F — FILTER FABRIC WITH SUPPORTING FRAME
- CFS — COMPOST FILTER SOCK
- LIMITS OF DISTURBANCE
- CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT
- CF — 3' TALL ORANGE CONSTRUCTION FENCE



(12) I CERTIFY UNDER PENALTY OF LAW THAT THIS PLAN WAS PREPARED AFTER A SITE VISIT TO THE LOCATIONS DESCRIBED HEREIN BY MYSELF OR MY AUTHORIZED AGENT, UNDER MY SUPERVISION.

GSWCC LEVEL II DESIGN PROFESSIONAL — 0000043822 CERTIFICATION #

(13) I CERTIFY THAT THE PERMITTEE'S EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN PROVIDES FOR AN APPROPRIATE AND COMPREHENSIVE SYSTEM OF BEST MANAGEMENT PRACTICES REQUIRED BY THE GEORGIA WATER QUALITY CONTROL ACT AND THE DOCUMENT "MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA" (MANUAL) PUBLISHED BY THE STATE GEORGIA SOIL AND WATER CONSERVATION COMMISSION AS OF JANUARY 1 OF THE YEAR IN WHICH THE LAND-DISTURBING ACTIVITY WAS PERMITTED, PROVIDES FOR THE SAMPLING OF THE RECEIVING WATER(S) OR THE SAMPLING OF THE STORM WATER OUTFALLS AND THAT THE DESIGNED SYSTEM OF BEST MANAGEMENT PRACTICES AND SAMPLING METHODS IS EXPECTED TO MEET THE REQUIREMENTS CONTAINED IN THE GENERAL NPDES PERMIT NO. GAR100001.

GSWCC LEVEL II DESIGN PROFESSIONAL — 0000043822 CERTIFICATION #

(14) THE DESIGN PROFESSIONAL WHO PREPARED THE ES&PC PLAN IS TO INSPECT THE INSTALLATION OF THE INITIAL SEDIMENT STORAGE REQUIREMENTS,PERIMETER CONTROL BMPS AND SEDIMENT BASINS IN ACCORDANCE WITH PART IV.A.5. WITHIN 7 DAYS AFTER INSTALLATION

(19) THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO, OR CONCURRENT WITH, LAND DISTURBING ACTIVITIES.

(20) EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.

SYMBOL KEY

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- CATCH BASIN (DOUBLE WING)
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- SANITARY SEWER MANHOLE
- SHRUB OR BUSH
- SIGN (ONE POLE)
- SIGN (TWO POLES)
- SITE BENCHMARK
- 2811 - STREET ADDRESS
- TELEPHONE BOX
- TELEPHONE MANHOLE
- TRAFFIC POLE
- UTILITY POLE
- WATER METER
- WATER VALVE
- YARD/GRATE INLET

LINETYPES

- CENTERLINE
- EASEMENT / SETBACK
- FENCE - BARBED
- FENCE - CHAIN LINK
- FENCE - WOOD
- FLOOD ZONE BOUNDARY
- LAND HOOK
- LAND LOT LINE
- NOT TO SCALE
- OVERHEAD UTILITY
- E - ELECTRIC
- T - TELEPHONE
- C - CABLE
- SUBSURFACE UTILITY
- C - CABLE
- E - ELECTRIC
- G - GAS
- S - SANITARY
- T - TELEPHONE
- W - WATER
- POLITICAL BOUNDARY
- RIGHT-OF-WAY
- STORM PIPES
- TREE / BRUSH LINE
- NATURAL DRAINAGE SWALE

GSWCC GEORGIA SOIL AND WATER CONSERVATION COMMISSION
JOHN NOURZAD
Level II Certified Design Professional
CERTIFICATION NUMBER 0000043822
EXPIRES: 06/28/2022

811 Know what's below. Call before you dig.

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SCALE: 1"= 20'

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CHEROKEE COUNTY

PROJECT NUMBER
20180300.0

SHEET TITLE
EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER
C-400

MATERIAL	RATE	DEPTH
STRAW OR HAY	–	2" TO 4"
WOOD WASTE, CHIPS, SAWDUST, BARK	–	2" TO 3"
CUTBACK ASPHALT	1,200 GAL/AC, 1/3 GAL/SY OR SEE MANUFACTURER'S RECOMMENDATIONS	–
POLYETHYLENE FILM	SECURE WITH SOIL, ANCHORS, WEIGHTS	–
GEOTEXTILES, JUTE MATTING, NETTING, ETC.	SEE MANUFACTURER'S RECOMMENDATIONS	–

- APPLY STRAW OR HAY UNIFORMLY, AS SHOWN IN TABLE, BY HAND OR MECHANICAL EQUIPMENT, AND ANCHOR BY PRESSING INTO SOIL OR USING NETTING.
- MULCH ON SLOPES GREATER THAN 3% SHOULD BE ANCHORED WITH EMULSIFIED ASPHALT (GRADE AE–5 OR SS–1) OR OTHER SUITABLE TACKIFIER.
- MULCH SHALL BE USED DURING THE MONTHS THAT GRASSING SHOULD NOT BE APPLIED BASED ON THE SCHEDULE BELOW.

Ds1 MULCHING RATES

SPECIES	RATE PER ACRE		PLANTING DATES
	ALONE	IN MIXTURES	
LESPEDEZA, ANNUAL (LESPEDEZA STRIATA)	40 LBS	10 LBS	3/1 – 3/31
LOVEGRASS, WEEPING (ERAGROSTIS CURVULA)	4 LBS	2 LBS	4/1 – 5/31
MILLET, PEARL (PENNESETUM GLAUCUM)	50 LBS	DO NOT MIX	5/1 – 7/31
RYEGRASS (LOLIUM TENULENTUM)	40 LBS	DO NOT MIX	9/1 – 12/15
RYE (SECALE CEREALE)	168 LBS	28 LBS	9/15 – 11/30
WHEAT	3 BU	0.5 BU	10/1 – 12/15

TEMPORARY GRASSES SHALL CONSIST OF SOWING A QUICK GRASS SUCH AS RYE, BROWN TOP MILLET, OR GRASS SUITABLE TO THE AREA AND SEASON. LIME AND FERTILIZER WILL BE OMITTED. MULCH IS NOT REQUIRED BUT SHOULD BE USED AS DICTATED BY SITE CONDITIONS. TEMPORARY GRASSING IS REQUIRED WHEN DISTURBED AREA IS LEFT EXPOSED FOR MORE THAN 14 DAYS.

Ds2 TEMPORARY GRASSING

SPECIES	RATE PER ACRE		PLANTING DATES
	ALONE	IN MIXTURES	
BAHA, WILMINGTON	60 LBS	30 LBS	3/1 – 5/31
BERMUDA, COMMON (HULLED SEED)	10 LBS	6 LBS	4/1 – 5/31
FESCUE, TALL	50 LBS	30 LBS	9/1 – 10/15
LESPEDEZA, SERICEA (LESPEDEZA CUINEATE)	60 LBS (SCARIFIED)	–	3/15 – 5/31
	75 LBS (UNSCARIFIED)	–	9/1 – 2/28
LESPEDEZA, AMBRO (VIRGATA OR APPALOW)	60 LBS (SCARIFIED)	–	3/15 – 5/31
	75 LBS (UNSCARIFIED)	–	9/1 – 2/28
LOVEGRASS, WEEPING	4 LBS	2 LBS	3/15 – 5/31

PERMANENT GRASSING SHALL CONSIST OF GROUND PREPARATION, LIMING, FERTILIZATION, MULCHING, AND SEEDING. THE GROUND SHALL BE PREPARED BY PLOWING AND DISKING TO A DEPTH NOT LESS THAN 4". FERTILIZER AND LIME SHALL BE UNIFORMLY MIXED INTO THE GROUND, WITH FERTILIZER AT THE RATE OF 1500 LBS PER ACRE AND LIME AT THE RATE OF 2000 LBS PER ACRE. THE GROUND SHALL BE FINISHED OFF AS SMOOTH AND UNIFORM AND BE FREE OF ROCKS, CLODS, ROOTS, AND WEEDS. FERTILIZER SHALL BE APPLIED PER THE TABLE BELOW. WEATHER PERMITTING, SEEDING SHALL BE DONE WITHIN 24 HOURS OF FERTILIZER APPLICATION. SEED SHALL BE UNIFORMLY SPREAD AT THE RATES SHOWN BELOW. MULCHING IS REQUIRED AND SHALL BE DONE IMMEDIATELY AFTER SEEDING. MULCH SHALL BE UNIFORMLY APPLIED OVER THE AREA LEAVING APPROXIMATELY 25% OF THE GROUND SURFACE EXPOSED. THE RATE OF APPLICATION SHALL BE DOUBLED ON SLOPES STEEPER THAN 4:1.

Ds3 PERMANENT GRASSING

FERTILIZER REQUIREMENTS

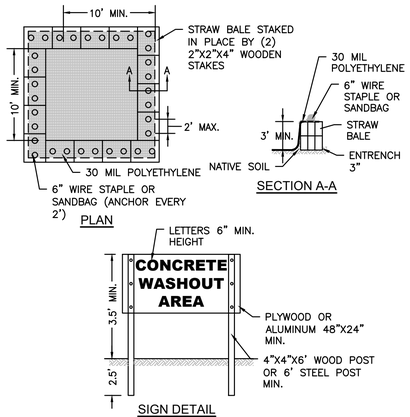
TYPE OF SPECIES	YEAR	ANALYSIS OR EQUIVALENT N–P–K	RATE (LBS/AC)	N TOP DRESSING RATE (LBS/AC)
1. COOL SEASON GRASSES	FIRST	6–12–12	1500	50–100
	SECOND	6–12–12	1000	–
	MAINTENANCE	10–10–10	400	30
2 COOL SEASON GRASSES AND LEGUMES	FIRST	6–12–12	500	0–50
	SECOND	0–10–10	1000	–
	MAINTENANCE	0–10–10	400	–
3 GROUND COVERS	FIRST	10–10–10	1300	–
	SECOND	10–10–10	1300	–
	MAINTENANCE	10–10–10	1100	–
4 SHRUB LESPEDEZA	FIRST	0–10–10	700	–
	MAINTENANCE	0–10–10	700	–
5 WARM SEASON GRASSES	FIRST	6–12–12	1500	50–100
	SECOND	6–12–12	800	50–100
	MAINTENANCE	10–10–10	400	30
6 WARM SEASON GRASSES AND LEGUMES	FIRST	6–12–12	1500	50
	SECOND	0–10–10	1000	–
	MAINTENANCE	0–10–10	400	–

LIMING RATES

AGRICULTURAL LIME IS REQUIRED AT THE RATE OF ONE TO TWO TONS PER ACRE UNLESS SOIL TESTS INDICATE OTHERWISE. GRADED AREAS REQUIRE LIME APPLICATION. IF LIME IS APPLIED WITHIN SIX MONTHS OF PLANTING PERMANENT PERRENIAL VEGETATION, ADDITIONAL LIME IS NOT REQUIRED. AGRICULTURAL LIME SHALL BE WITHIN THE SPECIFICATIONS OF THE GEORGIA DEPARTMENT OF AGRICULTURE.

NOTES:

1. THE ABOVE APPLICATION RATES ARE FOR EROSION CONTROL PURPOSES ONLY.
2. RESOURCE AREA "P" REPRESENTS SOUTHERN PIEDMONT MAJOR LAND RESOURCE AREA (MLRA).
3. SEE LANDSCAPE PLAN FOR PERMANENT VEGETATION.



(ADAPTED FROM AISWCD "ILLINOIS URBAN MANUAL IUM–654SB1")

NOTES:

1. WASHOUT OF THE CONCRETE DRUM AT THE CONSTRUCTION SITE IS PROHIBITED.
2. PREFABRICATED CONCRETE WASHOUT FACILITIES MAY BE USED. PREFABRICATED FACILITIES SHALL BE WATER–TIGHT AND OF SUFFICIENT VOLUME AND QUANTITY TO CONTAIN ALL THE LIQUIDS AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS.
3. PERFORM WASHOUT OF CONCRETE MIXER TRUCKS IN DESIGNATED AREAS ONLY.
4. EACH FACILITY SHALL HAVE APPROPRIATE SIGNAGE TO INFORM CONCRETE EQUIPMENT OPERATORS OF THE PROPER WASHOUT LOCATION(S).
5. EACH FACILITY SHALL BE LOCATED IN AN AREA PROTECTED FROM POSSIBLE DAMAGE FROM CONSTRUCTION TRAFFIC AND HAVE A STABILIZED ACCESS TO PREVENT TRACKING ONTO STREETS.
6. WASHOUT FACILITIES SHALL BE LOCATED ON LEVEL GROUND A MINIMUM OF 50FT FROM STORM DRAIN INLETS AND ALL OPEN DRAINAGE FACILITIES.
7. THE WASHOUT FACILITY SHALL BE INSPECTED DAILY AND REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN THE CAPACITY OF CONCRETE WASTE. ACCUMULATED MATERIALS SHALL BE REMOVED ONCE THE FACILITY IS TWO–THIRDS FULL.
8. WASHOUT WATER SHALL NOT BE DISCHARGED INTO THE ENVIRONMENT.
9. SOLIDIFIED CONCRETE WASTE FROM WASHOUT FACILITIES SHALL BE DISPOSED OF IN ACCORDANCE WITH STATE LAWS.

STRUCTURAL PRACTICES

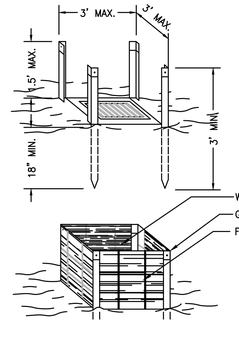
CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Cd	CHECKDAM			A small temporary barrier or dam constructed across a swale, drainage ditch or area of concentrated flow.
Co	CONSTRUCTION EXIT		(LINE)	A crushed stone pad located at the construction site exit to provide a place for removing mud from tires thereby protecting public streets.
Sd1	SEDIMENT BARRIER		(INDICATE TYPE)	A barrier to prevent sediment from leaving the construction site. It may be sandbags, bales of straw or hay, brush, logs and poles, gravel, or a silt fence.
Tr	TREE PROTECTION		(ENTER TREE CENTER)	To protect desirable trees from injury during construction activity.
Sd2	INLET SEDIMENT TRAP			An impounding area created by excavating around a storm drain drop inlet. The excavated area will be filled and stabilized on completion of construction activities.
St	STORMDRAIN OUTLET PROTECTION		St	A paved or short section of riprap channel at the outlet of a storm drain system preventing erosion from the concentrated runoff.

VEGETATIVE PRACTICES

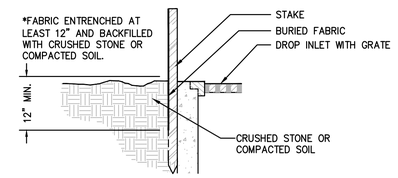
CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Ds1	DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)		Ds1	Establishing temporary protection for disturbed areas where seedlings may not have a suitable growing season to produce an erosion retarding cover.
Ds2	DISTURBED AREA STABILIZATION (WITH TEMP. SEEDING)		Ds2	Establishing a temporary vegetative cover with fast growing seedings on disturbed areas.
Ds3	DISTURBED AREA STABILIZATION (WITH PERM SEEDING)		Ds3	Establishing a permanent vegetative cover such as trees, shrubs, vines, grasses, or legumes on disturbed areas.
Du	DUST CONTROL ON DISTURBED AREAS		Du	Controlling surface and air movement of dust on construction site, roadways and similar sites.

NOTE: CONSTRUCTION ACTIVITY ALLOWED WITHIN CRZ (FOR UP TO 20%), (TYP.)

811 Know what's below. Call before you dig.



Sd2-F



NOTES

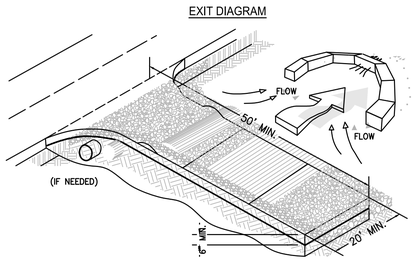
1. DESIGN IS FOR SLOPES NO GREATER THAN 5% (NOT DESIGNED FOR CONCENTRATED FLOWS).
2. THE STEEL POSTS SUPPORTING THE SILT FENCE MATERIAL SHOULD BE SPACED EVENLY AROUND THE PERIMETER OF THE INLET (MAXIMUM OF 3' APART).
3. THE STEEL POSTS SHOULD BE SECURELY DRIVEN AT LEAST 18" DEEP.
4. THE FABRIC SHOULD BE ENTRENCHED AT LEAST 12" AND THEN BACKFILLED WITH CRUSHED STONE OR COMPACTED SOIL.

1 C–401 DISTURBED AREA STABILIZATION

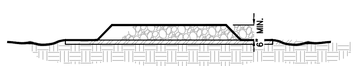
Ds1 Ds2 Ds3

SCALE: N.T.S.

EXIT DIAGRAM



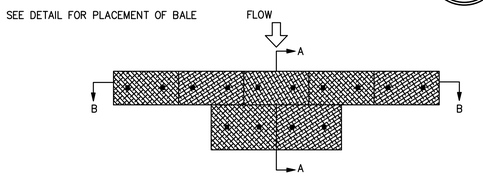
ENTRANCE ELEVATION



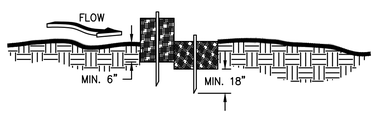
NOTES:
1. AVOID LOCATING ON STEEP SLOPES OR AT CURVES ON PUBLIC ROADS.
2. REMOVE ALL VEGETATION AND OTHER UNSUITABLE MATERIAL FROM THE FOUNDATION AREA, GRADE, AND CROWN FOR POSITIVE DRAINAGE.
3. AGGREGATE SIZE SHALL BE IN ACCORDANCE WITH NATIONAL STONE ASSOCIATION R–2 (1.5"–3.5" STONE).
4. GRAVEL PAD SHALL HAVE A MINIMUM THICKNESS OF 6".
5. PAD WIDTH SHALL BE EQUAL FULL WIDTH AT ALL POINTS OF VEHICULAR EGRESS, BUT NO LESS THAN 20'.
6. A DIVERSION RIDGE SHOULD BE CONSTRUCTED WHEN GRADE TOWARD PAVED AREA IS GREATER THAN 2%.
7. INSTALL PIPE UNDER THE ENTRANCE IF NEEDED TO MAINTAIN DRAINAGE DITCHES.
8. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN (DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE ENTRANCE TO A SEDIMENT CONTROL DEVICE).
9. WASHRACKS AND/OR TIRE WASHERS MAY BE REQUIRED DEPENDING ON SCALE AND CIRCUMSTANCE. IF NECESSARY, WASHRACK DESIGN MAY CONSIST OF ANY MATERIAL SUITABLE FOR TRUCK TRAFFIC THAT REMOVE MUD AND DIRT.
10. MAINTAIN AREA IN A WAY THAT PREVENTS TRACKING AND/OR FLOW OF MUD ONTO PUBLIC RIGHTS–OF–WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

2 C–401 CONCRETE WASHOUT AREA

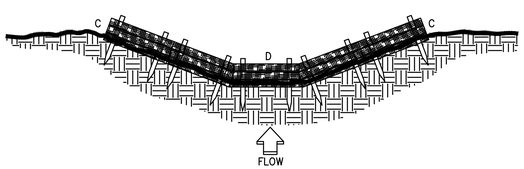
PLAN



SECTION A-A



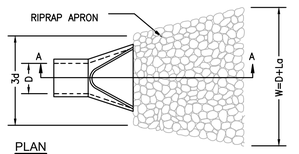
SECTION B-B



NOTES:
1. BALES SHOULD BE BOUND WITH WIRE OR NYLON STRING AND SHOULD BE PLACED IN ROWS WITH BALE ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. REMOVE #4 REBAR AFTER STRAW BALES ARE NO LONGER IN PLACE.
3. POINT C OF SECTION B–B SHOULD ALWAYS BE HIGHER THAN POINT D.

3 C–401 FILTER FABRIC AND SUPPORTING FRAME INLET PROTECITON

PIPE OUTLET TO FLAT AREA -- NO WELL DEFINED CHANNEL



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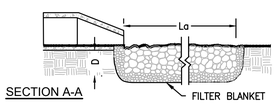
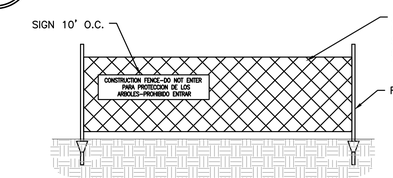


SECTION A-A

NOTES:
1. Lo IS THE LENGTH OF THE RIPRAP APRON.
2. D = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6".
3. IN A WELL–DEFINED CHANNEL, EXTEND THE APRON UP THE CHANNEL BANKS TO AN ELEVATION OF 6" ABOVE THE MAXIMUM TAILWATER DEPTH OR TO THE TOP OF THE BANK (WHICHEVER IS LESS).
4. A FILTER BLANKET OR FILTER FABRIC SHOULD BE INSTALLED BETWEEN THE RIPRAP AND THE SOIL FOUNDATION.

4 C–401 RIPRAP OUTLET PROTECTION

St



5 C–401 STABILIZED CONSTRUCTION EXIT

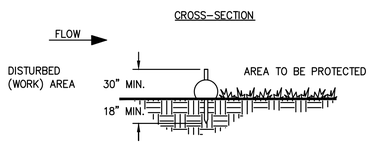
Co

SCALE: N.T.S.

6 C–401 COMPOST FILTER SOCK

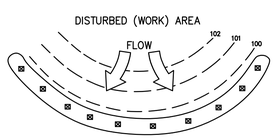
CFS

CROSS–SECTION



NOTE: FILTER SOCK SIZED TO SUIT CONDITIONS (SEE APPROVED LIST)

PLAN



7 C–401 STRAW BALE CHECK DAM

CD

8 C–401 3' TALL ORANGE CONSTRUCTION FENCE

GreenbergFarrow

1430 W. Peachtree St. NW
Suite 200
Atlanta, GA 30309
t: 404 601 4000 f: 404 601 3970

PROJECT TEAM

ISSUE/REVISION RECORD

DATE	DESCRIPTION
08/22/19	ISSUED FOR BID

PROFESSIONAL SEAL

PROFESSIONAL IN CHARGE
JOHN NOURZAD
PROFESSIONAL ENGINEER
LICENSE NO. 23430

PROJECT MANAGER
PATRICK WAYLOR

QUALITY CONTROL
LIZ COLE

DRAWN BY
THOMAS HARGRETT

PROJECT NAME

ELM STREET PLAYGROUND

WOODSTOCK GEORGIA

MARKET STREET AND MAPLE STREET
WOODSTOCK, GA 30189
CHEROKEE COUNTY

PROJECT NUMBER
20180300.0

SHEET TITLE

EROSION AND SEDIMENT CONTROL DETAILS

SHEET NUMBER

C-401

CITY OF WOODSTOCK TREE PROTECTION CALCULATIONS:

TOTAL SITE AREA = 2.78 AC
DISTURBED AREA = 0.37 AC
TOTAL INCHES REQUIRED (100"/AC)
0.37 X 100 = 37" REQUIRED
TOTAL INCHES TO REMAIN = 66"

TREES TO REMAIN (100% CRZ MAINTAINED)

1-6" HWD
1-8" HWD
1-9" HWD
1-11" HWD
1-32" HWD

TREE PROTECTION NOTES

1. ALL TREES SHOWN ON THIS PLAN TO BE RETAINED SHALL BE PROTECTED DURING ALL PHASES OF DEMOLITION/CONSTRUCTION WITH TEMPORARY FENCING.
2. TREE PROTECTION TAPE SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING). CLEARING SHALL BE DONE BY HAND.
3. ANY ROOTS EXPOSED BY CONSTRUCTION ACTIVITY SHALL BE PRUNED WITH A CLEAN CUT FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOP SOIL IMMEDIATELY. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN 2 DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE AND MINIMIZES WATER LOSS DUE TO EVAPORATION.
4. PRIOR TO EXCAVATION OR GRADE CUTTING WITHIN TREE DRIP LINES, MAKE A CLEAN CUT BETWEEN THE DISTURBED AND UNDISTURBED ROOT ZONES WITH A ROCK SAW OR SIMILAR EQUIPMENT TO MINIMIZE DAMAGE TO REMAINING ROOTS.
5. TREES MOST HEAVILY IMPACTED BY CONSTRUCTION ACTIVITIES SHOULD BE WATERED DEEPLY ONCE A WEEK DURING PERIODS OF HOT, DRY WEATHER. TREE CROWNS SHOULD BE SPRAYED WITH WATER PERIODICALLY TO REDUCE DUST ACCUMULATION ON THE LEAVES.
6. DAMAGE TO TREES OR ANY NATURAL RESOURCE DUE TO CONTRACTOR'S NEGLIGENCE DURING THE CONSTRUCTION PHASE SHALL BE APPRAISED BY THE PROJECT LANDSCAPE ARCHITECT AND OWNER, AND ORDERED REPAIRED, REPLACED, OR COMPENSATED.

ENVIRONMENTAL NOTES

1. TREES WITHIN THE LIMITS OF DISTURBANCE HAVE BEEN DESIGNATED FOR PROTECTION WITHIN TREE SAVE AREAS. ANY TREES DESIGNATED FOR PROTECTION THAT ARE REMOVED OR DAMAGED SHALL REQUIRE REPLACEMENT BY THE CONTRACTOR AT NO COST TO THE OWNER. REQUIRED REPLACEMENT SHALL MEET THE SATISFACTION OF THE CITY OF WOODSTOCK AND THE PROJECT LANDSCAPE ARCHITECT. REFER TO TECHNICAL SPECIFICATION 31 00 00 TREE PROTECTION & SELECTIVE TRIMMING FOR ADDITIONAL INFORMATION.
2. CONTRACTOR IS TO MAINTAIN CONSTRUCTION RELATED ACTIVITIES WITHIN THE DESIGNATED LIMITS SHOWN ON THE DRAWINGS.
3. CONSTRUCTION SITE STAGING AND STORAGE SHALL NOT INFRINGE UPON, DAMAGE OR DESTROY ANY TREE SAVE AREAS AND SHALL BE LIMITED TO THE AREA DESIGNATED BY THE LIMIT OF CONSTRUCTION BOUNDARY.
4. EXISTING INVASIVE SPECIES TO BE REMOVED BY CONTRACTOR. CONTRACTOR TO PROVIDE PLAN FOR INVASIVE SPECIES REMOVAL TO CITY ARBORIST FOR REVIEW AND APPROVAL.

TREE PROTECTION LEGEND

- HARDWOOD (TO REMAIN)
- HARDWOOD (TO BE REMOVED)
- TPF — TREE PROTECTION TAPE
- LIMITS OF DISTURBANCE
- CRITICAL ROOT PROTECTION ZONE (CRZ)
- CF — CONSTRUCTION FENCE

PLAYGROUND LEGEND

- PROPOSED CONCRETE PLAZA
- EWF PLAY ZONE (INSIDE FALL ZONE)
- EWF PLAY AREA (OUTSIDE FALL ZONE)
- BOULDER ROCK SCRAMBLE
- 6' WIDE BOARDWALK
- ARTIFICIAL TURF
- CONCRETE PLAYGROUND CURBING
- MUSIC EQUIPMENT
- CHALKBOARD WALL
- BALSA WOOD CONSTRUCTION PLAYZONE
- HAMMOCKS
- TABLES AND CHAIRS
- CATCHBASIN

GRADING LEGEND

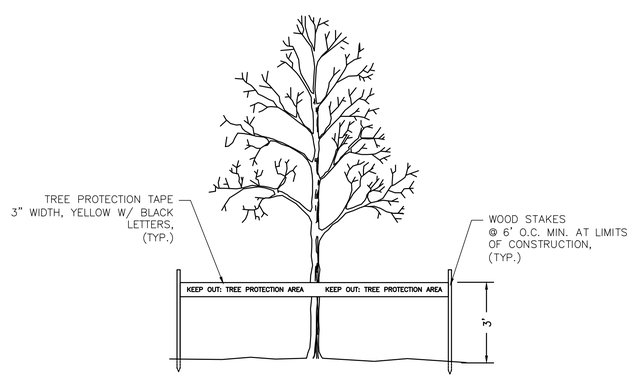
- STM—> DRAIN TRUNK LINE
- 950 EXISTING CONTOUR
- 955 PROPOSED CONTOUR

SYMBOL KEY

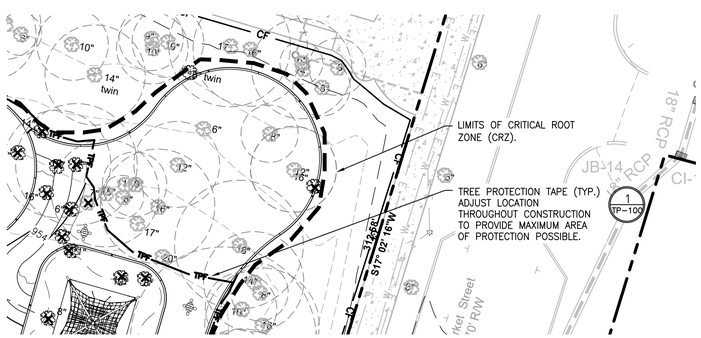
- BOLLARD
- CABLE TV PEDESTAL
- CALCULATED POINT
- CATCH BASIN (SINGLE WING)
- CATCH BASIN (DOUBLE WING)
- CENTRAL ANGLE (DELTA)
- CONIFEROUS TREE
- CURB INLET
- DECIDUOUS TREE
- DROP INLET
- ELECTRICAL MANHOLE
- ELECTRIC METER
- ELECTRICAL TRANSFORMER
- FIRE HYDRANT
- GAS VALVE
- GAS METER
- GAS PEDESTAL
- GUY ANCHOR WIRE
- HANDICAP
- HEADWALL
- JUNCTION BOX
- LAND LOT NUMBER
- LIGHT POLE
- LOT NUMBER
- MAIL BOX
- CAPPED RE-BAR SET MSC
- MONUMENT FOUND
- CONCRETE MONUMENT FOUND
- PULL BOX
- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- SHRUB OR BUSH
- SIGN (ONE POLE)
- SIGN (TWO POLES)
- SITE BENCHMARK
- STREET ADDRESS
- TELEPHONE BOX
- TELEPHONE MANHOLE
- TRAFFIC POLE
- UTILITY POLE
- WATER METER
- WATER VALVE
- YARD/GIRATE INLET

LINETYPES

- CENTERLINE
- EASEMENT / SETBACK
- FENCE - BARBED
- FENCE - CHAIN LINK
- FENCE - WOOD
- FLOOD ZONE BOUNDARY
- LAND HOOK
- LAND LOT LINE
- NOT TO SCALE
- OVERHEAD UTILITY
- E - ELECTRIC
- T - TELEPHONE
- C - CABLE
- SUBSURFACE UTILITY
- C- CABLE
- E - ELECTRIC
- G - GAS
- S- SANITARY
- T- TELEPHONE
- W- WATER
- POLITICAL BOUNDARY
- RIGHT-OF-WAY
- STORM PIPES
- TREE / BRUSH LINE
- NATURAL DRAINAGE SWALE



1 TREE PROTECTION TAPE
SCALE: N.T.S.



2 TREE PROTECTION - ADD ALTERNATE #1
SCALE: N.T.S.

811 Know what's below. Call before you dig.

0 10 20 40 80
SCALE: 1"= 20'

GreenbergFarrow
1430 W. Peachtree St. NW
Suite 200
Atlanta, GA 30309
t: 404 601 4000 f: 404 601 3970

PROJECT TEAM

ISSUE/REVISION RECORD

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PROFESSIONAL IN CHARGE
JOHN NOURZAD
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ELM STREET PLAYGROUND

WOODSTOCK GEORGIA

MARKET STREET AND MAPLE STREET
WOODSTOCK, GA 30189
CHEROKEE COUNTY

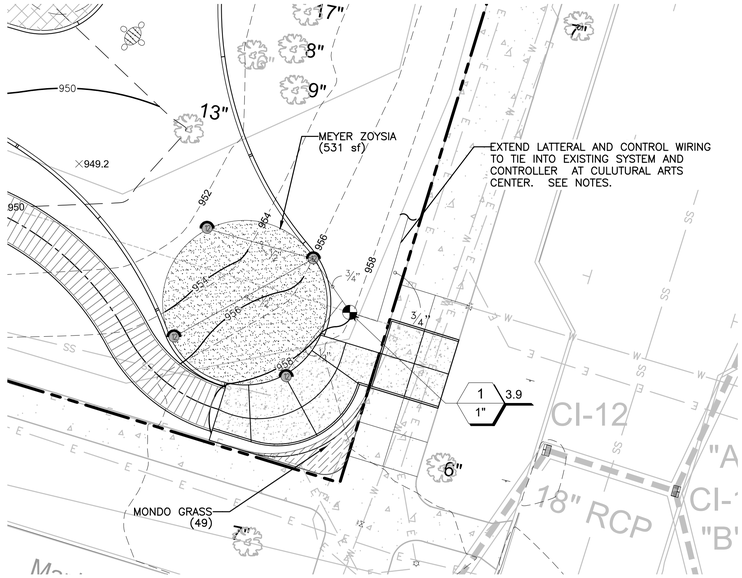
PROJECT NUMBER
20180300.0

SHEET TITLE

TREE SURVEY AND PROTECTION PLAN

SHEET NUMBER

TP-100



PLANT SCHEDULE

GROUND COVERS	QTY	BOTANICAL NAME / COMMON NAME	CONT	REMARKS
	49	OPHIOPOGON JAPONICUS / MONDO GRASS	1 GAL	
	531 SF	ZOYSIA JAPONICA 'MEYER' / MEYER ZOYSIA	SOD	CERTIFIED WEED FREE

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
Q T H TQ F	RAIN BIRD 1806 12 SERIES MPR TURF SPRAY 6.0" POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL. SIDE AND BOTTOM INLET. 1/2" NPT FEMALE THREADED INLET.	
	RAIN BIRD PEB 1", 1-1/2", 2" PLASTIC INDUSTRIAL VALVES. LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION.	1
	IRRIGATION LATERAL LINE: PVC CLASS 200 SDR 21	71.5 L.F.

Valve Callout
- # — ZONE NUMBER
- # — GALLONS PER MINUTE
- #" — VALVE SIZE

PLANTING NOTES

1. LANDSCAPE PLANS ARE FOR THE LOCATION AND IDENTIFICATION OF PLANT MATERIAL ONLY. NO OTHER WORK IS TO BE PERFORMED BASED ON THESE PLANS.
2. QUANTITIES ON THE PLANT SCHEDULE ARE PROVIDED FOR CONVENIENCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY CALCULATIONS. IN THE EVENT OF A DISCREPANCY BETWEEN THE LANDSCAPE PLANS AND THE PLANT SCHEDULE, THE LANDSCAPE PLAN WILL TAKE PRECEDENCE. THE CONTRACTOR SHALL INFORM THE LANDSCAPE ARCHITECT IMMEDIATELY UPON DISCOVERING ANY QUANTITY DISCREPANCIES.
3. THE CONTRACTOR SHALL NOT CHANGE OR SUBSTITUTE PLANT VARIETIES OR SPECIES WITHOUT PRIOR WRITTEN APPROVAL FROM THE PROJECT LANDSCAPE ARCHITECT.
4. CONTRACTOR SHALL TAKE 3 REPRESENTATIVE SOIL SAMPLES OF EACH PROPOSED PLANT BED AND SUBMIT COPIES OF THE RESULTS TO THE PROJECT LANDSCAPE ARCHITECT PRIOR TO BEGINNING WORK.
5. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE OF ALL PLANTING HOLES AND PLANT BEDS PRIOR TO INSTALLATION.
6. TOPSOIL WILL NOT BE STOCKPILED FOR RE-USE IN LANDSCAPE WORK. CONTRACTOR SHALL IMPORT TOPSOIL AS REQUIRED TO COMPLETE LANDSCAPE WORK.

   PROVIDE NEW TOPSOIL THAT IS FERTILE, FRIABLE, NATURAL LOAM, SURFACE SOIL, REASONABLY FREE OF ROOTS, STUMPS AND LARGE STONES AND FREE OF BRUSH, WEEDS, LITTER, AND OTHER EXTRANEOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH.

   OBTAIN TOPSOIL FROM LOCAL SOURCES OR FROM AREAS HAVING SIMILAR SOIL CHARACTERISTICS TO THAT FOUND AT PROJECT SITE. OBTAIN TOPSOIL ONLY FROM NATURALLY, WELL DRAINED SITES WHERE TOPSOIL OCCURS IN A DEPTH OF NOT LESS THAN 4 INCHES. DO NOT OBTAIN FROM BOGS OR MARSHES.

   PLANT MATERIAL SHALL BE PLACED AS SHOWN ON THE LANDSCAPE PLANS.
7. PLANTING SOIL MIX FOR SOD AND GROUNDCOVERS SHALL CONSIST OF THE FOLLOWING:

   80% TOPSOIL
   20% PREPARED ADDITIVES (BY VOLUME AS FOLLOWS):
   — 3 PARTS — ORGANIC SOIL CONDITIONER (NATURE'S HELPER OR EQUAL
   — 1 PART — STERILIZED COW MANURE (OR EQUAL)
   COMMERCIALLY AVAILABLE STARTER FERTILIZER @ RATES SPECIFIED BY MANUFACTURER
   LIME (AS RECOMMENDED IN SOIL ANALYSIS)

   QUALITY OF PLANT MATERIAL: ALL PLANT MATERIAL TO CONFORM TO THE CURRENT VERSION OF THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1 — 2014) PUBLISHED BY AMERICANHORT. A COPY OF THIS MANUAL CAN BE DOWNLOADED AT HTTP://AMERICANHORT.ORG/STANDARD.

   PLANT MATERIAL SHALL BE FREE OF DISEASE AND/OR INSECTS, AND SHALL HAVE A HEALTHY ROOT SYSTEM WITH NO CIRCLING OR KINKED ROOTS. CONTAINER PLANTS SHALL NOT BE ROOT BOUND.

   ALL PLANT MATERIAL SHALL BE SUFFICIENTLY WATERED TO WET THE ENTIRE ROOT BALL WITHIN TWO HOURS OF PLANTING.
8. INSPECTION AND APPROVAL OF PLANT MATERIAL: ALL PLANT MATERIAL SHALL BE INSPECTED AND APPROVED BY THE LANDSCAPE ARCHITECT UPON DELIVERY TO THE SITE, PRIOR TO INSTALLATION. CONTRACTOR SHALL GIVE PROJECT LANDSCAPE ARCHITECT AT LEAST LEAST ONE WEEK NOTICE PRIOR TO PLANT DELIVERY.
9. BED PREPARATION FOR SOD INSTALLATION: REMOVE EXISTING VEGETATION WITHIN THE APPROVED BEDLINE. IF THE EXISTING SOIL IS COMPACTED OR OTHERWISE UNSUITABLE FOR PLANTING, REMOVE THE TOP 4 INCHES OF SOIL. TILL SUBGRADE TO A MINIMUM DEPTH OF 6 INCHES. REMOVE LARGE STONES, STICKS, ROOTS, RUBBISH, AND OTHER EXTRANEOUS MATERIAL.

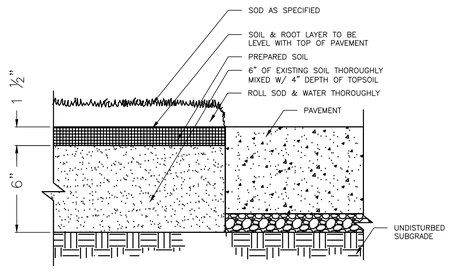
   SPREAD 2 INCHES OF TOPSOIL OVER THE PREPARED BED AND TILL INTO THE TOP 4 INCHES OF LOOSENED SUBGRADE. SPREAD THE REMAINING 2 INCHES OF TOPSOIL, RAKE SMOOTH AND ROLL COMPACT. BEDS SHALL BE FINISHED WITH A SLIGHT CROWN AT THE CENTER TO ALLOW WATER TO SHEET FLOW TO THE SIDES.

   WATER THE BED IMMEDIATELY BEFORE LAYING THE SOD SO THAT THE TOP INCH OF SOIL IS MOIST. ALLOW WATER TO PERCOLATE SO THERE IS NO STANDING WATER. LIMIT PREPARATION TO AREAS THAT WILL BE SODDED THAT SAME DAY.
10. MAINTENANCE: CONTRACTOR SHALL MAINTAIN ALL PLANT MATERIAL FROM THE TIME IT IS INSTALLED UNTIL FINAL ACCEPTANCE OR WHEN THE OWNER TAKES OVER MAINTENANCE, WHICHEVER OCCURS FIRST. MAINTENANCE SHALL INCLUDE BUT NOT BE LIMITED TO MOWING, EDGING, WEEDING, WATERING, PRUNING, FERTILIZING, ETC.
11. WARRANTY: CONTRACTOR SHALL PROVIDE A ONE-YEAR WARRANTY ON ALL PLANT MATERIAL AND LABOR. WARRANTY PERIOD SHALL BEGIN UPON FINAL COMPLETION OR WHEN THE OWNER TAKES OVER MAINTENANCE, WHICHEVER OCCURS FIRST.

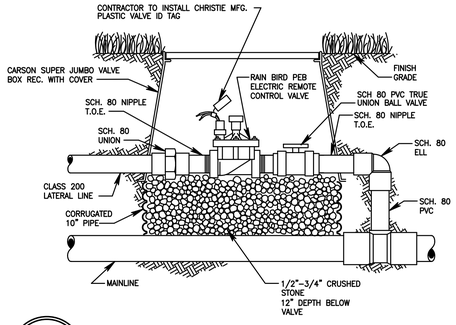
    THE CONTRACTOR SHALL MAKE PERIODIC INSPECTIONS OF THE PROJECT DURING THE WARRANTY PERIOD TO ENSURE THAT THE ESTABLISHMENT RATE OF GROWTH IS ADEQUATE. ANY METHODS OR PRODUCTS DEEMED NOT NORMAL OR DETRIMENTAL TO GOOD PLANT GROWTH SHALL BE REPORTED TO THE LANDSCAPE ARCHITECT IN WRITING. FAILURE TO INSPECT AND REPORT WILL BE INTERPRETED AS APPROVAL, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL REPLACEMENTS.
12. NO PLANT MATERIAL SUBSTITUTIONS MAY BE MADE PRIOR TO APPROVAL FROM PROJECT LANDSCAPE ARCHITECT.

IRRIGATION NOTES

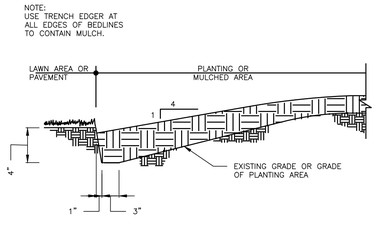
1. CONNECT NEW LINE AND VALVE TO EXISTING SYSTEM AT CULTURAL ARTS CENTER.
2. CONTRACTOR SHALL TEST EXISTING SYSTEM FOR FUNCTIONALITY PRIOR TO INSTALLATION OF NEW EQUIPMENT AND ENSURE THAT EXISTING SYSTEM IS FULLY FUNCTIONAL UPON COMPLETION OF NEW WORK.
3. BORE UNDER EXISTING WALKS AND PAVING. ANY DAMAGE TO EXISTING FACILITIES SHALL BE REPAIRED TO EXISTING CONDITION AT CONTRACTOR'S EXPENSE.
4. CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES WITHIN LIMITS OF WORK.
5. PROVIDE ISOLATION VALVE AT TIE IN POINT TO EXISTING MAIN LINE.
6. CONTRACTOR IS RESPONSIBLE FOR DETERMINING LOCATION OF EXISTING MAIN LINE AND SIZING OF MAIN LINE EXTENSION.



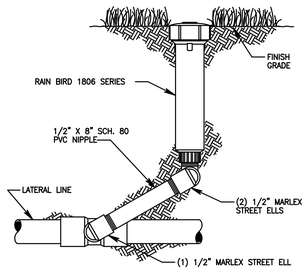
1 SOD DETAIL
SCALE: N.T.S.



3 CONTROL VALVE
SCALE: NTS



2 TRENCH EDGER
SCALE: N.T.S.



4 LAWN SPRAY
SCALE: NTS

Know what's below. Call before you dig.

SCALE: 1"= 10'

GreenbergFarrow
1430 W. Peachtree St. NW
Suite 200
Atlanta, GA 30309
t: 404 601 4000 f: 404 601 3970

PROJECT TEAM

ISSUE/REVISION RECORD

DATE	DESCRIPTION
08/22/19	ISSUED FOR BID

PROFESSIONAL SEAL

PROFESSIONAL IN CHARGE
JOHN NOURZAD
PROFESSIONAL ENGINEER
LICENSE NO. 23430

PROJECT MANAGER
PATRICK WAYLOR

QUALITY CONTROL
LIZ COLE

DRAWN BY
THOMAS HARGRETT

PROJECT NAME

ELM STREET PLAYGROUND

WOODSTOCK GEORGIA

MARKET STREET AND
MAPLE STREET
WOODSTOCK, GA 30189
CHEROKEE COUNTY

PROJECT NUMBER
20180300.0

SHEET TITLE

LANDSCAPE AND IRRIGATION PLAN

SHEET NUMBER

L-100

Specifications

and other documents

City of Woodstock - Woodstock, GA

Site
Elm Street Playground
Market Street & Maple Street
Woodstock, GA 30189

Issue/Revision Date	Description
August 22, 2019	Issued for Bid

Prepared by
GreenbergFarrow
1430 West Peachtree Street
Suite 200
Atlanta, GA 30309
t: 404 601 4000
f: 404 601 3970

GF Project Number
20180300.0

GreenbergFarrow

ATLANTA
NEW YORK
CHICAGO
LOS ANGELES
BOSTON
DALLAS
NEW JERSEY
ST. PETERSBURG

SECTION INDEX - TABLE OF CONTENTS

City of Woodstock
Elm Street Playground
Market Street & Maple Street
Woodstock, GA 30189

GFA JOB NUMBER 20180300.0

TECHNICAL SPECIFICATIONS

ADDITIONAL INFORMATION

Elm Street Playground Geotech Report

END OF SECTION

SECTION 01 11 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Project description

B. Work by others

C. Owner-furnished products

D. Work sequence

E. Existing Site conditions

1.02 PROJECT DESCRIPTION

A. The Work under this Contract consists of, in general, the construction of the Elm Street Playground, located at Market Street and Maple Street, Woodstock, GA 30188.

B. The Work includes, but is not necessarily limited to, the following items:
   1. Compliance with all applicable federal, state and local laws and regulations.
   2. Obtaining required permits and authorizations from governing jurisdictions.
   3. Preparation and submittal of initial documents prior to commencement of the Work.
   4. Mobilization of supplies, equipment and personnel, including transportation to job site, set-up and maintenance of all equipment and temporary facilities and controls required for project execution.
   5. Installation and maintenance of erosion and sedimentation control measures.
   6. Installation and maintenance of controls for protection of vegetation (including tree protection fencing) and structures to remain in place.
   7. Locating and protection of all existing utilities (buried and above grade), structures, and other facilities on the Site not indicated to be removed.
   8. Demolition and removal of existing facilities and structures.
   9. Clearing and grubbing of designated areas.
   10. Site excavation (including subgrade stabilization as required), filling, grading and other earthwork required for construction of new facilities.
   11. Installation of stormwater drainage structures and piping throughout designated playground zones.
   12. Design and installation of wooden boardwalk.
   13. Installation of entry plaza.
   14. Installation of playground curbing, equipment and safety surface.
   15. Inspections, reports and compliance with CPSI Inspections.
   16. Coordination of installation of Kompan Play Structure with City of Woodstock contractor.
   17. Installation of site landscape and irrigation.
   18. Final site cleanup and demobilization.

1.03 WORK BY OTHERS

A. During the Work, contracts may be in place for execution of other work at the Site. The Contractor shall coordinate with other contractors, consultants and/or the Owner by providing access to the Site to allow activities including, but not limited to, the following:
   1. Construction Quality Assurance
   2. Construction Quality Control

1.04 WORK SEQUENCE

A. Detailed sequencing of the Work shall be the responsibility of the Contractor as long as the requirements of these specifications are met, the Contractor's progress is according to the schedule approved by the Owner and Project Landscape Architect, and Contract Times stated in the Agreement are complied with.

1.05 EXISTING SITE CONDITIONS

A. The property on which the Work will be performed (designated as the “Site”), is indicated on the Drawings.

B. Limited subsurface information has been obtained and is available for review by the Contractor. Refer to the Geotechnical Engineering Report prepared by NOVA, dated April 11, 2019 located in the additional information section of the technical specifications.

C. Existing Utilities and Other Facilities:
   1. Refer to the Drawings for available information on utilities and other facilities.
   2. The Contract Document present provisions regarding available information on existing utilities and other facilities, and limitations on completeness of the information.
   3. Existing utilities and other facilities not indicated to be removed shall be protected as specified in Section 01 50 00 and other applicable specification sections.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 11 00

SECTION 01 15 00 – CLIMATALOGICAL DATA

PART I - GENERAL

1.01 SUMMARY:

A. The Contractor agrees that said Work shall be executed regularly, diligently and uninterruptedly at such rate of progress as shall ensure full completion of the entire project and its many and separate components and subcontractors, vendors and suppliers, thereof within the time specified.

B. It is expressly understood and agreed that the Contractor has visited the site where the work of the Project is to be performed, has considered all contingencies and factors affecting the Contractor's ability to perform all the Work within the time specified, including among others, delays caused by inclement weather (temperature and all forms of precipitation) and other possible delays caused by the climatological conditions prevailing in the general localities and recording stations of The City of Woodstock, Georgia.

C. After consideration of these factors, the Contractor has made allowances for such factors before determining and submitting his Bid and executing the Construction Agreement agreeing to the completion times and durations specified in the Contract Documents, and does, further, agree that all things considered, such completion durations are a reasonable time for completion of all Work to be performed hereunder, without the need for any extension of time or any other reasons than those specified below.

D. The Project's completion time shall not be extended for normal inclement weather for the named locale. Inclement weather days (for temperature and all forms of precipitation) per month have been anticipated and included in the contractual time period given for project completion. The Contractor's written and documented request to The City of Woodstock, through the Project Landscape Architect, for additional time may only be granted for actual days beyond those normally anticipated for the locale, per the schedule below, and only for which work was actually significantly impeded or precluded by the documented inclement weather.

January	4 Calendar Days
February	5 Calendar Days
March	6 Calendar Days
April	4 Calendar Days
May	3 Calendar Days
June	2 Calendar Days
July	2 Calendar Days
August	2 Calendar Days
September	2 Calendar Days
October	2 Calendar Days
November	2 Calendar Days
December	3 Calendar Days

E. The burden of proof and documentation for such request for additional time beyond the days indicated shall rest solely with the Contractor. Documentation must clearly show the additional weather days (for above normal inclement temperature and all forms of precipitation) are historically unique to The City of Woodstock, Georgia, area in general, and the Project's site in particular.

F. Contractor shall submit all days considered to be "Inclement Weather Days" to the City of Woodstock through the Project Landscape Architect each week for the week prior.

G. In the granting and approving of any additional time for completion of the Project, by a mutually agreed upon and properly executed Change Order, in no instance shall a change in Contract Sum be granted to the Contractor by The City of Woodstock for any adjustments to the Contract Time due to weather.

H. Requests for time extensions for delays due to inclement weather shall be reported by the Contractor, and considered and evaluated on a quarterly basis, as determined by the Project Landscape Architect, in consultation with The City of Woodstock. Only those actual days lost in excess of the cumulative allowable number of inclement weather calendar days, according to the schedule and data provided, will be considered. Time extensions for time losses due to weather conditions will be considered only for full complete calendar days.

I. No deduction or reduction in the contract time shall be made due to weather conditions of temperature and precipitation below or less than the anticipated or historical forecast.

J. Bidders shall review the climatological information as they solely deem necessary and draw their own individual conclusions for bidding and contracting purposes.

END OF SECTION 01 15 00

SECTION 01 22 00 - UNIT PRICES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Unit price work
   2. List of prices required
   3. Procedures for unit price work

B. Related sections:
   1. Applications for payment: As outlined in General Conditions and Bid Schedule.
   2. Procedures for modifications to the contract: As outlined in General Conditions.
   3. Procedures for utilization of testing and inspection: As outlined in Specifications.
   4. Contract closeout procedures: As outlined in Specification 01 70 00

1.02 UNIT PRICE LIST

A. Unit Price No. 1: Rock (Open Excavation)
   1. Removal of mass rock encountered and requiring excavation as defined in the specifications.
   2. Purpose: to adjust the contract sum when actual quantity is determined
   3. Quantity to be included in contract sum: 1 cubic yards
   4. Unit of measurement: cubic yard
   5. Include only the following in the unit price:
      a. Excavation to 1’ below plan subgrade, or below as defined in the specifications, hauling and disposal off site, cost of providing sufficient and suitable fill material from offsite from 1’ below subgrade to original level of rock removed, overhead and profit.
   6. Include all other costs in the contract sum.
   7. Method of measurement: Measurement will be made and verified by the City as outlined in the specifications.

B. Unit Price No. 2: Rock (Trench Excavation)
   1. Removal of trench rock encountered and requiring excavation as defined in the specifications.
   2. Purpose: to adjust the contract sum when actual quantity is determined.
   3. Quantity to be included in contract sum: 1 cubic yards
   4. Unit of measurement: cubic yard
   5. Include only the following in the unit price:
      a. Excavation to 6” below plan subgrade, or below as defined in the specifications, hauling and disposal off site, cost of providing sufficient and suitable fill material from off site from 6” below subgrade to original level of rock removed, overhead and profit.
   6. Include all other costs in the contract sum.
   7. Method of measurement: Measurement will be made and verified by the City as outlined in the specifications.

C. Unit Price No. 3: Excavation of unsatisfactory materials and replacement with suitable soil material
   1. Removal of unsatisfactory materials encountered and requiring excavation as directed by the City, and replacement with suitable soil material to subgrade as shown on plans.
   2. Purpose: to adjust the contract sum when actual quantity is determined.
   3. Quantity to be included in contract sum: 1 cubic yards
   4. Unit of measurement: cubic yard
   5. Include only the following in the unit price:
      a. Excavation to plan subgrade, hauling and disposal off site, cost of providing sufficient and suitable fill material to subgrade, allowing for replacement of all suitable material removed, overhead and profit.

6. Include all other costs in the contract sum.
7. Method of measurement: Measurement will be made and verified by the City as outlined in the specifications.

D. Unit Price No. 4: Excavation of unsatisfactory materials and replacement with #57 crushed stone.
   1. Removal of unsatisfactory materials encountered and requiring excavation as directed by the City, and replacement with suitable soil material to subgrade as shown on plans.
   2. Purpose: to adjust the contract sum when actual quantity is determined.
   3. Quantity to be included in contract sum: 1 cubic yards
   4. Unit of measurement: cubic yards
   5. Include only the following in the unit price:
      a. Excavation to plan subgrade, hauling and disposal off site, cost of providing sufficient and suitable material to subgrade, allowing for replacement of all suitable material removed, overhead and profit.
   6. Include all other costs in the contract sum.
   7. Method of measurement: Measurement will be made and verified by the City as outlined in the specifications.

E. Unit Price No. 5: Excavation of unsatisfactory materials and replacement with surge stone.
   1. Removal of unsatisfactory materials encountered and requiring excavation, as directed by the City, and replacement with surge stone to subgrade as shown on plans.
   2. Purpose: to adjust the contract sum when actual quantity is determined.
   3. Quantity to be included in contract sum: 1 cubic yards
   4. Unit of measurement: cubic yard
   5. Include only the following in the unit price:
      a. Excavation to plan subgrade, hauling and disposal off site, cost of providing sufficient and suitable surge stone to subgrade, allowing for replacement of all suitable material removed, overhead and profit.
   6. Include all other costs in the contract sum.
   7. Method of measurement: Measurement will be made and verified by the City as outlined in the specifications.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 22 00

SECTION 01 25 00 - SUBSTITUTIONS

PART 1 - GENERAL

1.01 SECTION INCUDES:

A. Requirements included

B. Substitutions / prior approvals

C. Submittal requirements

D. Contractor's representation

1.02 REQUIREMENTS INCLUDED:

A. Substitutions for products specified shall be allowed only under the conditions stated in this section.

1.03 SUBSTITUTIONS/PRIOR APPROVALS:

A. If it is desired to use products different from those indicated in the Contract documents, the party requesting the substitution shall make written application as described herein. The burden of proving equality of proposed substitutions rests on the party making the request for substitution.

B. Substitution requests shall only be considered from the awarded Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SUBMITTAL REQUIREMENTS:

A. Submit a separate request for each substitution.

B. Support each request with the following information:
   1. Date of request
   2. Name of party proposing substitution.
   3. Project name.
   4. Specification reference.
   5. Complete data substantiating compliance of proposed substitution with requirements stated in Contract Documents:
      a. Product identification, including manufacturer's name and address.
      b. Manufacturer's literature, identify:
         1) Product description.
         2) Reference standards.
         3) Performance and test data.
         4) Manufacturer's recommendation for use and installation.
      c. Samples, as applicable.
      d. Name and address of similar projects on which product has been used, and date of each installation.
   6. Itemized comparison of the proposed substitution with product specified, list all variations.
   7. Data relating to changes in construction schedule.
   8. Any effect of substitution on separate contracts.
   9. List of changes required in other work or products.

10. Designation of required license fees or royalties.
11. Designation of availability of maintenance services and sources of replacement materials.

3.02 CONTRACTOR'S REPRESENTATION

A. In connection with the use of any substitute item approved by the Owner and Project Landscape Architect, it shall be the General Contractor's responsibility to see that such items meet all space requirements, and that any alterations to connecting items necessitated by use of the alternate items are properly made at no increase in cost to the Owner, and that all items are in compliance with the specification requirements. Contractor shall waive all claims for additional costs caused by substitution which may subsequently become apparent.

END OF SECTION 01 25 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Construction Management Plan

B. Construction Progress Schedule

C. Preconstruction and progress meetings

D. Project coordination and scheduling

1.02 CONSTRUCTION MANAGEMENT PLAN

A. Submit a Construction Management Plan within the time limit specified in subsection 1.02 of Section 01 33 00.

B. The Construction Management Plan shall indicate how the construction activities are to be implemented and coordinated, and shall include the following at a minimum:
   1. Identification of key project personnel and lines of authority, and descriptions of the duties of the key personnel, and an organizational chart.
   2. Proposed work days and hours.
   3. Procedures for project communication and coordination.
   4. A diagram of the work site with a layout showing existing site conditions, and the location of anticipated haul routes, staging areas, office trailers, and access to the Site. The Contractor shall mark up one of the Contract Drawings to develop this diagram.
   5. Contractor quality control procedures.
   6. Lists of construction equipment, systems and materials to be used for the Work.
   7. Description of temporary facilities and utilities required to conduct the Work.
   8. Identification of all permits required to conduct the Work.
   9. Staging of operations, including sequencing of the Work, impact of Work on streets and properties, required timing and location of street closures if any, and routing of haul vehicles and construction equipment.
   10. Identification of areas for parking of equipment and personal vehicles and storage of materials.
   11. Traffic diversion and control plan, including a map with traffic patterns, description of signage, other required controls and route monitoring. Traffic controls must comply with the requirements specified in Section 01 50 00.

1.03 CONSTRUCTION PROGRESS SCHEDULE

A. Submit initial Construction Progress Schedule within the time limit specified in subsection 1.02 of Section 01 33 00.

B. Prepare the Construction Progress Schedule in the form of a horizontal bar chart. The Schedule is to be used as the baseline/target schedule.

C. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, duration, submittals with logic, and successor/predecessor logic. Identify all Critical Path elements.

D. The Construction Progress Schedule shall be in accordance with the required work sequence and completion dates specified in the Agreement.

E. The Construction Progress Schedule shall be revised as required to indicate anticipated and actual durations and sequence of activities. Copies of revised Schedules shall be provided to the Owner and Project Landscape Architect at the time of Progress Meetings for review and comment.

F. Indicate estimated percentage of completion for each item of Work at each submission. Schedule updates shall present baseline/target bars for individual construction activities directly beneath current timeline bars for comparison purposes.

G. Whenever it becomes apparent from the current Construction Progress Schedule that delays to the Critical Path have resulted, and hence, that the contract completion date will not be met, Contractor shall submit to the Owner and Project Landscape Architect for approval a written Recovery Plan stating the steps Contractor intends to take to remove or arrest the delay to the Critical Path in the Construction Progress Schedule. The Contractor shall take some or all of the following actions at no additional cost to the Project:
   1. Increased construction manpower in such quantities and crafts as will substantially eliminate, in the judgment of the Owner and Project Landscape Architect, the backlog of work.
   2. Increase the number of working hours per shift, shifts per working days per week, the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate, in the judgment of the Owner and Project Landscape Architect, the backlog of work (as allowed by local ordinances and the requirements of the Contract Documents).
   3. Reschedule activities to achieve maximum practical concurrence of accomplishment of activities, and comply with the revised Construction Progress Schedule.

H. The Contract Time will be adjusted by the Owner and Project Landscape Architect only as defined in the Contract Documents. If the Owner and Project Landscape Architect find that the Contractor is entitled to any extension of the Contract Time under the provisions of this Contract, the Owner's and Project Landscape Architect's determination as to the total number of days extensions will be based upon the currently approved Construction Progress Schedule and on all data relevant to the request for extension.

1.04 PRECONSTRUCTION MEETING

A. The Owner and Project Landscape Architect will schedule and administer a preconstruction meeting as specified in the following paragraphs.

B. The location of the preconstruction conference will be at a site convenient for all parties, as designated by the Owner and Project Landscape Architect.

C. Parties responsible for attending the preconstruction conference are representatives of the Owner, Contractor, Project Landscape Architect, and other parties as appropriate.

D. Agenda:
   1. Distribution of copies of the Contract Documents
   2. Designation of personnel – representatives of Owner, Project Landscape Architect, Contractor, and other parties as appropriate
   3. Review and clarification of the responsibilities of project personnel
   4. Review and clarification of the lines of communication
   5. Review of: Contractor's Construction Management Plan; Construction Progress Schedule; Schedule of Submittals; and lists of subcontractors and suppliers
   6. Procedures for submission and processing of submittals; and discussion of the importance of complete, correct, and timely submittals
   7. Procedures for measurement and payment, including the Schedule of Values, applications for payment, and contract modifications
   8. Procedures for Contractor's submittal of requests for information (RFIs), and Owner's or Project Landscape Architect's issuance of Field Orders, interpretations and clarifications
   9. Discussion of construction quality assurance and quality control procedures
   10. Procedures for maintaining Project Record Documents

11. Use of premises, including work areas, storage areas, temporary facilities, and housekeeping procedures
12. Site security and work hours
13. Scheduling for progress meetings
14. Other items as appropriate

1.05 PROGRESS MEETINGS

A. The Owner and Project Landscape Architect will schedule and administer regular progress meetings. The progress meetings will be held as determined by the Owner.

B. The location of the progress meetings will be at a site convenient for all parties, as designated by the Owner.

C. Attendance: Representatives of Owner, Project Landscape Architect, Contractor, and other parties as appropriate.

D. Agenda:
1. Minutes of previous meeting
2. Health and safety issues
3. Community and/or public issues
4. Construction progress review
    a. Contractor's estimate of planned percent completion compared to actual percent completion
    b. Review of activities completed since last meeting
    c. Two-week "look-ahead" of anticipated work items
5. Materials and Products:
    a. Status of submittal reviews
    b. Substitutions
    c. Ordering of materials and products, and delivery issues
    d. Storage and protection of materials and products
6. Deficiencies:
    a. Identification of deficiencies
    b. Status of correction
    c. Field observations, problems, and conflicts
    d. Regulatory and/or environmental issues (permits, etc.)
7. Requests for information
8. Progress payments
9. Contract modifications
10. Action items
11. Other business

1.06 PROJECT COORDINATION AND SCHEDULING

A. Coordinate scheduling, submittals, and Work of the various sections of the Specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. It is the responsibility of the Contractor performing the defined Scope of Work to coordinate the Work with the other trades in order to accomplish the completion of the total Project within the time required by the overall Project Schedule.

C. Contractor acknowledges that other trades and scopes of work may be in progress in connection with the Project as required to meet the overall Project Schedule. Contractor agrees to complete the Work so as to accommodate the completion of the other trades and work packages and to provide necessary barricades and other facilities to protect the Work from other trades and work packages.

D. Contractor shall initiate the Work in accordance with the Project Schedule, and shall thereafter proceed and complete performance of the Work promptly, diligently and in such a manner and sequence with the work of other contractors in order to permit completion of the Project within the required schedule.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 31 00

SECTION 01 32 33 - CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions in this section are mandatory procedures for preparing and submitting construction photographs.

1.02 SUBMITTALS

A. Take progress photographs on a monthly basis. Schedule photography to allow submittal of photos with monthly Application for Payment.

B. Take photographs beginning at the first month of construction activity and terminating at Date of Final Acceptance.

C. Take photographs on same day each month, weather permitting, and at same time of day.

D. Four locations of which photos will be taken will be selected by Owner and Project Landscape Architect. Take photos of same standard location each month, unless otherwise directed by Owner and Project Landscape Architect. Assign a number of each of the standard photo locations, for comparison with previous and future submittals.

E. In addition to photographs of standard locations, take eight photographs which best show significant elements of the Work. Locations for these photos shall be selected by the Contractor. Assign a number to each of the non-standard photograph locations, for comparison with previous and future submittals.

F. Provide Aerial Photographs monthly of the project site before and during construction, and upon completion of the project. Photographs shall be four different views that show the entire property.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

A. Submit photographs in electronic copy format, with Contractor's Application for Payment. Electronic format copy must be a high-resolution JPEG for 8" x 10" print, with a minimum 1536 x 1024 pixel image resolution.

B. Identify each photograph with photograph number of location or element of Work. Provide written description of photograph number, project name, date, and Contractor's name.

C. Aerial Photographs shall be submitted as high-resolution JPEG's for 8" x 10" print, with a minimum 1536 x 1024 pixel image resolution prior to each application for payment.

END OF SECTION 01 32 33

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Initial and progress submittals

B. Schedule of submittals

C. Shop drawings and samples

D. General procedures for submittals

E. Owner’s and Project Landscape Architect’s review of submittals

1.02 INITIAL SUBMITTALS

A. Submit the following to the Owner and Project Landscape Architect for review not more than 15 days after issuance of the Notice to Proceed:
   1. Construction Management Plan (refer to Section 01 31 00)
   2. Spill Prevention, Control and Countermeasures Plan (refer to Section 01 50 00)
   3. Initial Construction Progress Schedule (refer to Section 01 31 00)
   4. Schedule of Submittals (refer to this Section)

1.03 PROGRESS SUBMITTALS

A. Submit the following to the Owner and Project Landscape Architect for review during the progress of the Work and at project completion:
   1. Applications for Payment (refer to Contract Documents)
   2. Shop drawings, including product data and samples
   3. Surveying information (refer to Section 01 71 23)
   4. All other miscellaneous submittals not mentioned above but specified in individual specification sections

1.04 SCHEDULE OF SUBMITTALS

A. The Schedule of Submittals shall include the following:
   1. List of all submittals required, with applicable specification section number and paragraph number indicated
   2. The planned dates for Contractor's submittals
   3. The dates approved submittals will be required from the Owner and Project Landscape Architect
   4. The planned dates of manufacture, delivery and installation of materials, supplies and equipment

B. Maintain an accurate updated Schedule of Submittals. Include the following items:
   1. Submittal description and file number assigned as each submittal is made
   2. Date sent to Owner and Project Landscape Architect
   3. Date returned to Contractor from Owner and Project Landscape Architect
   4. Status of submittal
   5. Date of resubmittal and return (if applicable)
   6. Date material released for fabrication (if applicable)
   7. Projected date of fabrication (if applicable)
   8. Projected date of delivery to Site (if applicable)

1.05 SHOP DRAWINGS

A. The term “Shop Drawings” shall be as defined in the Contract Documents. Shop Drawings shall include:
   1. Fabrication, erection, setting, and schedule drawings
   2. Manufacturers’ scale drawings
   3. Manufacturers’ product data (such as manufacturer's product specification and installation instructions, manufacturers’ printed statements of compliance and applicability, catalog cuts, product photographs, production or quality control inspection and test reports and certifications, mill reports, and printed product warranties).

B. All details on Shop Drawings submitted for approval shall clearly show the relationships of the various parts to the main members and lines of the structure or equipment. Where correct fabrication of the Work depends upon field measurements, such measurements shall be made and noted on the Shop Drawings before being submitted for approval.

1.06 SAMPLES

A. Furnish, for the approval of the Owner and Project Landscape Architect, samples required in the Specifications or requested by the Owner and Project Landscape Architect. Samples shall be delivered to the Owner and Project Landscape Architect in quantities and sizes as specified. A minimum of two samples of each item shall be submitted unless otherwise specified. The Contractor shall pre-pay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in the Work until approved by the Owner and Project Landscape Architect.

B. Samples specified in individual sections, include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols, and units of work to be used by the Owner and Project Landscape Architect for independent inspection and testing, as applicable to the Work.

C. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.

D. Approved samples not destroyed in testing shall be stored at the site of the Work. Approved samples in good condition will be marked for identification and may be used in the Work, unless otherwise directed by the Owner and Project Landscape Architect. Materials incorporated in the Work shall match the approved samples. Samples which fail testing or are not approved will be returned to the Contractor at his expense, if so requested at time of submission.

1.07 GENERAL PROCEDURES FOR SUBMITTALS

A. Submit, with reasonable promptness and in such sequence so as to cause no delay in the Contract Work, all Shop Drawings, quality control reports, record drawings, and other submittals required by the Contract Documents. No extension of time will be authorized because of the Contractor's failure to transmit complete and acceptable submittals sufficiently in advance of incorporation of products in the Work.

B. Provide no less than 15 days for review from the time the Owner and Project Landscape Architect receives them, unless otherwise agreed with the Owner and Project Landscape Architect.

C. Submit the number of copies of submittal packages that Contractor requires, plus three copies which will be retained by the Owner and Project Landscape Architect.

D. Submittals shall clearly indicate any deviations or variations from the requirements of the Contract Documents.

E. All submittals shall be furnished with the following information at a minimum (as applicable to the submittal):
   1. Number and title of the submittal
   2. Date of submittal
   3. Name of Contractor, subcontractor, and manufacturer
   4. Clear identification of contents
   5. Contractor's certification statement as defined in subsection 1.07.F below
   6. Specification section reference
   7. Contract Drawing number reference

F. Each submittal shall bear a stamp or specific written indication that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal. The certification shall be signed by the Contractor's authorized representative, and shall read as follows:
   1. "By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data, and I have checked and coordinated each item with other applicable approved Shop Drawings and all Contractor requirements"

G. Submittal packages that do not include the Contractor's certification statement will be returned to the Contractor, without review at the Owner's and Project Landscape Architect's option, for non-conformance with this requirement.

H. Submittals and shop drawings to be submitted as digital 'PDF' files. Large-size shop drawings shall also be submitted with four (4) full-sized hard copies.

1.08 OWNER'S AND PROJECT LANDSCAPE ARCHITECT'S REVIEW OF SUBMITTALS

A. Owner's and Project Landscape Architect's review is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Contractor is responsible for compliance with the Contract Documents, confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques (including means, methods, and sequencing) of construction, coordinating the Work with that of all other trades, and performance of the Work in a safe and satisfactory manner. The Owner's and Project Landscape Architect's review shall not relieve the Contractor from compliance with the Contract Documents.

B. Contractor shall not begin any work or purchase any materials or products affected by a submittal which has been returned with the notations "Revise and Resubmit" or "Not Acceptable" until a revision or correction of the submittal has been resubmitted and returned with the notations "Approved" or "Approved as Noted". Corrections noted on the submittals shall be followed without exception. The Contractor shall be responsible for and bear all costs of damages that may result from the ordering of any material or from proceeding with any part of the Work prior to the review and approval by Owner and Project Landscape Architect of the necessary submittals.

C. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing on the letter of transmittal and on resubmitted Shop Drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the Owner and Project Landscape Architect on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the Contractor. The Contractor shall make corrections to any Work done because of this type revision that is not in accordance to the Contract Documents as may be required by the Owner and Project Landscape Architect.

D. Partial submittals will not be reviewed. The Owner and Project Landscape Architect will determine the completeness of a submittal. Submittals not complete will be returned to the Contractor. The Owner and Project Landscape Architect may provide a list or mark the submittal directing the Contractor to the areas that are incomplete.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 33 00

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Regulatory requirements

B. References

C. Source quality control testing

D. Quality control of installation

E. Manufacturers' field services and reports

F. Quality control (QC) services

G. Duties of QC firms and laboratories

H. Limits on authority of QC firm(s)

I. Contractor's responsibilities

1.02 REGULATORY REQUIREMENTS

A. Comply with all applicable local, state and federal standards and regulations.

1.03 REFERENCES

A. Conform to latest edition of reference industry standards as of date of the Contract Documents or date otherwise specified in specification sections.

B. If specified reference standards conflict with Contract Documents, request clarification from Project Landscape Architect before proceeding.

C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 SOURCE QUALITY CONTROL TESTING

A. Materials and equipment forming the Work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents.

B. Provide statements or certificates from the manufacturers, fabricators and/or suppliers as specified in individual sections.

C. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no extra charge to the Project shall be allowed on account of such testing and certification.

1.05 QUALITY CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply fully with manufacturers' instructions, including each step-in sequence.

C. If manufacturers' instructions conflict with Contract Documents, request clarification from Owner and Project Landscape Architect before proceeding.

D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Work shall be performed by persons qualified to produce workmanship of specified quality.

1.06 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel (representatives) to observe and document site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, testing and adjusting of equipment as applicable, and initiation of instructions when necessary.

B. Submit qualifications of manufacturers' and suppliers' representatives to Owner and Project Landscape Architect 15 days in advance of required observations. Representatives are subject to approval by Owner and Project Landscape Architect.

C. The suppliers' or manufacturers' representatives shall report observations and site decisions, or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

1.07 QUALITY CONTROL SERVICES

A. Owner will employ and pay for the services of inspection QC firms to perform specified inspection and testing services. Contractor responsible to request testing services when needed.

B. Performance of quality control inspection and testing by Owner’s QC firm(s) shall in no way relieve Contractor of obligation to perform the Work in accordance with requirements of the Contract Documents.

C. Retesting required because of non-conformance to specifications will be charged to the Contractor by deducting inspection and testing charges from the Contract Price. Retesting charges will be determined in accordance with testing firm's standard fee schedule.

D. Contractor shall allow sufficient time in the Construction Progress Schedule for quality control testing, evaluation, and reporting of test results. Contractor shall give particular attention to this in areas where results/approvals will be required prior to continuing with the Work.

E. If Contractor elects to continue with work in advance of receipt of test results and Owner’s and Project Landscape Architect's approval, it shall be understood that it shall be entirely at Contractor's risk. Owner and Project Landscape Architect will not be responsible for consequential delays attributable to failing test results or retesting requirements.

F. Contractor is responsible for coordination of testing and is liable for the cost of any site visits he schedules if the site is not ready for inspection upon arrival.

1.08 DUTIES OF QC FIRMS AND LABORATORIES

A. The Owner's QC Firm(s) shall:
   1. Provide qualified personnel at the site;
   2. Cooperate with Owner and Project Landscape Architect in performance of services;
   3. Perform specified inspection, sampling, and testing of products in accordance with specified standards;
   4. Promptly notify Project Landscape Architect of observed irregularities or non-conformance of Work or Products; and
   5. Perform additional inspections and tests required by the Owner and Project Landscape Architect.

1.09 LIMITS ON AUTHORITY OF QC FIRM(S)

A. The Owner's QC Firm(s) shall not release, revoke, alter, or enlarge on requirements of Contract Documents.

B. The Owner's QC Firm(s) shall not approve or accept any portion of the Work, and shall not assume any duties of Contractor, Project Landscape Architect or Owner.

1.10 CONTRACTOR'S RESPONSIBILITIES

A. Furnish incidental labor and facilities:
   1. To provide access to work to be tested;
   2. To obtain and handle samples at the Site or at the source of products to be tested;
   3. To facilitate inspections and tests; and
   4. For storage and curing of test samples as required.

B. Coordinate with Owner and Project Landscape Architect sufficiently in advance of construction operations to allow for assignment of personnel and scheduling of tests and inspections.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 40 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Submittals

B. Temporary utilities

C. Temporary sanitation facilities

D. Protection of existing utilities and surface facilities

E. Protection of installed work

F. Fencing and other barriers

G. Public traffic control

H. Construction roads and parking

I. Site security

J. Site cleaning

K. Noise control

L. Control of pollutants

M. Dust control

N. Field offices (provided by the Contractor)

1.02 SUBMITTALS

A. The following submittals referenced in this Section shall be submitted to the Owner and Project Landscape Architect within the time period specified in subsection 1.02.A of Section 01 33 00:
   1. Traffic Control Plan (see subsection 1.09)
   2. Spill Prevention, Control and Countermeasures Plan (see subsection 1.14)
   3. Layout plan for temporary field offices; include as part of the Construction Management Plan specified in Section 01 31 00.

1.03 TEMPORARY UTILITIES

A. Temporary Power and Lighting
   1. Connect to existing power service to provide required temporary electricity for the Work. Pay all costs for connection and use of service.
   2. Temporary electrical utilities shall be installed by a licensed electrician. All electrical connections shall meet appropriate NEMA ratings consistent with the intended service. Comply with National Electrical Code (NEC) and all other applicable federal, state and local codes and regulations.
   3. Coordinate with local electric utility and Owner. Obtain any necessary permits.
   4. Provide and maintain adequate lighting for construction operations and field offices in accordance with

applicable codes and regulations.
5. Pay costs for power service during construction.

B. Temporary Water
1. Connect to existing water source for construction operations. Pay all costs for installation, maintenance and use of the water service. Install flow meters, pipelines and accessories as required by the local water authority.
2. Provide and pay for adequate drinking water for construction personnel.

C. Provide adequate fire protection at the Site as required by local fire codes and standards.

D. Temporary Telephone Service
1. Cellular phones shall be used for on-site communication.
2. Pay all costs for telephone utility services.

E. Provide, maintain and pay for utility services to Contractor's field office (if mobilized to Site) as specified in subsection 1.16.

1.04 TEMPORARY SANITATION FACILITIES

A. Provide and maintain (as applicable) temporary potable water, toilets, washing facilities, and other sanitation facilities on construction sites in accordance with 29 CFR 1926.51, all other applicable regulations, and as discussed in the erosion, sedimentation and pollution control notes on the Drawings.

B. Job sites without a temporary sanitary sewer shall be provided with temporary toilet facilities such as chemical toilets, recirculating toilets or combustion toilets in accordance with local codes and regulations. Portable toilets shall be cleaned and serviced a minimum of one time per week by a licensed portable toilet facility provider in compliance with applicable local and state regulations. Provide a sufficient number of portable toilet facilities for Contractor’s work crews, and authorized visitors. The number of toilets per employee shall conform to the requirements of 29 CFR 1926.51 at a minimum.

C. The temporary sanitation facilities shall be provided at the time of mobilization and maintained in a clean and sanitary condition for the duration of the Work.

1.05 PROTECTION OF EXISTING UTILITIES

A. Protect all existing active and inactive utilities from damage during the Work unless indicated to be removed or abandoned on the Drawings or in these Specifications. If damaged, the utilities shall be repaired at the Contractor's expense.

B. Contact and cooperate with the Owner and the utility companies to locate all utilities (including pipelines, electrical cables, power poles and other utility structures) on the Site prior to beginning the Work. Conform to the requirements of the Contract Documents for locating and protection of Underground Facilities.

C. The approximate locations of selected utilities are shown on the Drawings. Additional utilities not indicated on the Drawings or reference documents may exist. Notify Owner and Project Landscape Architect if unanticipated utilities are encountered and request guidance regarding whether they are to remain or be removed.

D. Comply with the requirements of the “Georgia Utility Facility Protection Act” (Chapter 9 of Title 25 of the Official Code of Georgia Annotated) for protection of underground utilities, including the requirement to give not less than 48 hours notice to the Utilities Protection Center of Georgia.

E. Comply with the requirements of the utility owner and the “High-voltage Safety Act” (Chapter 3 of Title 46 of the Official Code of Georgia Annotated) for protection of overhead high-voltage lines, including the requirement to give notice to the Utilities Protection Center of Georgia at least 72 hours prior to commencing work in the vicinity of the high-voltage lines.

1.06 PROTECTION OF EXISTING SURFACE FACILITIES

A. Protect all existing surface facilities (including but not limited to buildings, roadways, walkways, curbs and gutters) from damage during the Work unless otherwise indicated to be demolished or abandoned.

B. Provide protection for plant life designated to remain (or not designated for removal) as specified in Section 31 10 00.

C. Repair or replace any existing buildings, fencing, pavement, walkways, curbs and gutters, and other surface facilities that are cracked, broken or otherwise damaged by Contractor, to original condition, or better, in accordance with local requirements at no additional cost to the Project. Assessment of damage will be made by the Owner and Project Landscape Architect based on field observations.

1.07 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where required in individual specification sections.

B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.

1.08 FENCING AND OTHER BARRIERS

A. If requested by the Owner, install temporary chain link fencing to prevent unauthorized entry to construction areas, and to protect existing facilities and adjacent properties from damage from construction operations. Maintain fencing on a daily basis and replace or repair damaged materials.

B. Provide barricades, covered walkways and other temporary construction required by governing authorities for public rights-of-way. All temporary construction shall be in accordance with applicable federal, state and local laws and building codes.

C. Furnish and post signs warning the general public to prevent unauthorized access and to identify hard hat area.

D. Clearly mark and protect open excavations using barriers, signs and other markers in accordance with all applicable regulations. Install high-visibility fencing (such as orange high-density polyethylene safety fencing), caution tape, suitable barricades, “No Trespassing” and other warning signs as required. An excavation shall be classified as “deep” if it presents a trip or fall hazard or as otherwise defined in applicable OSHA regulations. Maintain barriers and signs on a daily basis at each excavation and replace damaged materials until excavation has been backfilled.

1.09 PUBLIC TRAFFIC CONTROL

A. Coordinate with the local jurisdictions and comply with applicable requirements for maintaining and protecting traffic on all affected public roads during the Work. A Traffic Control Plan shall be developed and submitted to the Owner and Project Landscape Architect for review. Contractor shall submit the Traffic Control Plan to the local jurisdiction for approval and permitting as required.

B. Protect and divert pedestrian and vehicular traffic when needed in compliance with the requirements of City of Brookhaven, DeKalb County, Georgia DOT, and other local agencies having jurisdiction. Traffic control shall include: provision of properly trained and equipped flagmen; erection of barricades; placing of lights around and in front of equipment and the Work; and the erection and maintenance of adequate warning, danger, and directional signs. Pedestrians and the traveling public shall be protected from injury or damage.

C. Obtain and pay for all required road/lane closure permits, haul route permits, and other traffic control permits required for execution of the Work.

D. Traffic control devices shall comply with the “Manual on Uniform Traffic Control Devices”, Part 6 Temporary Traffic Control, published by U.S. Department of Transportation, latest edition.

1.10 CONSTRUCTION ROADS AND PARKING

A. Contractor’s vehicles shall enter and exit the Site only at the locations designated on the Drawings.

B. If needed, construct temporary gravel surface parking areas in area(s) approved by the Owner and Project Landscape Architect to accommodate construction personnel. When Site space is not adequate, provide additional off-site parking. Vehicles shall not be parked in any locations where they impede traffic or access by emergency vehicles. Vehicles shall not be parked beneath the canopy of existing trees if the trees are scheduled to remain.

C. Repair existing roads damaged by operation of construction equipment as determined by the Owner and Project Landscape Architect in compliance with applicable requirements of the City of Woodstock.

1.11 SITE SECURITY

A. Provide security and facilities to protect the Site from unauthorized entry, vandalism or theft. Initiate security program at project mobilization and maintain the security throughout the duration of the Work.

1.12 SITE CLEANING

A. Site housekeeping shall be utilized to ensure that the Site is kept in a clean and orderly condition throughout the Work. Comply with the requirements indicated on the Drawings, at a minimum, the following requirements:
   1. Supply all covered containers required for collection, storage and removal of trash, rubbish and debris resulting from the Work. No containers will be supplied by the Owner. Remove trash, rubbish and debris from the Site at least once each week and dispose of off-site at a licensed waste disposal facility in accordance with all applicable regulations.
   2. Burying of trash, debris, or similar by-products of the Work is strictly prohibited

B. Bermed containment areas or equivalent shall be provided for washing concrete truck chutes and other placement equipment. Disposal of excess concrete or drum washout water shall not be allowed onsite.

C. Provide weekly janitorial services for field office(s) (if mobilized for the Work) to perform cleaning and maintenance of field office and storage areas. Maintain field office approach walks free of mud, water, and snow.

D. Implement measures to ensure that public roads and rights-of-way and adjacent properties are kept free of any impact due to the Work. These measures shall include, but shall not be limited to, the following:
   1. Construction and operation of construction exit(s) to prevent tracking of materials off-site.
   2. Covering all trucks transporting materials to and from the Site.
   3. Controlling dust, smoke, or other emissions from the Site as a result of the Work.
   4. Keeping public rights-of-way free of debris and refuse from the Site.

E. Any impact to public roads, rights-of-way or adjacent properties shall require immediate attention and corrective action by the Contractor at no cost to the Owner.

1.13 NOISE CONTROL

A. Contractor is responsible for controlling noise levels by utilizing appropriate noise control on equipment and by complying with required work hour restrictions and other limitations imposed by authorities having jurisdiction.

B. Contractor's vehicles and equipment shall have appropriate noise reduction and protection devices that conform to the latest OSHA standards (including 29 CFR 1926.52), and other applicable state, county and local ordinance requirements.

C. For work performed near the property boundary or near inhabited areas, the Contractor shall consider additional noise mitigation measures if warranted by off-site property uses.

D. Noise mitigation measures shall include, but shall not be limited to, utilizing noise control devices, limiting night work hours for noisy activities, and scheduling and controlling traffic.

E. Coordinate with the Owner to revise work procedures and hours as needed to address noise complaints, if received, while implementing methods to preserve the project schedule without additional cost to the Owner.

1.14 CONTROL OF POLLUTANTS

A. If fuel or other petroleum-based products will be stored on-site to support equipment fleet, prepare and implement a Spill Prevention, Control and Countermeasures Plan (SPCC Plan) in accordance with the provisions of 40 CFR Part 112, Oil Pollution Prevention, latest edition. The SPCC Plan shall be submitted to the Owner and Project Landscape Architect for review, and shall include, but shall not be limited to, the following:
   1. Provisions for the prevention of spills as well as clean-up of spills of gasoline, diesel fuel, hydraulic fluids, and lubricants.
   2. Names and telephone numbers of local and State officials to be contacted in the event of a spill.
   3. List of subcontractors that may be used to manage off-site impacts of spills.
   4. Fire prevention and fire fighting measures to be employed for responses to fires that may occur in equipment, or elsewhere on the Site.
   5. Services available from the local fire department and coordination with services of the Contractor's on-site personnel.

B. Prevent disposal of wastes, effluents, chemicals, or other such substances into sanitary or storm sewers discharging off-site without treatment in accordance with permits obtained by the Contractor.

C. Fueling of equipment shall be performed away from storm drain inlets. If above-ground fuel storage tanks (ASTs) are present on-site, the ASTs shall be stored in an approved bermed and lined containment areas.

D. Provide systems for control of atmospheric pollutants. Prevent dust, smoke or other emissions from impacting adjacent properties. Prevent toxic concentrations of chemicals, and prevent harmful dispersal of pollutants into the atmosphere.

E. Contractor's equipment used during construction shall conform to all current federal, state and local laws and regulations.

1.15 DUST CONTROL

A. During construction, the Contractor shall (at a minimum) implement, monitor and maintain best management practices (BMPs) for erosion, sedimentation and pollution control (ES&PC), including airborne transport of sediment (dust carried by wind) and physical transport by vehicles as indicated on the Drawings.

B. Control dust particles, smoke, aerosols and gaseous by-products from construction activities at all times, including weekends, holidays and hours when the Work is not in progress. Additional requirements for dust control are presented on the Drawings.

C. Maintain excavations, stockpiles, and other areas within the Work area free from particulates which would cause the air pollution standards to be exceeded or cause a hazard or nuisance.

D. Provide all labor, materials and equipment, including water trucks and dust suppressant, needed to limit visible dust generation during the Work.

1.16 FIELD OFFICES

A. Furnish and maintain field office trailer(s) for Contractor's use. The field office trailer(s) shall be structurally sound, secure, and weather-tight, with floors raised above ground, and conform to all applicable regulations for the occupancy classification.

B. The field office(s) shall be equipped with sufficient lighting, electrical outlets, restrooms, and heating, cooling and ventilating equipment and vents. All systems shall comply with applicable codes, laws and regulations.

C. Provide and maintain all required utilities for the temporary field office(s) and associated facilities necessary to support work crews in compliance with applicable codes, laws and regulations and as acceptable to Owner and Project Landscape Architect from time of mobilization until Substantial Completion of the Work.

D. Prepare and submit a layout plan of all proposed field offices, and related amenities and utilities to be used for the duration of the Project. The layout plan shall be included in the Construction Management Plan as specified in Section 01 31 00. Do not proceed with furnishing and installation of temporary field office(s) prior to Owner and Project Landscape Architect approval of location(s).

E. Clean field office(s) and surrounding areas as specified in subsection 1.12.

F. Maintain the temporary field office(s) and related temporary utilities until Substantial Completion of the Work, at which time the temporary facilities shall be removed.

G. Provide separate heat/air conditioned construction trailer for resident inspector with, at a minimum, local and long distance telephone service, fax, copy machine, restroom with toilet and sink, sanitary system, hot/cold water, office space, desk with office chair, two drawer lockable file cabinet, plan rack and table, conference table and chairs to accommodate ten people.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 50 00

SECTION 01 57 13 - TEMPORARY SOIL EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SUMMARY

A. Contractor shall implement and maintain best management practices (BMPs) and perform other required activities as indicated on the Erosion, Sedimentation and Pollution Control (ES&PC) Plan, which is included as a part of the Drawings. This Section shall be considered supplementary to the provisions and measures presented in the approved ES&PC Plan.

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):
   1. AASHTO M 288, Geotextile Specification for Highway Applications

B. Georgia Soil and Water Conservation Commission (GSWCC):
   1. "Manual for Erosion and Sediment Control in Georgia", latest edition

C. Georgia Department of Transportation (GDOT):
   1. "Standard Specifications, Construction of Transportation Systems", 2001 Edition (GDOT Standard Specifications)

1.03 QUALITY ASSURANCE

A. Comply with the requirements of pollution control laws, rules and regulations of governmental authorities having jurisdiction, and applicable permit conditions as presented on the Drawings, including, but not limited to, the following:
   1. State of Georgia's "Erosion and Sedimentation Act of 1975" (O.C.G.A. Title 12, Chapter 7).

1.04 PROJECT REQUIREMENTS

A. During construction, the Contractor shall (at a minimum) implement BMPs as indicated on the ES&PC Plan. The purpose of the provisions of the ES&PC Plan are to provide for the construction, monitoring (including reporting) and maintenance of temporary control measures to control soil erosion and sediment transport within the Site and prevent the transport of sediment from the Site as a result of the Work

B. The use of temporary control measures shall be coordinated with the permanent erosion control features specified elsewhere to the extent practical, to assure effective and continuous erosion control.

PART 2 - PRODUCTS

2.01 CONSTRUCTION EXITS

A. Construction exits shall be constructed using aggregate and geotextile conforming to the requirements shown on the Drawings. Geotextile to be installed under the aggregate shall be nonwoven geotextile conforming to the specifications for Survivability Class 1 geotextile as defined in AASHTO M 288.

2.02 CONCRETE WASHOUT AREA

A. Concrete washout area shall be as indicated on Drawings.

2.03 FILTER FABRIC AND SUPPORTING FRAME INLET PROTECTION

A. Filter fabric and supporting frame inlet protection shall be as indicated on Drawings.

2.04 DISTURBED AREA STABILIZATION WITH TEMPORARY SEEDING

A. Grass seed for temporary vegetation shall be as indicated on the Drawings.

2.05 DISTURBED AREA STABILIZATION WITH MULCHING

A. Mulch shall be as indicated on the Drawings.

2.06 COMPOST FILTER SOCK

A. Compost filter sock shall be as indicated on the Drawings.

2.07 STRAW BALE CHECK DAM

A. Straw bale check dam shall be as indicated on Drawings.

2.08 3’ TALL ORANGE CONSTRUCTION FENCE

A. 3’ tall orange construction fence shall be installed as indicated on Drawings.

2.09 OTHER TEMPORARY CONTROLS

A. Furnish materials for other erosion, sedimentation and pollution controls as indicated on the Drawings and in accordance with the applicable requirements of the referenced GSWCC Manual.

PART 3 - EXECUTION

3.01 GENERAL PROCEDURES

A. Comply with the requirements indicated on the Drawings and specified in this Section. Modify and enhance erosion and sedimentation controls throughout the Work as necessary to address Site conditions.

B. Install BMPs prior to any land disturbance.

C. Erosion and sediment control measures shown on the Drawings are minimal requirements. It is the responsibility of the Contractor to install additional measures as needed to control sediment, whether or not directed to add such measures by the Owner and Project Engineer.

D. Incorporate all permanent erosion and sediment control measures (including seeding) into the Project at the earliest practical time.

E. At the time of installation, the filter fabric will be rejected if it has defects, deterioration or damage incurred during manufacture, transportation, storage or installation. Replace at the Contractor’s expense.

3.02 INSPECTION AND MAINTENANCE

A. Temporary erosion and sediment control measures shall be inspected and maintained as indicated on the Drawings until completion of the Work.

B. Replace or reconstruct ES&PC measures when the structures no longer effectively perform.

3.03 REMOVAL OF TEMPORARY CONTROL MEASURES

A. Temporary erosion and sediment control measures shall not be removed until approved by the Owner and Project Engineer. The upgradient areas shall be sufficiently stabilized with permanent erosion control measures as specified prior to removal.

END OF SECTION 01 57 13

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Definition of products

B. Transportation and handling

C. Storage and protection

D. Product options

E. Substitutions

1.02 DEFINITION OF PRODUCTS

A. The term “Products” refers to new material, machinery, components, equipment, fixtures, and systems forming the Work. Products do not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.

1.03 TRANSPORTATION AND HANDLING

A. Comply with the requirements of individual specification sections.

B. Transport and handle products in accordance with manufacturers' instructions.

C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

D. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, and damage.

1.04 STORAGE AND PROTECTION

A. Comply with to the requirements of individual specification sections.

B. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.

C. For exterior storage of fabricated products, place on sloped supports, above ground.

D. Provide off-site storage and protection when site does not permit on-site storage or protection.

E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

F. Store loose granular materials on solid flat surfaces in well-drained areas. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store products by methods to prevent damage.

H. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

1.05 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications; no options or substitutions allowed without written authorization by the Owner and Project Landscape Architect.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following subsection 1.06.

D. ALL REFERENCES TO VENDORS AND 'APPROVED MANUFACTURERS' ARE INCLUDED FOR DESCRIPTION OF QUALITY AND CONTENT OF THE DESIGNATED EQUIPMENT/MATERIALS AS A BASIS OF DESIGN. EQUIVALENT ITEMS MAY BE ACCEPTED IF THEY MEET ALL STANDARDS OF QUALITY AND PURPOSE FOR THE INTENDED USE, AS DETERMINED BY CITY OF BROOKHAVEN.

1.06 SUBSTITUTIONS

A. Owner and Project Landscape Architect will consider requests for Substitutions only within 30 days after date established for commencement of the Work in the Notice to Proceed.

B. Subsequent Substitutions will be considered only when a product becomes unavailable through no fault of the Contractor. Improper planning will not be considered as a reason to increase Contract Price as a result of product substitution.

C. In addition to the provisions of the General Conditions, a request for a Substitution constitutes a representation that the Contractor:
   1. Shall provide the same warranty for the Substitution as for the specified product.
   2. Shall coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to the Project.

D. Substitutions will not be considered when they are indicated or implied on Shop Drawings or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

E. Substitution Submittal Procedure:
   1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
   2. Submit Shop Drawings, product data, and certified test results attesting to the proposed product equivalence.
   3. Owner and Project Landscape Architect will notify Contractor in writing of decision to accept or reject request.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 60 00

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Starting of systems.

D. Demonstration and instructions.

E. Testing, adjusting and balancing.

F. Protecting installed construction.

G. Project record documents.

H. Operation and maintenance data.

I. Manual for materials and finishes.

J. Manual for equipment and systems.

K. Spare parts and maintenance products.

L. Product warranties and product bonds.

M. Maintenance service.

N. As-built Record Documents.

1.02 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Owner and Project Landscape Architect's review.

B. Provide submittals to Owner and Project Landscape Architect as required by authorities having jurisdiction.

C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

D. Owner will occupy all of building as specified in Section 01 10 00 - Summary.

1.03 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

B. Clean and remove temporary labels, stains and foreign substances.

C. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.

D. Clean site; sweep paved areas, rake clean landscaped surfaces.

E. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.04 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Owner's personnel 2 weeks prior to date of Substantial Completion.

B. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

C. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at Project location.

D. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

1.05 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Protect surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

D. Prohibit traffic from landscaped areas.

1.06 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed Shop Drawings, Product Data, and Samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish main floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

G. As-built drawings:
   1. Contractor must submit to Project Landscape Architect and Owner with request for review the full set of marked-up As-built Record Drawings and Final As-built Record Drawings as described later in this Section.

H. Submit documents to Owner and Project Landscape Architect with request for final Application for Payment.

1.07 OPERATION AND MAINTENANCE DATA

A. Submit data bound in 8-1/2 x 11 inch (A4) text pages, three D side ring binders with durable plastic covers, and complete document in ‘PDF’ format.

B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.

C. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

E. Contents: Prepare Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, telephone numbers, websites and email addresses of Owner, Project Landscape Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions arranged by system and subdivided by applicable specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.
      b. Air and water balance reports.
      c. Certificates.
      d. Photocopies of warranties and bonds.

1.08 MANUAL FOR MATERIALS AND FINISHES

A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Owner and Project Landscape Architect will review draft and return one copy with comments.

B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within 10 days after acceptance.

C. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Owner and Project Landscape Architect comments. Revise content of document sets as required prior to final submission.

D. Submit two sets of revised final volumes in final form within 10 days after final inspection, including digital files in 'PDF' format.

E. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations.

F. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

G. Additional Requirements: As specified in individual product specification sections.

H. Include listing in Table of Contents for applicable design data, with tabbed fly sheet and space for insertion of data.

1.09 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Owner and Project Landscape Architect will review draft and return one copy with comments.

B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.

C. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Owner and Project Landscape Architect comments. Revise content of document sets as required prior to final submission.

D. Submit two sets of revised final volumes in final form within 10 days after final inspection, including digital files in 'PDF' format.

E. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with Project Landscape Architecting data and tests, and complete nomenclature and model number of replaceable parts.

F. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and special operating instructions.

G. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

H. Include servicing and lubrication schedule, and list of lubricants required.

I. Include manufacturer's printed operation and maintenance instructions.

J. Include sequence of operation by controls manufacturer.

K. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

L. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

M. Additional Requirements: as specified in individual product specification sections.

N. Include listing in Table of Contents for applicable design data, with tabbed dividers and space for insertion of data.

1.10 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.

B. Deliver to Project site and place in location as directed by Owner’s Representative; obtain receipt prior to final payment.

1.11 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.

B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.

C. Verify documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Include Table of Contents and assemble in three D side ring binder with durable plastic cover, and with digital files in ‘PDF’ format.

F. Submit prior to final Application for Payment.

G. Time of Submittals:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.12 MAINTENANCE SERVICE

A. Furnish service and maintenance of components as required by Contract from date of Substantial Completion.

B. Examine system components at frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by manufacturer of original component.

D. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

1.13 AS-BUILT RECORD DRAWINGS

A. Contractor may not use record documents for construction purposes. Contractor must protect record documents from deterioration and loss in a secure location. Contractor must provide access to record documents for Owner and Project Landscape Architect's reference or review during normal working hours.

B. Contractor must furnish as-built record drawings made from the Project Landscape Architect's Contract Drawings, or subsequent updates thereof, annotated as noted below with actual as-built conditions.
   1. As-built drawings must show all changes in the Work relative to the original Contract Documents; and must show additional information of value to Owner's records but not indicated in the original Contract Documents.

C. As-built record documents must include marked-up copies of the Contract Drawings and Specifications, including newly prepared drawings if applicable or necessary to achieve the Owner’s intended result, and shop drawings including all changed conditions issued through addenda and/or change orders.
   1. Contractor must include marked-up product data submittals, field records for variable and concealed conditions such as excavations and foundations, and miscellaneous record information on Work that was schematically recorded only schematically or not recorded at all.

D. The Contractor shall bear all costs associated with obtaining the Project Landscape Architect's original Contract Documents, and subsequent updated plots thereof, drafting as-built information, reproduction, or other related work.
   1. Contractor shall ensure that all as-built changes are of good drafting quality, performed by a person skilled in drafting and knowledgeable of the conventions of the trades involved.
   2. Contractor may utilize Contractor’s staff or seek outside assistance, including the Project Landscape Architect, for this drafting work provided the contractual requirements pertaining to quality, format, and content are met.

1.14 FINAL AS-BUILT RECORD DRAWINGS

A. This Section requires that the original marked-up as-built drawings and a copy of the marked-up as-built drawings be submitted to the Project Landscape Architect (original) and Owner (copy) for review prior to requesting Substantial Completion inspections
   1. Following the Project Landscape Architect's review of the marked-up as-built drawings and supplemental drawings, and upon the Project Landscape Architect’s acceptance that the marked-up information is accurate and complete, the Contractor shall proceed with preparation of a full set of professionally drafted record as-built drawings in electronic format made from Project Landscape Architect’s Contract Drawing files.
   2. Contractor shall submit final as-built record drawings to Project Landscape Architect in AutoCAD Civil 3D 2018.

B. All drawings shall bear the official Project name and number. Further, all drawings, including supplemental drawings, shall also bear a stamp to the effect of ‘record As-built’ along with the Contractor’s certification that such is an accurate reflection of actual as-built conditions. Contractor shall sign and date each certification in a format that is acceptable to the Owner.
   1. All drawings shall be the same size as the original Contract Documents.
   2. Once the final as-built record drawings are complete, the Contractor shall transmit them to the Owner within 30 calendar days after Final Completion.

3. Contractor shall ensure that all drawings issued as addenda, clarifications and/or change orders are incorporated into the as-built record drawing set and fully shown on the applicable Contract Drawing. If supplemental sheets are used, Contractor must follow the requirements outlined above for supplemental shop drawing sheets.

PART 2 - - Not Used

PART 3 - - Not Used

END OF SECTION 01 70 00

SECTION 01 71 23 - CONSTRUCTION SURVEYING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Surveyor qualifications

B. Submittals

C. Survey reference points

D. General survey requirements

E. Surveys for measurement and payment (where applicable)

F. Survey documentation of the Work

1.02 SURVEYOR QUALIFICATIONS

A. Record survey drawings for review and approval shall be performed by an independent surveying firm with a Registered Land Surveyor (RLS) licensed and registered in the State of Georgia, retained by the Contractor, and acceptable to the Owner and Project Landscape Architect.

B. Qualifications documentation shall be provided for the proposed RLS, as described in subsection 1.03.A of this Section.

C. Day to day surveying for Contractor's control purposes may be performed by Contractor's own surveyors.

1.03 SUBMITTALS

A. Submit qualifications documentation for proposed RLS. Information shall include: name, address, telephone number, and photocopy of registration of RLS.

B. Submit record survey drawings (specified in subsection 3.03 of this Section), certified by the RLS, along with computer files on diskette in AutoCAD Civil 3D 2018. Redline mark-ups of the Contract Drawings are not acceptable. A digitized tracing of a manually drawn record survey drawing, derived from non-digital surveying techniques, is also not acceptable.

1.04 SURVEY REFERENCE POINTS

A. The Owner's surveyor has established benchmarks and horizontal control for the Work. Control datum for survey is that indicated on the Drawings.

B. Contractor's RLS shall establish additional temporary benchmarks and horizontal control points as required.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL SURVEY REQUIREMENTS

A. Utilize recognized engineering survey practices appropriate for obtaining the information specified.

B. Protect and preserve permanent reference points during construction.

C. Promptly report to Owner and Project Landscape Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated reference points based on original survey control. Make no changes without prior written notice to Owner and Project Landscape Architect.

D. Establish elevations, lines and levels required for all items of the Work.

3.02 SURVEYS FOR MEASUREMENT AND PAYMENT

A. Contractor shall perform surveys to determine quantities for unit price items, including control surveys to establish measurement reference lines. Notify Owner and Project Landscape Architect prior to starting surveys.

B. Contractor shall submit calculations and certify the correctness of quantities for payment purposes. County will confirm quantities prior to payment.

3.03 SURVEY DOCUMENTATION OF THE WORK

A. Maintain a complete and accurate log of control and survey work as it progresses.

B. Record survey drawings shall be prepared to fully document the Work, as specified in individual specification sections.

C. Contractor's RLS shall prepare and certify the record survey drawings.

END OF SECTION 01 71 23

SECTION 02112 - TREE PROTECTION AND SELECTIVE TRIMMING

PART 1 - GENERAL

1.01 SUMMARY

A. All necessary tree protection measures shall be implemented and maintained throughout the duration of construction in order to ensure that all existing project site vegetation is protected from impact by construction activities. Tree protection operations include but are not limited to the following:
   1. Staking by the Contractor and written approval of the Project Landscape Architect of location of tree protection measures prior to installation.
   2. Construction and maintenance of tree protection fencing, barricades, guards, tree tape, etc.
   3. Removal of vegetation as indicated in the Contract Documents.
   4. Placement and maintenance of temporary seeding as indicated in the Contract Documents.
   5. Underbrush cleanup and selective tree trimming as indicated in the Contract Documents.

B. Related Sections:
   1. Section 01 57 13 – Temporary Erosion and Sediment Control
   1. Section 02 40 00 – Demolition and Structure Moving
   2. Section 31 10 00 – Site Clearing
   3. Section 31 22 00 - Grading

1.03 CODES AND STANDARDS

A. In addition to complying with all pertinent codes and regulations, comply with the requirements of those insurance carriers providing coverage for this work.

1.04 QUALITY ASSURANCE

A. QUALIFICATION OF THE WORKMEN: Contractor shall provide a project superintendent who shall be present at all times during tree clearing and grubbing operations and who shall direct the trimming of roots and limbs where required. The project superintendent shall be qualified in the various other trades involved including demolition, protection of property and erosion control.

1.05 JOB CONDITIONS

A. Dust Control: Use all means necessary to prevent the spread of dust during performance of the work of this section. Thoroughly moisten all surfaces in order to fulfill the requirements of local and state erosion and sedimentation regulations. Prevent dust from being a nuisance to the work on the site and surrounding areas.

B. Erosion Control: Install and maintain per the requirements of Section 01 57 13 and the Drawings.

C. Protection: Contractor shall use all means necessary to protect existing objects designated to remain. In the event of damage, the Contractor shall immediately make all repairs and replacements necessary as directed by the Project Landscape Architect at no additional cost to the Owner.

D. Tree Protection:

1. Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of roots by stockpiling construction materials or damage to roots by excavating materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line.

2. Provide temporary fences, barricades or guards as required to protect trees and vegetation to be left undamaged. Contractor shall not store, stack or place materials of any form under the drip line of trees to be saved. Equipment such as vehicles shall not be parked under trees or traverse beneath the drip line of trees to be saved.

3. Water trees and other vegetation which are to remain within the limits on the contract work as required to maintain their health during the course of construction operations.

4. Provide protection for roots over 2” diameter that are cut during construction operation. Coat any cut faces with an orange shellac, or other acceptable coating, especially formulated for horticultural use on cut or damaged plant tissues. Temporarily cover all exposed roots with wet burlap to prevent from drying out; provide earth cover as soon as possible.

5. Repair or replace trees and vegetation damaged by construction operations, in a manner acceptable to the Project Landscape Architect. Tree damage repair shall be performed by a qualified tree surgeon. Replace trees which cannot be repaired and restored to full-growth status, as determined by the tree surgeon.

6. Protect tree root system from damage due to deleterious materials in solution caused by run-off, or spillage during mixing of construction materials or drainage from stored materials. Protect root system from flooding, erosion or excessive wetting resulting from de-watering operations.

7. Tree Penalty: The intent of this clause is to emphasize the importance of all trees to be saved. All trees to be saved shall be maintained in an undamaged condition. Damage shall be defined as the act of scarring, nailing, cutting, breaking limbs, etc., of any tree or its root system in such a manner as may cause the tree to be permanently harmed. Accidental damage due to dead trees falling, equipment breakdown or any act on the part of the operator which appears to the Project Landscape Architect as unavoidable would not warrant a penalty. However, the Contractor will be liable for consistently damaging trees by accidental damage. Damage due to improper location of utility trenches or ditches will not be considered accidental. The Contractor will be responsible for damage on the part of the operator or operators, whether by method of excavation, use of improper equipment, incompetency of the operator, or failure to properly inform the operator as determined by the Project Landscape Architect.

8. All trees on the site shall be saved except those marked specifically to be removed, those within the clearing limits on the plans; and those marked specifically on the site by the Project Landscape Architect to be removed. No tree, either those marked for removal on the site, or any other tree may be removed from the site prior to the Project Landscape Architect's inspection. Penalties for damage to or removal of any tree not specifically approved by the Project Landscape Architect on the site will be as follows:

Large Trees		**Small Trees & Evergreen Trees** (Dogwoods, Hollies, Wax Myrtles, Magnolias, etc.)	
Caliper	**Price**	**Caliper**	**Price**
1 1/2" - 2"	300.00	6'- 7'	200.00
2" - 2 1/2"	400.00	7'-8'	300.00
2 1/2" - 3"	500.00	8'-9'	400.00
3" - 3 1/2"	600.00	9'-10'	500.00
3 1/2" - 4"	700.00	10'-11'	600.00
4" - 4 1/2"	800.00	11'-12'	700.00
4 1/2" - 5"	900.00	12'-13'	800.00
5" - 6"	1000.00	13'-14'	900.00
6" - 7"	1500.00	14'-15'	1100.00
7" - 8"	2000.00	15'-16'	1300.00
8" - 11"	2500.00	16'-17'	1400.00
12" - 20"	3000.00	17'-18'	1600.00
21" - Larger	4000.00	18'-19'	1900.00
		19'-20'	2200.00

9. Trees that are damaged by the Contractor will be evaluated by the Project Landscape Architect. The Project Landscape Architect will determine the replacement value of damaged trees based up on the use of the Tree Penalty Chart and current material market costs. The Contractor is responsible for all costs associated with replacements.

10. Trees designated to remain on site and are removed by the Contractor will be evaluated by the Project Landscape Architect. The Project Landscape Architect will determine the replacement value of damaged trees based upon the use of the Tree Penalty Chart and current material market costs. The Contractor is responsible for all costs associated with replacements.

11. Root Rakes: No root rake devices shall be used within the drip line of trees scheduled to remain.

12. Disposal: All materials removed by the clearing operation shall be disposed of off-site. No burning of trees, stumps or other matter shall be conducted on the site, unless permission is obtained in writing from the Owner.

PART 2 - PRODUCTS

2.01 TEMPORARY BARRICADES

A. Unless otherwise approved by the Project Landscape Architect, use only new and solid lumber of industry accepted, pre-approved grade to construct temporary barricades around trees and areas designated to remain undisturbed.

2.02 TEMPORARY FENCES

A. Unless otherwise approved by the Project Landscape Architect, use only orange nylon safety fencing 3’-0” height, stapled to 2” x 4” x 5’-0” wood stake post at 5’-0” on center to construct temporary fences around trees and areas designated to remain undisturbed.

2.03 PRUNING PAINT

A. Use only a pruning paint specifically formulated for horticultural application to cut or damaged plant tissue and approved by the Project Landscape Architect for use on this work. Preferably orange shellac.

2.04 EXPLOSIVES

A. The use of explosives is prohibited.

2.05 OTHER MATERIALS

A. All other materials, not specifically described but required for proper completion of the work of this Section, shall be submitted by the Contractor to the Project Landscape Architect for approval.

PART 3 EXECUTION

3.01 SITE INSPECTION

A. The Contractor shall carefully inspect the project site and stake the limits of all tree save measures to be installed prior to commencing construction. Location and limits of staking of tree save measures must be approved in writing by the Project Landscape Architect.

3.02 SCHEDULING

A. The Contractor shall schedule all work in a manner that will not negatively impact the operations of adjoining properties and/or the general public.

B. The Contractor shall notify the Project Landscape Architect at least five (5) full working days prior to commencing clearing and tree removal work of this contract in order to receive written approval of the location and limits of tree save and erosion and sedimentation measures.

3.03 STAKING

A. The Contractor shall stake the location and limits of all tree save measures.

B. The purpose of the staking, with inspection and adjustment by the Project Landscape Architect, is to adjust the areas of the site to allow the Contractor maximum use of the land. Staking is subject to various degrees of adaptation which can only be determined by the Project Landscape Architect. The amount of adjustment is determined by the existing trees, terrain, soil conditions, sub-surface water and other intangibles which are impractical to survey in absolute accuracy.

C. The Contractor shall notify the Project Landscape Architect at least five (5) working days before inspection of the construction stakeout to coordinate tree protection. During the inspection the Project Landscape Architect will adjust the stake-out as necessary to accommodate trees, topography and all other objects and conditions on the site. At this time the Landscape Architect will clearly mark all trees and other vegetation to be removed. The staking-inspection process must take place prior to any tree removal, grading, construction, or any other work on the site.

D. It is a condition of this Contract that the Contractor and project superintendent attend all staking inspection meetings

E. The staking-inspection process shall be repeated for any work not staked and approved or adjusted during the initial site visit. No work shall be done without the written approval of the location and limits of project elements by the Project Landscape Architect. All alignment, dimensions and elevation of any grading, excavation, construction and planting is subject to adjustment. Refer to the staking process as described in the Special Conditions.

3.04 TOPSOIL REMOVAL

A. Contractor shall not strip topsoil in tree save areas. Limit of stripping operations shall be of a sufficient distance from existing trees to prevent damage to the main root system.

B. Topsoil shall not be stockpiled in tree save areas.

3.05 WOODLAND PRUNING AND UNDERBRUSHING

A. Clear the site of brush, rubbish, dead limbs, snags, fallen trees, and any other plant material designated by the Project Landscape Architect to be removed. No trees, limbs and/or roots shall be cut or removed, without prior approval of Project Landscape Architect.

B. Do not remove stumps in areas to be left natural. The use of root rakes or track equipment in areas designated as tree save and/or scheduled for woodland pruning and under brushing is prohibited.

C. Prune remaining trees by removing all low hanging limbs less than 6' above the ground by cutting with a hand saw. Pruning cuts shall be made in accordance with good pruning practices. Pruner shall not cut the cambrium collar. Remove all dead trees, broken trees, leaning trees and deceased trees. Refuse may be removed from the site or chipped with a chipper and spread under the trees.

D. Underbrush all small sprouts, scrubs, vines, and weeds as defined on site by Project Landscape Architect. Project Landscape Architect shall meet on site with Contractor to review requirements.

E. Do not rake or remove existing leaf or pine nettle mulch located within woodland and under brushing zones.

F. All woodland pruning and clean up shall be conducted with handheld equipment. The use of motorized equipment is prohibited.

G. All under brushing shall be conducted with handheld equipment. The use of motorized equipment is prohibited.

3.06 EROSION CONTROL-PERMANENT SEEDING

A. Contractor shall sow grass as necessary during construction to prevent erosion of disturbed areas and prevent damage to tree save areas from runoff and silt. Refer to Section 01 57 13.

3.07 EROSION CONTROL-TEMPORARY SEEDING

A. Contractor shall temporarily sow grass with appropriate grass seed in the event that permanent grass cannot be sown during the specified season. Refer to Section 01 57 13.

3.08 EROSION CONTROL-BARRIER PLACEMENT

A. Erosion and sediment control measures must be installed and approved in writing by the Project Engineer prior to commencing construction activities. Erosion and sediment control measures shall be placed and maintained in order to prevent the silting and erosion of adjacent streams, woodland, tree save and under brushing areas. Refer to Section 01 57 13.

3.09 FILL PLACEMENT OVER TREE ROOTS

A. Where fill dirt is necessary to establish acceptable finished grades over tree roots, Contractor shall contact the Project Landscape Architect to determine extent and execution of fill placement.

3.10 CLEANUP:

A. Contractor shall be responsible for removing all rubbish, refuse, soil, waste, and other products or elements resulting from the construction effort.

B. All woodland, underbrush and tree save areas disturbed by construction activity shall be repaired. Contractor shall restore pre-existing natural grade through the use of hand rakes. All raked areas shall be covered with 1" deep layer of pine straw mulch, unless otherwise directed by the Project Landscape Architect to receive seeding. All pruning refuse shall be removed from the site, or ground and spread as mulch in the natural areas.

END OF SECTION 02 11 20

SECTION 02 40 00 - DEMOLITION AND STRUCTURE MOVING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes demolition and removal and/or abandonment of:
   1. Asphalt and concrete pavement
   2. Concrete curbs, gutters and walkways
   3. Other facilities and above-grade structures

B. Related Sections:
   1. Section 31 23 17 – Excavating and Backfilling for Structures
   2. Section 31 23 33 – Trenching and Backfilling

1.02 REFERENCES

A. Code of Federal Regulations Publications (CFR)
   1. United States Department of Labor, 29 CFR 1926, Safety and Health Regulations for Construction

1.03 SUBMITTALS

A. Submit written certification of proper transport and final disposal of demolition materials to a permitted waste disposal facility.

1.04 QUALITY ASSURANCE

A. Conform to applicable local, state, and federal regulations (including 29 CFR 1926, Part T – Demolition) related to operation of equipment and tools, protection of persons and property, and environmental controls.

B. Notify affected utility companies before starting work and comply with their requirements.

1.05 PROJECT CONDITIONS

A. Work with Owner and Project Landscape Architect to coordinate schedule for demolition, relocations, and removals.

B. During demolition, relocations and removal, use all procedures necessary to assure that no portion of the structures, either that to be removed or to remain, become a hazard to persons by instability or other condition.

C. Notify all local, state, and federal agencies having jurisdiction and complete all necessary forms required for demolition and disposal.

D. Demolition and relocations shall be performed in a manner that will not disturb existing pavement, utilities, structures, and other facilities not indicated to be removed.

E. Contractor shall take all necessary measures to protect all areas, site improvements utilities and other features that are not be demolished or removed. Any areas, site improvements, utilities or other features that are damaged during demolition shall be repaired at no additional cost to owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PREPARATION FOR DEMOLITION

A. By careful study of the Drawings and these Specifications, and coordination with the Owner and Project Landscape Architect, determine the location and extent of demolition to be performed.

B. Excavate for removal of buried structures and piping as specified in Sections 31 23 17 and 31 23 33.

C. If not indicated to be removed, shut off and or capped, protect all existing public utility lines in the area of demolition in accordance with the requirements of the Owner and Project Landscape Architect, utility owner, or public agency have jurisdiction (as applicable).

D. Barricade the work areas from pedestrian and vehicular traffic. Post "No Trespassing" and other necessary warning signs around the work areas during the entire duration of demolition work. Maintain barricades and signs during the construction period.

3.02 ASPHALT AND CONCRETE REMOVAL

A. Existing asphalt and concrete shall be cut and removed as specified herein and as shown on the Drawings.

B. Where portions of pavement and walkways are to be removed, cut asphalt and concrete in uniform line at the designated limits of removal. Use an adequately powered, water-cooled, mechanical saw with a diamond-edge blade or abrasive wheel, unless otherwise approved by the Owner and Project Landscape Architect.

C. Break up and remove asphalt and concrete at the designated locations and to the required limits.

D. At limits of asphalt and concrete remaining in place, maintain cuts in good order until adjacent construction is completed.

3.03 REMOVAL OF CURBS, GUTTERS AND WALKWAYS

A. Cut and remove existing granite curbs, gutters and walkways where indicated on the Drawings.

B. Saw cut concrete at the limits of removal as approved by the Owner and Project Landscape Architect. Use an adequately powered, water-cooled, mechanical saw with a diamond-edge blade or abrasive wheel.

C. Break up and remove concrete using suitable tools and equipment. Maintain saw cuts in good order until new curb and gutter and new walkway construction work is completed (as applicable).

3.04 DEMOLITION AND REMOVAL OF ABOVE-GRADE STRUCTURES

A. Demolish and remove building and other designated structures down to sub-grade, including all interior debris, structure, and appurtenances.

B. Break up and remove all structural concrete slabs and foundations within the designated demolition limits using suitable equipment as specified in this Section.

3.05 REMOVAL OF STRUCTURES

A. Remove designated existing structures where indicated on the Drawings.

B. During removal of structures, use all procedures necessary to assure that no portion of the structures become a hazard to persons by instability or other conditions.

C. Structures may be moved intact, without disassembly. If intact removal is not feasible, disassembly may be allowed as determined by the contractor. Proper equipment and methods shall be used to prevent damage to the structures.

3.06 DISPOSAL OF REMOVED MATERIALS

A. Demolition materials and debris classified as non-hazardous construction and debris (C&D) wastes shall be transported off-site and disposed at a permitted landfill in conformance with all applicable local, state and federal regulations.

3.07 SITE RESTORATION

A. Backfill and grade excavated areas as indicated on the Drawings and specified in applicable specification sections.

END OF SECTION 02 40 00

SECTION 03 30 02 - SITE CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes cast-in-place concrete construction of: structural foundations and slabs; concrete walkways (including sidewalks, handicap ramps, steps, and other exterior pedestrian walkways); and miscellaneous concrete work.

B. Related Sections:
   1. Section 31 22 00 - Grading

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):
   1. AASHTO M154, Standard Specification for Air-Entraining Admixtures for Concrete
   2. AASHTO M194, Standard Specification for Chemical Admixtures for Concrete

B. American Concrete Institute (ACI):
   1. ACI 301, Specifications for Structural Concrete
   2. ACI 318, Building Code Requirements for Structural Concrete

C. ASTM International:
   1. ASTM A 185, Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
   2. ASTM A 615, Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
   3. ASTM C 31, Standard Practice for Making and Curing Concrete Test Specimens in the Field
   4. ASTM C 39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
   5. ASTM C 94, Standard Specification for Ready-Mixed Concrete
   6. ASTM C 143, Standard Test Method for Slump of Hydraulic Cement Concrete
   7. ASTM C 172, Standard Practice for Sampling Freshly Mixed Concrete
   8. ASTM C 231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
   9. ASTM C 260, Standard Specification for Air Entraining Admixtures for Concrete
   10. ASTM C 494, Standard Specification for Chemical Admixtures for Concrete
   11. ASTM D 994, Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
   12. ASTM D 1751, Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
   13. ASTM D 1752, Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
   14. ASTM C 1116, Standard Specification for Fiber-Reinforced Concrete and Shotcrete.

D. Georgia Department of Transportation (GDOT):
   1. “Standard Specifications, Construction of Transportation Systems”, 2013 Edition (GDOT Standard Specifications)

1.03 SUBMITTALS

A. Submit the following to the Owner and Project Landscape Architect, for review and approval no later than 15 days upon receipt of the city issued notice to process. Owner and Project Landscape Architect have 15 days to review submittal, upon which as approval or rejected will be provided. If a resubmitted is required, a new 15 days review period will start the date the resubmittal is received from contractor:
   1. Concrete mix designs
   2. Manufacturer's product data sheets for reinforcing steel, joint devices, concrete admixtures, joint fillers,

joint sealants, curing aids, and other specified materials.

B. Submit copy of truck ticket for every load of concrete delivered to the site.

1.04 QUALITY ASSURANCE / QUALITY CONTROL

A. Owner will retain the services of independent QC firm(s) to determine conformance of the materials and the constructed work with the specifications.

B. Concrete walkway and curb construction shall conform to the requirements of the City of Woodstock Standards as shown on the Drawings.

1.05 PROJECT CONDITIONS

A. Concrete placement and finishing shall be performed only during periods of acceptable ambient temperatures in accordance with the applicable requirements of ACI 301.

B. Concrete shall not be placed on subgrade that is frozen or excessively wet. Concrete shall not be placed during periods of precipitation without adequate protection that meets the approval of the Owner and Project Landscape Architect.

C. Coordinate concrete construction with site grading work and other related construction.

PART 2 - PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Proposed materials shall be approved by the Owner and Project Landscape Architect as specified prior to delivery and use in the construction.

2.02 REINFORCEMENT

A. Rebars shall conform to ASTM A615, Grade 60, unfinished. Size shall be as indicated on the Drawings.

B. Concrete Reinforcing Fibers shall be high strength industrial-grade fibers specifically engineered for secondary reinforcement of concrete and shall conform to ASTM C 1116.

C. Furnish devices for elevating and supporting reinforcement in correct position.

2.03 CONCRETE MATERIALS AND MIX DESIGNS

A. Concrete materials and mix design shall conform to the applicable requirements of Section 500 of the GDOT Standard Specifications and as specified in the following paragraphs.

B. Admixtures:
1. The use of chemical admixtures shall be approved by the Project Landscape Architect.
2. Air entrainment admixtures shall conform to AASHTO M154 or ASTM C260.
3. Chemical admixtures (including any combination of water-reducing, retarding, and accelerating admixtures) shall conform to the requirements of AASHTO M194 or ASTM C494.

C. Unless otherwise indicated on the Drawings or in other specification sections, concrete mix for structural foundations and slabs, concrete walkways, curbs and gutters, and miscellaneous work shall be Class “A” concrete conforming to the mix design requirements in Table 1 of Section 500 as summarized below:
1. Concrete mix shall be proportioned such that the 28-day compressive strength of moist cured laboratory

samples achieve not less 3,500 pounds per square inch (psi) or as indicated on drawings.
2. Slump Range: 2 to 4 inches
3. Entrained Air Content: 2.5 to 6 percent (as determined using ASTM C231).
4. Coarse aggregate size: numbers 56, 57 or 67 in accordance with Section 800 of the GDOT Standard Specifications.
5. Maximum water/cement ratio (or water/cementitious material ratio if pozzolanic materials such as fly ash are added to Portland cement): 0.49

2.04 JOINT DEVICES AND FILLER MATERIALS

A. Expansion joint filler shall comply with ASTM D994, D1751, or D1752 (unless otherwise indicated on the Drawings).

2.05 JOINT SEALANTS

A. Joint sealant shall conform to the requirements of Subsection 833.2.06 of the GDOT Standard Specifications.

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL

A. No concrete for a specific pour shall be ordered for delivery to the Site until pertinent concrete mix design and specified materials are approved by the Project Landscape Architect.

B. Sampling and testing during the placement of concrete shall conform to the requirements of ACI 301, and as specified below.
1. Sampling Fresh Concrete: Comply with ASTM C172.
2. Slump Testing (ASTM C143): One test for each concrete load at point of discharge; and one for each set of compressive strength test specimens.
3. Concrete Temperature: Tested hourly when air temperature is 40 degrees F. and below, and when 80 degrees F. and above, and each time a set of compression test specimens is made.
4. Concrete Test Specimens (ASTM C31): One set of four standard cylinders for each compressive strength test.
5. Air Entrainment (ASTM C231): One test for each set of compressive strength test specimens.
6. Compressive Strength Test (ASTM C39): One set for every 100 cubic yards or fraction thereof, of each concrete mixture placed in any one day, and at least one set per pour. One specimen of each set shall be tested at seven days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

3.02 SUBGRADE PREPARATION

A. Verify that subgrade has been excavated, graded and compacted (as applicable) to the required elevations and dimensions indicated on the Drawings and as specified in Section 31 22 00.

B. Remove and dispose of debris and other unsuitable material from the subgrade surface.

C. Subgrade shall be in a moist condition when concrete is placed.

3.03 FORMWORK

A. Construct formwork as necessary to provide the required dimensions for concrete construction indicated on the Drawings.

B. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete and shall have sufficient rigidity to maintain required shape.

3.04 INSTALLATION OF REINFORCEMENT

A. Unless otherwise approved by the Project Landscape Architect, reinforcement shall be fabricated to the shapes and dimensions shown on the Drawings and installed where indicated.

B. At the time of concrete placement all reinforcement shall be free from loose, flaky rust, scale (except tight mill scale), mud, oil, grease, or any other coating that might reduce the bond with the concrete.

C. Accurately position, support, and secure reinforcement against displacement by concrete placement operations.

D. Place reinforcement to obtain at least the minimum coverages for concrete protection as shown on the Drawings.

E. Do not place reinforcing bars more than two inches beyond the last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

F. Tolerance for bar placement shall be plus or minus one bar diameter, but not exceeding one inch. Tolerance for cover over reinforcement shall be plus or minus one-half inch.

G. Splices in reinforcement steel shall be in accordance with approved splicing procedures and the requirements of ACI 318 and only as approved by the Project Landscape Architect. Welding or butt-welding of re-bar will not be allowed.

3.05 INSTALLATION OF OTHER MATERIALS

A. Items to be cast into the concrete shall be accurately placed and positioned securely.

3.06 CONCRETE PLACEMENT

A. Concrete shall be placed at the locations and to the elevations and dimensions indicated on the Drawings.

B. Mix, place and consolidate concrete in accordance with the applicable requirements of ACI 301, to suit the type of concrete and project conditions, and as specified herein.

C. Truck mixers shall furnish a concrete batch that is homogeneous with respect to consistency, mix, and grading.

D. Concrete that has been batched for over 1-1/2 hours shall not be placed.

E. In order to ensure consistent slump at the point of placement, a small quantity of “trim water” may be held out at the batch plant. The amount of withheld water shall be indicated on the truck ticket, and the truck shall leave the batch plant with a full water tank.

F. When concrete arrives at the point of delivery with a lower than specified slump and the concrete is unsuitable for placing at that slump as determined by the Project Landscape Architect or QC Firm, the slump may be adjusted to the required maximum by adding the withheld “trim water”. Water may be added up to the amount allowed in the accepted mixture proportions as shown on the ticket, unless otherwise approved by the Project Landscape Architect.

G. The addition of mixing water at the jobsite shall be in accordance with ASTM C94. The specified water/cement ratio shall not be exceeded.

H. Do not use concrete which becomes non-plastic and unworkable, or does not meet the required quality control limits, or which has been contaminated by foreign materials.

I. Deposit concrete as nearly in final position as practical to avoid rehandling. Do not permit concrete to drop freely a distance greater than three feet. Where longer drops are necessary, use chutes, tremies, or other conveyance to prevent separation.

J. As soon as concrete is deposited, thoroughly agitate with mechanical vibrators and suitable hand tools to work mixture into corners of forms and around reinforcing and embedded items. Do not over-vibrate or use vibrators to transport concrete within forms.

3.07 FINISHING

A. Finish concrete in accordance with the applicable requirements of ACI 301, to suit the type of concrete and project conditions, and as specified herein.

B. Finishing of Concrete Slabs:
   1. Strike off (screed) concrete to required elevations and immediately start finishing and flattening operations. Ensure finishing operations are no more than necessary to remove irregularities and meet specified tolerances. Exposed concrete edges shall be worked with an edging tool having a radius of approximately 3/8 inch.
   2. At the Contractor's option, immediately after screeding, proceed with initial hand floating operations using appropriate tools to compact and consolidate unformed concrete slab surface. Complete floating work before any excess moisture or bleeding water is present on the surface.
   3. Allow concrete to stiffen before proceeding with finishing operations. No subsequent operation should be accomplished until the concrete will sustain foot pressure with only about 1/4-inch indentation.
   4. After evaporation of most of the bleed water has taken place, proceed with the second floating operation on slab surfaces using either hand trowels or power trowels as appropriate.

C. On unexposed slab surfaces, trowel concrete surfaces using hand or power trowels as appropriate to produce a dense, smooth, hard surface.

D. Tool chamfer all exposed concrete edges.

E. Provide a medium broomed finish (or as indicated on plans) to all concrete surfaces that will receive foot or vehicular traffic. Finish exposed edges with steel edging tool.

F. For unformed surfaces (including tops of walls) occurring adjacent to formed surfaces, strike off smooth and finish with texture matching the adjacent exposed formed surfaces.

G. The exposed surfaces of concrete walls and columns shall receive a smooth rubbed finish. Produce finish on newly hardened concrete no later than the day following formwork removal. Wet the surface and rub it with a carborundum stone or an abrasive of equal quality until uniform color and texture are produced. The rubbing shall be continued sufficiently to remove all form marks and projections, producing a smooth dense surface without pits or irregularities. Allow concrete to cure as specified in subsection 3.09. Provide a final rubbed finish if required.

3.08 JOINTS

A. Construct the required type of joint to the dimensions and at the locations shown on the Drawings.

B. Install expansion joint filler and waterstops where shown on the Drawings and in accordance with manufacturers' recommendations.

C. For concrete slabs on grade, contraction and expansion joints shall be provided as indicated on the Drawings, and as specified in the following paragraphs.

D. For pedestrian walkways, expansion joints shall be formed at maximum spacing of not greater than 30 feet and at intersections with building walls and other structures. Expansion joint width shall be 1/2-inch minimum. Joint filler shall extend for the full depth of the joint. Install joint filler in accordance with the manufacturer's recommendations.

E. Contraction joints for exposed concrete slabs and walkways shall be provided for crack control at the dimensions and spacing indicated on the Drawings and as specified below:
   1. Spacing of transverse contraction joints for sidewalks shall match sidewalk width.
   2. In all other locations, maximum spacing shall be 10 feet.
   3. Joints shall be formed using suitable hand tools (such as a pointed trowel), a 1/8-inch blade saw, or metal dividers. Depth of each contraction joint shall be one-third of the concrete thickness.

3.09 CURING AND PROTECTION

A. Immediately following finishing operations, cure and protect concrete in conformance with the applicable requirements of ACI 301, and as specified in the following paragraphs.

B. Protect fresh concrete from direct rays of sunlight, drying winds and rain.

C. Maintain concrete temperature below 80 degrees F at time of placement, or furnish test data or provide other proof that admixtures and mix ingredients will not produce flash set plastic shrinkage, or cracking due to heat of hydration. Ingredients may be cooled before mixing to maintain fresh concrete temperatures at 80 degrees F or less.

D. Curing shall be performed using wet coverings such as burlap, or moisture retaining coverings such as polyethylene film. Place coverings as soon as possible after finishing operations and after concrete has hardened sufficiently to prevent surface damage. Cover entire surface, including edges. Seal and secure laps and edges with six inches minimum overlap.

E. Exposed surfaces of concrete shall be kept continuously moist for a minimum of 3 days.

F. Use curing compound only where approved by the Project Landscape Architect. Cure formed surfaces with curing compound applied in accordance with manufacturer's directions as soon as forms are removed and finishing is completed.

G. During the curing period, protect concrete from damaging mechanical disturbances including load stresses, heavy shock, excessive vibration, and from damage caused by rain or flowing water.

3.10 TOLERANCES

A. Tolerances for formed and unformed surfaces shall conform to the applicable requirements of ACI 301 and as specified below:
   1. Variation from plumb in the lines and surfaces of walls: less than 1/2 inch in 10 feet.
   2. Variation of the linear structure lines from established position in plan and related position of walls: 1 inch
   3. Variation in the thickness and height of walls: plus or minus 1/2 inch
   4. Slab thickness tolerance: plus or minus 1/2 inch
   5. Slab Surface: Maximum gap of 1/4 inch at any point between an unleveled 10 foot straightedge and the slab, anywhere on the slab; measure within 72 hours after slab placement.

3.11 JOINT SEALING

A. Install joint sealant (including accessories) at top of all expansion joints as soon as possible after proper curing of concrete in accordance with the sealant manufacturer's recommendations.

3.12 REMOVAL OF FORMWORK

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads (including wind load).

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finished concrete surfaces scheduled for exposure to view.

C. Store removed forms in a manner that will not damage surfaces to be in contact with fresh concrete. Do not use damaged forms.

3.13 CORRECTION OF DEFECTIVE WORK

A. Concrete work that does not conform to the specified requirements, including strength, tolerances, and finishes, shall be corrected at the Contractor's expense as determined by the Owner and Project Landscape Architect.

B. All finished concrete on exterior concrete walkways shall drain with no puddles or areas of standing water. Areas not draining shall be removed and reconstructed or otherwise repaired using procedures acceptable to the Owner and Project Landscape Architect.

END OF SECTION 03 30 02

SECTION 31 10 00 - SITE CLEARING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: tree protection; clearing and grubbing of vegetation; stripping and on-site stockpiling of topsoil; and disposal of vegetation.

B. Related Sections:
   1. Section 01 57 13 – Temporary Soil Erosion and Sediment Control
   2. Section 02 11 20 – Tree Protection and Selective Trimming

1.02 REFERENCES

A. ASTM International:
   1. ASTM A 116.11, Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric

1.03 QUALITY ASSURANCE

A. Conform to all applicable local codes for disposal of cleared vegetation.

1.04 PROJECT CONDITIONS

A. Site clearing shall be performed in a manner that does not disturb existing pavement, structures, utilities, other facilities and trees not indicated to be removed.

B. The contractor shall repair at no additional costs to the owner any areas of existing pavement, structures, utilities, other facilities and trees not indicated to be removed which become damaged during site cleaning and any other phase during construction.

PART 2 - PRODUCTS

2.01 ALL REFERENCES TO VENDORS AND 'APPROVED MANUFACTURERS' ARE INCLUDED FOR DESCRIPTION OF QUALITY AND CONTENT OF THE DESIGNATED EQUIPMENT/MATERIALS AS BASIS OF DESIGN. EQUIVALENT ITEMS MAY BE ACCEPTED IF THEY MEET ALL STANDARDS OF QUALITY AND PURPOSE FOR THE INTENDED USE, AS DETERMINED BY CITY OF WOODSTOCK.

2.02 TREE PROTECTION FENCING

A. Tree protection fencing shall be orange high-visibility safety fencing, PSF-Series Plastic Safety Fence manufactured by DGI Industries. Furnish metal posts and woven wire fence backing as indicated on the Drawings and as specified below.

B. Metal posts shall be standard steel fence T-posts, 5 feet minimum length. Furnish fence post caps.

C. Woven wire (hog wire) shall conform to ASTM A116.11, with Class 3 coating.

D. "Tree Save Area" signs shall be attached to tree protection fencing as indicated on plans and details. Signs shall be made of corrugated plastic, printed with exterior grade graphics and include metal grommets at four corners for attaching to fence with nylon cable ties. Signs that are damaged or removed shall be replaced within 24 hours.

PART 3 - EXECUTION

3.01 PREPARATION

A. Implement temporary erosion and sediment control measures prior to clearing of vegetation in accordance with the Erosion, Sedimentation and Pollution Control (ES&PC) Plan as indicated in Section 01 57 13.

3.02 TREE PROTECTION

A. Prior to commencement of clearing activities, install tree protection fencing at the locations and alignments indicated on the Drawings or as otherwise determined by the Owner and Project Landscape Architect. The installed locations of temporary barrier fencing shall be approved by the Owner and Project Landscape Architect before clearing and other construction operations will be allowed to proceed. Maintain the fencing as required.

B. No trucks or other equipment shall be driven or parked within the drip line of any tree, except for designated trees to be saved whose limbs overspread construction areas and as approved by the Owner and Project Landscape Architect.

3.03 CLEARING AND GRUBBING

A. Cut and remove existing trees, brush, shrubs, invasive plant material and other vegetation outside the limits of tree protection fencing indicated on the Drawings and as approved by the Project Landscape Architect and Owner.

B. Remove roots to a minimum depth of one foot below existing grade or one foot below the proposed subgrade elevation for construction, whichever is lower.

3.04 TOPSOIL STRIPPING, STOCKPILING, AND ON-SITE PLACEMENT

A. Excavate and remove topsoil outside the limits of tree protection fencing to an approximate depth of 4 - 6 inches below existing grade or as otherwise determined by the Owner and Project Landscape Architect.

B. All grass, root fiber, decayed vegetation matter and other organic or deleterious material shall be removed such that a sound surface which provides a stable base for construction is exposed.

C. Stockpile the removed topsoil on-site where approved by the Owner and Project Landscape Architect for later placement on designated surfaces to be seeded or otherwise landscaped. Protect stockpile and adjacent surfaces from erosion as stated in the Drawings.

D. At completion of the Work, grade all excess stockpiled topsoil on-site as approved by the Owner and Project Landscape Architect.

3.05 DISPOSAL OF CLEARED VEGETATION

A. Burning of cleared vegetation will not be permitted.

B. All cleared vegetation that is not chipped and disposed on-site shall be transported off-site and disposed in accordance with all applicable local, state and federal regulations.

END OF SECTION 31 10 00

SECTION 31 22 00 - GRADING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: excavation, subgrade stabilization (if required), fill placement and grading required for pavement, buildings and other construction and site grading.

B. Related Sections:
1. Section 01 71 23 – Construction Surveying
2. Section 02 40 00 – Demolition and Structure Moving
3. Section 31 10 00 – Site Clearing
4. Section 31 23 18 – Rock Removal
5. Section 31 23 19 – Dewatering
6. Section 02 11 20 – Tree Protection and Selective Trimming

1.02 REFERENCES

A. ASTM International:
1. ASTM D 448, Standard Classification for Sizes of Aggregate for Road and Bridge Construction
2. ASTM D 1556, Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
3. ASTM D 1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
4. ASTM D 2216, Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
5. ASTM D 2487, Standard Practice for Classification of Soils for Project Engineering Purposes (Unified Soil Classification System)
6. ASTM D 2974, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils
7. ASTM D 4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
8. ASTM D 4643, Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Heating
9. ASTM D 4959, Standard Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating
10. ASTM D 6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

B. Georgia Department of Transportation (GDOT):
1. “Standard Specifications, Construction of Transportation Systems”, 2013 Edition (GDOT Standard Specifications)

1.03 SUBMITTALS

A. Submit the following for review prior to commencement of the work of this Section:
1. Proposed source(s) of borrow material.

B. Submit the following during work progress:
1. Written reports of all specified tests showing conformance of the materials and constructed work with the Specifications. Submit test results within five days after samples are obtained.

C. Submit the following at completion of the work:
1. Record survey drawings of completed grading as specified in this Section.

1.04 QUALITY ASSURANCE / QUALITY CONTROL

A. Owner will retain the services of Quality Control firm(s) to determine conformance of the materials and constructed work with the Specifications.

B. Record surveys shall be performed by the Contractor's Georgia Registered Land Surveyor as specified in this Section.

C. Excavation, grading and preparation of subgrades for pavement and structures shall conform to the requirements of applicable City of Woodstock standards.

D. Work within right-of-ways for construction of entrances shall conform to the requirements of City of Woodstock as indicated on the Drawings.

1.05 PROJECT CONDITIONS

A. Site Information
   1. All excavation is unclassified, unless otherwise approved by the Owner. Additional test borings and other exploratory operations may be made by the Contractor, and such activities shall be at no cost to the Owner. All excavations made during the additional exploratory operations shall be backfilled to match existing or proposed grade contours.

B. Acceptance: Claims for additional compensation for additional work due to alleged differences between actual existing site conditions and the site conditions indicated in the Contract Documents or in the geotechnical report will not be recognized.

C. Work shall be performed in a manner that does not disturb existing utilities, structures, trees, or other site features not indicated to be removed. Any damage to existing site features shall be repaired by the contractor and returned to existing conditions at no expense to the owner.

PART 2 - PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Proposed materials and source of supply shall be approved by the Owner and Project Landscape Architect as specified, prior to delivery.

B. Testing of soils to be used for soil fill (for determination of acceptability of soil and for quality control during compaction) shall conform to the following at a minimum rate of one test every 10,000 cubic yards and for each visible change in material:
   1. Soil Classification (ASTM D 2487)
   2. Laboratory Moisture Content (ASTM D 2216)
   3. Moisture-Density Curve, modified proctor (ASTM D 1557)
   4. Atterberg Limits (ASTM D 4318)
   5. Organic Content (ASTM D 2974)

2.02 STABILIZER AGGREGATE (if required)

A. Stabilizer Aggregate shall consist of coarse aggregate with gradation conforming to size number 2 aggregate (2 ½ inch to 1 ½ inch nominal size) as defined in ASTM D 448.

2.03 SOIL FILL

A. Soil Fill shall be obtained from on-site grading operations and from approved off-site borrow source(s) and shall consist of: gravels with fines (GM, GC); sands with fines (SP-SM, SP-SC, SM, SC); silts (ML); inorganic clays (CL); or blends of these materials as defined by the Unified Soil Classification System (USCS). The material shall also conform to the following material specifications:
   1. Plasticity Index shall be less than 10 and liquid limit shall not be greater than 50.
   2. Material shall have less than three percent by weight fibrous, organic matter as determined by ASTM D 2974.
   3. Maximum particle size shall be two inches.
   4. Substantially free of roots, trash and other material which may be compressible or which cannot be compacted properly.

2.04 TOPSOIL

A. Topsoil to be placed on graded areas to be seeded or landscaped shall be obtained from on-site stockpiles of stripped topsoil. If sufficient topsoil is not present, existing soils shall be amended, as necessary, to support specified vegetation as approved by the Owner and Project Landscape Architect.

PART 3 - EXECUTION

3.01 BORROW SOURCE

A. Obtain borrow material from on-site and from approved off-site borrow source(s). For soil obtained from off-site borrow source(s), the Contractor shall be responsible for obtaining any permits or approvals from authorities having jurisdiction, unless the borrow source is being operated under an existing permit. Furnish off-site borrow as part of the Base Bid.

B. Unless otherwise provided in the Contract, the Contractor is responsible for obtaining the right to procure material, pay all required fees, and develop the sources including rights-of-way for hauling from the borrow source owner(s).

3.02 FIELD QUALITY CONTROL

A. The following tests shall be performed during placement of Soil Fill:
   1. In-Place Density (using ASTM D 6938 or ASTM D 1556): Minimum of one test for each lift per 5,000 square feet (or every 200 linear feet along roadway alignment).
   2. Moisture Content (using ASTM D 4643, ASTM D 4959, or ASTM D 6938): Minimum of one test for each lift per 5,000 square feet (or every 200 linear feet along roadway alignment).
   3. In-place density and moisture content testing performed using nuclear instruments shall be checked by comparison to test results using laboratory methods as specified in the following subsection 3.02.B.

B. Calibration of Test Results:
   1. If selected for compaction/density testing, the calibration of each nuclear densitometer shall be checked weekly by comparison to the density measured on the same material by the sand-cone test method (ASTM D 1556). If there is more than two pounds per cubic foot difference in density, sand-cone results will be accepted over nuclear density results, as determined by the QC Firm and approved by the Owner and Project Landscape Architect.
   2. At least weekly, moisture content test results shall be checked by comparison to the moisture content measured on the same material using laboratory testing in accordance with ASTM D 2216 or D 4643. If there is more than five percentage points difference in moisture content, laboratory test results will be accepted over field testing, as determined by the QC Firm and approved by the Owner and Project Landscape Architect.
   3. If the nuclear densitometer cannot be calibrated to match the sand-cone results, and laboratory moisture content tests, the nuclear densitometer shall not be used for measurement of the in-place

density and moisture content.

C. Record Surveying
   1. Surveying shall be performed to record completed grading. At a minimum, survey surface elevations shall be surveyed on a 50-foot grid pattern. Establish survey points at top and bottom of all slopes, drainage ditches, and at other required locations to define constructed grades.
   2. Survey data and record drawings shall be prepared by a Registered Land Surveyor as specified in Section 01 71 23.
   3. Submit 1 copy of the final signed and sealed survey and an electronic file in AutoCAD Civil 3d 2018.

3.03 PREPARATION

A. The Contractor's surveyor shall lay out the limits and elevations for site grading. Where new grades tie into existing grades, the existing grades shall be verified by the Contractor. If existing conditions vary from the Drawings, notify the Owner and Project Landscape Architect before proceeding with site grading. Adjustments will be made if necessary as determined by the Owner and Project Landscape Architect.

B. Protect designated trees, clear and grub vegetation, and strip topsoil as specified in Section 31 10 00.

C. Remove existing asphalt and concrete pavement, walkways, structures and other designated facilities as indicated on the Drawings and specified in Section 02 40 00.

D. Implement, operate and maintain a dewatering system to control groundwater for excavations below groundwater level as specified in Section 31 23 19. This work shall be included as part of the Base Bid.

3.04 EXCAVATION AND GRADING

A. After stripping of topsoil, excavate and grade existing subgrade soils for pavement, structures, and other facilities to the elevations and limits shown on the Drawings.

B. If rock is encountered during site grading, remove rock using methods approved by the Owner and Project Landscape Architect. Rock removal shall be part of the Unit Pricing.

C. Place and compact fill as specified in subsection 3.06.

D. Shape and compact fill with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades. The graded areas shall be shaped to be free from irregular surface changes and within the tolerance specified for the location.

E. Unless otherwise indicated on the Drawings, grade areas adjacent to structures to achieve drainage away from the structures and to prevent ponding.

3.05 PLACEMENT OF SOIL FILL

A. Place Soil Fill in horizontal layers not exceeding eight inches loose thickness. Place to the elevations and horizontal limits required for roadway and trail subgrade as indicated on the Drawings.

B. All Soil Fill placed within 12 inches of the finished subgrade under roadways, parking lots, and trails shall be compacted to a minimum of 95 percent of the material's maximum dry density as determined by ASTM D 1557.

C. Soil Fill placed outside the limits described in the above paragraph B shall be compacted to a minimum of 90 percent of the material's maximum dry density as determined by ASTM D 1557.

D. If necessary, soil shall be moisturized or dried to the correct moisture content prior to compaction. Soils within certain areas of the Site may be above optimum moisture for compaction. The Contractor shall scarify and dry the fill soils (as part of the Base Bid) as necessary to achieve proper compaction as determined by the Owner's QC Firm. Careful planning of fill operations will be required to allow drying time for individual fill lifts.

E. Maintain the moisture content of Soil Fill to within plus or minus three percentage points of the soil's optimum moisture content, or as otherwise determined by the Owners QC Firm.

F. Uniformly grade Soil Fill to the required finish elevations. Shape the graded surface to be free from irregular surface changes. Tolerances for grading shall be as specified in subsection 3.07.

G. Based on the results of surveying of the finished surface, areas that are not constructed to the required elevations shown on the Drawings, within specified tolerance, shall be adjusted to the proper elevations.

H. Excess material that remains when finish grades are achieved shall be placed on-site where approved by the Owner and Project Landscape Architect or hauled off site for legal disposal.

3.06 GRADING TOLERANCE

A. Finished surface within limits of pavement and structures shall not vary more than one inch above or below the required elevations.

B. Finished surface of graded areas outside limits described in the above paragraph 3.07.A (including walkway subgrade and fill slopes) shall be graded to the elevations required within a tolerance of plus or minus two inches.

3.07 PLACEMENT OF TOPSOIL

A. Topsoil shall not be placed until all specified quality control testing has been performed for placement of Soil Fill.

B. Place topsoil over graded soil surface in all areas to be grassed to a depth of approximately four inches unless otherwise indicated on the Drawings and approved by the Owner and Project Landscape Architect.

C. Topsoil will not require compaction other than that provided by the equipment used to place the material. Shape the final surface of topsoil to be free from irregular surface changes.

3.08 SURFACE STABILIZATION

A. Completed graded surfaces outside the limits of pavement, walkways and structures shall be stabilized with grass, landscaping, or other improvements as indicated on the Drawings and specified in applicable specification sections.

3.09 MAINTENANCE AND PROTECTION

A. Protect graded surfaces from erosion and keep free from accumulation of debris.

B. Damage to finished surfaces during the course of construction, such as rutting under the loads imposed by earth-moving or hauling equipment, or damage due to erosion from rainfall events, shall be fully repaired prior to placement of any overlying materials.

C. Where completed graded areas are disturbed by subsequent construction operations or erosion, regrade to the required elevations and compact to the specified density prior to further construction. Work shall include repair and reestablishment of grades in settled, eroded, and rutted areas without any additional cost to the Project.

END OF SECTION 31 22 00

SECTION 31 23 17 - EXCAVATING AND BACKFILLING FOR STRUCTURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes excavation, backfill and compaction for the installation of utility structures and structural foundations. Section does not include trench excavation and backfilling for installation of piping.

B. Related Sections:
   1. Section 31 23 19 – Dewatering

1.02 REFERENCES

A. ASTM International:
   1. ASTM D 448, Standard Classification for Sizes of Aggregate for Road and Bridge Construction
   2. ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
   3. ASTM D 1556, Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
   4. ASTM D 2216, Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
   5. ASTM D 2937, Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method
   6. ASTM D 6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.03 SUBMITTALS

A. Submit the following for review prior to commencement of the work of this Section:
   1. Certifications by material suppliers for proposed borrow materials showing conformance with the Specifications as applicable.

1.04 QUALITY ASSURANCE / QUALITY CONTROL

A. Owner will retain the services of independent Quality Control firm(s) to determine conformance of the materials and constructed work with the Specifications.

1.05 PROJECT CONDITIONS

A. The Contractor is solely responsible for excavation slope stability. Excavation work shall be in compliance with applicable local, state and federal regulations (including OSHA).

PART 2 - PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Proposed materials and source of supply shall be approved by the Owner and Project Landscape Architect as specified prior to delivery and use in the construction.

B. The QC Firm shall also determine:
   1. The suitability of excavated bottom for structure foundation.

2.02 STABILIZER AGGREGATE

A. Stabilizer Aggregate shall consist of coarse aggregate with gradation conforming to Size Number 2 aggregate (2 1/2 inch to 1 1/2 inch nominal size) as defined in ASTM D 448.

2.03 STONE BASE FOR STRUCTURES

A. Stone base material shall consist of coarse aggregate with gradation conforming to Size Number 57 aggregate as defined in ASTM D 448.

2.04 BACKFILL MATERIAL

A. Soil used for backfill around utility structures and structural foundations shall consist of on-site material obtained during excavation and grading, provided that it is substantially free of rocks larger than approximately three inches in greatest dimension, roots, trash and other material which may be compressible or which cannot be compacted properly. All soil used backfill around utility structures and structural foundations must be approved by Owner's QC Firm prior to installation.

B. Testing of Backfill Material:
   1. Moisture-Density Curve (ASTM D 698): Minimum of one test for each visible change in material.

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL

A. Tests specified below will be performed by the Owner's QC Firm during placement of backfill for the structures.

B. Testing of Backfill:
   1. In-Place Density (using ASTM D 1556, ASTM D 2937, or ASTM D 6938): Minimum of one test for every three lifts of backfill placed at each structure.
   2. Moisture Content (using ASTM D2216 or ASTM D 6938): Minimum of one test for every three lifts of backfill placed at each structure.

3.02 PREPARATION

A. Establish required limits and elevations for excavations.

B. Implement, operate and maintain dewatering system as required to control groundwater in conformance with the requirements of Section 31 23 19. This work shall be included as part of the Base Bid.

3.03 EXCAVATING FOR UTILITY STRUCTURES

A. Perform excavating of every type of material encountered at the required locations and to the limits shown on the Drawings and specified herein.

B. Excavate to the dimensions and elevations required for installation of structures. Slope sides of excavations and provide shoring and bracing as required to conform to applicable OSHA regulations.

C. Excavate in a manner and sequence that will provide proper drainage at all times.

D. Do not disturb materials below the required bottom of excavations unless otherwise required and approved by the Owner and Project Engineer.

E. If existing material below the required subgrade elevation is unsuitable for proper installation of the structure (such as excessively soft soil), excavate and remove the unsuitable material to the required depth below the base of the structure as determined by the Owner's QC Firm and approved by the Owner and Project Landscape Architect. Replace the removed unsuitable material with Stabilizer Aggregate, thoroughly compacted and graded to provide a firm and stable surface for installation of the structure.

F. If rock is encountered in the excavation, remove rock to a depth of six inches below the base of the structure using methods approved by the Owner and Project Landscape Architect. Place and compact Stone Base material as specified in paragraph 3.03.H.

G. Removal of rock and stabilization of subgrade for structures shall be included as part of the Base Bid.

H. Place and compact Stone Base material under all utility structures to a minimum depth of six inches, unless otherwise indicated on the Drawings. Accurately grade the Stone Base material to the required elevation to provide a firm and uniform bearing surface for the structure.

I. Maintain side slopes of excavations in a safe condition until completion of excavation, structure installation and backfilling.

3.04 EXCAVATING FOR FOOTING CONSTRUCTION

A. Excavate to the depth and horizontal dimensions required for construction of footings as indicated on the Drawings and specified herein.

B. Do not disturb materials below the required bottom of excavations unless otherwise required and approved by the Owner and Project Landscape Architect.

C. Construct formwork as required for concrete footing in applicable specification sections.

3.05 BACKFILLING AROUND STRUCTURES

A. Place and compact backfill as promptly as progress of the Work permits, but not until completion of the following:
   1. Acceptance by Owner and Project Landscape Architect of construction below finish grade.
   2. Removing concrete formwork, if applicable.
   3. Removing shoring and bracing as the excavation is backfilled, if applicable.
   4. Removing trash and debris.

B. Placing Backfill
   1. Place backfill in layers not more than eight inches loose thickness.
   2. Do not place backfill on surfaces that are muddy or frozen.
   3. Place backfill evenly adjacent to structures, to required finish grade.
   4. Take care to prevent unbalanced forces against structures by carrying the material uniformly around the structure to approximately the same elevation in each lift.

C. Compacting of Backfill
   1. Except as required in the following paragraph 2, compact each layer of backfill material to a minimum of 95 percent of the material's maximum dry density as determined by ASTM D 698.
   2. Backfill placed within 12 inches of the finished subgrade under building slabs and pavement shall be compacted to a minimum of 98 percent of the material's maximum dry density as determined by ASTM D 698.

3.06 DISPOSAL OF MATERIALS

A. Excess and unsuitable materials shall be placed on-site where approved by the Owner and Project Landscape Architect or hauled offsite and legally disposed of.

END OF SECTION 31 23 17

SECTION 31 23 18 - ROCK REMOVAL

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes excavation and removal of rock within the limits of excavations using mechanical methods or blasting methods.

B. Related Sections:
   1. Section 31 22 00 – Grading
   2. Section 31 23 17 – Excavating and Backfilling for Structures
   3. Section 31 23 33 – Trenching and Backfilling

1.02 DEFINITIONS

A. “Rock” or “Blast Rock” (for Grading specified in Section 31 22 00): Material that cannot be excavated with a single-tooth ripper mounted on a crawler tractor having a minimum draw bar pull rated at not less than 56,000 pounds, and occupying an original volume of at least one cubic yard.

B. “Rock” or “Blast Rock” (for trench and structural footing excavations specified in Sections 31 23 17 and 31 23 33): Material that cannot be excavated with a backhoe having a bucket curling force rated at not less than 25,700 pounds, and occupying an original volume of at least 1/2 cubic yard.

1.03 SUBMITTALS

A. Submit the following prior to commencement of any rock removal work requiring blasting:
   1. Pre-blast structural condition survey report(s) and photographs in conformance with the requirements of paragraphs 1.04.C and D.
   2. Documentation that personnel performing pre-blast structural condition surveys are qualified in accordance with paragraph 1.04.C.

1.04 QUALITY ASSURANCE

A. Work shall be performed by qualified personnel in conformance with applicable local, state and federal regulations.

B. Rock blasting shall be performed in conformance with all applicable laws and regulations, including:
   1. “Georgia Blasting Standards Act of 2015” (O.C.G.A. §25-8)
   2. U.S. Department of Justice, Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) (27 CFR 555)

C. Contractor shall retain the services of a qualified firm to perform pre-blast structural condition surveys to determine the general baseline condition of visible and accessible existing structures and other facilities within the defined limits of the survey. The firm shall have a minimum of 5 years documented experience in the performance of surveys of the type required for this project.

D. The pre-blast structural condition surveys shall consist of a visual assessment and photographs of accessible portions of structures (including building exteriors, slabs, floors, walls, roofs, and exposed structural members), roads, curbing, sidewalks, utility structures, and other visible facilities to identify and document existing cracks, structural distress, wall and floor defects, and other existing structural damage. The limits of the survey shall be within 1000 feet outside the limits of rock blasting (or as otherwise required by applicable regulations). Significant representative cracks shall be marked and photographed with gage marks to monitor potential future movement during the construction.

E. Obtain permits from authorities having jurisdiction before explosives are brought to site or drilling is started.

1.05 PROJECT CONDITIONS

A. Rock excavation shall be accomplished using mechanical methods unless otherwise approved by the Project Engineer.

B. The Contractor is solely responsible for excavation slope stability. Excavation work shall be in compliance with OSHA regulations.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL

A. Field inspection will be performed by the Project Engineer.

B. Rock quantities must be verified by the Owner's QC Firm prior to payment for this work.

C. Provide for visual inspection of rock surface and cavities formed by removed rock.

3.02 ROCK REMOVAL - MECHANICAL METHOD

A. Excavate and remove rock by the mechanical method where possible. Drill holes and utilize expansive tools to fracture rock and remove fractured layers to required depth.

B. For general excavation, remove rock to six inches below final subgrade or as otherwise determined by the Project Engineer.

C. For structure subgrade and trench excavations, remove rock to one foot below structure base and minimum six inches below pipe invert elevation and 24 inches wider than diameter of pipe or horizontal dimensions of structure, as applicable. Conform to the requirements of Sections 31 23 17 and 31 23 33 for placement of suitable backfill material over the exposed rock surface.

3.03 ROCK REMOVAL - EXPLOSIVE METHOD

A. If rock is uncovered requiring the explosive method for rock disintegration, notify the Project Engineer. Rock removal may be accomplished using this method only if approved by the Project Engineer, and the requirements of the following paragraphs are met.

B. Removal of rock using the explosive method shall comply with applicable regulations as indicated in subsection 1.03, and all other pertinent laws and regulations of agencies having jurisdiction.

C. Disintegrate rock and remove from area or trench to required depth. Conform to the requirements of paragraphs 3.02.C for depth of rock removal.

3.04 DISPOSAL OF MATERIAL

A. Removed rock shall be removed from the site and legally disposed of.

END OF SECTION 31 23 18

SECTION 31 23 19 - DEWATERING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes dewatering requirements for control of groundwater and collected surface water in excavations during construction activities.

1.02 PERFORMANCE REQUIREMENTS

A. Contractor shall be responsible for the design, implementation and removal of temporary dewatering systems required for installation of pipes and structures, subgrade stabilization, and fill placement if groundwater is encountered as part of the Base Bid price for the associated earthwork.

B. The extent of control of water includes, but is not limited to:
   1. Furnishing, installing and operating all necessary pumps, piping, and accessories.
   2. Removing all temporary structures and equipment after they have served their purpose.

1.03 QUALITY ASSURANCE

A. Handling, and discharge of removed water shall comply with all applicable local, state and federal environmental laws and regulations.

1.04 PROJECT CONDITIONS

A. Some subsurface information has been obtained and is available for review by the Contractor. Contractor is responsible for determining the character of materials, extent of groundwater or other conditions to be encountered. No warranty, either expressed or implied, is made as to the accuracy of the subsurface information presented by the Owner and Project Landscape Architect.

1.05 COORDINATION

A. Dewatering shall be coordinated with other phases of the Work to comply with the approved schedule, to provide required conditions for stability of excavations, control of groundwater during excavation activities, and proper discharge of removed groundwater as specified.

PART 2 - PRODUCTS

2.01 EQUIPMENT

A. Provide and maintain at all times proper dewatering equipment to meet the maximum requirements for the removal of water from excavations as specified.

B. Keep on hand, or have immediate access to, additional pumps of sufficient capacity to provide reasonably for any equipment breakdown.

C. Sufficient suction and discharge hose or piping shall be available for adequate disposal of pumped liquids without causing erosion, sedimentation or other adverse consequences.

PART 3 - EXECUTION

3.01 DEWATERING

A. If groundwater is encountered during excavations, the groundwater surface shall be lowered to an elevation below the required excavation bottom.

B. Operate and maintain the dewatering equipment until excavation of materials, and placement and compaction of backfill is complete.

C. Removal of liquids shall not interfere with other work.

D. Provide erosion and sediment control necessitated by the liquids removal and discharge operations.

3.02 HANDLING OF LIQUIDS

A. Water removed during dewatering operations shall be discharged on-site where approved by the Project Landscape Architect using suitable equipment and methods.

3.03 REMOVAL OF DEWATERING SYSTEM

A. Deactivate and remove dewatering systems at completion of backfilling.

END OF SECTION 31 23 19

SECTION 31 37 00 - RIPRAP

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes furnishing and placement of riprap at storm drain outlets and at other locations as indicated on the Drawings.

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):
   1. AASHTO M 288, Geotextile Specification for Highway Applications

B. Georgia Department of Transportation (GDOT):
   1. “Standard Specifications, Construction of Transportation Systems”, 2013 Edition (GDOT Standard Specifications)

1.03 SUBMITTALS

A. Submit the following to the Owner and Project Landscape Architect, for review and approval, no later than 15 days prior to scheduled delivery of specified materials to the Site
   1. Written documentation (including gradation test results) signed by the material producer, indicating that riprap meets or exceeds the specified requirements.
   2. Manufacturer’s documentation (including material properties sheet and quality control certifications) for geotextile as specified in Section 31 32 20.

PART 2 - PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Proposed materials shall be approved by the Owner and Project Landscape Architect as specified, prior to delivery and use in the construction.

B. Riprap material shall meet specified gradation prior to placement. All processing shall be completed at the source.

2.02 GEOTEXTILE

A. As specified on Drawings.

2.03 RIPRAP

A. Riprap shall consist of hard, angular shaped stone complying with the quality requirements of Section 805.2.01 of the GDOT Standard Specifications.

B. Unless otherwise indicated on the Drawings, gradation shall comply with the requirements for Type 3 Stone-Dumped Riprap (individual stones ranging in size from approximately six to twelve inches).

PART 3 - EXECUTION

3.01 PREPARATION OF SUBGRADE

A. Excavate, grade and compact the subgrade to the lines and elevations required for placement of riprap to the thickness indicated on the Drawings so that the top surface of riprap will be at the required finish grade.

3.02 PLACEMENT OF GEOTEXTILE

A. Install geotextile on graded surface prior to placement of riprap as indicated on the Drawings and as specified in the following paragraphs and Section 31 32 20.

B. Subgrade shall be smooth and free of litter, sharp protrusions, and large stones prior to geotextile placement.

C. The geotextile shall be placed loosely upon the slope so that placement of the overlying materials do not stretch or tear the fabric.

D. Bury the upper edges of the geotextile a minimum of six inches below grade at tops of slopes. Overlap adjacent sections or rolls of geotextile down the slope. Anchor geotextile at overlaps using approved pins or staples. Overlaps shall be a minimum of one foot.

3.03 PLACEMENT OF RIPRAP

A. Riprap shall be placed into a well-graded mass of stone with a minimum of voids.

B. Placement of riprap by dumping into chutes or similar methods which are likely to cause segregation of the riprap or damage to the geotextile will not be permitted.

C. Place riprap to its full thickness in one operation. Riprap shall not be placed in layers.

D. Rock shall be tamped into place until the surface conforms approximately to the required grade and cross section.

END OF SECTION 31 37 00

SECTION 32 11 23 - AGGREGATE BASE COURSE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes construction of aggregate base course for pavement.

B. Related Sections:
   1. Section 01 71 23 – Construction Surveying
   2. Section 31 22 00 - Grading

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):
   1. AASHTO T2, Standard Method of Test for Sampling of Aggregates
   2. AASHTO T27, Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates
   3. AASHTO T180, Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop
   4. AASHTO T191, Standard Method of Test for Density of Soil In-Place by the Sand-Cone Method
   5. AASHTO T224, Standard Method of Test for Coarse Particles in the Soil Compaction Test

B. Georgia Department of Transportation (GDOT):
   1. “Standard Specifications, Construction of Transportation Systems”, 2013 Edition (GDOT Standard Specifications)
   2. GDT 21, Determining Field Density of Soils Containing > 45% Retained on 2 mm Sieve (or > 10% Retained on 25 mm Sieve)
   3. GDT 59, Testing Density of Roadway Materials with Nuclear Gauges

1.03 SUBMITTALS

A. Submit written certification, signed by the material producer, documenting that the proposed materials to be furnished for this Project meet or exceed the specified requirements. Submit information to the Owner and Project Landscape Architect, for review and approval no later than 15 days upon receipt of the City issued notice to process. Owner and Project Landscape Architect have 15 days to review submittal, upon which as approval or rejection will be provided. If a resubmittal is required, a new 15 days review period will start the date the resubmittal is received from contractor.

B. Submit the following during work progress and at completion:
   1. Written reports of all specified tests showing conformance of the materials and constructed work with the Specifications.
   2. Copy of truck ticket for every load of aggregate delivered to the Site.

1.04 QUALITY ASSURANCE / QUALITY CONTROL

A. Owner will retain the services of independent Quality Control firm(s) to determine conformance of the materials and constructed work with the Specifications.

B. Construction of aggregate base course shall conform to the requirements of referenced GDOT Standard Specifications and as specified in this Section and in the Drawings.

1.05 DELIVERY, STORAGE AND HANDLING

A. Aggregate materials shall be adequately protected to preserve the fitness and quality of the materials.

PART 2 - PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Proposed materials and source of supply shall be approved by the Owner and Project Landscape Architect prior to delivery and use in the construction.

B. Aggregate shall meet specified gradation prior to placement. All processing shall be completed at the source or with on-site crushers. If the aggregate, at any time, deviates from the required gradation, the Contractor shall, at his own expense, correct the inconsistency to the satisfaction of the Owner and Project Landscape Architect.

2.02 AGGREGATE FOR BASE COURSE

A. Furnish Graded Aggregate Base conforming to the requirements of Section 815 of the GDOT Standard Specifications. Unless otherwise approved by the Owner and Project Landscape Architect, gradation shall be as specified for Group II Aggregates in subsection 815.2.01 as summarized below:

Sieve Size	Percent Passing, by Weight
2 inch	100
1 1/2 inch	97 - 100
3/4 inch	60 - 90
No. 10	25 - 45
No. 60	5 - 30
No. 200	4 - 11

B. Testing of Aggregate:
   1. Verification testing samples shall be taken upon delivery of aggregate to the Site, at a minimum rate of one for every 1,000 tons of material, and for each visible change in material. Sampling shall be in conformance with AASHTO T2.
   2. The following tests shall be performed:
      a. Sieve analysis (using AASHTO T27 or ASTM C136)
      b. Moisture-Density relationship (using AASHTO T180, Method C; use coarse particle correction in accordance with AASHTO T224)

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL

A. Tests specified below shall be performed during placement and compaction of aggregate base course:
   1. In-Place Density (using AASHTO T191, GDT 21 or GDT 59): Minimum of one test per lift for every 5,000 square feet of material placed, and at every material change as determined by the Owner and Project Landscape Architect.
   2. If the material is too coarse (more than about 20 percent retained on the 3/4-inch sieve) to use the above methods, proper compaction will be considered to have been reached when the surface is tightly bound and shows no detectable rutting or movement under operation of compaction equipment with a minimum of three coverages of a 5-ton roller.

B. Surveying shall be performed by, or under the direction of, a Registered Land Surveyor in the State of Georgia as specified in Section 01 71 23.

C. Aggregate thickness, surface elevations and uniformity of surface shall be checked during construction. Construction of subsequent asphalt concrete pavement shall not proceed until the Owner and Project Landscape Architect reviews survey documentation for the finished surface of aggregate base course.

3.02 PREPARATION

A. Installation of sanitary sewers, storm drains and other utilities within the construction limits for pavement shall be completed as specified in applicable specification sections.

B. Pavement subgrade construction shall be completed as specified in Section 31 22 00. Surveyor shall verify that subgrade gradients and elevations are correct before placement of aggregate base course commences.

3.03 AGGREGATE PLACEMENT AND COMPACTION

A. Aggregate base course shall not be placed on soft, muddy, frozen or otherwise unsuitable subgrade. Correct unsuitable subgrade conditions as specified in Section 31 22 00.

B. Construct aggregate base course in accordance with the applicable requirements of Section 310 of the GDOT Specifications and as specified in the following paragraphs.

C. Construct aggregate base course in one uniform layer, unless otherwise approved by the Owner and Project Landscape Architect. The total compacted thickness shall be as indicated on the Drawings. The maximum compacted thickness of each layer shall not exceed six inches.

D. Place, spread, shape, and compact aggregate as continuously as practicable during each day's operations. Place the material in a manner to avoid segregation. Uncontrolled spreading shall not be permitted.

E. Level and contour surfaces to elevations and gradients required to achieve the finish surface grades as indicated on the Drawings.

F. At the time aggregate is placed, it shall have a moisture content sufficient to obtain the required compaction. If necessary, uniformly apply water over the aggregate during compaction. Prevent free water from appearing on the surface during, or subsequent to, compaction operations. Compaction shall follow the spreading operation closely to prevent loss of contained moisture and displacement of material.

G. The depth of aggregate base course and aggregate shoulders shall be carefully controlled, with periodic measurements of the loose and compacted depth.

H. Each layer shall be compacted to a density of at least 95 percent of the material's maximum dry density as determined by AASHTO T180, with coarse particle correction in accordance with AASHTO T224.

I. Areas of aggregate base course that do not meet the specified density requirement shall be recompacted and retested.

3.04 MAINTENANCE AND PROTECTION

A. The completed aggregate base course shall be maintained smooth and uniform until covered by the subsequent stage of construction.

B. Hauling equipment and other traffic shall not be operated on the completed aggregate base course.

C. Damaged areas shall be repaired using methods approved by the Owner and Project Landscape Architect.

D. Construct asphalt pavement as soon as possible after completion of the aggregate base course to prevent damage due to weather and mechanical disturbances.

3.05 THICKNESS AND SURFACE TOLERANCES

A. Acceptable tolerance for thickness of aggregate base course shall be plus or minus 1/2 inch.

B. Uniformity of the surface shall conform to the requirements of subsection 310.3.06.B of the GDOT Standard Specifications for aggregate base course under pavement.

C. Based on the results of surveying and other measurements, areas of aggregate base course that are not constructed to the required thickness and surface elevations, within the allowed tolerances, shall be adjusted to the proper thickness and elevations as approved by the Owner and Project Landscape Architect at no additional cost to the Project.

END OF SECTION 32 11 23

SECTION 32 16 13 - CONCRETE CURBS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes construction of Portland cement concrete curbs.

B. Related Sections:
   1. Section 03 30 02 – Site Cast-in-Place Concrete
   2. Section 31 22 00 - Grading
   3. Section 32 11 23 – Aggregate Base Course

1.02 REFERENCES

A. Georgia Department of Transportation (GDOT):
   1. “Standard Specifications, Construction of Transportation Systems”, 2013 Edition (GDOT Standard Specifications)

1.03 SUBMITTALS

A. Submit the following to the Owner and Project Engineer, for review and approval no later than 15 days upon receipt of the city issued notice to proceed. Owner and Project Landscape Architect have 15 days to review submittal, upon which an approval or rejection will be provided. If a resubmittal is required, a new 14 days review period will start the date the resubmittal is received from contractor:
   1. Concrete mix design
   2. Manufacturers’ product data sheets for expansion joint filler material

B. Additional Submittals (In-Progress and at Completion)
   1. Field quality control test results

1.04 QUALITY ASSURANCE / QUALITY CONTROL

A. Owner will retain the services of independent Quality Control firm(s) to determine conformance of the materials and constructed work with the Specifications.

B. Construction of concrete curbs and gutters shall conform to the requirements of referenced GDOT Standard Specifications, and as specified in this Section.

1.05 PROJECT CONDITIONS

A. Conform to the applicable requirements of Section 441 of the GDOT Standard Specifications for required weather conditions and other restrictions for concrete curb and gutter construction.

B. Coordinate curb and gutter construction with construction of aggregate base course and pavement and other related site work.

PART 2 - PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Proposed materials shall be approved by the Owner and Project Landscape Architect as specified prior to delivery and use in the construction.

2.02 CONCRETE MATERIALS AND MIX DESIGN

A. Concrete materials and mix design shall conform to the requirements specified in subsection 2.03 of Section 03 30 02.

2.03 EXPANSION JOINT FILLER

A. Expansion joint filler shall comply with the applicable requirements of Subsection 833.2.01 of the GDOT Standard Specifications.

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL

A. No concrete for a specific pour shall be ordered for delivery to the Site until pertinent concrete mix design and specified materials are approved by the Owner and Project Landscape Architect.

B. If determined necessary by the Owner and Project Landscape Architect, sampling and testing will be performed during placement of concrete in conformance with the procedures specified in subsection 3.01 of Section 03 30 02.

3.02 PREPARATION

A. Preparation of subgrade shall be completed as specified in applicable specification sections and indicated on the Drawings.

B. Verify that soil subgrade or aggregate base course (as applicable) has been constructed to the correct lines, grade and cross-sections, and that it has been compacted as specified in Section(s) 31 22 00 and 32 11 23.

C. Maintain subgrade in a smooth, compacted condition until curb and gutter construction is complete.

D. Subgrade shall be in a moist condition when concrete is placed.

3.03 FORMWORK

A. Formwork shall conform to the requirements of Section 441 of the GDOT Standard Specifications.

B. Construct formwork to provide the required dimensions for curb construction. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete and shall have sufficient rigidity to maintain required shape.

3.04 CONCRETE PLACEMENT AND FINISHING

A. Conform to the applicable requirements of Section 441 of the GDOT Standard Specifications, and as specified in the following paragraphs.

B. Concrete curbs shall be constructed on prepared subgrade at the locations, elevations and alignments indicated on the Drawings.

C. Tool chamfer all exposed concrete edges.

D. Construct curbs prior to construction of asphalt pavement.

E. After concrete has been consolidated and forms have been removed, the surface shall be finished to a uniform texture. All edges shall be rounded. The finished surface shall conform to the required lines and grades indicated on the Drawings. The gutters shall be sloped as indicated and shall not have depressions which trap water.

F. Expansion and contraction joints shall be provided as specified below:
   1. Expansion joints shall be located as indicated on the Drawings. Expansion joint width shall be ½ inch. Joint filler shall extend for the full depth of the joint. Install joint filler in accordance with the manufacturer's recommendations
   2. Contraction joints shall be provided for crack control and located as indicated on the Drawings. Joints shall be formed using 1/4-inch edging tool, a 1/8-inch blade saw, or metal dividers. Depth of each contraction joint shall be one-fifth to one-quarter of the concrete thickness.

3.05 CURING AND PROTECTION

A. Immediately following finishing operations, cure and protect concrete in conformance with the applicable requirements of Section 441 of the GDOT Standard Specifications.

3.06 CORRECTION OF DEFECTIVE WORK

A. Concrete work that does not conform to the specified requirements, including strength, tolerances, and finishes, shall be corrected by the Contractor at the Contractor's expense, as determined by the Owner and Project Landscape Architect.

END OF SECTION 32 16 13

SECTION 32 84 00 - IRRIGATION

PART 1 - GENERAL

1.01 SUMMARY

A. Irrigation system required for this work includes but is not limited to the furnishing of all labor, tools, materials, appliances, tests, permits, taxes, etc., necessary for the installation of a landscape irrigation system as herein specified and shown on the drawings, and the removal of all debris from the site.
   1. Locate, purchase, deliver and install piping, conduit, sleeves, 120 volt and low voltage electrical and water connections, valves, backflow preventer devices, controllers, rain sensors, spray and bubbler heads, drip irrigation lines, and associated accessories for a fully operational automatic irrigation system.
   2. Trenching and water settling of backfill material.
   3. Testing and startup of the irrigation system.
   4. Prepare an as built record set of drawings.
   5. Training of the Owner's maintenance personnel in the operational requirements of the Irrigation system.
   6. Clean up and disposal of all excess and surplus material.
   7. Maintenance of the irrigation system during the proscribed maintenance period.

B. The system shall efficiently and evenly irrigate all areas and be complete in every respect and shall be left ready for operation to the satisfaction of the Project Landscape Architect.

C. Coordinate with other trades, as needed to complete work, including but not limited to Water Meter, Point of Connection (POC) and Backflow Preventer Device (BFPD) location and electrical hookups.

1.02 CONTRACT DOCUMENTS

A. Shall consist of specifications and its general conditions and the drawings. The intent of these documents is to include all labor, materials, and services necessary for the proper execution of the work. The documents are to be considered as one. Whatever is called for by any part shall be as binding as if called for in all parts.

1.03 RELATED DOCUMENTS AND REFERENCES

A. Related Documents:
   1. Drawings and general provisions of contract, including general and supplementary conditions and Division I specifications, apply to work of this section.
   2. Related Specification Sections
      a. Section 32 93 10 – Landscape Plantings
      b. Section 32 92 23 - Sodding

B. References:
   1. American Society of Testing Materials (ASTM): cited section numbers.
   2. National Sanitation Foundation (NSF): rating system.
   3. Irrigation Association: Turf & Landscape Irrigation Best Management Practices

1.04 VERIFICATION

A. Irrigation piping and related equipment are drawn diagrammatically. Scaled dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions and immediately notify the Project Landscape Architect of discrepancies between the drawings or specifications and the actual conditions. Although sizes and locations of plants and or irrigation equipment are drawn to scale wherever possible, it is not within the scope of the drawings to show all necessary offsets, obstructions, or site conditions. The Contractor shall be responsible to install the work in such a manner that it will be in conformance to site conditions, complete, and in good working order.

B. Piping and equipment is to be located within the designated planting areas wherever possible unless specifically defined or dimensioned otherwise.

1.05 PERMITS AND REGULATIONS

A. The Contractor shall obtain and pay for all permits related to this section of the work unless previously excluded under provision of the contract or general conditions. The Contractor shall comply with all laws and ordinances bearing on the operation or conduct of the work as drawn and specified. If the Contractor observes that a conflict exists between permit requirements and the work outlined in the contract documents, the Contractor shall promptly notify the Project Landscape Architect in writing including a description of any necessary changes and changes to the contract price resulting from changes in the work.

B. Wherever references are made to standards or codes in accordance with which work is to be performed or tested, the edition or revision of the standards and codes current on the effective date of this contract shall apply, unless otherwise expressly set forth.

C. In case of conflict among any referenced standards or codes or between any referenced standards and codes and the specifications, the more restrictive standard shall apply or Project Landscape Architect shall determine which shall govern.

1.06 PROTECTION OF WORK, PROPERTY AND PERSON

A. The Contractor shall adequately protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to the Contractor’s actions.

1.07 CHANGES IN THE WORK

A. The Project Landscape Architect may order changes in the work, and the contract sum being adjusted accordingly. All such orders and adjustments plus claims by the Contractor for extra compensation must be made and approved in writing before executing the work involved.

B. All changes in the work, notifications and Contractor’s request for information (RFI) shall conform to the contract general condition requirements.

1.08 CORRECTION OF WORK

A. The Contractor shall re-execute any work that fails to conform to the requirements of the contract and shall remedy defects due to faulty materials or workmanship upon written notice from the Project Landscape Architect, at the soonest as possible time that can be coordinated with other work, and seasonal weather demands, but not more than 90 (ninety) days after notification.

1.09 DEFINITIONS

A. Project Landscape Architect: The person appointed by the Owner to represent their interest in the review and approval of the work and to serve as the contracting authority with the Contractor. The Project Landscape Architect may appoint other persons to review and approve any aspects of the work.

B. Substantial Completion Acceptance: The date at the end of the Planting, Planting Soil, and Irrigation installation where the Project Landscape Architect accepts that all work in these sections is complete and the Warranty period has begun. This date may be different that the date of substantial completion for the other sections of the project.

C. Final Acceptance: The date when the Project Landscape Architect accepts that the plants and work in this section meet all the requirements of specification. It is intended that the materials and workmanship warranty for Planting, Planting Soil, and Irrigation work run concurrently.

1.10 SUBMITTALS

A. See the contract General Conditions for policy and procedures related to submittals.

B. Product data
   1. Submit a minimum of (3) complete lists of all irrigation equipment to be used, manufacturer's brochures, maintenance manuals, warrantees and operating instructions, within 15 days after the notice to proceed.
      a. This submission may be done digitally and all documents shall be submitted in one PDF document.
   2. The submittals shall be packaged and presented in an organized manner, in the quantity described in Division 1 of the specifications. Provide a table of contents of all submitted items.
   3. Clearly identify on each submitted sheet by underlining or highlighting (on each copy) the specific product being submitted for approval. Failure to clearly identify the specific product being submitted will result in a rejection for the entire submittal. No substitutions of material or procedures shall be made concerning these documents without the written consent of an accepted equivalent by the Project Landscape Architect.
   4. Equipment or materials installed or furnished without prior approval of the Project Landscape Architect, may be rejected by the Project Landscape Architect and the Contractor shall be required to remove such materials from the site at their own expense.
   5. Approval of substitution of material and/or products, other than those specified shall not relieve the Contractor from complying with the requirements of the contract documents and specifications. The Contractor shall be responsible, at their own expense, for all changes that may result from the approved substitutions, which affect the installation or operations other items of their own work and/or the work of other Contractors.

C. Samples: Samples of the equipment may be required at the request of the Project Landscape Architect if the equipment is other than that specified.

D. Other Submittals: Submit for approval:
   1. Documentation of the installer’s qualifications.
   2. As built record set of drawings.
   3. Testing data from all required pressure testing.
   4. Backflow prevention device certification: Certification from the manufacturer or their representative that the back flow prevention device has been installed correctly according to the manufacture’s and DeKalb County requirements.
   5. Booster pump certification (if required): Certification from the manufacturer or their representative that the booster pump has been installed correctly according to the manufacturer’s requirements.

1.11 OBSERVATION OF THE WORK

A. The Project Landscape Architect may inspect the work at any time. They may remove samples of materials for conformity to specifications. Rejected materials shall be immediately removed from the site and replaced at the Contractor's expense. The cost of testing materials not meeting specifications shall be paid by the Contractor.

B. The Project Landscape Architect shall be informed of the progress of the work so the work may be observed at the following key times in the construction process. The Project Landscape Architect shall be afforded sufficient time to schedule visit to the site. Failure of the Project Landscape Architect to make field observations shall not relieve the Contractor from meeting all the requirements of this specification.
   1. Trenching, directional boring, and sleeving review. These shall be laid out with paint on site prior to beginning work for approval by Project Landscape Architect.
   2. Hydrostatic pressure testing.
   3. Adjustment and coverage test.
   4. Pre maintenance observation.
   5. Final acceptance / system malfunction corrections.

1.12 PRE-CONSTRUCTION CONFERENCE

A. Schedule a pre-construction meeting with the Project Landscape Architect at least 15 days before beginning work to review any questions the Contractor may have regarding the work, administrative procedures during construction and project work schedule.

1.13 QUALITY ASSURANCE

A. It is the intention of this specification to accomplish the work of installing an automatic irrigation system, which will operate in an efficient and satisfactory manner. The irrigation system shall be installed and made operational according to the workmanlike standards established for landscape installation and sprinkler irrigation operation as set forth by the most recent Best Management Practices (BMP) of the Irrigation Association.

B. The specification can only indicate the intent of the work to be performed rather than a detailed description of the performance of the work. It shall be the responsibility of the Contractor to install said materials and equipment in such a manner that they shall operate efficiently and evenly and support optimum plant growth and health.

C. The Project Landscape Architect shall be the sole judge of the true intent of the drawings and specifications and of the quality of all materials furnished in performance of the contract.

D. The Contractor shall keep one copy of all drawings and specifications on the work site, in good order. The Contractor shall make these documents available to the Project Landscape Architect when requested.

E. In the event of any discrepancies between the drawings and the specification, the final decision as to which shall be followed, shall be made by the Project Landscape Architect.

F. In the event the installation is contradictory to the direction of the Project Landscape Architect, the installation shall be rectified by the Contractor at no additional cost to the Owner. The Contractor shall immediately bring any such discrepancies to the attention of the Project Landscape Architect.

G. It shall be distinctly understood that no oral statement of any person shall be allowed in any manner to modify any of the contract provisions. Changes shall be made only on written authorization of the Project Landscape Architect.

H. Installer Qualifications: The installer shall be a firm having at least 5 years of successful experience of a scope similar to that required for the work and shall be a licensed irrigator.
   a. Installer Field Supervision: The installer shall maintain on site an experienced full-time supervisor who can communicate in English with the Project Landscape Architect.
   b. Submit the installer's qualifications for approval.

1.14 IRRIGATION SYSTEM WARRANTY:

A. The Contractor shall Warrantee all workmanship and materials for a period of 1 year following the acceptance of the work.
   1. Any parts of the irrigation work that fails or is defective shall be replaced or reconstructed at no expense to the Owner including but not limited to: restoring grades that have settled in trenches and excavations related to the work. Reconstruction shall include any plantings, soil, mulch or other parts of the constructed landscape that may be damaged during the repair or that results from soil settlement.

B. The date of acceptance of the work and start of the Guarantee period shall be determined by the Project Landscape Architect, upon the finding that the entire irrigation system is installed as designed and specified, and found to be operating correctly, supplying water evenly to all planting and/or lawn areas.

C. Neither the final acceptance nor any provision in the contract documents shall relieve the Contractor of responsibility for faulty materials or workmanship. The Contractor shall remedy any defects within a period of 7 days (s) from the date of notification of a defect.

1.15 SITE CONDITIONS

A. It is the responsibility of the Contractor to be aware of all surface and sub-surface conditions, and to notify the Project Landscape Architect, in writing, of any circumstances that would negatively impact the installation of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

1.16 DELIVERY, STORAGE, AND HANDLING

A. All materials and equipment shall be stored properly and protected as required by the Contractor. The Contractor shall be entirely responsible for damages or loss by weather or other cause to work under the contract. Materials shall be furnished in ample quantities and at such times as to ensure uninterrupted progress of the work.

B. Deliver the products to the job site in their original unopened container with labels intact and legible at time of use.

C. Store in accordance with the manufacturers' recommendations.

1.17 PROTECTION

A. The Contractor shall continuously maintain adequate protection of all their work from damage, destruction, or loss, and shall protect the owner's property from damage arising in connection with this contract. Contractor shall make good any such damage, destruction, loss or injury. Contractor shall adequately protect adjacent property as provided by law and the contract documents.

B. The Contractor shall maintain sufficient safeguards, such as railings, temporary walks, lights, etc., against the occurrence of accidents, injuries or damage to any person or property resulting from their work, and shall alone be responsible for the same if such occurs.

C. All existing paving, structures, equipment or plant material shall be protected at all times, including the irrigation system related to plants, from damage by workers and equipment. The Contractor shall follow all protection requirements including plant protection provision of the general contract documents. All damages shall be repaired or replaced at the Contractor's expense. Repairs and or replacement shall be to the satisfaction of the Project Landscape Architect, including the selection of a Contractor to undertake the repair or maintenance. Repairs shall be at no cost to the owner.
   1. For trees damaged to the point where they will not be expected to survive or which are severely disfigured and that are too large to replace, the cost of damages shall be as determined by the Owner's arborist using accepted tree value evaluation methods.

D. The Contractor shall refrain from trenching within the drip line of any existing tree to remain. The Project Landscape Architect may require the Contractor to relocate proposed irrigation work, bore lines beneath roots or use air spade technology to dig trenches through and under the root system to avoid damage to existing tree root areas.

1.18 EXCAVATING AROUND UTILITIES

A. Contractor shall carefully examine the civil, record, and survey drawings to become familiar with the existing underground conditions before digging.
   1. Do not begin any excavation until all underground utilities have been located and marked. Determine location of underground utilities and perform work in a manner that will avoid possible damage. Hand excavate, as required. Maintain stakes and or markings set by others until parties concerned mutually agree to their removal.

B. Notification of Local Utility Locator Service is required for all excavation around utilities. The Contractor is responsible for knowing the location and avoiding utilities that are not covered by the Local Utility Locator Service.

1.19 POINT OF CONNECTION

A. The point of connection of the irrigation system to its electrical power sources shall be provided by the irrigation installer. All connections shall be made by a licensed electrical Contractor per governing codes at the location shown on the drawings.

B. The point of connection of the irrigation system to its potable and or non-potable water sources, including the main shutoff valve and backflow preventer shall be provided by the irrigation installer. All connections shall be made by a licensed Contractor per governing codes, at the location shown on the drawings.

1.20 TEMPORARY UTILITIES

A. All temporary piping, wiring, meters, panels and other related appurtenances required between source of supply and point of use shall be provided by the Contractor and coordinated with the Project Landscape Architect. Existing utilities may be used with the written permission of the owner.

1.21 CUTTING, PATCHING, TRENCHING AND DIGGING

A. The Contractor shall do all cutting, fitting, trenching or patching of their work that may be required to make its several parts come together as shown upon, or implied by, the drawings and specifications for the completed project.

B. Digging and trenching operations shall be suspended when the soil moisture is above field capacity.

1.22 USE OF PREMISES

A. The Contractor shall confine their apparatus; the storage of materials, and the operations of their workers to limits indicated by the law, ordinances, or permits and shall not unreasonably encumber the premises with their materials.

B. Contractor parking, and material and equipment storage shall in areas approved by the Owner.

1.23 AS BUILT RECORD SET OF DRAWINGS

A. Immediately upon the installation of any buried pipe or equipment, the Contractor shall indicate on the progress record drawings the locations of said pipe or equipment. The progress record drawings shall be made available at any time for review by the Project Landscape Architect.

B. Before final acceptance of work, the Contractor shall provide an as built record set of drawings showing the irrigation system work as built. The drawings shall be transmitted to the Project Landscape Architect in pdf file format. The drawings shall include all information shown on the original contract document and revised to reflect all changes in the work. The drawings shall include the following additional information
   1. All valves shall be numbered by station and corresponding numbers shall be shown on the as built record set of drawings.
   2. All main line pipe or irrigation equipment including sleeves, valves, controllers, irrigation wire runs which deviate from the mainline location, backflow preventers, remote control valves, grounding rods, shut-off valves, rain sensors, wire splice locations, and quick coupling valves shall be located by two (2) measured dimensions, to the nearest one-half foot. Dimensions shall be given from permanent objects such as buildings, sidewalks, curbs, walls, structures and driveways. All changes in direction and depth of main line pipe shall be noted exactly as installed. Dimensions for pipes shall be shown at no greater than a 50 ft. maximum interval.
   3. One (1) hardcopy and one (1) pdf copy of the As built record set of drawings shall be signed and dated by the Contractor attesting to and certifying the accuracy of the as built record set of drawings. As built record set of drawings shall have "As Built Record Set of Drawings", company name, address, phone number and the name of the person who created the drawing and the contact name (if different).

1.24 CONTROLLER CHARTS:

A. Provide one controller chart for each automatic controller installed.
   1. On the inside surface of the cover of each automatic controller, prepare and mount a color-coded chart showing the valves, main line, and systems serviced by that particular controller. All valves shall be numbered to match the operation schedule and the drawings. Only those areas controlled by that controller shall be shown. This chart shall be a plot plan, entire or partial, showing building, walks, roads and walls. The plan, reduced as necessary and legible in all details, shall be made to a size that will fit into the controller cover. This print shall be approved by the Project Landscape Architect and shall be protected in laminated in a plastic cover and be secured to the inside back of the controller cabinet door.
   2. The controller chart shall be completed and approved prior to acceptance of the work.

1.25 TESTING

A. Provide all required system testing with written reports as described in Part 3.

1.26 OPERATION AND MAINTENANCE MANUALS AND GUARANTEES

A. Prepare and deliver to the Project Landscape Architect within 7 calendar days prior to completion of construction, two 3-ring hard cover binders containing the following information:
   1. Index sheet stating Contractor's address and telephone number, list of equipment with name and

addresses of local manufacturers' representatives.
2. Catalog and parts sheets on all material and equipment.
3. Guarantee statement. The start of the guarantee period shall be the date the irrigation system is accepted by the Owner.
4. Complete operating and maintenance instruction for all major equipment.
5. Irrigation product manufacturers warrantees.

B. In addition to the above-mentioned maintenance manuals, provide the Owner's maintenance personnel with instructions for maintaining major equipment and show evidence in writing to the Project Landscape Architect at the conclusion of the project that this has been rendered.

PART 2 - PRODUCTS

2.01 MATERIALS GENERAL

A. All materials shall be of standard, approved and first grade quality and shall be new and in perfect condition when installed and accepted.

B. All controllers, valves, and heads shall be manufactured by the following manufacturer(s).
1. Hunter Industries
2. Wilkins Division
3. Nibco
4. Watts
5. Febco

C. Approval of any items or substitutions indicates only that the product(s) apparently meet the requirements of the drawings and specifications on the basis of the information or samples submitted. The Contractor shall be responsible for the performance of substituted items. If the substitution proves to be unsatisfactory or not compatible with other parts of the system, the Contractor shall replace said items with the originally specified items, including all necessary work and modifications to replace the items, at no cost to the Owner.

2.02 PIPING MATERIAL

A. Individual types of pipe and fittings supplied are to be of compatible manufacturer unless otherwise approved. Pipe sizes shown are nominal inside diameter unless otherwise noted.

B. Plastic pipe:
All pipe shall be free of blisters, internal striations, cracks, or any other defects or imperfections. The pipe shall be continuously and permanently marked with the following information: manufacturer’s name or trade mark, size, class and type of pipe pressure rating, quality control identifications, date of extrusion, and National Sanitation Foundation (NSF) rating.
1. All mainlines and transmission lines shall be Schedule 40 PVC; laterals shall be Class 200 PVC. Pipe shall be rigid unplasticized conforming to ASTM D-1784 and D-2241 standard specifications for PVC pipe.
2. Galvanized pipe shall be used for above ground connections to, backflow prevention device assemblies, hose bibs, and booster pumps and as shown on the plans and details.
   a. Pipe shall be hot dip galvanized continuous welded, seamless, Schedule 40 conforming to applicable current ASTM standards.

2.03 FITTINGS AND CONNECTIONS:

A. Polyvinyl chloride pipe fittings and connections: Type II, Grade 1, Schedule 40, high impact molded fittings, manufactured from virgin compounds as specified for piping tapered socket or molded thread type, suitable for either solvent weld or screwed connections. Machine threaded fittings and plastic saddle and flange fittings are not acceptable. Furnish fittings permanently marked with following information: nominal pipe size, type and schedule of material, and National Sanitation Foundation (NSF) seal of approval. PVC fittings shall conform to ASTM D2464 and D2466.

B. Brass pipe fittings, unions and connections: standard 125 pound class 85% red brass fittings and connections, IPS threaded.

C. PVC Schedule 80 threaded risers and nipples: Type I, grade 1, Schedule 80, high impact molded, manufactured from virgin compounds as specified for piping and conforming to ASTM D-2464. Threaded ends shall be molded threads only. Machined threads are not acceptable.

D. Galvanized pipe fittings shall be galvanized malleable iron ground joint Schedule 40 conforming to applicable current ASTM standards.

2.04 SOLVENT CEMENTS AND THREAD LUBRICANT

A. Solvent cements shall comply with ASTM D2564. Socket joints shall be made per recommended procedures for joining PVC plastic pipe and fittings with PVC solvent cement and primer by the pipe and fitting manufacturer and procedures outlined in the appendix of ASTM D2564.

B. Thread lubricant shall be Teflon ribbon-type, or approved equal, suitable for threaded installations as per manufacturer's recommendations.

C. Pipe Joint Compound (Pipe dope) shall be used on all galvanized threaded connections. Pipe Joint Compound is a white colored, non-separating thread sealant compound designed to seal threaded connections against leakage due to internal pressure. It shall contain PTFE (Polytetrafluoroethylene) to permit a tighter assembly with lower torque, secure permanent sealing of all threaded connections and allow for easy disassembly without stripping or damaging threads.

2.05 BACKFLOW PREVENTION DEVICES

A. The backflow prevention device shall be certified to NSF/ANSI 372 shall be ASSE Listed 1013, rated to 180 degree F, and supplied with full port ball valves.

B. The main body and access covers shall be low lead bronze (ASTM B 584)

C. The seat ring and all internal polymers shall be NSF Listed Noryl and the seat disc elastomers shall be silicone.

2.06 PRESSURE REGULATOR

A. Pressure regulator shall certified to NSF/ANSI 372, consisting of low lead bronze body bell housing, a separate access cap shall be threaded to the body and shall not require the use of ferrous screws.

B. The main valve body shall be cast bronze (ASTM B 584).

C. The access covers shall be bronze (ASTM B 584 or Brass ASTM B 16)

D. The assembly shall be of the balanced piston design and shall reduce the pressure in both flow and no flow conditions.

E. Pressure regulator shall be as indicated on the drawings.

2.07 WYE STRAINER

A. Strainer shall conform to MIL –S-16293, and be ANSI 3rd party certified to comply with the states lead plumbing law 0.25% maximum weighted average lead content.

B. The main body shall be low lead bronze (ASTM B 584)

C. The access covers shall be yellow brass or cast bronze (ASTM B 16 or ASTM B 584)

D. Strainer screen shall be 300 series stainless steel available in 20, 40, 60, 80, or 100 mesh.

E. Wye strainer shall be as indicated on the plans.

2.08 BACKFLOW PREVENTER ENCLOSURE

A. A heavy-duty insulated enclosure with rust proof finish. The enclosure shall be sized to allow space for the entire piping assembly associated with the Backflow Preventer unit, and all associated equipment.

B. The cage shall include the manufacturers' standard tamper proof locking mechanism.

C. Provide a concrete base as detailed on the drawings.

D. Backflow Preventer Enclosure type, manufacturer and color shall be submitted to Project Landscape Architect for approval.

2.09 BOOSTER PUMP

A. Booster pump (when required) shall be housed in a sturdy, locking, weather-resistant case, furnished for maximum exterior protection.

2.10 BALL VALVES

A. Ball valves for 3/4 inch through 2 1/2 inch shall be of PVC, block, tru-union design with EDPDM seals and o-ring.

B. Ball valves for 3 inch and larger shall be gate design and shall be iron body, brass or bronze mounted AWWA gate valves, and shall have a clear waterway equal to the full nominal diameter of the valve, and shall be rubber gasket, flanged or mechanical joint only, and shall be able to withstand a continuous working pressure of 150 PSI. Valve shall be equipped with a square-operating nut.

C. All ball valves located in a valve manifold shall be the same size as the main line (1-1/2 inch size minimum). Provide pipe-reducing adapters down stream of valves, as required. All ball valves in line shall be the same size as the pipe.

2.11 CHECK VALVES

A. Swing check valves 2 inch and smaller shall be 200 lbs., W.O.G., bronze construction with replaceable composition, neoprene or rubber disc and shall meet or exceed federal specification WW-V 5ld, class a, type iv.

B. Anti drain valves shall be of heavy duty virgin PVC construction with female iron pipe thread inlet and outlet. Internal parts shall be stainless steel and neoprene. Anti drain valves shall be field adjustable against draw out from 5 to 40 feet of head.

2.12 REMOTE CONTROL VALVES

A. Remote control valves shall be electrically operated, single seat, normally closed configuration, equipped with flow control adjustment and capability for manual operation.

B. Valves shall be actuated by a normally closed low wattage solenoid using 24 volts, 50/60 cycle solenoid power requirement. Solenoid shall be epoxy encased. A union shall be installed on the discharge end.

C. Remote control valves shall be wired to controller in same numerical sequence as indicated on drawings.

2.13 MASTER CONTROL VALVES

A. Master Control Valve shall be compatible with the irrigation controller.

2.14 FLOW SENSOR

A. Flow sensor shall be compatible with the irrigation controller.

2.15 HYDROMETER

A. Hydrometer shall be compatible with the irrigation controller.

2.16 QUICK COUPLER VALVES

A. Quick coupler valves shall be a one or two piece, heavy-duty brass construction with a working pressure of 150 PSI with a built in flow control and a self closing valve.

B. Quick coupler shall be equipped with locking red brass cap covered with durable yellow thermo-plastic rubber cover. Key size shall be compatible with quick coupler and of same manufacturer.

2.17 SPRINKLER HEADS

A. All sprinkler heads shall have check valves installed where required on plans.

B. Riser nipples for all sprinkler heads shall be the same size as the riser opening in the sprinkler body and fabricated as shown on the drawings.

2.18 AUTOMATIC CONTROLLER

A. Controller shall be housed in a sturdy, locking, weather resistant case, furnished for maximum exterior protection.

B. Controller shall be equipped with evapo-transpiration (ET) sensor, which adjusts the controller programming based on local climatic conditions. The sensor shall also have a rain sensing shut-off switch, wind sensing shut off switch, and freeze sensing shut-off of switch.
   1. If a moisture sensor is used in lieu of an evapo-transpiration sensor an additional sensor, which has a rain-sensing shut-off switch, wind sensing shut-off switch, and freeze sensing shut-off switch shall be provided.

2.19 CONTROLLER DECODERS

A. All decoders shall be per the controller manufacturer's specifications.

2.20 ELECTRICAL CONTROL WIRING

A. Low voltage
   1. The electrical control wire shall be direct burial type UF, no. 14 AWG, solid, single conductor, copper wire UL approved or larger, if required to operate system as designed.
   2. For 2-Wire controllers all irrigation wire for the controller, flow sensor, master valve, hydrometer, remote control valves and moisture sensors shall be per the controller manufacturer's specifications and recommendations.
   3. Color code wires to each valve. Common wire shall be white.
   4. If multiple controllers are being utilized, and wire paths of different controllers cross each other, both common and control wires from each controller to be of different colors.
   5. Control wire splices: Splices are when required shall be placed in splice boxes.
   6. Wire connections shall be per the controller manufacturer's specifications and recommendations.

B. High voltage
   1. Shall be of type as required by local codes and ordinances.
   2. Shall be of proper size to accommodate needs of equipment it is to serve.

2.21 VALVE BOXES AND MATERIALS

A. Valve boxes: valve boxes shall be constructed of ABS (acrylonitrile butadiene styrene) plastic, green in color, with rigid base and sides and shall be supplied with bolt lock cover secured with stainless steel bolts. Cover shall be identified as shown on drawings. Provide box extensions as required.
   1. Master valves, flow sensors, remote control irrigation valves, gate valves, and ball valves 3 inch or less in size shall use a 14 inch x 19 inch x 12 inch rectangular box.
   2. Quick coupler valves, wire splices, and grounding rods shall use a 10 inch circular box.
   3. For re-use or other non-potable systems, purple lids shall be used.

2.22 CONCRETE THRUST BLOCKS

A. Concrete thrust blocks shall be sized per the pipe manufactures requirement.

2.23 VALVE IDENTIFICATION TAGS

A. Valve Identification Tags shall be 2.25 inch x 2.65 inch polyurethane. Color: potable water; yellow / Non-potable water; purple. Tags shall be permanently attached to each remote control valve with tamper proof seals as indicated on the drawings.

2.24 EQUIPMENT TO BE FURNISHED TO OWNER

A. Two (2) sets of keys for each automatic controller.

B. Two (2) 48 inch tee wrenches for operating the gate valves.

C. Three (3) sets of special tools required for removing, disassembling and adjusting each type of sprinkler and valve supplied on this project.

D. Five (5) Extra sprinkler heads, nozzles, shrub adapters, nozzle filter screens, for each type used on the project.

E. Two (2) quick coupler keys to match manufacturer type of quick coupler.

2.25 INCIDENTAL MATERIALS AND EQUIPMENT

A. Furnish all materials and equipment not specified above, but which are necessary for completion of the work as intended.

2.26 MAIN LINE LOCATOR TAPE

A. 3 - inch wide plastic detectable locator tape.

2.27 MAIN LINE AND LATERAL LINE BEDDING SAND

A. Sand shall consist of natural or manufactured granular material, free of organic material, mica, loam, clay or other substances not suitable for the intended purpose.

B. Sand shall be masonry sand ASTM C 144 or coarse concrete sand, ASTM C 33.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. Code requirements shall be those of state and municipal codes and regulations locally governing this work, providing that any requirements of the drawings and specifications, not conflicting therewith, but exceeding the code requirements, shall govern unless written permission to the contrary is granted by the Project Landscape Architect.

B. Extreme care shall be exercised at all times by the Contractor in excavating and working in the project area due to existing utilities and irrigation systems to remain. Contractor shall be fully responsible for expenses incurred in the repair of damages caused by their operation.
   1. The Contractor is responsible for identifying and maintaining existing irrigation main lines that supply water to areas on the site as noted on the drawings and outside of the proposed limit of work. The Contractor shall relocate or replace existing irrigation main line piping as required to provide a continuous supply of water to all areas of existing irrigation on site.
      a. Providing continuous water supply shall include hand watering and or the use of watering trucks to provide adequate water.

C. Plan locations of backflow preventers, valves, controllers, irrigation lines, sleeves, spray heads and other equipment are diagrammatic and indicate the spacing and relative locations of all installations. Final site conditions and existing and proposed plantings shall determine final locations and adjusted as necessary and as directed to meet existing and proposed conditions and obtain complete water coverage. Minor changes in locations of the above from locations shown shall be made as necessary to avoid existing and proposed trees, piping, utilities, structures, etc. at the Contractor's expense or when directed by the Project Landscape Architect.
   1. The Contractor shall be held responsible for relocation of any items without first obtaining the Project Landscape Architect's approval. The Contractor shall remove and relocate such items at their expense if so directed by the Project Landscape Architect.

D. Prior to any work the Contractor shall stake out locations of all pipe, valves, and otherequipment using an approved staking method and maintain the staking of the approved layout in accordance with the drawings and any required modifications. Verify all horizontal and vertical site dimensions prior to staking of heads. Do not exceed spacing shown on drawings for any given area. If such modified spacing demand additional or less material than shown on the drawings, notify the Project Landscape Architect before beginning any work in the adjacent area.

E. Stub out main line at all end runs and as shown on drawings. Stub out wires for future connection where indicated on plan and as directed.

F. Point of connection shall be approximately as shown on drawings. Connect new underground piping and valves and provide all flanges, adapters or other necessary fittings for connection.

G. Permission to shut off any existing in-use water line must be obtained 48 hours in advance, in writing from the Owner. The Contractor shall receive instructions from the Project Landscape Architect as to the exact length of time of each shut-off.

H. No fittings shall be installed on pipe underneath pavement or walls.

I. Prior to starting any work, Contractor shall obtain a reading of existing static water pressure (no flow condition) at the designated point of connection and immediately submit written verification of pressure with date and time of recording to Project Landscape Architect.

3.02 TRENCHING, DIRECTIONAL BORING AND SLEEVING

A. Perform all trenching, directional boring, sleeving and excavations as required for the installation of the work included under this section, including shoring of earth banks to prevent cave ins.

B. The Contractor may directional bore lines where it is practical or where required on the plans.
   1. Extend the bore 1’ past the edge of pavement unless noted differently on the plans
   2. Cap ends of each bore and locate ends at finished grade using metal stakes.
   3. All boring and sleeving shall have detectable locator tape placed at the ends of the pipe.

C. Make trenches for mains, laterals and control wiring straight and true to grade and free of protruding stones, roots or other material that would prevent proper bedding of pipe or wire.

D. Excavate trenches wide enough to allow a minimum of 4 - inch between parallel pipelines and 8 inch from lines of other trades. Maintain 3 - inch vertical clearance between irrigation lines. Minimum transverse angle is 45 degrees. All pipes shall be able to be serviced or replaced without disturbing the other pipes.

E. Trenches for pipelines shall be made of sufficient depth to provide the minimum cover from finished grade as follows:
   1. Pressure main line: 18 inches below finish grade and 24-30 inches below paved areas in Schedule 40 PVC sleeves.
   2. Reclaimed water constant pressure main lines shall cross at least twelve (12) inches below potable water lines.
      a. If a constant pressure reclaimed water main line must be installed above a potable water line or less than twelve (12) inches below a potable water line, then reclaimed water line shall be installed within an approved protective sleeve. The sleeve shall extend ten (10) feet from each side of the center of the potable line, for a total of twenty (20) feet. The sleeve shall be color-coded (purple) for use with reclaimed water.
   3. Lateral lines: 12 inches below finish grade and 18 inches below paved areas in Schedule 40 PVC sleeves.
   4. Control wiring: to the side of pressure main line and 24 inches below paved areas in Schedule 40 PVC sleeves.

F. On new on-site systems (post-meter), the required horizontal separation between potable water lines, reclaimed water constant pressure main lines and sewer lines shall be a minimum of four (4) feet apart as directed by the project landscape architect and/ or regulatory agency. Measurements shall be between facing surfaces, not pipe centerlines.

G. When trenching through areas of imported or modified soil, deposit imported or modified soils on one side of trench and subsoil on opposite side.

H. Backfill the trench per the requirements in paragraphs “Backfilling and Compacting” below.

3.03 PIPE INSTALLATION

A. General Pipe Installation
   1. Exercise caution in handling, loading and storing, of plastic pipe and fittings to avoid damage.
      a. The pipe and fittings shall be stored under cover until using, and shall be transported in a vehicle with a bed long enough to allow the length of pipe to lay flat so as not to be subjected to undue bending or concentrated external load at any point.
      b. All pipe that has been dented or damaged shall be discarded unless such dent or damaged section is cut out and pipe rejoined with a coupling.
   2. Trench depth shall be as specified above from the finish grade to the top of the pipe.
   3. Install a detectable pipe locator tape 6 to 8 inches above all main line pipes.

B. Polyvinyl Chloride Pipe (PVC) Installation
   1. Under no circumstance is pipe to rest on concrete, rock, wood blocks, construction debris or similar items.
   2. No water shall be permitted in the pipe until a period of at least 24 hours has elapsed for solvent weld setting and curing.
   3. Install assemblies and pipe to conform to respective details and where shown diagrammatically on drawings, using first class workmanship and best standard practices as approved. All fittings that are necessary for proper connections such as swing joints, offsets, and reducing bushings that are not shown on details shall be installed as necessary and directed as part of the work.
   4. Dielectric bushings shall be used in any connections of dissimilar metals.
   5. Gasketed plastic pipe: pipe-to-pipe joints or pipe to fittings shall be made in accordance with manufacturer’s specifications.
   6. Solvent weld or threaded plastic pipe:
      a. Installation of all pipe and fittings shall be in strict accordance with manufacturer’s specifications.
      b. Pipe shall be cut using approved PVC pipe cutters only. Sawed joints are disallowed. All field cuts shall be beveled to remove burrs and excess before gluing.
      c. Welded joints shall be given a minimum of 15 minutes to set before moving or handling. Excess solvent on the exterior of the joint shall be wiped clean immediately after assembly.
      d. Plastic to metal connections shall be made with plastic adapters and if necessary, short (not close) brass threaded nipples. Connection shall be made with two (2) wraps of Teflon tape and hand tightened plus one turn with a strap wrench.
      e. Snake pipe horizontally in trench to allow one (1) foot of expansion and contraction per 100 feet of straight run.
      f. Threaded pipe joints shall be made using Teflon tape. Solvent shall not be used with threaded joints. Pipe shall be protected from tool damage during assembly. All damaged pipe shall be removed and replaced. Take up threaded joints with light wrench pressure.
      g. No close nipples or risers are allowed. Cross connections in piping is disallowed.
      h. Center load pipe at 10 feet on center intervals with small amount of backfill to prevent arching and slipping under pressure. Other than this preliminary backfill all pipe joints, fittings and connections are to remain uncovered until successful completion of hydrostatic testing and written approval of the testing report.
      i. Concrete thrust blocks shall be constructed behind all pipe fittings 1-1/2 inch diameter and larger at all changes of direction of 45 degrees or more.

C. Galvanized Pipe Installation
   1. All joints shall be threaded with pipe joint compound used on all threads.
   2. Dielectric bushings shall be used in any connections of dissimilar metals.

3.04 TRENCHING, DIRECTIONAL BORING, AND SLEEVING REVIEW:

A. Upon completion and installation of all trenching, directional boring, and sleeving, all installed irrigation control wiring, lines and fittings shall be visually observed by the Project Landscape Architect unless otherwise authorized. Do not cover any wires, lines or fittings until they have been tested and observed by the Project Landscape Architect.

3.05 FLUSHING

A. Openings in piping system during installation are to be capped or plugged to prevent dirt and debris from entering pipe and equipment. Remove plugs when necessary to flush or complete system.

B. After completion and prior to the installation of any terminal fittings, the entire pipeline system shall be thoroughly flushed to remove dirt, debris or other material.

3.06 HYDROSTATIC PRESSURE TESTING

A. After flushing, and the installation of valves the following tests shall be conducted in the sequence listed below. The Contractor shall furnish all equipment; materials and labor necessary to perform the tests and all tests shall be conducted in the presence of the Project Landscape Architect.

B. Water pressure tests shall be performed on all pressure main lines before any couplings, fittings, valves and the like are concealed.

C. Immediately prior to testing, all irrigation lines shall be purged of all entrapped air or debris by adjusting control valves and installing temporary caps forcing water and debris to be discharged from a single outlet.

D. Test all pressure main line at 150 PSI. For a minimum of four (4) hours with an allowable loss of 5 PSI. Pressure and gauges shall be read in PSI, and calibrated such that accurate determination of potential pressure loss can be ascertained.

E. Re test as required until the system meets the requirements. Any leaks, which occur during test period, will be repaired immediately following the test. All pipe shall be re tested until final written acceptance.

F. The Contractor is responsible for proving documentation stating the weather conditions, date, the start time and initial water pressure readings, the finish time and final water pressure readings and the type of equipment used to perform the test. The documentation must be signed by a witness acceptable to the Owner, verifying all of the above-mentioned conditions.

G. Submit a written report of the pressure testing results with the other above required information to the Project Landscape Architectfor approval.

3.07 BACKFLOW PREVENTER TESTING

A. The backflow preventer shall be tested according to procedures and results per the requirements of the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California or American Water Works Association whichever is more stringent.

B. Testing shall be performed by a Backflow Prevention Assembly Tester with a current certification from the American Backflow Preventer Association.

3.08 BACKFILLING AND COMPACTING

A. Irrigation trenches shall be carefully backfilled with material approved for backfilling and free of rocks and debris one (1) inch in diameter and larger. When back filling trenches in areas of imported or modified planting soil, replace any excavated subsoil at the bottom and the imported soil or modified planting soil at the top of the trench.

B. Backfill shall be compacted with approved equipment to the following densities
   1. Backfill under pavement and within 2 feet of the edge of pavement: Compact to 95% or greater of maximum dry density standard proctor.
   2. Backfill of subsoil under imported planting mixes or modified existing planting soil: Between 85 and 90% of maximum dry density standard proctor.
   3. Backfill of imported planting mixes or modified existing planting soil: Compact to the requirements of the adjacent planting mix or planting soil as specified in section “Planting Soil”.

C. Finish grade of all trenches shall conform to adjacent grades without dips or other irregularities. Dispose of excess soil or debris off site at Contractor's expense.

D. Any settling of backfill material during the maintenance or warranty period shall be repaired at the Contractor’s expense, including any replacement or repair of soil, lawn, and plant material or paving surface.

3.09 RESURFACING PAVING OVER TRENCHES

A. Restore all surfaces and repair existing underground installations damaged or cut as a result of the excavation to their original condition, satisfactory to the Project Landscape Architect.

B. Trenches through paved areas shall be resurfaced with same materials quality and thickness as existing material. Paving restoration shall be performed by the project paving Sub-contractor or an approved Contractor skilled in paving work.

C. The cost of all paving restoration work shall be the responsibility of the irrigation Contractor unless the trenching thru the paving was, by previous agreement, part of the general project related construction.

3.10 INSTALLATION OF EQUIPMENT

A. General:
   1. All equipment shall be installed to meet all installation requirements of the product manufacturer. In the event that the manufactures requirements cannot be implemented due to particular condition at the site or with other parts of the design, obtain the Project Landscape Architect’s written authorization and approval for any modifications.
   2. Install all equipment at the approximately at the location(s) and as designated and detailed on the drawings. Verify all locations with the Project Landscape Architect.
   3. Install all valves within a valve box of sufficient size to accommodate the installation and servicing of the equipment. Group valves together where practical and locate in shrub planting areas.
   4. All sprinkler irrigation systems that are using water from potable water systems shall require backflow prevention. All backflow prevention devices shall meet and be installed in accordance with requirements set forth by local codes and the health department.

B. Pressure regulator:
   1. Set regulator for required PSI per manufacturer's specifications.

C. Check Valve:
   1. Install check valves approximately at the locations necessary to prevent low head run off.

D. Remote control valves:
   1. Remote control valve manifolds and quick coupler valves shall be separate allowing use of a quick coupler with all remote control valves shut off.
   2. Install boxes no farther than 12 inches from edge of paving and perpendicular to edge of paving and parallel to each other. Allow 12 inches clearance between adjacent valve boxes.

E. Quick coupler valve:
   1. Install each quick coupler valve in its own valve box.
   2. Install thrust blocks on quick couplers.
   3. Place no closer than 12 inches to adjacent paving.
   4. Install 18 inches off set from main line.

F. Sprinkler heads:
   1. All main lines and lateral lines, including risers, shall be flushed and pressure tested before installing sprinkler heads.
   2. Install specified sprinkler heads as shown in details at locations shown on the drawings. Adjust layout for full coverage, spacing of heads shall not exceed the maximum spacing recommended by the manufacturer.
   3. All sprinkler heads shall be set perpendicular to finish grade unless otherwise designated on the drawings or details.

G. Irrigation controllers:
   1. Remote control valves shall be connected to controller in numerical sequence as shown on the drawings.
   2. Controller shall be tested with complete electrical connections. The Contractor shall be responsible for temporary power to the controller for operation and testing purposes.
   3. Connections to control wiring shall be made within the pedestal of the controller. All wire shall follow the pressure main insofar as possible.
   4. Electrical wiring shall be in a rigid gray PVC plastic conduit from controller to electrical outlet. The electrical Contractor shall be responsible for installing all wiring to the controller, in order to complete this installation. A disconnect switch shall be included.

H. Wiring:
   1. Low Voltage
      a. Control wiring between controller and electrical valves shall be installed in the same trench as the main line where practical. The wire shall be bundled and secured to the lower quadrant of the trench at 10 foot intervals with plastic electrical tape.
      b. When the control wiring cannot be installed in the same main line trench it shall be installed a minimum of 18 inches below finish grade and a bright colored plastic ribbon with suitable markings shall be installed in the trench 6 inches below grade directly over the wire.
      c. An expansion loop shall be provided every 500 feet in a box and inside each valve box. Expansion loop shall be formed by wrapping wire at least eight (8) times around a ¾ inch pipe and withdrawing pipe.
      d. Provide one control wire to service each valve in system.
      e. Run two (2) spare #14 1 wires from controller along entire main line to last electric remote control valve on each and every leg of main line. Label spare wires at controller and wire stub to be located in a box.
      f. All control wire splices not occurring at control valve shall be installed in a separate splice valve box.
      g. Wire markers (sealed, 1 inch to 3 inch square) are to identify control wires at valves and at terminal strips of controller. At the terminal strip mark each wire clearly indicting valve circuit number.
   2. High Voltage
      a. All electrical work shall conform to local codes, ordinances and any authorities having jurisdiction. All high voltage electrical work to be performed by licensed electrician.

b. The Contractor shall provide 120-volt power connection to the automatic controller unless noted otherwise on drawings.

I. Valve boxes:
1. Install one valve box for each type of valve installed as per the details.
2. Gravel sump shall be installed after compaction of all trenches. Final portion of gravel shall be placed inside valve box after valve is backfilled and compacted.
3. Permanently label valve number and or controller letter on top of valve box lid using a method approved by the Owners Representative.

J. Tracer wire:
1. Tracer wire shall be installed with non metallic plastic irrigation main lines where controller wires are not buried in the same trench as the main line.
2. The tracer wire shall be placed on the bottom of the trench under the vertical projection of the pipe with spliced joints soldered and covered with insulation type tape.
3. Tracer wire shall be of a color not used for valve wiring. Terminate wire in a valve box. Provide enough length of wire to make a loop and attach wire marker with the designation "tracer wire".

K. Drip Installation:
1. Clamp fittings with Oetiker clamps or approved equal when operating pressure exceeds specific drip tubing fitting requirements.
2. When installing drip tubing, install soil staples as listed below:
a. Sandy Soil - One staple every three (3') feet and two (2) staples on each change of direction (tee, elbow, or cross).
b. Loam Soil - One staple every four (4') feet and two (2) staples on each change of direction (tee, elbow, or cross).
c. Clay Soil - One staple every five (5') feet and two (2) staples on each change of direction (tee, elbow, or cross).
3. Cap or plug all openings as soon as lines have been installed to prevent the intrusion of materials that would obstruct the pipe. Leave in place until removal is necessary for completion of installation.
4. Thoroughly flush all water lines before installing valves and other hydrants.

3.11 ADJUSTMENT AND COVERAGE TEST

A. Adjustment:
1. The Contractor shall flush and adjust all sprinkler heads, valves and all other equipment to ascertain that they function according to the manufacturer's data.
2. Adjust all sprinkler heads not to overspray onto walks, roadways and buildings when under maximum operating pressure and during times of normal prevailing winds.

B. Coverage test:
1. The Contractor shall perform the coverage test in the presence of the Project Landscape Architect after all sprinkler heads have been installed, flushed and adjusted. Each section is tested to demonstrate uniform and adequate coverage of the planting areas serviced.
2. Any systems that require adjustments for full and even coverage shall be done by the Contractor prior to final acceptance at the direction of the Project Landscape Architect at no additional cost. Adjustments may also include realignment of pipes, addition of extra heads, and changes in nozzle type or size.
3. The Contractor at no additional cost shall immediately correct all unauthorized changes or improper installation practices.
4. The entire irrigation system shall be operating properly with written approval of the installation by the Project Landscape Architect prior to beginning any planting operations.

3.12 REPAIR OF PLANTING SOIL

A. Any areas of planting soil including imported or existing soils or modified planting soil which become compacted or disturbed or degraded as a result of the installation of the irrigation system shall be restored to the specified quality and compaction prior to beginning planting operations at no additional expense to the Owner. Restoration methods and depth of compaction remediation shall be approved by the Project Landscape Architect.

3.13 CLEAN-UP

A. During installation, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week.
    a. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all surfaces within the project or on public right of ways and neighboring property.

B. Once installation is complete, wash all soil from pavements and other structures.
    1. Make all repairs to grades ruts, and damage to the work or other work at the site.
    2. Remove and dispose of all excess soil, packaging, and other material brought to the site by the Contractor.

3.14 PROTECTION

A. The Contractor shall protect installed irrigation work from damage due to operations by other Contractors or trespassers.
    1. Maintain protection during installation until Acceptance. Treat, repair or replace damaged work immediately. The Project Landscape Architect shall determine when such treatment, replacement or repair is satisfactory.

3.15 PRE MAINTENANCE OBSERVATION:

A. Once the entire system shall be completely installed and operational and all planting is installed, the Project Landscape Architect shall observe the system and prepare a written punch list indicating all items to be corrected and the beginning date of the maintenance period.

B. This is not final acceptance and does not relieve the Contractor from any of the responsibilities in the contract documents.

3.16 GENERAL MAINTENANCE AND THE MAINTENANCE PERIOD

A. General maintenance shall begin immediately after installation of irrigation system. The general maintenance and the maintenance period shall include the following:
    1. On a weekly basis the Contractor shall keep the irrigation system in good running order and make observations on the entire system for proper operation and coverage. Repair and cleaning shall be done to keep the system in full operation.
    2. Records of all timing changes to control valves from initial installation to time of final acceptance shall be kept and turned over to the Project Landscape Architect at the time of final acceptance.
    3. During the last week of the maintenance period, provide equipment familiarization and instruction on the total operations of the system to the personnel who will assume responsibility for running the irrigation system.
    4. At the end of the maintenance period, turn over all operations logs, manuals, instructions, schedules, keys and any other equipment necessary for operation of the irrigation system to the Owner who will assume responsibility for the operations and maintenance of the irrigation system.

B. The maintenance period for the irrigation system shall coincide with the maintenance period for the Planting.

3.17 SUBSTANTIAL COMPLETION ACCEPTANCE

A. Upon written notice from the Contractor, the Owners Representative shall review the work and make a determination if the work is substantially complete.

B. The date of substantial completion of the irrigation shall be the date when the Project Landscape Architect accepts that all work in Planting, Planting Soil, and Irrigation installation sections is complete.

3.18 FINAL ACCEPTANCE / SYSTEM MALFUNCTION CORRECTIONS

A. At the end of the Plant Warrantee and Maintenance period, the Project Landscape Architect shall inspect the irrigation work and establish that all provisions of the irrigation system are complete and the system is working correctly.
   1. Restore any soil settlement over trenches and other parts of the irrigation system.
   2. Replace, repair or reset any malfunctioning parts of the irrigation system.

B. The Contractor shall show all corrections made from punch list. Any items deemed not acceptable shall be reworked and the maintenance period will be extended.

C. The Contractor shall show evidence that the Project Landscape Architect has received all charts, records, drawings, and extra equipment as required before final acceptance.

D. Failure to pass review: If the work fails to pass final review, any subsequent observations must be rescheduled as per above. The cost to the Owner for additional observations will be charged to the Contractor at the prevailing hourly rate of the reviewer.

END OF SECTION 32 84 00

SECTION 32 92 19 - SEEDING AND MULCHING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes establishing temporary and permanent grass as part of Erosion, Sedimentation and Pollution Control (ES&PC) measures on areas disturbed by construction as indicated on the Drawings.

B. Related Sections:
   1. Section 01 57 13 – Temporary Soil Erosion and Sediment Control
   2. Section 31 22 00– Grading

C. SPECIAL NOTE RELATED TO SEEDING: SEE SPECIAL PROVISIONS FOR LANGUAGE RELATED TO RELEASE OF PAYMENT AND OWNER ACCEPTANCE RELATED TO ESTABLISHMENT OF TURF IN AREAS REQUIRING SEEDING.

1.02 REFERENCES

A. Georgia Department of Transportation (GDOT):
   1. “Standard Specifications, Construction of Transportation Systems”, 2013 Edition (GDOT Standard Specifications)

1.03 SUBMITTALS

A. Submit the following for approval at time of shipment of materials to the Site:
   1. Certification of grass seed from seed vendor for each grass seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination and weed seed.
   2. Bag tags, receipts, truck weight tickets, and other information necessary to confirm application rates and types for all seed.

1.04 QUALITY ASSURANCE / QUALITY CONTROL

A. Contractor shall retain the services of a testing firm to perform analysis of soil samples as specified in this Section. The testing firm shall be an independent laboratory approved by the Owner and Project Engineer and recognized by the State of Georgia Department of Agriculture, with the experience and capability to conduct the testing specified.

B. Seeding shall be accomplished according to standard local practice and as indicated on the Drawings.

C. SPECIAL NOTE RELATED TO SEEDING: SEE SPECIAL PROVISIONS FOR LANGUAGE RELATED TO RELEASE OF PAYMENT AND OWNER ACCEPTANCE RELATED TO ESTABLISHMENT OF TURF IN AREAS REQUIRING SEEDING.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver packaged materials in containers showing weight, analysis and name of manufacturer/supplier.

B. Protect materials from deterioration during delivery and while stored at the Site.

1.06 PROJECT CONDITIONS

A. Perform seedbed preparation and seeding as soon as possible after completion of grading in each area.

B. Seeding shall be performed only during the appropriate growing season for the particular seed mix as recommended by the local agricultural extension office and approved by the Owner and Project Engineer.

1.07 MAINTENANCE SERVICE

A. Maintenance service for establishment of grassed areas shall begin immediately after seeding, and continue until final acceptance as specified in 3.06.

PART 2 - PRODUCTS

2.01 TOPSOIL

A. Topsoil to be placed on graded areas that require seeding shall be obtained from on-site stockpiles of stripped topsoil. The soil shall be substantially free of litter, stiff clay, stones larger than one inch in diameter, objectionable weeds, litter, brush, matted or large roots, toxic substances, or any other material which may be harmful to plant growth or hinder planting operations.

2.02 FERTILIZER

A. Fertilizer shall be a standard commercial fertilizer, in dry or liquid form, complying with Section 891 of the GDOT Standard Specifications.

B. The grade of fertilizer shall be as indicated on the Drawings or as otherwise determined based on soil test results and as approved by the Project Engineer.

2.03 LIME

A. Lime shall be ground dolomitic limestone designated for agricultural use, meeting the requirements of the Georgia Department of Agriculture and Subsection 882.2.01 of the GDOT Standard Specifications.

2.04 SEED

A. Seed shall be fresh, clean, new-crop seed mixed in the proportions specified for species and variety, meeting the requirements of Subsection 892.01 of the GDOT Standard Specifications, except that sampling and testing of the seed will not be required.

B. Seed mixtures for temporary and permanent grassing shall be as indicated on the Drawings.

C. The variety and blends of seed shall not be added, deleted or substituted unless otherwise approved by the Owner and Project Engineer. Proposed changes to the seed mixtures shall be submitted to the Project Engineer for approval prior to use.

D. Seed that has become wet, moldy or otherwise damaged will not be acceptable.

2.05 MULCH

A. Mulch shall be as indicated on the Drawings.

PART 3 - EXECUTION

3.01 SOIL SAMPLING

A. An independent testing firm shall obtain at least one sample (minimum 10-ounce sample) per acre of soil to be seeded, analyze the samples to determine amounts of nitrogen, phosphorus, potassium, and pH value in the soil, and provide recommendations on fertilizer and lime to be used.

3.02 PREPARATION

A. Maintain temporary erosion and sediment control measures as specified in Section 01 57 13 until a satisfactory stand of grass has been established.

B. Fill placement and grading shall be completed as specified in Section 31 22 00.

C. Place topsoil in areas to be grassed or landscaped as indicated on the Drawings. Shape the final surface of topsoil to be free from irregular surface changes.

D. Surface shall be scarified to an approximate depth of three inches in areas to be seeded. Remove stones and sticks, roots, rubbish and other extraneous matter.

3.03 SEED APPLICATION TIMES

A. Timing for temporary seeding shall be as indicated on the Drawings.

B. Seeding for permanent vegetation shall be performed during the first optimum planting season following completion of work in an area. Planting dates are indicated on the Drawings.

3.04 TEMPORARY VEGETATION

A. Seed mixture for temporary vegetation shall be uniformly applied at the rate indicated on the Drawings.

3.05 APPLICATION OF SOIL AMENDMENTS

A. Uniformly apply fertilizer and lime for permanent vegetation at the rates indicated on the Drawings or as otherwise determined based on soil test results and as approved by the Project Engineer.

3.06 APPLICATION OF PERMANENT SEEDING AND MULCH

A. Uniformly apply seed for permanent vegetation in conformance with the application rates and procedures indicated on the Drawings, unless otherwise approved by the Owner and Project Engineer.

B. Seed may be sown with a gravity, cyclone or hydraulic seeder, or as otherwise approved by the Owner and Project Engineer.

3.07 PROTECTION OF SEEDED AREAS

A. Immediately after seeding, protect seeded areas with mulch or erosion control matting as indicated on the Drawings and as specified in the following paragraphs.

B. Spread mulch over all other seeded areas not requiring erosion control matting. Rate and method of application shall be as indicated on the Drawings.

3.08 ESTABLISHMENT OF GRASS

A. Begin maintenance of seeded areas immediately after seed placement. Water, repair washed or eroded areas, and otherwise protect and maintain the seeded areas for a minimum of one month after seed placement has been completed and until date of Substantial Completion.

B. Final acceptance of seeded areas will not be made by the Owner and Project Engineer until a satisfactory stand of grass is obtained in all areas seeded. A satisfactory stand of grass is defined as a cover of living plants, after true leaves are formed, of the seed species applied, in which gaps larger than 6” x 6” do not occur. Bare spots shall be scattered, and the total bare areas shall not comprise more than ten percent of a 10 square foot area.

C. During the establishment period, re-seed bare and eroded areas as determined necessary by the Owner and Project Engineer. Repair of washed or eroded areas and re-seeding of bare areas shall be performed at no additional cost to the Project.

D. Water required to promote a satisfactory growth shall be furnished and applied by the Contractor until final acceptance of seeded areas, and will not be measured for payment. Apply water as required to supplement rainfall to provide approximately one inch of water per week over the seeded areas.

E. When initial maintenance period has not elapsed, or if lawn is not fully established, before the grass goes dormant, maintenance and or replanting must be done during the next planting season until established. Final payment will be delayed until final acceptance by the City.

3.09 MAINTENANCE SERVICE

A. Initial Lawn Maintenance Service: Provide full maintenance by skilled employees of landscape installer. Maintain as required in this Section. Begin maintenance immediately after each lawn area is planted and continue until acceptable lawn is established, but for not less than the following periods.
   1. Seeded Lawns: 60 days from date of planting completion.
   2. Sprigged Lawns: 60 days from date of planting completion.

END OF SECTION 32 92 19

SECTION 32 92 23 - SODDING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes requirements for planting and maintenance of sod.

B. Related Sections:
1. Section 01 57 13 – Temporary Soil Erosion and Sediment Control
2. Section 31 22 00 – Grading
3. Section 32 92 19 – Seeding and Mulching

1.02 REFERENCES

A. American Sod Producers Association (ASPA)

B. Turfgrass Producers International, ‘Specifications for Turfgrass Sod Materials’ and ‘Specifications for Turfgrass Sod Transplanting and Installation’ in its ‘Guideline Specifications to Turfgrass Sodding’.

C. Georgia Department of Transportation (GDOT):
1. “Standard Specifications, Construction of Transportation Systems”, 2013 Edition (GDOT Standard Specifications)

1.03 SUBMITTALS

A. Submit the following for review prior to commencement of the work of this Section:
1. Sod certification for grass species and location of sod source.
2. Soil sample analysis results and recommendations for soil amendments.

B. Submit the following at completion of the Work:
1. Instructions for continued maintenance of sodded areas, including: cutting method and maximum grass height; and types, application frequency, and recommended coverage of fertilizer.

1.04 QUALITY ASSURANCE / QUALITY CONTROL

A. Sodding shall be accomplished according to standard local practice and in compliance with applicable state and federal regulations and as indicated on the Drawings.

B. Contractor shall retain the services of a qualified testing firm approved by the Owner and Project Landscape Architect to perform analysis of soil samples to determine nutrient content and recommendations for soil amendments as specified in this Section.

C. Sod Producer shall be a firm specializing in sod production and harvesting with minimum 5 years experience, and certified by the Georgia Department of Agriculture.

D. Satisfactory Lawns.
1. Lawn installations shall meet the following criteria as determined by Owner:
a. Satisfactory Sodded Lawn: at end of maintenance period, a healthy, well-rooted, even colored, viable lawn has been established, free of weeds, open joints, bare areas, and surface irregularities.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver sod on pallets or in rolls. Protect exposed roots from dehydration and freezing.

B. Do not deliver more sod than can be laid within 24 hours of harvesting based on manpower, available resources, and weather conditions at the Site. In addition, sod that is not transplanted within 24 hours of harvesting shall be kept moist and protected from exposure to heat, direct sunlight and freezing until it is transplanted.

1.06 PROJECT CONDITIONS

A. Sodding shall be accomplished only during the appropriate growing season, as recommended by the local agricultural extension office and approved by the Owner and Project Landscape Architect.

1.07 MAINTENANCE

A. Maintain sodded areas immediately after placement until grass is well established and exhibits a vigorous growing condition for at least one cutting.

B. Furnish service and maintenance of sodded areas until date of acceptance of the Work.

PART 2 - PRODUCTS

2.01 TOPSOIL

A. Topsoil to be placed on graded areas to be sodded shall be obtained from on-site stockpiles of stripped topsoil or from approved sources. The material shall be substantially free of litter, stiff clay, stones larger than one-inch in diameter, stumps, objectionable weeds, litter, brush, matted or large roots, toxic substances, or any other material which may be harmful to plant growth or hinder planting operations.

2.02 SOIL AMENDMENTS

A. Specified in Section 32 92 19.

2.03 SOD

A. Sod shall be field grown grass sod of the species indicated on the Drawings. Use living, growing sod (including sod that is dormant during the cold or dry season and is capable of renewing growth after the dormant period).

B. Sod shall have a strong fibrous root system free of stones, burned or bare spots. It shall be free of all prohibited and noxious weeds, insects, eggs, and larvae as defined by the Georgia Department of Agriculture, and substantially free of all other weeds.

C. The sod shall have at least 1/2 inch of soil adhering firmly to the roots. At least 95 percent of the plants in the sod shall be of the designated variety of grass.

D. The sod may be cut in strips or in rolls. Sod that is excessively dried out, exposed to heat or is otherwise not viable shall be rejected.

2.04 ACCESSORIES

A. Furnish metal sod staples of sufficient size and length to ensure anchorage of sod on slope.

PART 3 - EXECUTION

3.01 SOIL TESTING

A. An independent testing firm shall obtain at least one sample (minimum 10-ounce sample) per acre of soil to be sodded, analyze the samples to determine amounts of nitrogen, phosphorus, potassium, and pH value in the soil, and provide recommendations on fertilizer and lime to be used.

3.02 PREPARATION FOR SODDING

A. Maintain temporary erosion and sediment control measures for each property as specified in Section 01 57 13 until sod placement and establishment has been completed.

B. Complete placement and grading of soil as indicated on the Drawings and specified in Section 31 22 00.

C. Protect existing structures, utilities, other facilities, and landscape plants from damage caused by sodding operations.

D. Backfill that has been compacted shall be loosened to a depth of six inches.

E. Fine grade to a smooth, uniform surface to provide a loose, fine texture. Roll and rake surface, remove ridges and fill depressions to meet finish grades. Limit fine grading to areas that can be sodded in the immediate future.

F. Finish surface shall be reasonably smooth and free of litter, large clods, roots, sticks, stones larger than one inch in any dimension, and other extraneous matter.

3.03 APPLICATION OF FERTILIZER AND LIME

A. Apply lime and fertilizer in accordance with the requirements of Section 32 92 19 and as otherwise approved by the Owner and Project Landscape Architect based on soil test results.

B. Apply fertilizer and lime no more than 48 hours before laying sod. Mix amendments thoroughly into upper layer of soil.

3.04 LAYING SOD

A. Moisten prepared sod bed and sod immediately prior to laying sod.

B. Lay sod within 24 hours after harvesting to prevent deterioration.

C. Remove all backing from sod as it is installed.

D. Lay sod tight with no open joints visible, and no overlapping. Stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.

E. On slopes 3 to 1 and steeper, lay sod perpendicular to slope and secure every row with metal sod staples at a minimum of four per square yard of sod. Drive staples flush with soil portion of sod.

F. Roll sodded areas to ensure good bond between sod and soil using rollers not exceeding 100 pounds or suitable wooden or metal tampers.

G. Water sodded areas immediately after installation. Saturate sodded area to soil depth of approximately three inches.

3.05 MAINTENANCE

A. Install signs and caution tape around sodded areas to limit traffic during the maintenance period.

B. Begin watering and other maintenance of sodded areas immediately after sod placement. Water, repair deteriorated or bare spots, and otherwise protect and maintain the sodded areas for a minimum of one month after sod placement has been completed.

C. Water as required to promote a satisfactory growth of grass shall be furnished and applied by the Contractor until final acceptance of sodded areas. Apply water as required to supplement rainfall to provide approximately one inch of water per week over the sodded areas.

D. Immediately replace sod in areas that show deterioration or bare spots.

E. Final acceptance of sodded areas will not be made by the Owner and Project Landscape Architect until a satisfactory stand of grass is obtained. A satisfactory stand of grass is defined as a cover of living plants in which gaps larger than 6” X 6” do not occur. Bare spots shall be scattered, and the total bare areas shall not comprise more than ten percent of a 10 square foot area.

F. When initial maintenance period has not elapsed, or if lawn is not fully established, before the grass goes dormant, maintenance and or resodding of unacceptable areas must be done during the next planting season until acceptable lawn is established. Final payment will be delayed until final acceptance by the City.

3.06 MAINTENANCE SERVICE

A. Initial Lawn Maintenance Service: Provide full maintenance by skilled employees of landscape installer. Maintain as required in this Section. Begin maintenance immediately after each lawn area is planted and continue until acceptable lawn is established, but for not less than the following periods.
   1. Sodded Lawns: 30 days from date of planting completion.

END OF SECTION 32 92 23

SECTION 32 93 10 - LANDSCAPE PLANTINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Excavation and preparation of planting pits and beds
   2. Planting of trees, shrubs, and ground cover plants
   3. Relocation of designated plants
   4. Maintenance of plantings

B. Related Sections:
   1. Section 32 92 23 - Sodding

1.02 REFERENCES

A. AmericanHort: American Standard for Nursery Stock, 2014 Edition

1.03 SUBMITTALS

A. Submit the following for review by the Owner and Project Landscape Architect not later than 15 days prior to scheduled shipment of materials to the Site:
   1. Certificates of Conformance or Compliance: Before delivery, notarized certificates attesting that trees and other plants to be furnished meet the requirements specified.
   2. Digital photographs of all trees and representative sample of all shrubs and groundcovers to be furnished. Include survey rod, ruler or other object of known size in all pictures.

B. Submit the following for review by the Owner and Project Landscape Architect at time of shipment of materials to the Site:
   1. Certification tags from trees, shrubs, and ground cover plants, verifying type and purity.

C. Notify Owner and Project Landscape Architect at least 5 days in advance of anticipated delivery date of planting materials to be furnished by Contractor. Submit legible copy of invoice, showing kinds and sizes of materials included for each shipment.

D. At completion of the Work, submit written Material and Installation Warranties as specified in subsection 1.08.

1.04 QUALITY ASSURANCE

A. Condition of new plants furnished by the Contractor shall be the responsibility of Contractor from the time of purchase and shall be approved by the Owner and Project Landscape Architect. The Owner and Project Landscape Architect reserves the right to inspect and reject plants at any time and place.

B. Furnish trees, shrubs and ground cover plants as indicated on the Drawings. Plants shall conform to requirements of the referenced AmericanHort publication for spread, height or container size for the sizes shown.

C. The plant sizes indicated on the Drawings are minimum size acceptable and, where pruning is required, are sizes after pruning.

1.05 DELIVERY, STORAGE AND HANDLING

A. Cover plants transported to the Site in open vehicles with tarpaulins or other suitable covers securely fastened to body of vehicle to prevent injury to plants. Closed vehicles shall be adequately ventilated to prevent overheating of plants.

B. Evidence of inadequate protection following digging, carelessness while in transit, or improper handling or storage shall be cause for rejection.

C. Plants shall be kept moist, fresh, and protected. Such protection shall encompass the entire period during which plants are in transit, being handled, or are in temporary storage.

D. Coordinate with the Owner and Project Landscape Architect regarding schedule for delivery of required plants. Contractor shall maintain plants beginning at time of delivery, and shall perform planting work as specified in this Section.

1.06 PROJECT CONDITIONS

A. Landscape plantings shall be performed as soon as possible after finish grades are established in each area, unless otherwise approved by the Owner and Project Landscape Architect.

1.07 MAINTENANCE

A. Maintain plants immediately after planting as specified in subsection 3.06.

B. Furnish service and maintenance of plantings until date of acceptance of the Work.

1.08 MATERIAL AND INSTALLATION WARRANTY

A. Provide a written one-year Material and Installation Warranty for all plants purchased and installed by Contractor. Warranty period shall extend for one continuous growing season after inspection and acceptance. Warranty shall include replacement of dead or unhealthy plants in accordance with the requirements of subsection 3.06 and a new Material and Installation warranty shall be provided, commencing on the date of replacement.

PART 2 - PRODUCTS

2.01 ALL REFERENCES TO VENDORS AND ‘APPROVED MANUFACTURERS’ ARE INCLUDED FOR DESCRIPTION OF QUALITY AND CONTENT OF THE DESIGNATED EQUIPMENT/MATERIALS AS BASIS OF DESIGN. EQUIVALENT ITEMS MAY BE ACCEPTED IF THEY MEET ALL STANDARDS OF QUALITY AND PURPOSE FOR THE INTENDED USE, AS DETERMINED BY CITY OF WOOSTOCK.

2.02 PLANTS

A. Plants to be furnished shall be as indicated on the Drawings.

B. Plants shall be free of pests and disease, as well as dead branches and tips.

C. Plants shall not be pruned before delivery.

D. Trees with abrasion of bark, sunscalds, disfiguring knots, or fresh cuts of limbs over 1-1/4 inch which have not completely calloused, shall be rejected.

E. Plants shall be typical of their species or variety and shall have normal habit of growth and be legibly tagged with proper name. Plants shall have been grown under climatic conditions similar to those of the vicinity of the Site or have been acclimated to such condition for at least two years.

F. Root system of each plant shall be well provided with fibrous roots. Plants shall be sound, healthy, vigorous, well branched, and densely foliated when in leaf.

G. Plants designated ball and burlap shall be moved with root systems as solid units with balls of earth firmly wrapped with burlap and comply with the following:
   1. Diameter and depth of balls of earth shall be sufficient to encompass fibrous root feeding systems necessary for healthy development of plant.
   2. No plant shall be accepted when ball of earth surrounding its roots has been badly cracked or broken prior to or during process of planting. Balls shall remain intact during all operations.
   3. Hemp burlap and twine is preferable to treated burlap. If treated burlap is used, twine shall be cut from around trunk and burlap shall be removed.
   4. Contractor shall review plant locations to ensure that nursery provides rootballs that are not overly large for the specified location and coordinate rootball size with nursery as necessary.

H. Trunk of each tree shall be single trunk growing from single unmutilated crown of roots unless a multi-stem tree is specifically called for on drawings. No part of trunk shall be conspicuously crooked as compared with normal trees of same variety.

I. Clear height of trees from top of rootball to beginning of canopy shall be as specified on drawings.

J. Thickness of each shrub shall correspond to trade classification "Number 1". Single stemmed or thin plants shall not be accepted. Side branches shall be generous, well twigged, and plant as whole well branched to ground. Plants shall be in moist condition, free from dead wood, bruises, or other root or branch injuries.

K. Ground cover plants, other than sod, shall be well rooted in pots or similar containers. Sod shall be as specified in Section 32 92 23.

2.03 BACKFILL MIX

A. Backfill mix for plants shall be a prepared mixture of the following (as indicated on the Drawings): 2 parts topsoil; 1 part decomposed organic matter; 1 part sand; and hyrdogel additive as specified in the following paragraphs.

B. Topsoil shall be obtained from on-site stockpiles of stripped topsoil. The soil shall be substantially free of litter, stiff clay, stones larger than one inch in diameter, objectionable weeds, litter, matted or large roots, toxic substances, or any other material which may be harmful to plant growth or hinder planting operations.

C. Decomposed organic matter shall be commercially prepared compost which has been composted sufficiently to be free of all woody fibers, seeds, and leaf structures, and free of toxic and nonorganic matter.

D. Sand shall be coarse concrete sand conforming to the gradation, quality and composition requirements of ASTM C 33 for Fine Aggregate.

E. Hydrogel additive shall be Terra-Sorb® medium hyrdogel, manufactured by Plant Health Care, Inc. Rate shall be in accordance with manufacturer’s specifications.

2.04 MULCH

A. Mulch shall be free from deleterious materials and suitable as a top dressing for trees and shrubs, and shall consist of shredded hardwood bark mulch. Pinestraw mulch shall be acceptable on slopes greater than 3:1.

2.05 STAKING MATERIALS

A. Furnish wood stakes, biodegradable twine, and accessories for anchoring of trees as indicated on the Drawings.

2.06 WATER

A. Water shall be potable and furnished by Contractor.

B. Contractor shall furnish watering truck, hose and other appropriate watering equipment.

PART 3 - EXECUTION

3.01 PREPARATION FOR PLANTING

A. Complete site grading and other adjacent construction prior to commencement of landscape planting work.

B. Remove foreign materials, weeds, undesirable plants and their roots, and unsuitable subsoil.

C. Prepare subsoil to eliminate uneven areas. Blend slopes into level areas.

D. Protect roots or balls of plants at all times from sun and drying winds.

E. Ball and burlap plants that cannot be planted immediately upon delivery shall be set on ground and protected with soil, wet moss, or other acceptable material. Heel-in bare rooted plants that cannot be planted immediately upon delivery. Plant root balls shall be kept moist.

F. Open bundles of plants and separate plants before roots are covered. Take care to prevent air pockets among roots. During planting operations, cover bare roots with canvas, hay, or other suitable material. No plant shall be bound with wire or rope at any time so as to damage bark or break branches.

3.02 TREE AND SHRUB PLANTING

A. Perform planting at steady rate of work unless weather conditions make it impossible to work. No plant material shall be planted in frozen ground.

B. Conform to the details shown on the Drawings and as specified below for planting of trees and shrubs.

C. Trees and shrubs shall be planted in center of holes and at the required depths. Backfill Mix shall be placed in layers of not more than eight inches and each layer shall be watered sufficiently to settle before the next layer is put in place. Tamp soil mixture under edges of balled plants. Use enough Backfill Mix to bring surfaces to finish grade when settled. Provide saucer around each plant as shown on the Drawings. Soak plants with water at time of planting. Apply water with low pressure so as to soak in thoroughly without dislodging Backfill Mix.

D. Tops of rootballs shall be set above finished grade per details shown on the drawings.

3.03 GROUND COVER PLANTING

A. Set out ground cover as indicated on the Drawings. Space plantings in accordance with standard local practice and as approved by the Owner and Project Landscape Architect.

B. Dig holes large enough to allow spreading of roots. Place Backfill Mix as specified for tree and shrub planting in subsection 3.02. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

C. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

3.04 PLANT RELOCATION AND RE-PLANTING

A. Relocate plants as indicated on the Drawings or otherwise approved by the Owner and Project Landscape Architect.

B. Dig ball and burlap plants with firm natural balls of earth of diameter and depth to include fibrous roots.

C. Replant in pits or beds in accordance with the requirements of subsection 3.02 or 3.03 as applicable.

3.05 PLACEMENT OF MULCH

A. Place much around plants as indicated on the Drawings.

3.06 MAINTENANCE

A. Begin maintenance immediately after planting. Plants shall be watered, mulched, weeded, pruned, sprayed, fertilized, cultivated, and otherwise maintained and protected until acceptance. Settled plants shall be reset to proper grade and position, planting saucer restored, and dead material removed. Tighten and repair stakes and biodegradable twine. Correct defective work as soon as possible after it becomes apparent and weather and season permit.

B. Water for planting and maintenance shall be provided by Contractor. Contractor shall furnish portable tanks, pumps, hose, pipe, connections, nozzles, and any other equipment required to transport water and apply it to new plants.

C. If a substantial number of plants are sickly or dead at time of final inspection, acceptance will not be granted and Contractor's responsibility for maintenance of plants shall be extended until replacements are made.

D. Remove and replace dead, defective and rejected plants as required before final acceptance. Replacements shall be plants of same kind and size as specified. Replacement of plant materials that may be necessary shall be at no additional cost to the Project.

E. Areas damaged during process of landscape planting work shall be repaired as specified in applicable specification sections.

F. Remove fences, signs, barriers, or other temporary protective devices upon final completion and acceptance of the Work.

END OF SECTION 32 93 10

GEOTECHNICAL ENGINEERING REPORT

Elm Street Playground
Woodstock, Georgia

PREPARED FOR:
Greenberg Farrow
1430 West Peachtree Street NW
Suite 200
Atlanta, Georgia 30309

NOVA Project Number: 2019044

April 11, 2019

NOVA
PROFESSIONAL | PRACTICAL | PROVEN

NOVA

April 11, 2019

GREENBERG FARROW
1430 West Peachtree Street NW
Suite 200
Atlanta, Georgia 30309

Attention: Ms. Liz Cole, RLA
Senior Project Manager

Subject: Geotechnical Engineering Report
ELM STREET PLAYGROUND
Woodstock, Georgia
NOVA Project Number 2019044

Dear Ms. Cole:

NOVA Engineering and Environmental, LLC (NOVA) has completed the authorized Geotechnical Engineering Report for the Elm Street Playground located in Woodstock, Georgia. The services were performed in general accordance with NOVA Proposal Number 002-20198995.1, dated March 6, 2019. This report briefly discusses our understanding of the project at the time of the subsurface exploration, describes the geotechnical consulting services provided by NOVA, and presents our findings, conclusions, and recommendations.

We appreciate your selection of NOVA and the opportunity to be of service on this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,
NOVA Engineering and Environmental, LLC

Raechel Davis
Project Engineer

D.L. Gilmore, P.E.
Senior Engineer
GA P.E. License 18079

Copies Submitted: Addressee (electronic)

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 PROJECT INFORMATION

Our understanding of this project is based on discussions with Mr. Patrick J. K. Waylor, RLA and Ms. Elizabeth Cole during the period of February 26 to March 5, 2019, review of the provided site plans, a site reconnaissance during boring layout, and our experience with similar projects.

1.1.1 Site Plans and Documents

We were furnished with Site Staking and Layout Plan, prepared by Greenberg Farrow, and dated February 11, 2019. We were also provided with a Grading and Drainage Plan with five (5) requested boring locations, prepared by Greenberg Farrow, and dated February 28, 2019.

1.1.2 Proposed Structures

We understand that the project will be built in phases and will consist of an elevated walkway on the southwest portion of the site, an elevated crow's nest at the southeast portion of the site, play areas, an earthen berm, as well as concrete steps and seating areas at the north portion of the site

1.1.3 Maximum Loads

From the provided information, we have assumed the columns supporting the elevated walkway and crow's nest will have maximum axial, base moment, and base shear loads of approximately 25 kips, 10 kip-feet, and 1 kip respectively.

1.1.4 Floor Elevations / Site Grading

The planned boardwalk and crow's nest elevations are currently proposed as elevation 956 to 959 feet-MSL. The playground is proposed as elevation 955 to 956 and is currently elevation 950 to 956 feet-MSL. Cuts and fills of 1 to 2 feet are anticipated to achieve design grades.

1.1.5 Requested Scope of Exploration

Following a meeting with Mr. Waylor, NOVA was asked to provide a proposal to perform five (5) soil test borings near the approximate locations specified by GFA. One (1) boring in the elevated walkway and one (1) boring in the crow's nest were designated to be performed to auger refusal to estimate screw pile embedment depths (estimated to be 50 feet below existing grade). Two (2) borings in the elevated walkway were to be performed 20 feet deep, each. One (1) boring was to be performed in the stairs / concrete seating area to 15 feet or to shallower auger refusal.

1.2 SCOPE OF EXPLORATION

Greenberg Farrow engaged NOVA to provide geotechnical engineering exploration services for the Elm Street Playground in Woodstock, Georgia. This report briefly discusses our understanding of the project, describes our exploratory procedures, and presents our findings, conclusions, and recommendations.

The primary objective was to perform a geotechnical exploration within the area of the proposed construction and to assess these findings as they relate to geotechnical aspects of the planned site development. The authorized geotechnical engineering services included a site reconnaissance, a soil test boring and sampling program, in-situ testing, laboratory testing, engineering evaluation of the field and laboratory data, and the preparation of this report.

The services were performed substantially as outlined in our proposal number 002-20198995.1, dated March 6, 2019, and in general accordance with industry standards.

As authorized per the above referenced proposal, the completed geotechnical report was to include:

- A description of the site, field services, and general soil conditions encountered, as well as a Boring and Traverse Location Plan, and individual Boring Records;
- Discussion regarding potential design/construction issues indicated by the exploration, such as materials that would require difficult excavation techniques, shallow groundwater table, etc.;
- Suitability of on-site soils for re-use as structural fill and backfill, with the criteria for suitable fill materials and soil compaction requirements;
- Recommendations for foundation design and construction, including allowable bearing pressures and bearing depths as well as recommendations for piles to support the walkway and crow's nest; and

- Recommended quality control measures (i.e. sampling, testing, and inspection requirements) for site grading and foundation construction.

The assessment of the presence of wetlands, floodplains, or water classified as State Waters of Georgia was beyond the scope of NOVA's services. Additionally, the assessment of site environmental conditions, including the detection of pollutants in the soil, rock, or groundwater, at the site was also beyond the authorized scope of services. If desired by the client, NOVA can provide these services.

2.0 SITE DESCRIPTION

For the purposes of this report, distances, directions, coordinates, measurements, areas, volumes, and loads are approximate.

2.1 LOCATION AND LEGAL DESCRIPTION

The Subject Property is in Woodstock, Cherokee County, Georgia, at the northwest quadrant of the intersection of Maple Street and Market Street. The Subject Property consists of a 1.7-acre parcel that has been identified by the Cherokee County Geographic Information System (GIS) Database as Parcel ID 15-1068-0016.

A Site Location Map and a Topographic Map depicting the location of the Subject Property and its surrounding topography are included in Appendix A (Figures 1 and 2). The latitude and longitude coordinates of the subject site are 34.0998° north and 84.5216° west, respectively.

2.2 SUBJECT PROPERTY AND VICINITY GENERAL CHARACTERISTICS

The generally irregularly shaped Subject Property is located within the Woodstock, Georgia, United States Geological Survey 7.5-minute series topographic quadrangle map. Topographically, the Subject Property slopes downward from a high point of 958 feet above mean sea level (MSL) in the southeastern portion to 942 feet-MSL in the southwestern portion of the Subject Property.

The vicinity of the Subject Property is generally developed with commercial and light-industrial land uses, and is bordered by the following:

DIRECTION	LAND USE DESCRIPTION/OBSERVATIONS
NORTH	Elm Street Cultural Arts Village Event Green
EAST	Woodstock West by Walton at 818 Market St.
SOUTH	White Wall Woodstock at 755 Market St.
WEST	Woodstock West by Walton at 820 Paden St.

2.3 CURRENT USE OF THE PROPERTY

The Subject Property is currently commercially undeveloped, with sidewalks paralleling adjacent streets, portions of the site landscaped with pinestraw, and the majority of the site covered with trees and underbrush.

3.0 FIELD AND LABORATORY PROCEDURES

3.1 FIELD EXPLORATION

Boring locations were established in the field by NOVA personnel using the provided site plan, a handheld GPS device, and estimating/taping distances and angles from site landmarks. The boring locations are shown on Figure 4 in Appendix A. Boring elevations were interpolated from the topographical survey prepared by Greenberg Farrow and dated February 28, 2019. The referenced boring locations and elevations are approximate. If increased accuracy is desired by the client, NOVA recommends that the boring locations and elevations be surveyed.

Our field exploration was conducted on March 25 and March 29, 2019 and included five (5) soil test borings (B-1 through B-5) drilled to depths of 15 to 75 feet below the existing ground surface.

Soil Test Borings: The soil test borings were performed using the guidelines of ASTM Designation D1586, "Penetration Test and Split-Barrel Sampling of Soils". A hollow-stem auger drilling process was used to advance the borings. At regular intervals, soil samples were obtained with a split-tube sampler, driven using the Standard Penetration Test (SPT) method. The SPT resistance can be used as an index to the soil strength and density. Representative portions of the soil samples, obtained from the sampler, were placed in glass jars and transported to our laboratory for further evaluation and laboratory testing.

Test Boring Records in Appendix B show the standard penetration test (SPT) resistances, or “N-values”, and present the soil conditions encountered in the borings. These records represent our interpretation of the subsurface conditions based on the field exploration data, visual examination of the split-barrel samples, laboratory test data, and generally accepted geotechnical engineering practices. The stratification lines and depth designations represent approximate boundaries between various subsurface strata. Actual transitions between materials are often more gradual.

Groundwater: The groundwater levels reported on the Test Boring Records represent measurements made at the completion of the soil test boring. The soil test borings were subsequently backfilled with the soil cuttings.,

3.2 LABORATORY TESTING

Laboratory testing was conducted to characterize materials recovered from the site. The laboratory test data are presented in the Appendix. Selected test data are presented on the Boring Logs attached in the Appendix. The specific tests are briefly described below.

The soil samples will be discarded 30 days following the submittal of this NOVA subsurface exploration report unless you request otherwise.

Soil Classification: Soil classification provides a general guide to the engineering properties of various soil types and enable the engineer to apply past experience to current problems. In our explorations, samples obtained during drilling operations are observed in our laboratory and visually classified by an engineer. The soils are classified according to consistency (based on number of blows from standard penetration tests), color and texture. These classification descriptions are included on our "Test Boring Logs". The classification system discussed above is primarily qualitative. Using the test results, the soils were classified using the Unified Soil Classification Systems. This classification system and the in-place physical soil properties provide an index for estimating the soil's behavior. The soil classification and physical properties obtained are presented in this report.

4.0 SUBSURFACE CONDITIONS

4.1 GEOLOGY

The site is located in the Piedmont Geologic Region, a broad northeasterly trending province underlain by crystalline rocks over 550 million years old. Numerous episodes of crystal deformation have produced varying degrees of metamorphism, folding and shearing in the underlying rock. The resulting metamorphic rock types in this area of the Piedmont are predominantly a series of Precambrian age schists and gneisses, with scattered granitic or quartzite intrusions.

According to the "Geology of the Greater Atlanta Region" by McConnell and Abrams, 1984, the site is generally underlain by the Laura Lake Mafic Complex, illustrated on Figure 3 in Appendix A. This geologic formation typically consists of magmatic garnet amphibolite of the Laura Lake Mafic Complex undifferentiated with smaller amounts of pyroxene (relict)-bearing metagabbro, meta-quartz, diorite, meta-ultramafic rock banded iron formations.

Residual soils in the region are primarily the product of in-situ chemical decomposition of the parent rock. The extent of the weathering is influenced by the mineral composition of the rock and defects such as fissures, faults and fractures. The residual profile can generally be divided into three zones:

- An upper zone near the ground surface consisting of red clays and clayey silts which have undergone the most advanced weathering,

- An intermediate zone of less weathered micaceous sandy silts and silty sands, frequently described as “saprolite”, whose mineralogy, texture and banded appearance reflects the structure of the original rock, and

- A transitional zone between soil and rock termed partially weathered rock (PWR). Partially weathered rock is defined locally by standard penetration resistances exceeding 100 blows per foot.

The boundaries between zones of soil, partially weathered rock, and bedrock are erratic and poorly defined. Weathering is often more advanced next to fractures and joints that transmit water, and in mineral bands that are more susceptible to decomposition. Boulders and rock lenses are sometimes encountered within the overlying PWR or soil matrix. Consequently, significant fluctuations in depths to materials requiring difficult excavation techniques may occur over short horizontal distances.

4.2 SOIL AND ROCK CONDITIONS

The Test Boring Records in Appendix B should be reviewed to provide more detailed descriptions of the subsurface conditions encountered at each boring location. These records represent our interpretation of the subsurface conditions based on the field logs and visual observations of samples by an engineer. The lines designating the interface between various strata on the Boring Logs represent the approximate interface locations and elevation. The actual transition between strata may be gradual. Groundwater levels shown on the Boring Logs represent the conditions at the time of drilling. Soil conditions may vary between boring locations.

4.2.1 Fill

Fill was encountered in borings B-2 and B-4 from ground surface to depths of 3 to 6 feet, respectively. The fill consisted of silty SAND with rock fragments, organics and/or other deleterious debris. Standard penetration resistances in the fill varied from weight of hammer to 8 blows per foot (bpf), but may have been amplified by the presence of rock fragments.

4.2.2 Residual Soils

Residual soils were encountered in the borings beneath the fill or ground surface. The residuum consisted of clayey or silty SAND and sandy CLAY. Standard penetration resistance values ranged from 4 to 47 bpf, but more typically varied from 7 to 18 bpf.

4.2.3 Partially Weathered Rock

Partially weathered rock (PWR) is a transitional material between soil and the underlying parent rock that is defined locally as materials that exhibit a standard penetration resistance exceeding 100 bpf.

PWR was encountered in the two deep borings that were performed for this project, as indicated in Table 4.2.3.

TABLE 4.2.3 Partially Weathered Rock

BORING	DEPTH (feet)	APPROXIMATE ELEVATION (feet-MSL)
B-1	63 to 68*	889 to 884
B-2	63 to 67	880 to 876

*Indicates a lens of PWR

4.2.4 Auger Refusal Materials

Auger refusal materials are any very hard or very dense material, frequently boulders or the upper surface of bedrock, which cannot be penetrated by a power auger. Auger refusal was encountered in one of the five borings performed for this project, as indicated in Table 4.2.4. Rock coring to determine the nature and continuity of refusal materials was beyond the scope of this exploration.

TABLE 4.2.4 Auger Refusal Materials

BORING	DEPTH (feet)	APPROXIMATE ELEVATION (feet-MSL)
B-2	67	876

4.3 GROUNDWATER CONDITIONS

4.3.1 General

Groundwater in the Piedmont typically occurs as an unconfined or semi-confined aquifer condition. Recharge is provided by the infiltration of rainfall and surface water through the soil overburden. More permeable zones in the soil matrix, as well as fractures, joints and discontinuities in the underlying bedrock can affect groundwater conditions.

The groundwater table in the Piedmont is expected to be a subdued replica of the original surface topography. Based on a review of topographic maps and our visual site observations, and as indicated by groundwater levels in the test borings, we anticipate the groundwater flow at the site to be towards the west.

Groundwater levels vary with changes in season and rainfall, construction activity, surface water runoff, and other site-specific factors. Groundwater levels in the Woodstock area are typically lowest in the late summer-early fall and highest in the late winter-early spring, with annual groundwater fluctuations of 4 to 8 feet; consequently, the water table may vary at times.

4.3.2 Soil Test Boring Groundwater Conditions

Groundwater was not observed in the shallower soil test borings (B-3, B-4, or B-5) at the time of drilling. Groundwater was measured at the time of drilling in the two deeper borings, as indicated in Table 4.3.2. ,

TABLE 4.3.2 Groundwater Measurements

BORING	DEPTH (feet)	APPROXIMATE ELEVATION (feet-MSL)
B-1	33	919
B-2	25	918

5.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on our understanding of the proposed construction, site observations, our evaluation and interpretation of the field and laboratory data obtained during this exploration, our experience with similar subsurface conditions, and generally accepted geotechnical engineering principles and practices.

Subsurface conditions in unexplored locations or at other times may vary from those encountered at specific boring locations. If such variations are noted during construction, or if project development plans are changed, we request the opportunity to review the changes and amend our recommendations, if necessary.

5.1 SITE PREPARATION

5.1.1 General

General: Prior to proceeding with construction, vegetation, root systems, topsoil, and other deleterious non-soil materials should be stripped from proposed construction areas. Clean topsoil may be stockpiled and subsequently re-used in landscaped areas. Debris-laden materials should be excavated, transported, and disposed of off-site in accordance with appropriate solid waste rules and regulations. Existing utility locations should be reviewed to assess their impact on the proposed construction and relocated/grouted in-place as appropriate.

After clearing and stripping, areas that are at grade, or which will receive fill, should be evaluated by a NOVA geotechnical engineer. Soft, weak, or excessively wet fill or residual soils should be undercut and replaced with structural fill or stabilized in-place, as determined by the geotechnical engineer at the time of construction.

The site should be graded during construction to maintain positive drainage away from the construction areas and to prevent ponding of storm water on the site during and shortly following significant rain events. The construction areas should be sealed and crowned with a smooth roller to minimize ponding water from storm events at the end of each day of work.

5.1.2 Existing / Old Fill

Previously placed fill materials were encountered during this exploration. We anticipate fill materials likely exist at other locations between our borings. Old fills are frequently erratic in composition and consistency.

Within towns and cities, it's not uncommon for former home or building sites to have been filled in the past with old fills that extend to depths on the order of 15 feet or more. For structures that are to be soil-supported, low consistency fills should be removed from beneath the structures' perimeters and at least 5 feet beyond those perimeters. New fill should be placed in accordance with the recommendations for fill placement in this report.

5.1.3 Difficult Excavation

The borings did not encounter very hard or dense soil, PWR or rock above planned finished grades.

5.2 FILL PLACEMENT

5.2.1 Fill Suitability

Fill materials should be low plasticity soil (Plasticity Index less than 30), free of non-soil materials and rock fragments larger than 3 inches in any one dimension. Based on visual examination, the existing residual and fill soils generally appear suitable for re-use as structural fill. Prior to construction, bulk samples of the proposed fill materials should be laboratory-tested to confirm their suitability.

Organic and debris-laden material are not suitable for re-use as structural fill. Topsoil, mulch, and similar organic materials can be wasted in architectural areas. Debris-laden materials should be excavated, transported, and disposed of off-site in accordance with appropriate solid waste rules and regulations.

5.2.2 Soil Compaction

Fill should be placed in thin, horizontal loose lifts (maximum 8-inch) and compacted to at least 95 percent of the standard Proctor maximum dry density (ASTM D698). The upper 8 inches of soil beneath pavements and slab-on-grade should be compacted to at least 98 percent. In confined areas, such as utility trenches or behind retaining walls, portable compaction equipment and thinner fill lifts (3 to 4 inches) may be necessary. Fill materials used in structural areas should have a target maximum dry density of at least 95 pounds per cubic foot (pcf). If lighter weight fill materials are used, the NOVA geotechnical engineer should be consulted to assess the impact on design recommendations.

Soil moisture content should be maintained within 3 percent of the optimum moisture content. We recommend that the grading contractor have equipment on site during earthwork for both drying and wetting fill soils. Moisture control may be difficult during rainy weather.

Filling operations should be observed by a NOVA soils technician, who can confirm suitability of material used and uniformity and appropriateness of compaction efforts. The technician can also document compliance with the specifications by performing field density tests using thin-walled tube, nuclear, or sand cone testing methods (ASTM D2937, D6938, or D1556, respectively). Testing should be performed at the minimum frequency of one test per 400 cubic yards, per 2-foot vertical lift, with test locations well distributed throughout the fill mass. When filling in small areas, at least one test per day per area should be performed.

5.2.3 PWR / Rock

We do not anticipate difficult excavation techniques will be required for this project. However, it is possible for there to be rock lenses or boulders that we did not encounter. We have provided the following guidelines in the event rock is encountered during construction.

Fill areas where these materials may be used include landscaped areas or other non-structural fill areas, provided the upper limit (elevation) of these materials is at least 2 feet below design subgrade elevations.

The widespread use of these materials in structural fill areas should be avoided. However, these materials may be placed in structural areas provided the upper limit of these materials is at least 3 feet below design elevations of pavements and 5 feet beneath the bottom of spread foundations.

Rock or PWR pieces with thicknesses over 3 inches should not be incorporated into the fills. Soil should be intermixed with the PWR/rock materials in sufficient quantities to prevent void formation within the mass. The soils should be at or near their optimum moisture content. Lift thicknesses should be as thin as practical and should not exceed 1 foot prior to compaction.

Where fill contains substantial quantities of rock and cannot be adequately tested, its placement and compaction should be observed on a full-time basis by a NOVA senior engineering technician. The technician will note the stability of the rock fill based on observations of compaction methods performed using heavy equipment. On a periodic basis, the rock fill procedure should be

evaluated by the geotechnical engineer to ensure that the PWR/rock fill materials are properly placed and compacted, with sufficient soil fines to prevent void formation.

5.3 GROUNDWATER CONTROL

5.3.1 General

The measured depth to groundwater in our borings were at 25 feet or greater. We do not anticipate groundwater control to be a construction issue for this project.

As previously noted, groundwater levels are subject to seasonal, climatic and other variations and may be different at other times and locations. The extent and nature of any dewatering required during construction will be dependent on the actual groundwater conditions prevalent at the time of construction and the effectiveness of construction drainage to prevent run-off into open excavations.

5.4 FOUNDATIONS

5.4.1 General

Design loads were not provided to NOVA.

5.4.2 Foundations: Crow's Nest and Elevated Walkway

We have assumed that timber piles would be used to support the crow's nest and the elevated walkway. We have based our analysis on the use of Southern Pine treated timber piles that comply with the material requirements of the **Timber Pile Design and Construction Manual by the Southern Pressure Treaters' Association.** The design was based on compressive forces only. It did not include wind or other weather-related loads, or seismic loading

We analyzed Southern Pine Timber Piles with a butt circumference of 41 inches. Table 5.4.2 presents individual pile capacities at different driven bearing depths:

Table 5.4.2 Timber Pile Foundations

Driven Depth (feet)	Southern Pine Treated Timber Pile, 41-inch butt diameter Capacity, tons		
	Pile Stick up 5 feet	Pile Stick up 10 feet	Pile Stick up 20 feet
30	44	40	35
35	60	55	47
40	75	70	60

Tension: Uplift loads for the timber piles may be estimated, by ignoring the uppermost 5 feet (due to ground disturbance during pile driving), then using 2500 pounds per square foot for the remainder of the embedded pile length. Higher skin friction values may be available but should be verified with a pull-out test on a driven test pile prior to construction.

Uplift capacity must consider both the sum of the capacity of the individual rock anchors, as well as the group capacity of the anchor system determined by the total weight of the soil/rock mass.

In addition to the sum of the capacity of the individual rock anchors, uplift capacity must also consider the group capacity determined by both the skin friction/adhesion along the circumference of the anchor group and by the total weight of the soil/PWR/rock mass.

Specifically, the International Building Code requires that the allowable uplift capacity be the lesser of:

#1 The proposed individual pile uplift working load times the number of piles in the group, or

#2 Two-thirds of the effective weight of the group and the soil contained within a block defined by the perimeter of the group and the length of the element, plus two-thirds of the ultimate shear resistance along the soil block.

NOVA's experience is that group capacity frequently controls uplift design. Once the structure design is complete and tension loads and locations are finalized, the structural engineer should contact the geotechnical engineer and review the design and construction of individual and group capacity of the rock anchors.

Shallow Foundations –

Design: Shallow foundations may be used to support lightly loaded structures (less than 55-kip column loads). Foundations bearing on undisturbed residual soils or, where existing fill is present, on the structural fill that replaced the existing fill, may be designed with a maximum allowable bearing pressure of 3,000 pounds per square foot (psf).

The footings should be designed with a minimum foundation width of 24 inches for ease of construction and to reduce the possibility of localized shear failures. Exterior foundation bottoms should bear at least 18 inches below exterior grades for protection against frost damage.

Settlement: Settlements for spread foundations bearing on the higher consistency residual materials were assessed using SPT values to estimate elastic modulus, based on published correlations and previous NOVA experience. We note that the settlements presented are based on random field data and an assumed subsoil profile. Conditions may be better or worse in other areas, however, we believe the estimated settlements are reasonably conservative. The time rate of settlement was estimated based on NOVA's experience with similar data and soil profiles/based upon the results of the consolidation testing.

Based on column loadings, soil bearing capacities and the presumed foundation elevations as discussed above, we expect primary total settlement beneath individual foundations to not exceed 1 inch.

The amount of differential settlement is difficult to predict because the subsurface and foundation loading conditions can vary considerably across the site. However, we anticipate differential settlement between adjacent foundations could vary from ½ to ¾inch. The final deflected shape of the structure will be dependent on actual foundation locations and loading.

Should lower consistency materials be encountered, a lower bearing capacity should be used or the foundations should be extended to more competent materials, to reduce the magnitude of differential settlements.

Construction: Foundation excavations should be evaluated by the NOVA geotechnical engineer prior to reinforcing steel placement to observe foundation subgrade preparation and confirm bearing pressure capacity.

Foundation excavations should be level and free of debris, ponded water, mud, and loose, frozen, or water-softened soils. Concrete should be placed as soon as is practical after the foundation is excavated, and the subgrade has been evaluated. Foundation concrete should not be placed on frozen or saturated

soil. If a foundation excavation remains open overnight, or if rain or snow is imminent, a 3 to 4-inch thick "mud mat" of lean concrete should be placed in the bottom of the excavation to protect the bearing soils until reinforcing steel and concrete can be placed.

5.5 CONCRETE STEPS, SEATS, SLABS

5.5.1 General

The concrete steps, seats and other flat concrete surfaces are assumed to act as slabs-on-grade. The conditions exposed at subgrade levels for these structures will vary across the site and may include structural fill or residual soils. Slabs-on-grade may be adequately supported on these subgrade conditions subject to the recommendations in this report.

An underdrain system is not required for concrete placed on structural fill or undisturbed residual soils. However, we recommend a minimum of 6-inches of graded aggregate base (GAB) beneath the slabs to:

- Reduce non-uniform support conditions
- Provide a stable base to support construction traffic
- Provide a base material that can be fine graded to design tolerances.

GAB should be compacted to 98 percent of the maximum dry density as determined by the standard Proctor compaction test (ASTM D1557) and overlain by a conventional plastic vapor barrier.

Once grading is completed, the subgrade is usually exposed to adverse construction activities and weather conditions during the period of sub-slab utility installation. The subgrade should be well-drained to prevent the accumulation of water. If the exposed subgrade becomes saturated or frozen, the geotechnical engineer should be consulted.

After utilities have been installed and backfilled, a final subgrade evaluation should be performed by the geotechnical engineer immediately prior to slab-on-grade placement. If practical, proofrolling may be used to redensify the surface and to detect any soil that has become excessively wet or otherwise loosened.

5.5.2 Subgrade Modulus

Slabs on Grade: A coefficient of subgrade reaction (k_{slab}) of 125 pci (psi per inch) may be used for conventional slab design where slabs bear upon subgrades prepared in accordance with previous recommendations.

Please note that this magnitude of ***k*** is intended to reflect the elastic response of soil beneath a typical slab under light loads with a small load contact area often measured in square inches, such as loads from forklifts, automobile/truck traffic or lightly loaded storage racks. The recommended coefficient of subgrade reaction (k_{slab}) of 125 pci is not applicable for heavy slab loads caused by bulk storage, heavy stage support, or for mat foundation design.

Mat Foundations: Based on our understanding of the project, some improvements may require mat foundations. As heavier loads are distributed across larger loaded areas, the loaded slab forms a larger zone of influence. Subsequently, the coefficient of subgrade reaction (k_{mat}) is reduced. We recommend a k_{mat} value of 10 psi in these areas.

Several design methods are applicable for conventional slab design. We have assumed that the slab designer will utilize the methods discussed in the American Concrete Institute (ACI) Committee 360 report, *"Guide to Design of Slabs-on-Ground, (ACI 360R-10)*.

5.5.3 Seating

Concrete seating built as slabs-on-grade should be jointed and sealed at every geometric change, and every 10 feet horizontally to prevent cracking. Additionally, we recommend a minimum of 6 inches of graded aggregate base below the tiered seating and below the pit level to create a level working platform.

6.0 CONSTRUCTION OBSERVATIONS

6.1 SHALLOW FOUNDATIONS

Foundation excavations should be level and free of debris, ponded water, mud, and loose, frozen or water-softened soils. Foundation excavations should be evaluated by the NOVA geotechnical engineer prior to reinforcing steel placement to observe foundation subgrade preparation and confirm bearing pressure capacity. Due to variable site subsurface and construction conditions, some adjustments in isolated foundation bearing pressures, depth of foundations or undercutting and replacement with controlled structural fill may be necessary.

6.2 SUBGRADE

Once site grading is completed, the subgrade may be exposed to adverse construction activities and weather conditions. The subgrade should be well-drained to prevent the accumulation of water. If the exposed subgrade becomes saturated or frozen, the NOVA geotechnical engineer should be consulted.

A final subgrade evaluation should be performed by the NOVA geotechnical engineer immediately prior to concrete placement. If practical, proofrolling may be used to re-densify the surface and to detect any soil, which has become excessively wet or otherwise loosened.

APPENDIX A
Figures and Maps

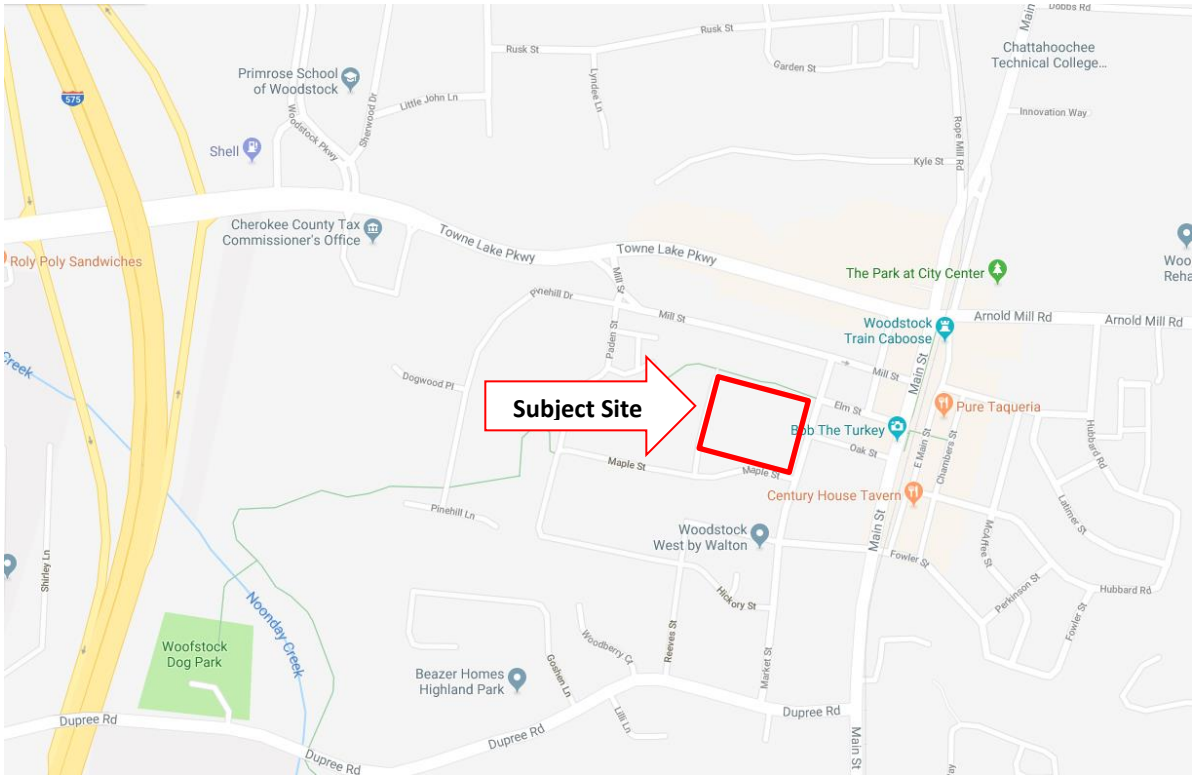


FIGURE 1
SITE LOCATION MAP
SOURCE: Google Earth
SCALE: Not to scale

NOVA
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Greenberg Farrow
Elm Street Playground
Woodstock, Georgia
NOVA Project Number 2019044

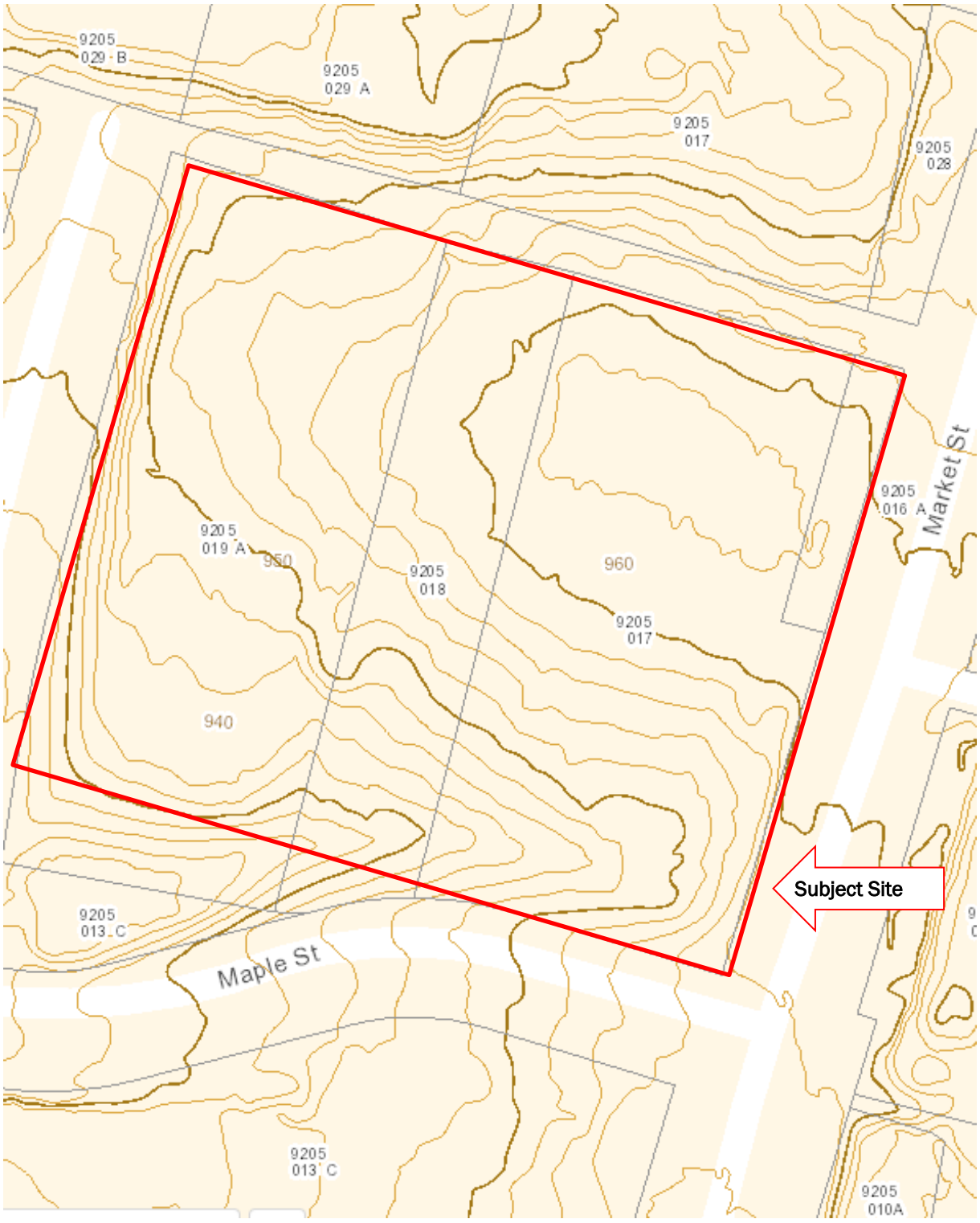

FIGURE 2
TOPOGRAPHIC MAP
SOURCE: Dekalb County Parcel Viewer Topography Map

NOVA
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Greenberg Farrow
Elm Street Playground
Woodstock, Georgia
NOVA Project Number 2019044

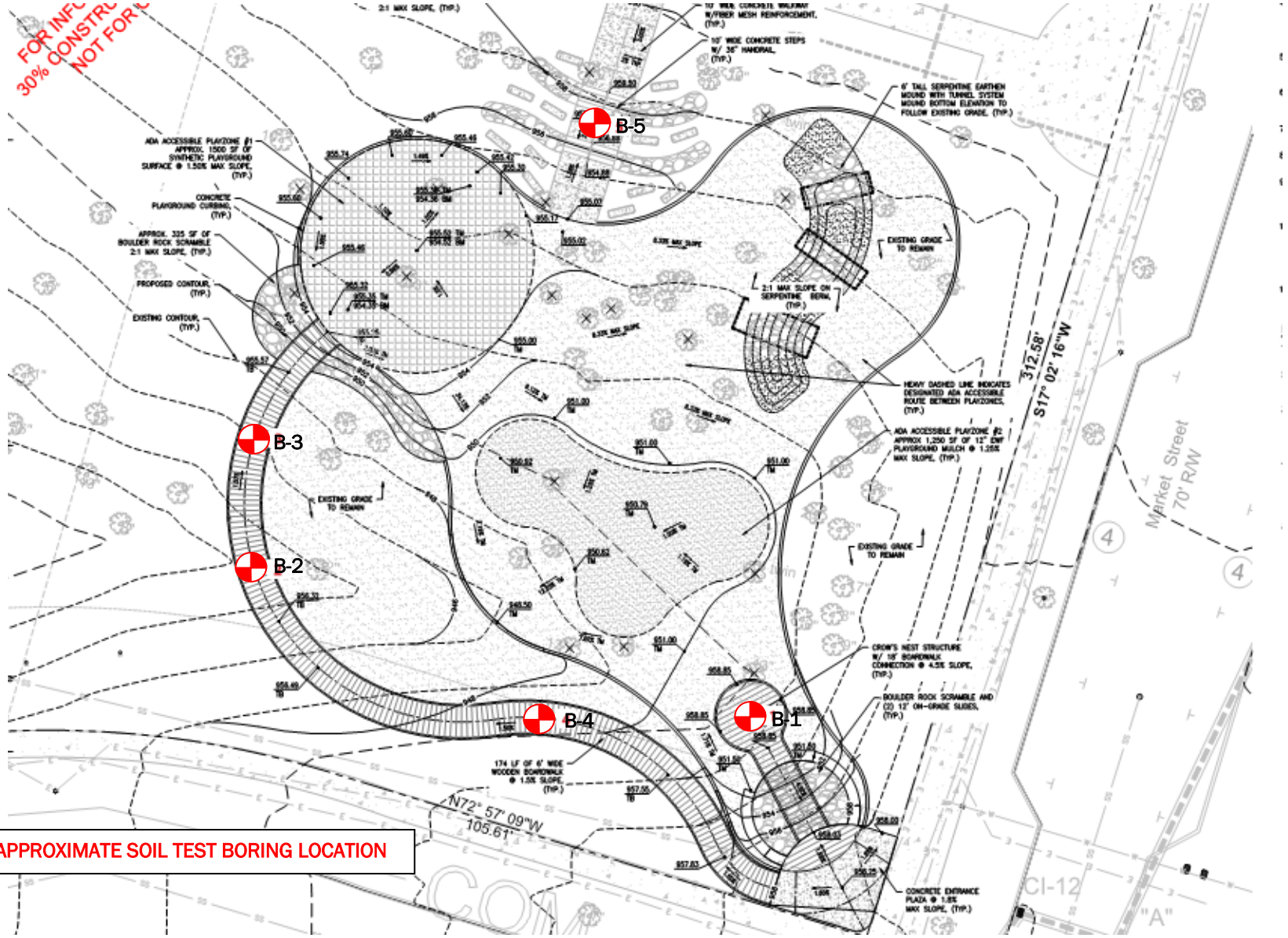

FIGURE 3
SOIL TEST BORING AND PIEZOMETER LOCATION PLAN
SCALE: Not to Scale
SOURCE: Client Provided Plan

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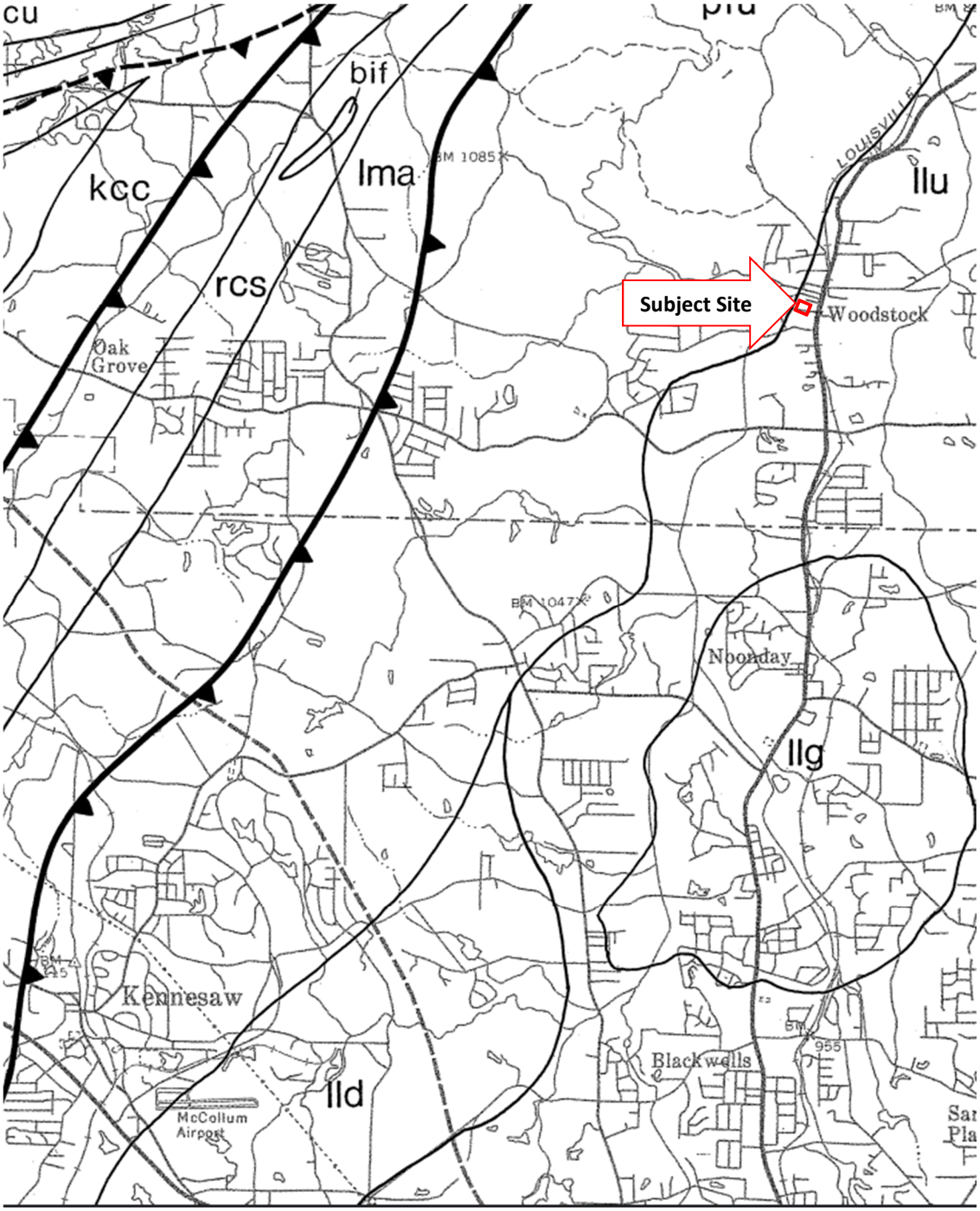
Greenberg Farrow
Elm Street Playground
Woodstock, Georgia
NOVA Project Number 2019044



llu
lld
llg

Laura Lake Mafic Complex (McConnell and Costello, 1980b; this report): migmatitic garnet amphibolite of the Laura Lake Mafic Complex undifferentiated llu) with smaller amounts of pyroxene (relict)-bearing metagabbro (llg), meta-quartz diorite (lld), meta-ultramafic rock and banded iron formation. Magnetite occurs as common porphyroblasts in amphibolite and coarse-grained amphibole-quartz-plagioclase rock is common neosome.

FIGURE 4
REGIONAL GEOLOGY
SOURCE: McConnell and Abrams, 1984

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Greenberg Farrow
Elm Street Playground
Woodstock, Georgia
NOVA Project Number 2019044

APPENDIX B
Subsurface Data

KEY TO SYMBOLS AND CLASSIFICATIONS

DRILLING SYMBOLS

	Split Spoon Sample
	Undisturbed Sample (UD)
	Standard Penetration Resistance (ASTM D1586-67)
	Water Table at least 24 Hours after Drilling
	Water Table 1 Hour or less after Drilling
100/2”	Number of Blows (100) to Drive the Spoon a Number of Inches (2)
NX, NQ	Core Barrel Sizes: 2⅛- and 2-Inch Diameter Rock Core, Respectively
REC	Percentage of Rock Core Recovered
RQD	Rock Quality Designation – Percentage of Recovered Core Segments 4 or more Inches Long
	Loss of Drilling Water
MC	Moisture Content Test Performed

CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

	Number of Blows, “N”	Approximate Relative Density
	0 – 4	Very Loose
	5 – 10	Loose
SANDS	11 – 30	Medium Dense
	31 – 50	Dense
	Over 50	Very Dense

	Number of Blows, “N”	Approximate Consistency
	0 – 2	Very Soft
	3 – 4	Soft
SILTS	5 – 8	Firm
and	9 – 15	Stiff
CLAYS	16 – 30	Very Stiff
	31 – 50	Hard
	Over 50	Very Hard

DRILLING PROCEDURES

Soil sampling and standard penetration testing performed in accordance with ASTM D1586-67. The standard penetration resistance is the number of blows of a 140 pound hammer falling 30 inches to drive a 2-inch O.D., 1⅜-inch I.D. split spoon sampler one foot. Core drilling performed in accordance with ASTM D2113-08. The undisturbed sampling procedure is described by ASTM D1587-08 (2012). Soil and rock samples will be discarded 60 days after the date of the final report unless otherwise directed.

NOVA

SOIL CLASSIFICATION CHART

COARSE GRAINED SOILS	**GRAVELS**	Clean Gravel less than 5% fines	GW	Well graded gravel
			GP	Poorly graded gravel
		Gravels with Fines more than 12% fines	GM	Silty gravel
			GC	Clayey gravel
	SANDS	Clean Sand less than 5% fines	SW	Well graded sand
			SP	Poorly graded sand
		Sands with Fines more than 12% fines	SM	Silty sand
			SC	Clayey sand
FINE GRAINED SOILS	**SILTS AND CLAYS** Liquid Limit less than 50	Inorganic	CL	Lean clay
			ML	Silt
		Organic	OL	Organic clay and silt
	SILTS AND CLAYS Liquid Limit 50 or more	Inorganic	CH	Fat clay
			MH	Elastic silt
		Organic	OH	Organic clay and silt
HIGHLY ORGANIC SOILS		Organic matter, dark color, organic odor	PT	Peat

PARTICLE SIZE IDENTIFICATION

GRAVELS	Coarse	¾ inch to 3 inches
	Fine	No. 4 to ¾ inch
SANDS	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40
SILTS AND CLAYS		Passing No. 200

NOVA

TEST BORING RECORD B-1

PROJECT: Elm Street Playground **PROJECT NO.:** 2019044
CLIENT: Greenberg Farrow
PROJECT LOCATION: Woodstock, Georgia
LOCATION: Market Street and Maple Street **ELEVATION:** 952 feet-MSL
DRILLER: Geolab Drilling **LOGGED BY:** R. Davis
DRILLING METHOD: Hollow Stem Auger **DATE:** 3/25/19
DEPTH TO - WATER> INITIAL: ▽ 33 **AFTER 24 HOURS:** ▽ N/M **CAVING>** C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0						
	950	RESIDUUM: Loose orange clayey very fine SAND with trace root fragments				8
5		Medium dense to loose white orange tan clayey very fine SAND				11
	945					7
10						6
	940					
15						7
	935					
20		Dense orange tan silty medium to fine SAND				47
	930					
25		Loose to medium dense brown tan white clayey silty medium to fine SAND				7
	925					
30						17
	920			▽		
35						13

Graphic Depiction

● BLOW COUNT
▲ NATURAL MOISTURE
PLASTIC LIMIT ⊢——⊣ LIQUID LIMIT
10 20 30 40 60 100

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

TEST BORING RECORD B-1

PROJECT: Elm Street Playground **PROJECT NO.:** 2019044
CLIENT: Greenberg Farrow
PROJECT LOCATION: Woodstock, Georgia
LOCATION: Market Street and Maple Street **ELEVATION:** 952 feet-MSL
DRILLER: Geolab Drilling **LOGGED BY:** R. Davis
DRILLING METHOD: Hollow Stem Auger **DATE:** 3/25/19
DEPTH TO - WATER> INITIAL: ▽ 33 **AFTER 24 HOURS:** ▽ N/M **CAVING>** C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
	915	Loose to medium dense brown tan white clayey silty medium to fine SAND				
40						18
	910					
		Dense to medium dense brown tan white clayey silty medium to fine SAND				
45						31
	905					
50						24
	900					
		Medium dense to dense tan white gray silty coarse to fine SAND				
55						26
	895					
60						36
	890					
		PARTIALLY WEATHERED ROCK: Sampled as very dense tan silty medium to fine SAND				100/2"
65						
	885					
		RESIDUUM: Dense tan silty medium to fine SAND				
70						43

Graphic Depiction

● BLOW COUNT
▲ NATURAL MOISTURE
PLASTIC LIMIT ⊢——⊣ LIQUID LIMIT
10 20 30 40 60 100

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NOVA

TEST BORING RECORD B-1

PROJECT: Elm Street Playground **PROJECT NO.:** 2019044
CLIENT: Greenberg Farrow
PROJECT LOCATION: Woodstock, Georgia
LOCATION: Market Street and Maple Street **ELEVATION:** 952 feet-MSL
DRILLER: Geolab Drilling **LOGGED BY:** R. Davis
DRILLING METHOD: Hollow Stem Auger **DATE:** 3/25/19
DEPTH TO - WATER> INITIAL: ▽ 33 **AFTER 24 HOURS:** ▽ N/M **CAVING>** C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction
	880	RESIDUUM: Dense tan silty medium to fine SAND					
		NO SAMPLE					
75		Boring Terminated at 75 ft.					
	875						
80							
	870						
85							
	865						
90							
	860						
95							
	855						
100							
	850						
105							
	845						

Graphic Depiction
● BLOW COUNT
▲ NATURAL MOISTURE
PLASTIC LIMIT ⊢——⊣ LIQUID LIMIT
10 20 30 40 60 100

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

TEST BORING RECORD B-2

PROJECT: Elm Street Playground **PROJECT NO.:** 2019044
CLIENT: Greenberg Farrow
PROJECT LOCATION: Woodstock, Georgia
LOCATION: Market Street and Maple Street **ELEVATION:** 943 feet-MSL
DRILLER: Geolab Drilling **LOGGED BY:** R. Davis
DRILLING METHOD: Hollow Stem Auger **DATE:** 3/29/19
DEPTH TO - WATER> INITIAL: ▽ 25 **AFTER 24 HOURS:** ▽ N/M **CAVING>** C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0						
		FILL: Loose orange clayey silty medium to fine SAND with trace rock fragments				8
	940					
5		RESIDUUM: Loose to dense orange and white clayey silty fine SANDL				11
						7
	935					
10						6
	930					
15						7
	925					
20						47
	920					
		Loose to medium dense white tan gray clayey silty medium to fine SAND		▽		7
25						
	915					
30						17
	910					
35						13

Graphic Depiction

● BLOW COUNT
▲ NATURAL MOISTURE
PLASTIC LIMIT ⊢——⊣ LIQUID LIMIT
10 20 30 40 60 100

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

TEST BORING RECORD B-2

PROJECT: Elm Street Playground **PROJECT NO.:** 2019044
CLIENT: Greenberg Farrow
PROJECT LOCATION: Woodstock, Georgia
LOCATION: Market Street and Maple Street **ELEVATION:** 943 feet-MSL
DRILLER: Geolab Drilling **LOGGED BY:** R. Davis
DRILLING METHOD: Hollow Stem Auger **DATE:** 3/29/19
DEPTH TO - WATER> INITIAL: ▽ 25 **AFTER 24 HOURS:** ▽ N/M **CAVING>** C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
	905	Medium dense to dense white tan gray clayey silty medium to fine SAND				
40						18
	900					
45						31
	895	Medium dense white tan gray clayey silty medium to fine SAND with trace mica				
50						24
	890	Medium dense to dense gray tan brown silty medium to fine SAND with trace mica				
55						26
	885					
60						36
	880	PARTIALLY WEATHERED ROCK: Sampled as very dense tan silty medium to fine SAND				
65						100/2"
		NO SAMPLE				
	875	Auger Refusal at 67 ft.				
70						

Graphic Depiction

● BLOW COUNT
▲ NATURAL MOISTURE
PLASTIC LIMIT ⊢——⊣ LIQUID LIMIT
10 20 30 40 60 100

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

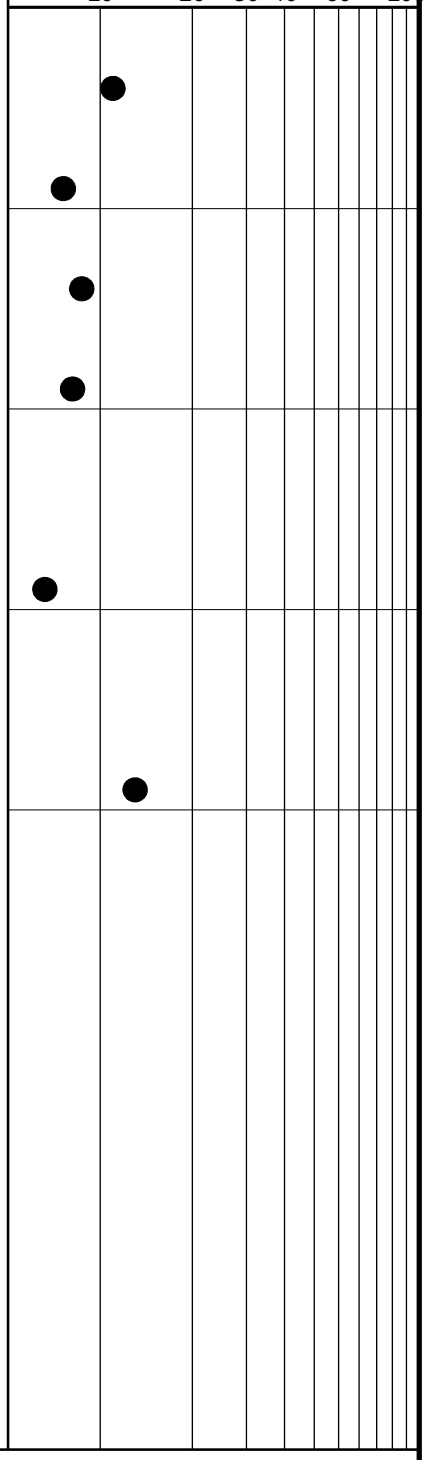
TEST BORING RECORD B-3

PROJECT: Elm Street Playground **PROJECT NO.:** 2019044
CLIENT: Greenberg Farrow
PROJECT LOCATION: Woodstock, Georgia
LOCATION: Market Street and Maple Street **ELEVATION:** 946 feet-MSL
DRILLER: Geolab Drilling **LOGGED BY:** R. Davis
DRILLING METHOD: Hollow Stem Auger **DATE:** 3/25/19
DEPTH TO - WATER> INITIAL: N/E **AFTER 24 HOURS:** N/M **CAVING>** C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0						
	945	RESIDUUM: Medium dense to loose white clayey silty medium to fine SAND				11
5						6
	940					8
10						7
	935					
15						4
	930					
		Medium dense white clayey silty medium to fine SAND				
20						13
	925	Boring Terminated at 20 ft.				
25						
	920					
30						
	915					
35						

Graphic Depiction

BLOW COUNT
NATURAL MOISTURE
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 60 100



This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

TEST BORING RECORD B-4

PROJECT: Elm Street Playground **PROJECT NO.:** 2019044
CLIENT: Greenberg Farrow
PROJECT LOCATION: Woodstock, Georgia
LOCATION: Market Street and Maple Street **ELEVATION:** 949 feet-MSL
DRILLER: Geolab Drilling **LOGGED BY:** R. Davis
DRILLING METHOD: Hollow Stem Auger **DATE:** 3/25/19
DEPTH TO - WATER> INITIAL: N/E **AFTER 24 HOURS:** N/M **CAVING>** C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0						
		FILL: Very loose to loose brown silty medium to fine SAND with trace root and leaf fragments				WOH
5	945					5
		RESIDUUM: Stiff to firm orange medium to fine sandy CLAY				9
10	940					6
		Stiff orange medium to fine sandy CLAY				
15	935					10
		Medium dense pink tan orange silty medium to fine SAND with trace rock fragments and trace mica				
20	930					14
		Boring Terminated at 20 ft.				
25	925					
30	920					
35	915					

Graphic Depiction

BLOW COUNT
NATURAL MOISTURE
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 60 100

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

TEST BORING RECORD B-5

PROJECT: Elm Street Playground **PROJECT NO.:** 2019044
CLIENT: Greenberg Farrow
PROJECT LOCATION: Woodstock, Georgia
LOCATION: Market Street and Maple Street **ELEVATION:** 957 feet-MSL
DRILLER: Geolab Drilling **LOGGED BY:** R. Davis
DRILLING METHOD: Hollow Stem Auger **DATE:** 3/25/19
DEPTH TO - WATER> INITIAL: N/E **AFTER 24 HOURS:** N/M **CAVING>** C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0						
	955	RESIDUUM: Medium dense orange black clayey silty medium to fine SAND with trace rock fragments				12
5						15
	950	Loose to medium dense orange black white clayey silty medium to fine SAND				9
10						13
	945					
15		Medium dense orange clayey very fine SAND				13
		Boring Terminated at 15 ft.				
	940					
20						
	935					
25						
	930					
30						
	925					
35						

Graphic Depiction

● BLOW COUNT
▲ NATURAL MOISTURE
PLASTIC LIMIT ⊢——⊣ LIQUID LIMIT
10 20 30 40 60 100

This information pertains only to this boring and should not be interpreted as being indicative of the site.

APPENDIX C
Qualifications of Recommendations

QUALIFICATIONS OF RECOMMENDATIONS

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site exploration and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the field testing and our past experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for NOVA to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings will differ from those encountered at specific boring locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this geotechnical report are not final. Field observations and foundation installation monitoring by the geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and foundation construction, are an extension of this report. Therefore, NOVA should be retained by the owner to observe all earthwork and foundation construction to document that the conditions anticipated in this report actually exist, and to finalize or amend our conclusions and recommendations. NOVA is not responsible or liable for the conclusions and recommendations presented in this report if NOVA does not perform these observation and testing services.

This report is intended for the sole use of Greenberg Farrow only. The scope of services performed during this exploration was developed for purposes specifically intended by Greenberg Farrow and may not satisfy other users' requirements. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. NOVA is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

Our professional services have been performed, our findings obtained, our conclusions derived and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices in the State of Georgia. This warranty is in lieu of all other statements or warranties, either expressed or implied.

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

EXHIBIT F Kompan Playground Equipment Purchased Separate from RFB

See following page(s).

Kompan Playground Equipment & Installation		
Qty.	Item No.	Description
1	NRO836-1201	Jungle Explorer Dome, Natural, IG
3	COR205021-1 108	Hammok Net, Hemp IG
6	NRO212-0501	Kids Table W/4 Sitting Poles, Natural IG
1	CUSTOMINSTALL	Installation of Kompan Product
		Site Prep and Drainage
1	SITEWORK	Erosion Control Fence, Tool Rental, Haul Away
		Removed Soils Following Drainage Excavation,
		Stabilization Throughout Project
1	SITEWORK	18" Modified French Drainline
		12" Catch Basin with Grate
1,307	TFG-GANO-14-01	EWF&FF/CFH 14'/12" Comp. (up to 65 cys)
65	CUSTOMINSTALL	Installation of EW/FF by Cubic Yard