SITE WORK PROJECT MANUAL

FOR

ADMINISTRATION BUILDING COMPLEX PROJECT

FOR

CITY OF DACULA

G E O R G I A

December 5, 2024

Prepared By:

Bowman

4174 Silver Peak Parkway
Suwanee, Georgia 30024

SITE WORK FOR ADMINISTRATION BUILDING COMPLEX PROJECT
FOR
CITY OF DACULA, GEORGIA

SECTION TITLE

DIVISION 0 – BIDDING AND CONTRACT REQUIREMENTS

DIVISION 1 - GENERAL REQUIREMENTS

DIVISION 2 – SITE WORK

APPENDIX

ADVERTISEMENT FOR BIDS

Sealed Lump Sum Bid Proposals are requested by the City of Dacula from general contractors for construction of the "Site Work for the Administration Building Complex Project" and will be received by the City at Dacula City Hall – 442 Harbins Road, Dacula, Ga. 30019, until **2:30 PM** local time on **Thursday, January 16th, 2025**. Bid proposals will be publicly opened and read aloud at this time. Any bid received after said time and date will not be accepted by the City of Dacula. Fax transmittals and emails of bid form/ proposals shall not be accepted by the City.

The Contract Documents, consisting of Advertisement for Bids, Information for Bidders, Bid Proposal Form, Preliminary Form of Agreement, Drawings, Specifications, Bid Forms, Bid Bonds, Performance Bond, Payment Bond, Bidders Qualifications Forms, and other Contract Documents may be obtained through the Engineer **(1) Bowman Consulting Group, Ltd. (Bowman; the Engineer)**, 4174 Silver Peak Parkway, Suwanee, Georgia 30024. Contact: Kevin D. Whigham, P.E. (770) 932-6550 email: kwhigham@bowman.com; and from the **(2) Georgia Procurement Website.**

All Bidders must be registered with the Engineer (Bowman) to assure that Bidders receive all addenda and/or clarifications to the Bid Documents in a timely manner, it is highly recommended that all bidders obtain at least one complete set of Bid Documents directly from Bowman. Entities that do not obtain Bid Documents from this source will not receive addenda and/or clarifications directly from Bowman. Bidders relying on plan rooms or other services to obtain Bid Documents, rather than obtaining them directly from the source are doing so at their own risk. Copies of the Project Manual, Documents, and Specifications will be provided in Electronic Format and can be obtained by contacting Bowman to be placed on the Bidder's List. Electronic Copies will be made available on Bowman FTP website or sent by email at no charge. If hard copies are required, there is a non-refundable cost for each set of Drawings and specifications of $150.00 (cash or check).

All Bidders must submit AIA Document A305, Contractors Qualification Statement, to be evaluated by the City and Engineer. Bidders who do not submit the AIA A305 will be subject to disqualification. The AIA A305 must show the Contractor's ability to complete the Contract in a satisfactory manner on projects of similar scope and complexity. References from past clients and projects must be included and will be verified. **As part of the prequalification process, a mandatory Pre-Bid Meeting will be held at Dacula City Hall, 442 Harbins Road, Dacula, Ga. 30019 on Tuesday, January 7th, 2025, at 2:30 PM.** The General Contractor is responsible to understand all existing conditions.

A Pre-Bid Site Visit will follow the Pre-Bid Meeting. Failure to attend the Pre-Bid Meeting will result in disqualification of the Bidder. Representatives shall be the Project Manager, Pre-Construction Coordinator, or Estimator directly responsible for the bidding of this project. Any Bidder may be required, at the discretion of the City, to furnish evidence satisfactory to the City, that the proposed subcontractors have sufficient means and experience in the types of work called for to assure completion of the contract in a satisfactory manner.

Contract, if awarded, will be in the form prepared by the City and on the basis stated in the Instructions to Bidders. No bid may be withdrawn for a period of 60 days after bid opening.

Bids must be accompanied by a Bid Bond made payable to the City of Dacula, in the amount equal to 5 percent of the bid price. (Certified or Personal Checks Not Acceptable.) The successful bidder will be required to furnish a Performance Bond and a Payment Bond acceptable to City of Dacula in an amount equal to 100 percent of the contract price and executed by a Surety Company licensed to do business in the State of Georgia and listed in the Department of the Treasury Circular 570, latest edition. The Surety Company shall have an A.M. Best Company minimum rating of "A" with a financial size of VI "6" or better. Bonds must be accompanied by letter stating bonding company's current rating for verification prior to acceptance by the Owner and execution of the formal Owner/Contractor agreement.

Contractor and Subcontractor shall require the Attorney-in-Fact who executes bonds on behalf of sureties to attach a certified, current copy of his Power of Attorney.

The City of Dacula reserves the right to award the project on whatever basis is in the interest of the Owner and to accept or reject any or all bids and to waive technicalities and informalities and to rebid.

BY: Mrs. Brittni Nix
TITLE: City Administrator for City of Dacula
DATE: December 5, 2024

A. BASE BID –

The Work to be completed for this Project consists of furnishing all labor, materials, grading and earthwork, construction operations, details, supervision, and coordination of all trades, utility suppliers, governmental inspections, and approvals to complete the construction, installation, and coordination for the City of Dacula "Site Work for the Administration Building Complex Project" as follows:

The scope of work includes mass grading of the entire site for the construction of the Administration Building Complex. Construction and installation of the Underground Stormwater Management System (StormPrism Concrete Vaults), Storm Sewer System, Sanitary Sewer System, Water Distribution System, Concrete Retaining Walls, Electrical Service Lines and Conduits, Rigid Paving and Site Concrete, Flexible Paving, and Erosion, Sedimentation, and Pollution Control Measures are all part of the Scope of Work for the project as illustrated on the Drawings.

Contractor is responsible for complying with all regulations and providing all documents as per City of Dacula and Gwinnett County Regulations.

Geo-technical data and information is performed and provided by Geo-Hydro Engineers – Report of Subsurface Exploration and Geotechnical Engineering Evaluation (Project #241895.20 dated 08-08-2024) and Report of Supplemental Subsurface Exploration and Geotechnical Engineering Evaluation (Project #241895.21 dated 11-06-2024).

The overall project for the City of Dacula Administration Building Complex will be performed in two phases; (1) Site Work Phase for which this scope of work and bid applies; (2) Building/Finished Site Work Phase that will be Bid out in first quarter of 2025. There are also several residential properties that the City has not purchased or does not completely control yet that will be phased out until acquired for future construction. The contractor shall not disturb or access private residential property at the following addresses: 1) #456 McMillan Road (5301 212) and 2) #426 McMillan Road (5301 004). Property at #446 McMillan Road (5301 006) in owned by City of Dacula but is in a living trust so no disturbance within the property is allowed without prior written permission from City of Dacula.

Grading and earthwork scope of the project will consist of mass grading the Phased Site as illustrated on the Drawings for construction and installation of the Underground Stormwater Management System, Storm Sewer System, Sanitary Sewer System, Water Distribution System, Concrete Retaining Walls, building pads, lawn areas, amphitheater building and seating areas, and drives and parking lots, etc. All earthwork operations and quantities either haul-in or haul-off is the responsibility of the Contractor shall be included in their overall Lump Sum Bid. The Site is not balanced.

Utility construction and installation, as mentioned above and as illustrated on the Drawings shall include but is not limited to: Underground Stormwater Management System; Storm Sewer System; Sanitary Sewer System; Water Distribution System; conduit installation for electrical, lighting, and other utilities; and sleeving for irrigation.

The paving scope will consist of Medium-Duty and Heavy-Duty pavement sections that meet or exceed the Geo-Technical Engineers Flexible Pavement recommendations that are detailed and illustrated on the Drawings. It will include a combination of the following: subgrade compacted to at least 100% standard proctor maximum dry density (ASTM D698), Graded Aggregate base (GAB) for base course, Asphaltic Concrete 19mm Superpave (Binder Course), and Asphaltic Concrete 25mm Superpave (Binder Course) depending on whether it applies to Medium Duty or Heavy Duty Paving. Surface / Topping Course will not be installed during this phase of work and shall not be included in the bid. Curb and Gutter will be installed along with the paving installation for all areas as illustrated on the Drawings and in the specifications.

The Contractor will also be required to install four (4) new entrances to the Site. Two (2) entrances will be installed and tie-in flush with McMillan Road; one across from Maple Creek Park Entrance and one across from Fortune Drive. Contractor will install a four way stop condition at the entrance across from the park. The other two entrances will be along Sanjo Street across from Maxey Street and Church Street. Sanjo Street is expected to be widened as a separate project, so the Contractor will be required to coordinate with the other Contractor for this project when grading slopes and installing entrances which tie-in to Sanjo Street and its right-of-way.

Construction of entrances, material deliveries, and staging are the responsibility of the Contractor and shall be coordinated with the City prior to any disruption of traffic along McMillan Road and Sanjo Street. Contractor must maintain one lane of traffic and access to any impacted residential driveways at all times while performing entrance work and material deliveries. Traffic Safety devices such as signage, barricades, etc., and the protection of the public-at-large, and the Contractor's personnel is part of this contract and is the Contractor's sole responsibility.

The Contractor will have *Nine Months (270) consecutive calendar days* from the "Notice to Proceed" to finish and complete the Site Work for this project.

All materials and appurtenances required to complete this Scope of Work is the responsibility of the Contractor and shall be provided in his overall Bid. Contractor with winning Bid is required to submit a schedule of values at the Pre-construction meeting.

Bidder will prepare Asphalt prices for bid based on the current GDOT Asphalt Cement Price Index listed at the time of bid opening. The successful Contractor's pay request will list the

current GDOT Asphalt Cement Price Index at the time of purchase. The difference in price between the GDOT Asphalt Cement Price Index at bid and at purchase will either be a

change order to the Contractor or a Credit to the Owner. The GDOT Asphalt Cement Price Index is in accordance with Special Provision 109 (dated 2008), Section 400.5.01

Adjustments, the asphalt price index for the month of the Letting posted on the Georgia Department of Transportation Website.

Additional items within Scope of Work

A. A site visit must be made by Contractor and subcontractors to determine the exact nature and scope of the work to be done. Contractor is responsible for hauling off all demolition materials (asphalt, concrete, etc.) to a State approved disposal facility at no additional cost to the Owner.

B. If any unforeseen sub-grade conditions arise, then the Contractor shall immediately notify the City, Geotechnical Engineer, and City's Engineer before proceeding with any work to determine the course of action. The Contractor shall coordinate with and have the City's Geotechnical Engineer (Geo-Hydro Engineers) perform all testing at the required intervals, milestones, and times to qualify and quantify all areas and determine the method of sub-grade repair in coordination with the City and/or City's Engineer on a case-by-case basis. Geotechnical Engineer will also monitor, observe, test, and report on all grading and earthwork operations as City's representative. All testing and inspections will be paid for by the City but shall be coordinated with by the Contractor.

C. The limits of work for this project are limited to the Site illustrated in the Project Drawings and the right-of-way of City of Dacula. Any disturbance outside of the site boundary and right-of-way of the City of Dacula shall be repaired in kind to existing condition at no additional cost to City.

D. Contractor is responsible to locate horizontally and vertically all existing utilities within limits of disturbance and protect throughout duration of project. Utilities present, include water, sewer, gas, electrical, fiber, CATV, AT&T, etc., but may not be limited to these within the limits of disturbance.

E. Contractor shall have a Site Superintendent on-site at all times while work is in progress to monitor, direct, and control construction activities. Superintendent in-charge shall be available to City, Geotechnical Engineer, and City's Engineer at all times.

Owner reserves the right to waive any informalities and any technicalities, and to reject any or all bids. All questions concerning this project shall be submitted in writing by email to Bowman (City's Engineer – Kevin D. Whigham, P.E.) 4174 Silver Peak Parkway, Suwanee, Georgia 30024, phone number 770-932-6550, email kwhigham@bowman.com no later

than **Thursday, January 9th, 2025, by 4:00 PM**. Final Addenda will be sent to Bidders on Monday, January 13th, 2025, by 5:00 P.M.

Contractor shall visit the site to observe, document, measure, and determine their own quantities for preparing the Bid for this project.

Attention of Bidders is particularly called to the requirements regarding conditions of employment and minimum wage rates to be paid on this project, and that the contractor and subcontractor must comply with all Federal, State, and local requirements. Minority and female owned firms are encouraged to participate in this project. Procurement will be in compliance with the Uniform Administrative Requirements, 2 CFR 200.318-326. Potential respondents are particularly called to the requirements of Title VI; Civil Rights Act of 1964 and 24 CFR 570.602; and Executive Order 11246 - Equal Employment Opportunity and Affirmative Action.

By: Mayor, Hon. Hugh D. King, III
City of Dacula, Georgia

SECTION 00 101

INSTRUCTIONS TO BIDDERS

In order to be entitled for consideration, proposals must be made in accordance with the following instructions as scheduled in the Advertisement for Bid, at which time and place the proposals will be publicly opened and read. The City reserves the right to reject any or all bids and to waive technicalities and informalities. See Advertisement for Bid, 00020, for bid date and time. Failure to comply with all instructions to bidders may be cause for rejection of bid.

The City of the proposed work is:

City of Dacula
442 Harbins Road,
Dacula, Georgia 30019

The title of the Work will be as indicated in the Advertisement for Bids.

Engineer: The Engineer of record whose seal occurs on the Construction Documents will administer the construction contract.

Each Bidder by making his bid represents that he has read and understands the bidding documents and has visited the site and familiarized himself with the local conditions under which the work is to be performed.

All bids must be prepared on the forms provided by the City and/or City's Engineer and submitted in accordance with the Instructions to Bidders. A bid is invalid if it has not been deposited at the designated location prior to the time and date for receipt of bids set forth in the advertisement or invitation to bid, or prior to any extension thereof issued to the bidders.

Bids:
1) Sealed bids shall be submitted on Bid Forms attached to these documents, Section 00310 - Bid Proposal Form. Submit in sealed envelope addressed to the City of Dacula plainly marked with the name of the project as shown in the Advertisement for Bid. Enclose in the envelope the other documents required to be submitted.
2) General Contractors are allowed to amend the Proposal on bid day by indicating an additive or deductive cost on the outside of the sealed envelope. Changes to the required list of Sub-Contractors can also be indicated on the outside of the sealed envelope. No changes will be allowed once time is called, and the opening of bids has commenced.
3) The successful bidder will be required to contract with those Sub-contractors listed on the Proposal Form unless there are objections, in writing, from the City or Sub-contractor. The Sub-contractor may withdraw, in writing, due to circumstances such as a financial error or being unable to meet certain requirements of the contract documents.

Documents: Bidding documents may be examined in the office of the City's Engineer or at Dacula City Hall.

Work under the contract consists of furnishing all labor and materials required to complete the project entitled:

"Site Work for the Administration Building Complex Project" for the City of Dacula.

In accordance with Contract Documents prepared by the City's Engineer: Bowman Consulting Group, Ltd. (Bowman), 4174 Silver Peak Parkway, Suwanee, Georgia 30024. Phone: (770) 932-6550 / Fax: (770) 932-6551. Dated: December 5, 2024.

Addenda: Any addendum issued prior to the time of opening of bids shall be covered in the proposal and, in closing the Contract, they shall become a part hereof.

Interpretation: No oral interpretations will be made to bidders as to the meaning of bid documents. Requests for such interpretations shall be made in writing to the City's Engineer no later than seven (7) days prior to time for receiving bids and failure on the part of the successful bidder to do so shall not relieve him, as a contractor, of the obligation to execute such work in accordance with a later interpretation by the Engineer. All the interpretations made to the bidders shall be made in the form of addenda to the Drawings and Project Manual and sent to all bidders. Efforts will be made to issue the last addendum not less than three business (3) days prior to the bid opening date.

Bond Requirements:

1) A Bid Bond (A.I.A. Document A310) payable to the City of Dacula in the amount equal to 5% of the bid price, must be submitted with the Proposal. The bid bond shall be executed by a surety company, licensed to do business in the State of Georgia listed in the Department of the Treasury Circular 570, latest revision. The Surety Company shall have an A.M. Best Company minimum rating of "A" with a minimum financial size of VI (6) or better in accordance with the General Conditions. No company, regardless of the size of financial rating, will be allowed to write its own bond. The Attorney-in-Fact who signs the bid bond must file with the bid bond a certified copy of his Power of Attorney to sign such bond. CERTIFIED OR CASHIER'S CHECKS WILL NOT BE ACCEPTED IN LIEU OF A BID BOND.
2) A Performance Bond and Labor and Materials Payment Bond satisfactory to the City each in the amount of 100% of the contract sum will be required of successful bidder to guarantee delivery of completed work under contract and payment for labor and materials.
3) 00310 – Bid Proposal Form. No company, regardless of size or financial rating, will be allowed to write its own bonds. The Surety Company shall have an A.M. Best Company minimum rating "A" with a minimum financial size of VI (6) or better in accordance with the General Conditions. Bonds must be accompanied by letter stating bonding company's current rating for verification prior to acceptance by the City and execution of the formal City/Contractor Agreement.
4) Bid Surety Bond and Performance and Labor and Material Payment Bonds must be accompanied by a Certificate of Power of Attorney showing that the party who executed the bonds is authorized to do so by the surety company.

Contract Award: The City of Dacula reserves the right to award the project on whatever basis is in the interest of the City and to accept or reject any or all bids and to waive technicalities and informalities. If awarded, the Contract will be let to the lowest responsible bidder whose base bid

is within the project budget and is able to furnish satisfactory surety company bonds. As a means of determining who the low bidder is, should all bids exceed the project budget, award will be made at option of the City to the responsible bidder whose base bid, when reduced by deductive alternates and as shown in the bid, is within funds available. City reserves the right to accept or reject alternates in any order that is in their best interest. Proposals which contain irregularities or qualifications of any kind, or which do not comply with the Contract Documents are subject to being rejected and returned to the bidder without having been read and entered in the bid tabulation.

Contract Form: The Contract for this project will be comprised of that form which is provided Section 00500 of these contract documents. The Contract Form will be prepared by the Engineer and issues to the City and Contractor for review. Execution and signatures of the Contract between the City and Contractor will occur at the Pre-Construction Meeting at a date set by the City on or about February 13, 2025, after the Bid opening and Council approval of the lowest most responsive bid.

Before visiting the site for any reason prior to the bid date, all prospective bidders (General Contractors and Subcontractors) shall call the City and notify the administrative personnel of the day and time when they plan to visit the site. Upon arriving at the Site. Failure to comply with the above-mentioned procedure would result in the personnel involved being asked to vacate the facility and site whether or not they have completed their investigation.

Fees: The City will pay for all Sewer Impact Fees, Water Tap Fees, and Water Meter Fees for work performed by the Gwinnett County Water Department. The Contractor will pay for all remaining work. Costs for temporary water, gas, telephone and power services will be paid for by the Contractor. The City will pay for utility costs starting on the date of Substantial Completion.

GEORGIA COMPETITIVE BID REQUIREMENTS OCGA 36-91-21 (d):
Contractor's full compliance with all applicable state competitive bid laws, O.C.G.A. §36-91-21 (d) is a condition to the bid proposal and contract. Contractors are required to affirm compliance by completing and returning the Affidavit for Bidding with Contractor's bid.

GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT OCGA 13-10-90 :
Contractor's full compliance with all applicable federal and state security and immigration laws, including without limitation the Georgia Security and Immigration Compliance Act as amended, O.C.G.A. §13-10-90, O.C.G.A. §13-10-91, and Georgia Department of Labor Rule 300-10-1, et. seq. is a condition to the bid proposal and contract. Contractors are required to affirm compliance by completing and returning the Georgia Security and Immigration Compliance Documents with Contractor's bid.

Documents Required at Pre-construction Conference: The winning contractor shall provide the following items at or prior to the Pre-Construction Meeting: Signed Contract (to be signed T Pre-Construction Meeting), Schedule of Values (G703), Sub-contractor List with 24 hour contacts (G705), Payment and Performance Bonds, Bond Rating Letter, Labor & Material Bond, Insurance Certificates, List of Suppliers, and Subcontractor Affidavits – licensed in Gwinnett County, and Schedule.

The following provisions shall be applicable to all Bidders:

A. During grading and excavation phases, should the following conditions be encountered: mass rock, trench rock, trench earth excavation, earth excavation, earth fill and unsuitable soils, Contractor shall immediately notify the City, City's Geotechnical Engineer, and City's Engineer who may observe and will determine the appropriate action necessary for the work to proceed. If, in the opinion of the Geotechnical Engineer and/or City's Engineer, work in addition to the original contract requirements is required, that portion pertaining to any of the foregoing conditions will be performed on a time and material basis and the contract shall be equitably adjusted by change order in accordance with the guidelines set forth in Section 00 801 of these Contract Documents. Contractor shall submit unit prices as required herein that are used to formulate his bid. Unit and/or lump sum prices shall include cost of material, sales tax, delivery, labor, labor burden, supervision, taxes, insurance, and all other costs including profit and overhead. City's Representative and City reserve the right to accept or reject these prices or request the work to be performed on a time and material basis with complete daily breakdowns and logs submitted by General Contractor.

   Contractor may draw his own conclusions, and no responsibility is assumed by the City's Representative or City for subsurface conditions or quality of same. No claims for extra compensation or for additional contract time will be allowed due to subsurface conditions.

B. Time is of the essence. Construction of the "Site Work for the Administration Building Complex Project" for the City of Dacula must be substantially complete within *Nine Months (270) consecutive calendar days* from the "Notice to Proceed" to finish and complete the Site Work Phase of this project.

C. Neither Contractor, nor his material suppliers, nor his Subcontractors shall install or otherwise incorporate any materials containing asbestos, PCB or other hazardous materials within the boundaries of the Project. No soil found on site or transported to the site from remote locations which is contaminated with material containing asbestos, PCB, radon, gasoline, fuel oil, diesel fuel or other similar fossil fuels shall be used for fill, backfill or landscape topsoil.

D. Each bidder represents that his bid is based upon the work described in the Bid Documents, Drawings, and Specifications.

E. When references are made in the specifications to trade names, or to the names of manufacturers, such references are made solely to designate and identify the quality of the equipment or material to be furnished and are not intended to restrict competitive bidding, except for the reference to the Underground Detention System which shall not be substituted for. In case the Contractor wishes to use material and equipment other than those specified, PRIOR WRITTEN REVIEW by City and/or City's Engineer must be obtained.

F. If it is desired to use equipment or materials of different manufacturer or trade names from those specified, application for review of such equipment or materials must reach the hands of the City and/or City's Engineer at least ten (10) days prior to the date set for the opening of bids. Application for review must be accompanied by supporting data clearly proving equality of the proposed substitute to that specified. To be acceptable, a substitute must be

equal, or exceed, all requirements of the base specifications, including space limitations. A comparative data schedule shall accompany the submittal. Any changes in the work which might be required to accommodate the proposed substitute shall be clearly shown and described. Should the proposed substitute be accepted, any such changes required in other work due to the use of the substitute shall be coordinated and accomplished by Contractor as part of the Contract at no additional cost to City.

G. No substitutes allowed.

H. No consideration can be given to requests for review received later than ten (10) days prior to the day set for the opening of bids.

I. METHOD OF AWARD

1. A lump sum, fixed price bid proposal is requested as outlined in the Bid Proposal Form, Section 00310. Award will be made to the lowest responsive, responsible, qualified bidder, but City has the right to reject any all bidders at their discretion. Awarded bidder/contractor shall provide a schedule of values by which they based their bid upon as part of the documents required prior to the pre-construction meeting.

2. The lump sum bid for the construction of the work as outlined in the Contract Documents and set forth in detail in the proposal, includes the furnishing of all equipment, materials, labor, insurance, overhead and profit for the completion of the work as per the Contract Documents.

J. RIGHT TO REJECT BIDS

City reserves the right to reject any or all bids and to waive informalities. It is distinctly understood, and all bids are made subject to this Agreement, that City reserves the right to decide which bid he deems lowest and best. In arriving at this decision, due consideration will be given to the reputation of the bidder, his financial responsibility, work of this type successfully completed, and the character of materials and equipment offered. No bids received after the time set for opening proposals will be considered. Any unauthorized conditions, limitations or provisions attached to the proposal, or the omission of a bid on any item in the proposal for the section bid upon, will render it informal and may cause its rejection. No bids will be allowed to be withdrawn after time set for receiving bids.

CONTRACT DOCUMENTS

1. The Contract Documents are intended to agree and be mutually explanatory, and they shall be accepted and used as a whole and not separately. Should any items be omitted from the Project Scope of Work and/or the Drawings, or vice versa, it shall be executed the same as if shown and combined in both. Should any item be omitted, or should any item be described in the Scope and/or Drawings, but not duplicated on other, it shall be executed the same as if shown and combined in both. Should contradiction be found, notify City's Representative prior to receipt of bids so that contradictions can be clarified by addendum (a).

2. Large scale details will be furnished by the City's Representative for all work which in the opinion of City's Representative requires same.

3. Details shall be accurately followed, deviation therefrom being cause for rejection of work.

4. Explanatory note shall be preferred to conflicting drawn out indications. Large scale details shall be preferred to scale measurements. In all cases the details shall be checked with existing conditions. Should any variation be found, it shall be immediately referred to City's Representative for clarification and adjustment.

5. City's Representative will be, in the first instance, the interpreter of the requirements of the Contract Documents and judge the performance thereunder by Contractor. City's Representative will within a reasonable time, render such interpretations as he may deem necessary for the proper execution or progress of the work.

6. Contractor shall field verify items as outlined in the Project Scope of Work and/or the Drawings. All items outlined in the Drawings are approximate and have not been surveyed. Drawings may or may not include all scope of work items that have been marked with orange paint by the City and/or City's representative in the field. Contractor and subcontractors shall visit the site to determine their own measurements and quantities for bidding the project and not reply on the project Drawings.

7. A site visit must be made by Contractor and subcontractors to determine the exact nature and scope of the work to be done.

8. Any quantities called out in the Scope of Work, Bid Documents, Drawings, Specifications, and/or Details are approximate. Contractor shall verify and determine his own quantities for all materials and other items required to complete the Scope of Work, Bid Documents, Drawings, and/or Specifications.
9. Contractor is responsible for hauling off all demolition materials (soil, base, existing asphalt, etc.) to a State approved disposal facility at no additional cost to the City.

10. Contractor shall use the Georgia DOT asphalt index when forming his bid and adjust prices during construction. Use the latest version of the Georgia DOT index for calculations. Bidder will prepare Asphalt prices for bid based on the current GDOT Asphalt Cement Price Index listed at the time of bid opening. The successful Contractor's pay request will list the current GDOT Asphalt Cement Price Index at the time of purchase. The difference in price between the GDOT Asphalt Cement Price Index at bid and at purchase will either be a change order to the Contractor or a Credit to the City. The GDOT Asphalt Cement Price Index is in accordance with Special Provision 109 (dated 2009, or latest version), Section 400.5.01 Adjustments, the asphalt price index for the month of the Letting posted on the Georgia Department of Transportation Website.

11. Contractor shall coordinate with City to locate a suitable staging area for the project. If necessary, the Contractor is responsible for the coordination and payment of fees or

leasing agreements needed for the storage and/or staging of equipment on private property.

12. The Contractor is responsible for any and all utility locates needed before commencing with scope of work. The Contractor shall contact the affected utility, not the City, should utility damage occur. Emergency contact numbers are provided to the successful bidder.

13. Testing requirements required by the Contractor shall be paid for by the City and performed by the City's Geotechnical Engineer (Geo-Hydro Engineers). All testing and proof roll of subgrade and base material shall be done in the presence of the City's Geotechnical Engineer prior to placing base and binder material over graded aggregate base material. If any areas fail, then the Contractor will be required to have the Geotechnical Engineer qualify and quantify bad materials, then follow the Geotechnical Engineer's recommendations once approved by the City.

14. Access through intersections and into the Site is the Contractor's responsibility. Maintaining one lane (12' wide minimum for school bus access) open for traffic at all times is the Contractor's responsibility. The Contractor's means, methods, and scheduling for completion of the contract work is his responsibility. No road closure is allowed. Access to residential driveways shall be provided at all times, if impacted.

15. **Limits of work for this project occur around residential areas so work is restricted to between the hours of 8 a.m. to 6 p.m. Monday through Friday. Saturday work is allowed once approved by the City. No work on Sunday.**

16. Contractor is responsible for all erosion control required to complete the scope of work such as temporary sediment controls (pigs-in-blanket), sediment basins, silt fence, tree save, slope stabilization matting, temporary and permanent grassing along with any other measures as outlined in the Scope of Work, Bid Documents, Drawings, and Specifications.

17. No partial sets of the Contract Documents will be issued by City or City's Engineer.

END OF SECTION

AFFIDAVIT FOR BIDDING

(This form to be executed in compliance with Official Code of Georgia Annotated Section 36-91-21 (3). If the Contractor is a partnership, the Affidavit shall be executed by all of the partners and any officer, agent, or other person who may have represented or acted for them in bidding for or procuring the contract. If the Contractor is a corporation, all officers, agents, or other persons who may have acted for or represented the corporation in bidding for or procuring the Contract shall execute the Affidavit.)

STATE OF GEORGIA
COUNTY OF: _____

_____ ,
being duly sworn, hereby deposes and says that he/she has read, and is familiar with the provisions of the Official Code of Georgia Annotated Section 36-91-21 (d) which provides as follows:

> (d) Whenever a public works construction contract for any governmental entity subject to the requirements of this chapter is to be let out by competitive sealed bid or proposal, no person, by himself or herself or otherwise, shall prevent or attempt to prevent competition in such bidding or proposals by any means whatsoever. No person who desires to procure such work for himself or herself or for another shall prevent or endeavor to prevent anyone from making a bid or proposal therefor by any means whatever, nor shall such person so desiring the work cause or induce another to withdraw a bid or proposal for the work.

and that he/ she has not directly or indirectly violated said provisions of the law.

Further, Affiant saith not.

This _____ day of _____ 2025.

Sworn to and subscribed before me this _____ day of _____ 2025.

_____
Notary Public

My commission expires _____

This _____ day of _____ 2025.

IMMIGRATION AND SECURITY FORM
(GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT AFFIDAVIT)

Contractor's Name:

State Entity's Name:

State Solicitation/
Contract No.:

CONTRACTOR AFFIDAVIT

By executing this affidavit, the undersigned Contractor verifies its compliance with O.C.G.A. §13-10-91, stating affirmatively that the Contractor identified above has registered with and is participating in a federal work authorization program*, in accordance with the applicability provisions and deadlines established in O.C.G.A. 13-10-91.

The undersigned further agrees that, should it employ or contract with any subcontractor(s) in connection with the physical performance of services pursuant to this contract with the State Entity, Contractor will secure from such subcontractor(s) similar verification of compliance with O.C.G.A. § 13-10-91 on the attached Subcontractor Affidavit. Contractor further agrees to maintain records of such compliance and provide a copy of each such verification to the State Entity at the time the subcontractor(s) is retained to perform such service.

_____
EEV / E-Verify
TM Company Identification Number

_____ _____
BY: Authorized Officer or Agent Date
(Contractor Name)

_____
Title of Authorized Officer or Agent of Contractor

_____
Printed Name of Authorized Officer or Agent

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE

_____ DAY OF _____, 2025

_____ [NOTARY SEAL]
Notary Public

My Commission Expires:

*any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603

IMMIGRATION AND SECURITY FORM
(GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT AFFIDAVIT)

Contractor's Name:

State Entity's Name:

State Solicitation/
Contract No.:

ADDITIONAL INSTRUCTIONS TO CONTRACTOR: Identify all subcontractors used to perform under the state contract. In addition, you must attach a signed and notarized affidavit (third page of this form) from each of the subcontractors listed below. The contractor is responsible for providing a signed and notarized affidavit to the State Entity within five (5) days of the addition of any new subcontractor used to perform under the identified state contract.

Contractor's Name:

Subcontractors:

IMMIGRATION AND SECURITY FORM
(GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT AFFIDAVIT)

Contractor's Name:

Subcontractor's (Your Name):

State Entity's Name:

State Solicitation/
Contract No.:

SUBCONTRACTOR AFFIDAVIT

By executing this affidavit, the undersigned Contractor verifies its compliance with O.C.G.A. §13-10-91, stating affirmatively that the Contractor identified above has registered with and is participating in a federal work authorization program*, in accordance with the applicability provisions and deadlines established in O.C.G.A. 13-10-91.

The undersigned further agrees that, should it employ or contract with any subcontractor(s) in connection with the physical performance of services pursuant to this contract with the State Entity, Contractor will secure from such subcontractor(s) similar verification of compliance with O.C.G.A. § 13-10-91 on the attached Subcontractor Affidavit. Contractor further agrees to maintain records of such compliance and provide a copy of each such verification to the State Entity at the time the subcontractor(s) is retained to perform such service.

_____
EEV / E-Verify
TM Company Identification Number

_____ _____
BY: Authorized Officer or Agent Date
(Contractor Name)

_____
Title of Authorized Officer or Agent of Contractor

_____
Printed Name of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE

_____ DAY OF _____, 2025

_____ [NOTARY SEAL]
Notary Public

My Commission Expires:

*any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603

SECTION 00210

SPECIFIC DATE CONSTRUCTION SCHEDULE

1.0 GENERAL

1.1 DESCRIPTION:

A. Work Included: A Specific Date Construction Schedule for the project is stated here-in. Dates for Items 1 through 4 may be considered preliminary until such time as Item No. 3 "Notice of Award" is made.

B. If all dates for Items 1 through 3 are maintained, then the dates for Items 4 and 5 become a fixed Construction Schedule.

C. If the Notice of Award date moves forward, then all subsequent dates for Items 4 and 5 shall move forward by the same number of days, unless otherwise stated in an Addendum.

2.0 EXECUTION

2.1 GENERAL: The schedule dates for the project shall be adhered to and are the last acceptable dates unless they are modified by change order. All dates indicate midnight unless otherwise stipulated. All work affecting an existing facility shall be accomplished during non-class time.

2.2 CONSTRUCTION SCHEDULE:

1. ADVERTISEMENT FOR BID: ..... December 18, 2024.

2. BID DATE & TIME: ..... Thursday, January 16, 2025, at 2:30 PM.

3. CONTRACT AGREEMENT DATE: ..... Thursday, February 13, 2025, at 2:30 PM.

4. START OF CONSTRUCTION & CONTRACT TIME: ..... Monday, February 24, 2025.

5. SUBSTANTIAL COMPLETION: ..... Monday, November 24, 2025.

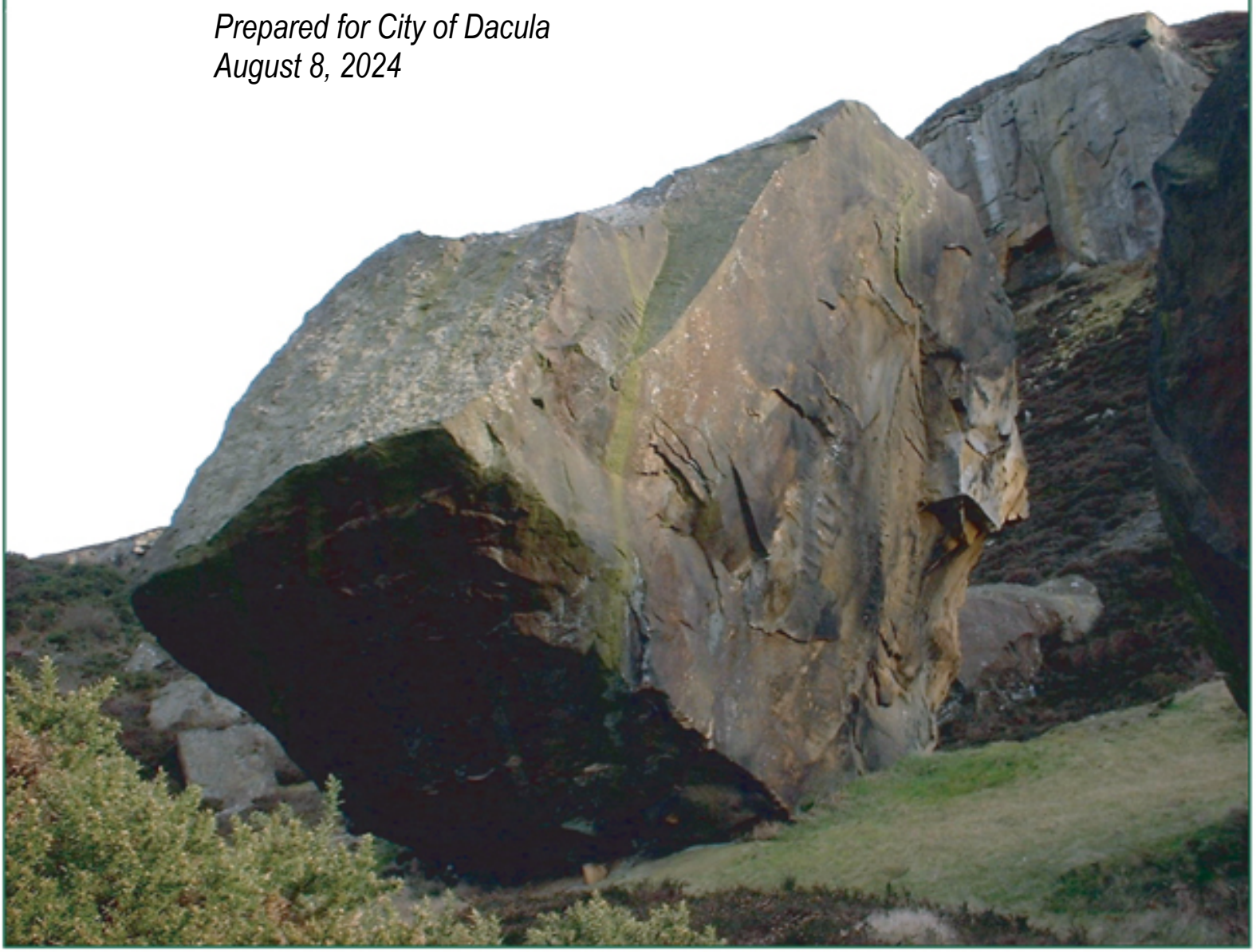
END OF SECTION

GEO HYDRO ENGINEERS

Report of Subsurface Exploration and Geotechnical Engineering Evaluation

New Dacula Facilities Campus
Sanjo Street
Dacula, Georgia
Geo-Hydro Project Number 241895.20

Prepared for City of Dacula
August 8, 2024



Ms. Brittni Nix, AICP
City of Dacula
442 Harbins Road, PO Box 400
Dacula, Georgia 30019

August 8, 2024

Report of Subsurface Exploration and
Geotechnical Engineering Evaluation
New Dacula Facilities Campus
Sanjo Street
Dacula, Georgia
Geo-Hydro Project Number 241895.20

Dear Ms. Nix:

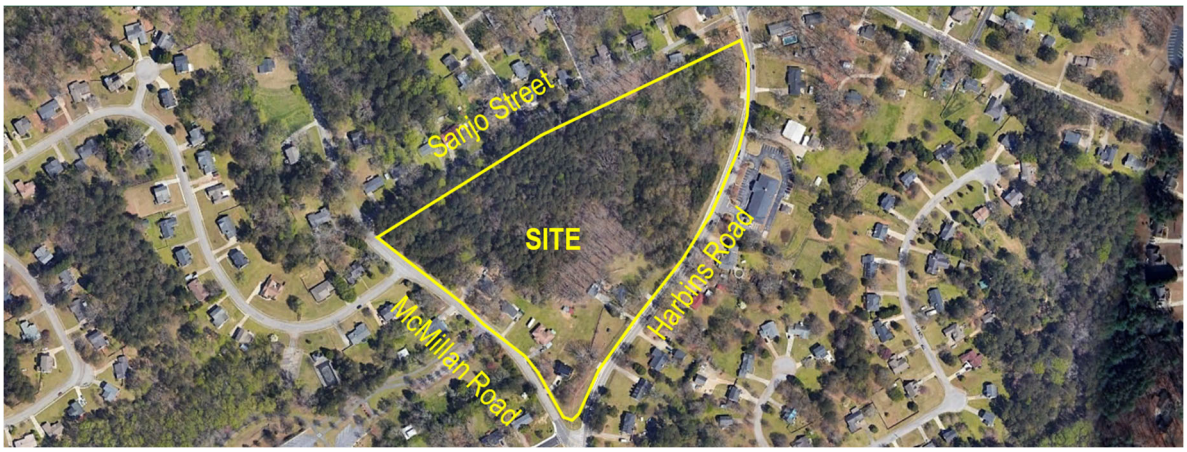
Geo-Hydro Engineers, Inc. has completed the authorized subsurface exploration and geotechnical engineering evaluation for the above referenced project. The scope of services for this project was outlined in our proposal number 241895.P0 Revision 1 dated June 27, 2024.

PROJECT INFORMATION

The project site is located on the triangular-shaped tract south of Sanjo Street, west of Harbins Road, and northeast of McMillian Road. Figure 1 in the Appendix shows the approximate site location.

We understand that the City of Dacula is planning a new facilities campus that will include a city hall building, a public parking deck, amphitheater, access drives, parking lots, and other city buildings. At the time of this report we have not been provided any loading information for the new buildings. We have assumed that the new city hall will be a one- to two-story structure with a structural steel frame and/or masonry walls. We have assumed that the public parking deck will be a two- to three-story cast-in-place or precast concrete structure. We have assumed that column loads for all structures will not exceed 300 kips with wall loads no greater than 12 kips per lineal foot.

The property is an approximately 14-acre tract composed of multiple properties. The site is generally wooded with single-family homes in the southern limits of the site and the northeast corner. The ground surface within the property generally slopes up from west to east with about 50 feet of vertical relief across the prospective construction area. The annotated aerial photograph below shows the approximate property limits and current site conditions.



EXPLORATORY PROCEDURES

Soil Test Borings

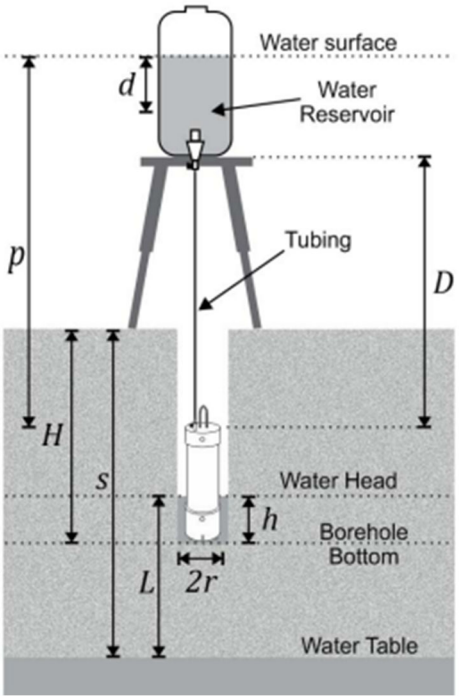
The subsurface exploration consisted of 15 machine-drilled soil test borings performed at the approximate locations shown on Figure 2 in the Appendix. The test borings were located in the field by Geo-Hydro using a handheld GPS unit with preloaded coordinates. The ground surface elevations shown on the test boring records were interpolated from the *Schematic Design – Grading and Drainage Plan - COD - Plaza and Administrative Building* "Boring Plan" dated May 14, 2024, prepared by Bowman Consulting. The elevation data is not certified as correct by this engineer, and users of the data do so at their own risk. In general, the boring locations and elevations should be considered approximate.

Standard penetration testing, as provided for in ASTM D1586, was performed at select depth intervals in the soil test borings. Soil samples obtained from the drilling operation were examined and classified in general accordance with ASTM D2488 (Visual-Manual Procedure for Description of Soils). Soil classifications include the use of the Unified Soil Classification System described in ASTM D2487 (Classification of Soils for Engineering Purposes). The soil classifications also include our evaluation of the geologic origin of the soils. Evaluations of geologic origin are based on our experience and interpretation and may be subject to some degree of error.

Descriptions of the soils encountered, groundwater conditions, standard penetration resistances, and other pertinent information are provided in the test boring records included in the Appendix.

Infiltration Tests

The field exploration also included three infiltration tests performed at the approximate locations shown on Figure 2 in the Appendix. The tests were advanced to a target test depth. We advanced test boreholes using a drill rig and continuous flight augers producing an approximately 8-inch diameter borehole. The tests were then performed using an Aardvark constant head permeameter to measure the saturated hydraulic conductivity (K_{sat}) of the soil. The Aardvark Permeameter estimates soil hydraulic conductivity using the amount of supplied water measured at equal time intervals, which is the equivalent to the amount of water that was infiltrated by the soil. The tests were performed until the soil-water infiltration rate reached a steady value that did not change over time. Soil hydraulic conductivity (K_{sat}) was then calculated using this steady flow rate (Q). The test procedure and model components are shown in the figure to the right.



Saturated hydraulic conductivity was calculated using the Reynolds and Elrick Method. The saturated hydraulic conductivity of a soil under steady flow from a borehole was calculated using the following equation:

$$K_S = \frac{Q_S C_0}{6000(2\pi(h^2) + (C_0\pi(r^2)) + (2\pi(h/\alpha)))}$$

Where $\mathbf{Q_S}$ is the steady flow rate in volume of water (cm^3) per time (min), **h** is the height of water ponded in the borehole (cm), **r** is the radius of the hole (cm), **α** is the soil macroscopic capillary length (cm), and $\mathbf{C_0}$ is a unitless geometric factor. The values of **α** and $\mathbf{C_0}$ are dependent on the texture and structure of the soil, and are fixed values predetermined by Reynolds and Elrick (1992)[1].

REGIONAL GEOLOGY

The project site is located in the Southern Piedmont Geologic Province of Georgia. Soils in this area have been formed by the in-place weathering of the underlying crystalline rock, which accounts for their classification as "residual" soils. Residual soils near the ground surface that have experienced advanced weathering frequently consist of red brown clayey silt (ML) or silty clay (CL). The thickness of this surficial clayey zone may range up to roughly 6 feet. For various reasons, such as erosion or local variation of mineralization, the upper clayey zone is not always present.

With increased depth, the soil becomes less weathered, coarser grained, and the structural character of the underlying parent rock becomes more evident. These residual soils are typically classified as sandy micaceous silt (ML) or silty micaceous sand (SM). With a further increase in depth, the soils eventually become quite hard and take on an increasing resemblance to the underlying parent rock. When these materials have a standard penetration resistance of l00 blows per foot or greater, they are referred to as partially weathered rock. The transition from soil to partially weathered rock is usually a gradual one, and may occur at a wide range of depths. Lenses or layers of partially weathered rock are not unusual in the soil profile.

Partially weathered rock represents the zone of transition between the soil and the indurated metamorphic rocks from which the soils are derived. The subsurface profile is, in fact, a history of the weathering process that the crystalline rock has undergone. The degree of weathering is most advanced at the ground surface, where fine-grained soil may be present. Conversely, the weathering process is in its early stages immediately above the surface of relatively sound rock, where partially weathered rock may be found.

The thickness of the zone of partially weathered rock and the depth to the rock surface have both been found to vary considerably over relatively short distances. The depth to the rock surface may frequently range from the ground surface to 80 feet or more. The thickness of partially weathered rock, which overlies the rock surface, may vary from only a few inches to as much as 40 feet or more.

[1] Reynolds and Elrick (1992). *Advances in measurement of soil physical properties: Bringing theory into practice* (Vol. 30, pp. 1-24). Soil Science Society of America.

SOIL TEST BORING SUMMARY

Starting at the ground surface, all borings encountered approximately 2 inches of topsoil. The borings were performed in freshly cleared access trails from which most of the topsoil was removed. The topsoil thickness at the site should be expected to vary. On wooded or overgrown sites, it is not unusual for the grading contractor to report an average topsoil thickness of 10 to 12 inches following the intermixing of topsoil, leaves, and branches during tree removal. Topsoil thicknesses will be greater in or near low-lying areas and drainage features. For planning purposes, we suggest a topsoil thickness of 12 inches.

Beneath the topsoil, boring D-15 encountered fill materials extending to a depth of about 5 feet. The fill was classified as silty sand with varying amounts of organics and rock fragments. Relatively abundant rock fragments in the fill yielded artificially elevated standard penetration test resistances greater than 100 blows per foot. Such elevated penetration resistances are not considered representative of the consistency of the fill mass. Boring D-15 and an offset of D-15 encountered auger refusal within fill materials at a depth of 5 feet.

Beneath the surface materials, all borings except D-15 encountered residual soils or partially weathered rock typical of the Piedmont Region. The residual soils were classified as sandy silt and silty sand with varying mica content a rock fragments. Standard penetration test resistances recorded in the residual soils ranged from 7 to 23 blows per foot.

Partially weathered rock was encountered in borings D-2, D-3, D-4, D-5, D-6, D-7, D-9, and D-11 at depths ranging from just below the surface materials to about 30 feet. Partially weathered rock is locally defined as residual material having a standard penetration test resistance of 100 blows per foot or greater.

Materials causing auger refusal in the residual profile were encountered in borings D-3, D-4, D-5, D-6, D-7, and D-10 at depths ranging from 5 to 27 feet. Auger refusal is the condition that prevents advancement of the boring using conventional soil drilling techniques. The residual material causing auger refusal may consist of a boulder, a lens or layer of rock, the upper surface of relatively massive rock, or other hard material. Boring D-15 and an offset encountered auger refusal within fill materials at a depth of about 5 feet. The fill material causing auger refusal may consist of debris within the fill, a structure, a boulder, or other hard material.

At the time of drilling, groundwater was encountered in boring D-2 at a depth of approximately 25 feet. It should be noted that groundwater levels will fluctuate depending on yearly and seasonal rainfall variations and other factors, and may rise in the future.

For more detailed descriptions of subsurface soil conditions, please refer to the test boring records included in the Appendix.

Summary of Subsurface Conditions

Boring	Approx. Current Ground Elevation	Bottom of Fill		Groundwater**		Top of PWR		Auger Refusal		Boring Termination	
		Depth (feet)	Elev.	Depth (feet)	Elev.	Depth (feet)	Elev.	Depth (feet)	Elev.	Depth (feet)	Elev.
D-1	1087	NE	---	NE	---	NE	---	NE	---	10	1077
D-2	1099	NE	---	25	1074	27	1072	NE	---	30	1069
D-3	1110	NE	---	NE	---	6*, 17	1104*, 1093	27	1083	27	1083
D-4	1114	NE	---	NE	---	0	1114	3, 5	1111, 1109	5	1109
D-5	1125	NE	---	NE	---	0*, 7	1125*, 1118	11, 13	1114, 1112	13	1112
D-6	1101	NE	---	NE	---	17	1084	23	1078	23	1078
D-7	1112	NE	---	NE	---	0*, 12	1112*, 1100	5, 17	1107, 1095	17	1095
D-8	1122	NE	---	NE	---	NE	---	NE	---	10	1112
D-9	1120	NE	---	NE	---	22	1098	NE	---	30	1090
D-10	1123	NE	---	NE	---	NE	---	18	1105	18	1105
D-11	1098	NE	---	NE	---	3	1095	NE	---	10	1088
D-12	1105	NE	---	NE	---	NE	---	NE	---	10	1095
D-13	1112	NE	---	NE	---	NE	---	NE	---	10	1102
D-14	1113	NE	---	NE	---	NE	---	NE	---	10	1103
D-15	1119	5	1114	NE	---	NE	---	5, 5	1114	5	1114

All Depths and Elevations in this Summary Table are Approximate
NE: Not Encountered
PWR: Partially Weathered Rock
*: Lens of PWR initially encountered
**: Groundwater level measured at the time of drilling

INFILTRATION TEST RESULTS AND SUMMARY

The following table presents the results of the infiltration tests.

Test Location	Ground Surface Elevation (feet)	Test Depth (feet)	Test Elevation (feet)	Infiltration Rate (inches/hour)
I-1	1087	12.5	1075	0.18
I-2	1105	11.5	1093	3.33
I-3	1122	12	1110	1.01

All Dimensions, Depths, and Elevations in this Table are Approximate

All of the infiltration tests were performed in residual soil classified as silty sand. It is important to note that infiltration properties can vary horizontally and vertically, and the results of the infiltration tests may not be representative of the entire area where infiltration is intended. Based on our experience, the infiltration rate measured in test I-2 likely represents the upper end of the infiltration properties of soil in this area. We suggest using a maximum infiltration rate of 2 inches per hour for design of any infiltration feature. Appropriate judgement should be used when selecting values for design.

EVALUATIONS AND RECOMMENDATIONS

The following evaluations and recommendations are based on the information available on the proposed construction, the data obtained from the test borings, and our experience with soils and subsurface conditions similar to those encountered at this site. Because the test borings represent a statistically small sampling of subsurface conditions, it is possible that conditions may be encountered during construction that are substantially different from those indicated by the test borings. In these instances, adjustments to the design and construction may be necessary.

Geotechnical Considerations

The following geotechnical characteristics of the site should be considered for planning and design:

- Boring D-15 encountered fill materials extending below the depth of auger refusal of about 5 feet. The fill materials contained varying amounts of organics. We expect that any fill encountered on site during construction will be highly variable, and it is likely that some management of poor-quality or loose fill will be necessary during construction. Any loose, unstable fill material that cannot be readily densified in place should be removed and replaced with well compacted structural fill.

- Partially weathered rock (PWR) was encountered in eight borings at depths ranging from the ground surface to about 27 feet. Large equipment capable of ripping and the use of impact hammers are typically required to facilitate excavation of PWR, and in some cases blasting is required to excavate very dense PWR.

- Materials causing auger refusal in the residual profile were encountered in borings D-3, D-4, D-5, D-6, D-7, and D-10 at depths ranging from 5 to 27 feet. For planning purposes, we recommend considering that blasting will be necessary to remove material below the depth of auger refusal. Based on the results of the test borings, it is likely that difficult excavation conditions will be encountered during mass grading and trench excavations. The elevations at which partially weathered rock and auger refusal were encountered in the borings should be considered when developing a final grading and drainage plan for the site.

- Boring D-15 and an offset of D-15 encountered auger refusal within fill materials at a depth of 5 feet. It is important to note that auger refusal conditions in fill are not necessarily indicative of difficult excavation. However, large debris within fill materials such as larger dimensions concrete rubble may require either the use if impact hammers to reduce the size of the debris or the use of excavators with a grappling bucket to facilitate handling of larger dimension materials.

- Based on the results of the soil test borings, residual soils should be reusable as structural fill. Whether excavated fill materials can be reused will depend on the composition of the fill. Organic debris and other refuse may render the excavated materials unsuitable if the debris cannot be segregated. Additionally, organic material such as topsoil in excess of about 5 to 6 percent by weight will also make excavated materials unsuitable for reuse. Routine adjustment of moisture content will be required to facilitate the reuse of excavated fill and residual soils. If generated during construction,

excavated partially weathered rock materials will be suitable for reuse as structural fill only if they break down into a reasonably well-graded material that can be satisfactorily compacted. For initial planning purposes, blast rock should be considered unsuitable for reuse as structural fill.

- At the time of drilling, groundwater was encountered in boring D-2 at a depth of approximately 25 feet. It is important to note that the groundwater level will fluctuate over time depending on local rainfall amounts and other factors and may be encountered at higher elevations. Depending on final grades and utility inverts, groundwater may be encountered during utility installation and construction.

- Based on the results of the test borings and in accordance with the 2018 International Building Code (Chapter 20, ASCE 7-16) we recommend using a seismic *Site Class* of *C*. The mapped and design spectral response accelerations are as follows: S_S=0.192, S_1=0.086, S_{DS}=0.166, S_{D1}=0.086.

- Based on the results of the soil test borings, it is our opinion that the planned city hall building and parking deck can be supported using conventional shallow foundations. For planning and design purposes, we recommend using an allowable bearing pressure of 3,000 psf for column loads no greater than 300 kips and wall loads not exceeding 12 kips per lineal foot.

- The city hall and parking deck building foundations will be supported on a combination of residual soils, variable partially weathered rock, and possibly mass bedrock. These variable materials and conditions will create the potential for contrasting differential settlement and could result in visible gaps at construction joints or cracking of the building veneer. The building foundations supported by rock or partially weathered rock will experience very little settlement while the footings supported on residual soils will settle as all conventional shallow foundation will normally settle. To reduce the differential settlement between footings, we recommend planning for the installation of a 1-foot thick "cushion" in foundations excavated into partially weathered rock or mass rock.

The following sections provide recommendations regarding these issues and other geotechnical aspects of the project.

Existing Fill Materials

Boring D-15 encountered fill materials extending to a depth of about 5 feet. The fill materials contained varying amounts of organics. We expect any fill encountered on site during construction to be highly variable, and it is likely that some management of poor-quality or loose fill will be necessary during construction. Any loose, unstable fill material that cannot be readily densified in place should be removed and replaced with well compacted structural fill.

There are several important facts that should be considered regarding existing fill materials and the limitations of subsurface exploration.

- The quality of existing fill materials can be highly variable, and test borings are often not able to detect all of the zones or layers of poor-quality fill materials.

- Layers of poor-quality fill materials that are less than about 2½ to 5 feet thick may often remain undetected by soil test borings due to the discrete-interval sampling method used in this exploration.

- The interface between existing fill materials and the original ground surface may include a layer of organic material that was not properly stripped off during the original grading. Depending on its relationship to the foundation and floor slab bearing surfaces, an organic layer might adversely affect support of footings and floor slabs. If such organic layers are encountered during construction, it may be necessary to "chase out" the organic layer by excavating the layer along with overlying soils.

- Subsurface exploration is simply not capable of disclosing all conditions that may require remediation.

General Site Preparation

Any vegetation, roots, topsoil, demolition debris, pavements, sidewalks, and other deleterious materials should be completely removed from the construction area. Clearing, grubbing, and stripping should be performed only during dry weather conditions. Operation of heavy equipment on the site during wet conditions could result in excessive rutting and mixing of debris or topsoil with underlying soils. All excavations resulting from rerouting of underground utilities or demolition of foundations or other underground structures should be backfilled in accordance with the *Structural Fill* section of this report.

We recommend that areas to receive structural fill be proofrolled wherever possible. Proofrolling should be performed using a loaded, tandem-axle dump truck weighing at least 18 tons. Proofrolling with multiple passes in at least two directions should be observed by Geo-Hydro to determine if remedial measures are necessary. Proofrolling must be avoided within 10 feet of existing structures, hardscapes to remain, or rights-of-way. Weak areas showing "pumping" will require remedial measures. Depending on the severity of the problem, unstable soils may be treated in place by densification, or by removal and replacement with stable fill materials or crushed stone.

For evaluation purposes, we recommend considering that approximately 20 percent of the planned aggregate construction area (building footprints, pavement areas, and hardscapes) will require undercutting and replacement with new structural fill extending to a depth of about 2 feet. *The suggested approach to quantify ground stabilization is intended only as a budgeting tool to facilitate the allocation of funds for ground stabilization. The need for, actual location, extent, and method used to manage unstable subgrade materials will depend on site conditions at the time of construction. In-place stabilization using geosynthetics (geofabric or geogrid) and crushed stone may be used instead of excavation and replacement if cost and site conditions are conducive to this approach.*

Items related to old homesteads which can be of concern for site development include domestic water wells and septic system tanks and drain fields. Water wells, if encountered, must be abandoned in accordance with the requirements of the Georgia Water Well Standards Act of 1985. The owner of the property is responsible for plugging the well in accordance with the requirements outlined in Circular 13, "Grouting and Plugging of Domestic Water Wells in Georgia" published by the Georgia Department of Natural Resources, Environmental Protection Division and the Georgia Geologic Survey. A water well contractor licensed to practice in Georgia must perform the actual work of plugging the well. Additionally, any

existing septic systems and drain fields must be removed, and the resulting excavation should be backfilled in accordance with the recommendations in the Structural Fill section of this report.

During site preparation, burn pits or trash pits may be encountered. On sites with previous agricultural use, which includes most of the state's landmass, pits used to dispose of tree refuse or farm animal carcasses may also be encountered. All too frequently such buried material occurs in isolated areas which are not detected by the soil test borings. Any buried debris or trash found during the construction operation should be thoroughly excavated and removed from the site.

Groundwater

At the time of drilling, groundwater was encountered in boring D-2 at a depth of approximately 25 feet. It is important to note that the groundwater level will fluctuate over time depending on local rainfall amounts and other factors and may be encountered at higher elevations. Depending on final grades and utility inverts, groundwater may be encountered during utility installation and construction. Regardless of groundwater conditions, the contractor should be prepared to manage runoff during wet weather conditions and subsurface drainage will be necessary behind all below-grade structures including foundation walls.

We recommend that the construction documents include a minimum *performance* specification for dewatering. The specification should require specific results from dewatering rather than dictate a dewatering method. Exhibit "A" as follows provides a minimum guide specification that may be used to develop a dewatering performance specification suitable for this project. In our opinion, Exhibit "A" represents the minimum specification for a project of this scope.

EXHIBIT "A"

Minimum Guide Specification for Dewatering

****

NOTE: The following specifications are for use as a guide for development of actual specifications. The guide is not intended for direct use as a construction specification without modifications to reflect specific project conditions.

****

Control of groundwater shall be accomplished in a manner that will preserve the strength of the foundation soils, will not cause instability of the excavation slopes, and will not result in damage to existing structures. Where necessary for these purposes, the water level shall be lowered in advance of excavation, utilizing trenches, sumps, wells, well points or similar methods. The water level, as measured in piezometers, shall be maintained a minimum of 3 feet below the prevailing excavation level. Open pumping from sumps and ditches, if it results in boils, loss of soil fines, softening of the ground or instability of slopes, will not be permitted. Wells and well points shall be installed with suitable screens and filters so that continuous pumping of soil fines does not occur. The discharge shall be arranged to facilitate collection of samples by the Engineer.

Adapted from Construction Dewatering - A Guide to Theory and Practice, John Wiley and Sons.

Excavation Characteristics

Partially weathered rock (PWR) was encountered in seven borings at depths ranging from the ground surface to about 27 feet. Partially weathered rock will require ripping to pre-loosen the material and facilitate excavation. Due to the leverage required to pre-loosen partially weathered rock, it is often impractical to rip partially weathered rock in trench excavations. In some instances, partially weathered rock having very high standard penetration resistances (50/0" to 50/2") may require the use of hydraulic impact hammers or blasting to achieve excavation.

Materials causing auger refusal in the residual profile were encountered in borings D-3, D-4, D-5, D-6, D-7, and D-10 at depths ranging from 5 to 27 feet. For planning purposes, we recommend considering that blasting will be necessary to remove material below the depth of auger refusal. Based on the results of the test borings, it is likely that difficult excavation conditions will be encountered during mass grading and trench excavations.

Boring D-15 and an offset of D-15 encountered auger refusal within fill materials at a depth of 5 feet. It is important to note that auger refusal conditions in fill are not necessarily indicative of difficult excavation. However, large debris within fill materials such as larger dimensions concrete rubble may require either the use if impact hammers to reduce the size of the debris or the use of excavators with a grappling bucket to facilitate handling of larger dimension materials.

Overburden soils with standard penetration test resistances of less than 100 blows per foot should be readily removeable with conventional grading equipment such as loaders and backhoes. It is important to note that the depth to partially weathered rock and rock can vary drastically over relatively short distances. It would not be unusual to encounter rock or partially weathered rock between the test borings at elevations above those shown on the test boring records. The results of the soil test borings should be considered when developing a final grading plan for site.

For construction bidding and field verification purposes it is common to provide a verifiable definition of rock in the project specifications. The following are typical definitions of mass rock and trench rock:

- Mass Rock: Material which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rated at 56,000 pounds (Caterpillar D-8K or equivalent), and occupying an original volume of at least one cubic yard.

- Trench Rock: Material occupying an original volume of at least one-half cubic yard which cannot be excavated with a hydraulic excavator having a minimum flywheel power rating of 123 kW (165 hp); such as a Caterpillar 322CL, John Deere 230C LC, or a Komatsu PC220LC-7; equipped with a short tip radius bucket not wider than 42 inches.

The foregoing definitions are based on large equipment typically utilized for mass grading. Subsequent excavations for building foundations, retaining walls, and underground utilities are often performed with smaller equipment such as rubber-tired backhoe/loaders or even mini-excavators. Contractors will often request additional payment for mobilizing larger equipment than that which was anticipated during

preparation of their construction bid. The amount of additional compensation, if any, and the minimum equipment size necessary to qualify for any additional compensation should be defined before the start of construction.

Blasting

In most cases rock excavation is performed by blasting. Standard blasting procedures include drilling through the materials to be blasted to introduce the explosives and covering up the area to be blasted to prevent flying debris. The area to be blasted is typically covered with several feet of soil or a blast mat. Alternatively, the existing soil overburden can be left in place, which in most cases will eliminate the need for a soil cover or a blast mat.

Blasting generates ground vibrations that can be detrimental to adjacent structures. Research by the United States Bureau of Mines and other organizations provides limits for safeguarding adjacent structures during blasting operations. A peak particle velocity of 2 inches per second is generally recognized as a conservative limit, and is the maximum peak particle velocity allowed by the Georgia Blasting Standards Act of 1978.

State and local laws require that precondition surveys of neighboring properties be performed prior to conducting blasting activities. Typical requirements are to conduct a precondition survey of structures and facilities within a 1,000-foot radius of the blast site. Vibration monitoring is also required in all four compass directions at the nearest structure not owned by the developer/owner. Some municipalities have variations of these requirements, and the local requirements should be reviewed prior to beginning blasting activities.

Reuse of Excavated Materials

Based on the results of the soil test borings, residual soils should be reusable as structural fill. Whether excavated fill materials can be reused will depend on the composition of the fill. Organic debris and other refuse may render the excavated materials unsuitable if the debris cannot be segregated. Additionally, organic material such as topsoil in excess of about 5 to 6 percent by weight will also make excavated materials unsuitable for reuse. Soft, unstable fill soils free of deleterious materials may be reusable after routine moisture adjustment. Routine adjustment of moisture content will be required to facilitate the reuse of excavated fill and residual soils.

It is important to establish as part of the construction contract whether soils having elevated moisture content will be considered suitable for reuse. We often find this issue to be a point of contention and a source of delays and change orders. From a technical standpoint, soils with moisture contents wet of optimum as determined by the standard Proctor test (ASTM D698) can be reused provided that the moisture is properly adjusted to within the workable range. From a practical standpoint, wet soils can be very difficult to dry in small or congested sites, and such difficulties should be considered during planning and budgeting. A clear understanding by the general contractor and grading subcontractor regarding the reuse of excavated soils will be important to avoid delays and unexpected cost overruns.

If generated during construction, excavated partially weathered rock materials will be suitable for reuse as structural fill only if they break down into a reasonably well-graded material that can be satisfactorily compacted. The presence of cobble size or boulder size material, which does not break down under the action of compaction equipment, will limit the suitability of partially weathered rock materials. Engineering judgment will be required in the field to evaluate the acceptability of partially weathered rock materials for reuse as structural fill.

For planning purposes, any blast rock generated during construction should be considered unsuitable for reuse as structural fill.

Structural Fill

Materials selected for use as structural fill should be free of organic matter, waste construction debris, and other deleterious materials. In general, the material should not contain rocks having diameters over 4 inches. It is our opinion that the following soils represented by their USCS group symbols will typically be suitable for use as structural fill and are commonly found in abundance in the Piedmont region: (CL), (SM), and (ML). The following soil types are typically suitable but are not abundant in the Piedmont region: (SW), (SP), (SC), (SP-SM), and (SP-SC). The following soil types are considered unsuitable: (MH), (CH), (OL), (OH), and (Pt).

Laboratory Proctor compaction tests should be performed on representative samples of proposed fill materials to provide data necessary to determine acceptability and for quality control. Soils having a standard Proctor maximum dry density of less than 90 pcf should be considered unsuitable unless laboratory evaluations of their stress-strain characteristics indicate that they will perform acceptably. The moisture content of suitable borrow soils should generally be no more than 3 percentage points above or below their optimum moisture content at the time of compaction. Tighter moisture limits may be necessary with certain soils.

Suitable fill material should be placed in thin lifts. Lift thickness depends on the type of compaction equipment; but in general lifts of 8 inches loose measurement are recommended. The soil should be compacted by heavy compaction equipment such as a self-propelled sheepsfoot roller. If highly micaceous soils exist at finished subgrade elevation, a smooth-drum, steel-wheeled roller can often be used to compact loose surface soils. Within small excavations, such as those in utility trenches or around manholes, we recommend the use of “wacker packers” or “Rammax” compactors to achieve the specified compaction. Loose lift thicknesses of 4 to 6 inches are recommended in small area fills.

We recommend that structural fill be compacted to at least 95 percent of the standard Proctor maximum dry density (ASTM D698). The upper 12 inches of floor slab subgrade soils should be compacted to at least 98 percent of the standard Proctor maximum dry density (ASTM D698). Following Georgia DOT guidelines, the upper 12 inches of pavement subgrade soils should be compacted to at least 100 percent of the standard Proctor maximum dry density. Geo-Hydro should perform density tests during fill placement.

Earth Slopes

Temporary construction slopes should be designed in strict compliance with OSHA regulations. The exploratory borings indicate that within the likely excavation depths for this project, soil types A, B, and C as defined in 29 CFR 1926 Subpart P will be encountered. Temporary construction slope gradients will vary from 1.5H:1V to ¾H:1V depending on the material forming the slope. Based on OSHA rules, temporary slope gradients for each material are as follows:

Material Classification	Maximum Slope Gradient for Excavations Less Than 20 Feet Deep
Type A – Partially Weathered Rock	¾H:1V
Type B – Residual Soil	1H:1V
Type C – Fill Materials, or Any Material Type Below the Groundwater Level	1.5H:1V

Excavations should be closely observed on a daily basis by the contractor's "competent person" for signs of mass movement: tension cracks near the crest, bulging at the toe of the slope, etc. The responsibility for excavation safety and stability of construction slopes should lie solely with the contractor.

We recommend that extreme caution be observed in trench excavations. Several cases of loss of life due to trench collapses in Georgia point out the lack of attention given to excavation safety on some projects. We recommend that applicable local and federal regulations regarding temporary slopes, and shoring and bracing of trench excavations be closely followed.

Formal analysis of slope stability was beyond the scope of work for this project. Based on our experience, permanent cut or fill slopes should be no steeper than 2H:1V to maintain long term stability and to provide ease of maintenance. The crest or toe of cut or fill slopes should be no closer than 10 feet to any foundation. The crest or toe should be no closer than 5 feet to the edge of any pavements. Erosion protection of slopes during construction and during establishment of vegetation should be considered an essential part of construction.

Earth Pressure (Cast-in-Place Structures)

Three earth pressure conditions are generally considered for retaining wall design: "at rest", "active", and "passive" stress conditions. Retaining walls which are rigidly restrained at the top and will be essentially unable to rotate under the action of earth pressure (such as basement walls or loading dock walls) should be designed for "at rest" conditions. Retaining walls which can move outward at the top as much as 0.5 percent of the wall height (such as free-standing walls) may be designed for "active" conditions. For the evaluation of the resistance of soil to lateral loads the "passive" earth pressure must be calculated. It should be noted that full development of passive pressure requires deflections toward the soil mass on the order of 1.0 percent to 4.0 percent of total wall height.

Earth pressure may be evaluated using the following equation:

$$p_h = K\,(D_w Z + q_s) + W_w(Z-d)$$

where: p_h = horizontal earth pressure at any depth below the ground surface (Z)
W_w = unit weight of water
Z = depth to any point below the ground surface
d = depth to groundwater surface
D_w = wet unit weight of the soil backfill (depending on borrow sources). The wet unit weight of most residual soils may be expected to range from approximately 115 to 125 pcf. Below the groundwater level, D_w must be the buoyant weight.
q_s = uniform surcharge load (add equivalent uniform surcharge to account for construction equipment loads)
K = earth pressure coefficient as follows:

Earth Pressure Condition	Coefficient
At Rest (K_o)	0.53
Active (K_a)	0.36
Passive (K_p)	2.8

The groundwater term, $W_w(Z-d)$, should be used if no drainage system is incorporated behind retaining walls. If a drainage system is included which will not allow the development of any water pressure behind the wall, then the groundwater term may be omitted. The development of excessive water pressure is a common cause of retaining wall failures. Drainage systems should be carefully designed to ensure that long term permanent drainage is accomplished.

The above design recommendations are based on the following assumptions:

- Horizontal backfill
- 95 percent standard Proctor compactive effort on backfill (ASTM D698)
- No safety factor is included

For convenience, equivalent fluid densities are frequently used for the calculation of lateral earth pressures. For “at rest” stress conditions, an equivalent fluid density of 66 pcf may be used. For the “active” state of stress an equivalent fluid density of 45 pcf may be used. These equivalent fluid densities are based on the assumptions that drainage behind the retaining wall will allow *no* development of hydrostatic pressure; that native sandy silts or silty sands will be used as backfill; that the backfill soils will be compacted to at least 95 percent of standard Proctor maximum dry density; that backfill will be horizontal; and that no surcharge loads will be applied.

For analysis of sliding resistance of the base of a cast-in-place concrete retaining wall, the coefficient of friction may be taken as 0.4 for the soils at the project site. This is an ultimate value and an adequate factor of safety should be used in design. The force that resists base sliding is calculated by multiplying the normal force on the base by the coefficient of friction. Full development of the frictional force could require deflection of the base of roughly 0.1 to 0.3 inches.

Foundation Design

After general site preparation and site grading have been completed in accordance with the recommendations of this report, it is our opinion that the proposed buildings can be supported using conventional shallow foundations. We recommend that footings be designed for an allowable soil bearing pressure of 3,000 psf. This allowable bearing pressure is contingent upon column loads not exceeding 300 kips and wall loads not exceeding 12 kips per lineal foot.

In addition, we recommend a minimum width of 24 inches for column footings and 18 inches for continuous wall footings to prevent general bearing capacity failure. Footings should bear at a minimum depth of 18 inches below the prevailing exterior ground surface elevation to avoid potential problems due to frost heave.

The recommended allowable soil bearing pressure is based on an estimated maximum total foundation settlement no greater than approximately 1 inch, with anticipated differential settlement between adjacent columns not exceeding about ½ inch. If the architect or structural engineer determine that the estimated total or differential settlement cannot be accommodated by the proposed structure, please contact us.

Foundation bearing surface evaluations should be performed in all footing excavations prior to placement of reinforcing steel. Geo-Hydro should perform these evaluations to confirm that the design allowable soil bearing pressure is available. Foundation bearing surface evaluations should be performed using a combination of visual observation, hand augering, and portable dynamic cone penetrometer testing (ASTM STP-399).

Because of natural variation, it is possible that some of the soils at the project site may have an allowable bearing pressure less than the recommended design value. Likewise, existing fill materials can be highly variable, and may have an allowable bearing pressure less than the recommended design value. Therefore, foundation bearing surface evaluations will be critical to aid in the identification and remediation of these situations.

Remedial measures should be based on actual field conditions. However, in most cases we expect the use of the stone replacement technique to be the primary remedial measure. Stone replacement involves the removal of soft or loose soils, and replacement with well-compacted graded aggregate base (GAB) meeting Georgia Department of Transportation specifications for gradation. Stone replacement is generally performed to depths ranging from a few inches to as much as 2 times the footing width, depending on the actual conditions. For budgetary purposes, we suggest considering that as much as 20 percent of the foundation excavations will require overexcavation and stone replacement extending to a depth of 2 feet below bearing elevation. The actual quantity of stone replacement will be different and may exceed the provided estimate.

Differential Settlement Mitigation - Parking Deck and City Hall Buildings

The city hall and parking deck building foundations will be supported on a combination of residual soils, variable partially weathered rock, and possibly mass bedrock. These variable materials and conditions will create the potential for contrasting differential settlement and could result in visible gaps at construction joints or cracking of the building veneer. The building foundations supported by rock or partially weathered rock will experience very little settlement while the footings supported on residual soils will settle as all conventional shallow foundation will normally settle. To reduce the differential settlement between footings, we recommend planning for the installation of a 1-foot thick "cushion" in foundations excavated into partially weathered rock or mass rock. The cushion layer should extend 1 foot below bearing elevation, and the cushion space should be backfilled with compacted graded aggregate base (GAB).

Seismic Design

Based on the results of the test boring and following the calculation procedure in the 2018 International Building Code (Chapter 20, ASCE 7-16), the seismic *Site Class* for the site is *C*. The mapped and design spectral response accelerations are as follows S_S=0.192, S_1=0.086, S_{DS}=0.166, S_{D1}=0.086.

Based on the information obtained from the soil test borings, it is our opinion that the potential for liquefaction of the residual soils at the site due to earthquake activity is relatively low.

Floor Slab Subgrade Preparation

The soil subgrade in the area of concrete slab-on-grade support is often disturbed during foundation excavation, plumbing installation, and superstructure construction. We recommend that the floor slab subgrade be evaluated by Geo-Hydro immediately prior to beginning floor slab construction. If low consistency soils are encountered that cannot be adequately densified in place, such soils should be removed and replaced with well-compacted fill material placed in accordance with the *Structural Fill* section of this report or with well-compacted graded aggregate base (GAB).

Assuming that the top 12 inches of floor slab subgrade soils are compacted to at least 98 percent of the standard Proctor maximum dry density, we recommend that a modulus of subgrade reaction of 120 pci be used for design. This value is suitable only for light floor loads (no greater than 150 psf) and transient loads, and should not be used for designing thickened slab sections or floors supporting permanent or semi-permanent loads such as those from equipment and storage racks. For design of floor areas supporting permanent or semi-permanent loads from floor storage, storage racks, etc., we recommend using a modulus of subgrade reaction of 70 pci for design purposes.

Moisture Control for Concrete Slabs

To prevent water vapor transmission from adversely affecting the concrete slab-on-grade floor and to provide a stable surface for floor support, we recommend that slab-on-grade floors be underlain by a minimum 4 inches of #57 stone. The stone must be covered by a vapor retarder. We suggest polyethylene sheeting at least 10 mils thick as a minimum vapor retarder. A more robust vapor retarder may be used

depending on construction sequencing and the potential for damaging or tearing the plastic sheeting during construction.

For floor areas that will be subjected to relatively heavy wheel loads from vehicles, lift platforms, or other similar equipment, we recommend that slab-on-grade floors be underlain by a minimum 5-inch thickness of GDOT compliant graded aggregate base (GAB) compacted to at least 100 percent of the modified Proctor maximum dry density (ASTM D1557). The GAB must be covered by a vapor retarder as suggested above.

A crushed stone capillary break course will be required in enclosed or occupied areas of the lower parking deck level (storage closets, offices, etc.). As discussed above, slab-on-grade floors in enclosed or climate-controlled areas should be underlain by a minimum 4-inch thickness of open-graded stone. Use of #57 crushed stone meeting Georgia DOT specifications for gradation is suggested. To avoid piecemeal work, graded aggregate base similar to the required for concrete pavement may be used in moisture-sensitive areas of the lower parking deck level. Both #57 stone and GAB must be covered by a vapor retarder.

Flexible Pavement Design

Based on our experience with similar projects, assuming standard pavement design parameters, and contingent upon proper pavement subgrade preparation, we recommend the following pavement sections:

Entrance/Exit Driveways and Truck Traffic Areas

Material	Thickness (inches)
Asphaltic Concrete 9.5mm Superpave Type II	2
Asphaltic Concrete 19mm Superpave	2
Graded Aggregate Base (GAB) (Base Course)	8
Subgrade compacted to at least 100% standard Proctor maximum dry density (ASTM D698)	12

Automobile Parking and Automobile Traffic Only

Material	Thickness (inches)
Asphaltic Concrete 9.5mm Superpave Type II	2
Graded Aggregate Base (GAB) (Base Course)	6
Subgrade compacted to at least 100% standard Proctor maximum dry density (ASTM D698)	12

A concrete thickness of 7 inches is recommended for the approach and collection zone in front of any dumpster, in loading/unloading zones, and in any designated truck turn-around areas. Please refer to the *Concrete Pavement* section of this report for concrete pavement recommendations.

The top 12 inches of pavement subgrade soils should be compacted to at least 100 percent of the standard Proctor maximum dry density (ASTM D698). Scarification and moisture adjustment will likely be required to achieve the recommended subgrade compaction level. Allowances for pavement subgrade preparation should be considered for budgeting and scheduling.

GAB must be compacted to at least 100 percent of the modified Proctor maximum dry density (ASTM D1557).

All pavement construction should be performed in general accordance with Georgia DOT specifications. Proper subgrade compaction, adherence to Georgia DOT specifications, and compliance with project plans and specifications, will be critical to the performance of the constructed pavement.

Concrete Pavement

A rigid Portland cement concrete pavement may be considered. Although usually more costly, a Portland cement concrete pavement is typically more durable and requires less maintenance throughout the life cycle of the facility. Concrete thicknesses of 5 inches in automobile parking areas and 6 inches in driveways and truck traffic areas are recommended for this project. A concrete thickness of 7 inches is recommended for the approach and collection zone in front any dumpster, in loading/unloading zones, and in any designated truck turn-around areas. A 600-psi flexural strength concrete mix (approximately 4,500 psi compressive strength) with 4 to 6 percent air entrainment should be used. The concrete pavement should be underlain by no less than 5 inches of compacted graded aggregate base (GAB). GAB should be compacted to at least 100 percent of the modified Proctor maximum dry density (ASTM D1557). The top 12 inches of soil subgrade should be compacted to at least 100 percent of the standard Proctor maximum dry density (ASTM D698).

The concrete pavement may be designed as a "plain concrete pavement" with no reinforcing steel, or reinforcing steel may be used at joints. Construction joints and other design details should be in accordance with guidelines provided by the Portland Cement Association and the American Concrete Institute.

In general, all pavement construction should be in accordance with Georgia DOT specifications. Proper subgrade compaction, adherence to Georgia DOT specifications, and compliance with project plans and specifications will be critical to the performance of the constructed pavement.

Pavement Design Limitations

The pavement sections discussed above are based on our experience with similar type facilities. After traffic information has been developed, we recommend that you allow us to review the traffic data and revise our recommendations as necessary.

Pavement Materials Testing

To aid in verifying that the pavement system is installed in general accordance with the design considerations, the following materials testing services are recommended:

- Density testing of subgrade materials.
- Proofrolling of pavement subgrade materials immediately prior to placement of graded aggregate base (GAB). This proofrolling should be performed the same day GAB is installed.

- Density testing of GAB and verification of GAB thickness. In-place density should be verified using the sand cone method (ASTM D1556) or nuclear density gauge method (ASTM D6938).

- Coring of the pavement to verify thickness and density (asphalt pavement only).

- Preparation and testing of beams and cylinders for flexural and compressive strength testing (Portland cement concrete only). The total number of test specimens required will depend on the number of concrete placement events necessary to construct the pavement.

* * * * * * *

We appreciate the opportunity to serve as your geotechnical consultant for this project and are prepared to provide any additional services you may require. If you have any questions concerning this report or any of our services, please call us.

Sincerely,

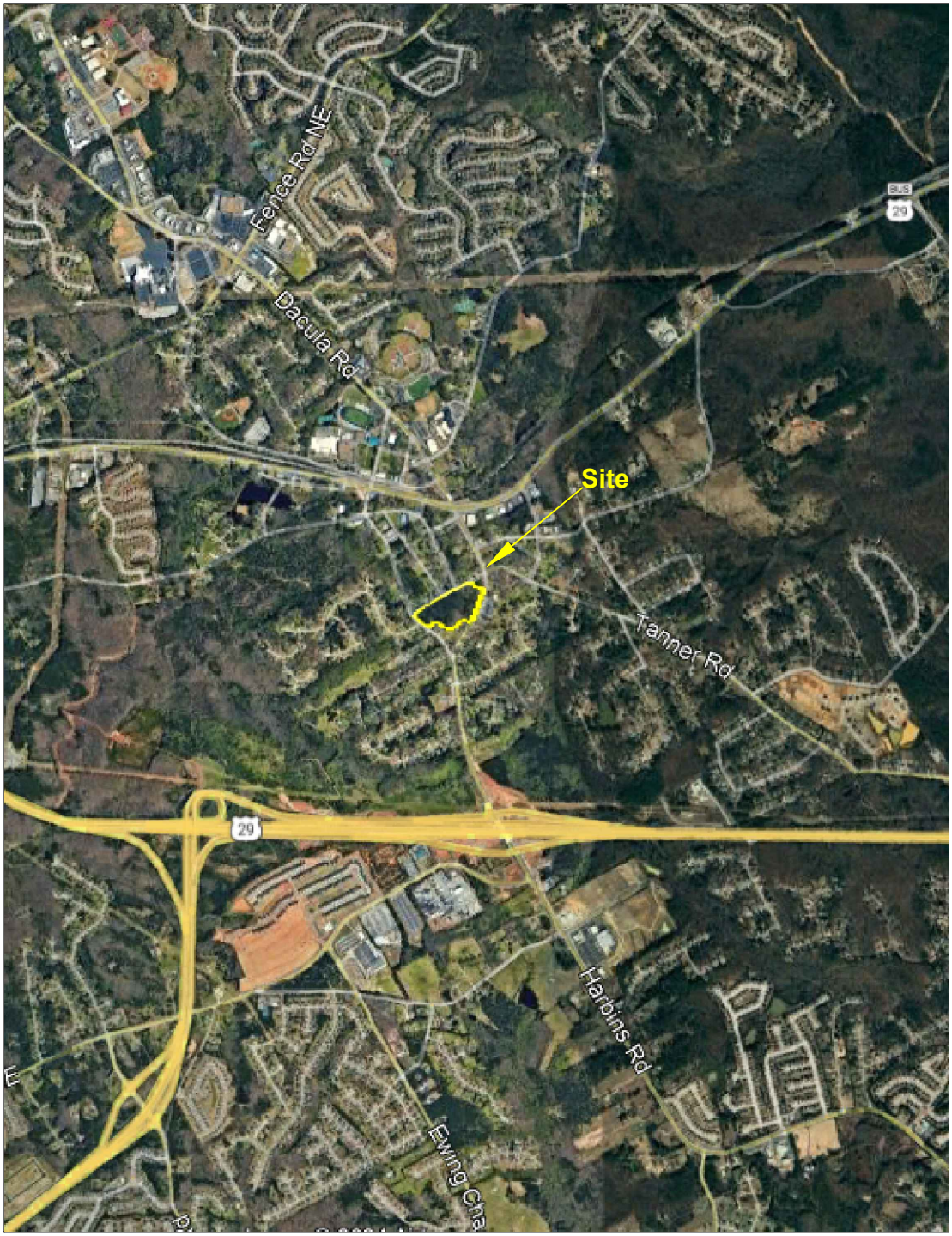
GEO-HYDRO ENGINEERS, INC.

Kaylin D. James, P.G.
Senior Project Geologist
kjames@geohydro.com

Luis E. Babler, P.E.
Chief Engineer
luis@geohydro.com

KDJ/LEB/241895.20 -Dacula Facilities Campus - Report leb.docx

APPENDIX



0 0.25 0.5 1 1.5

Approximate Scale, Miles

Figure 1: Site Location Plan

New Dacula Facilities Campus - Sanjo Road
Dacula, Georgia
Geo-Hydro Project Number 241895.20

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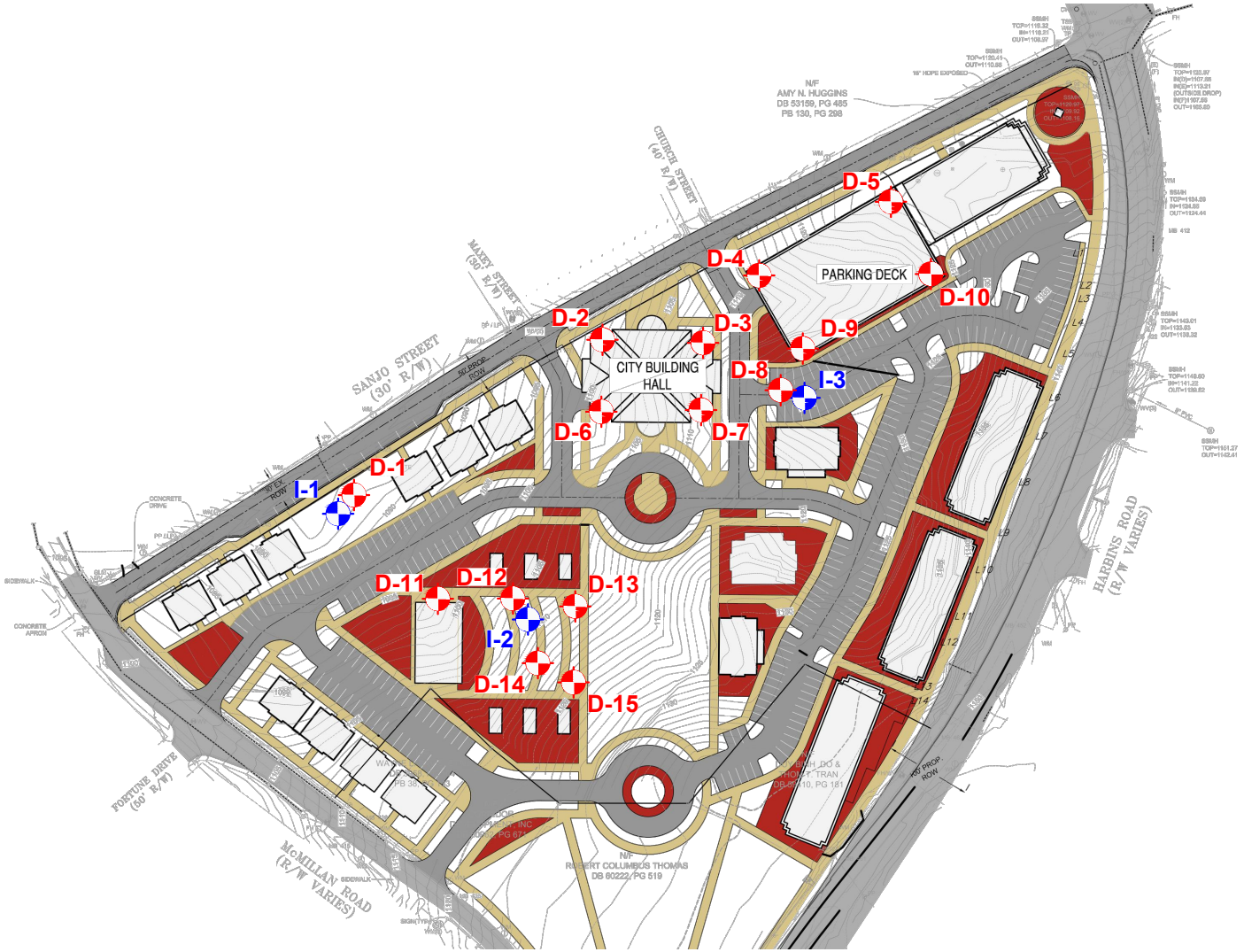


0 100 200 400 600

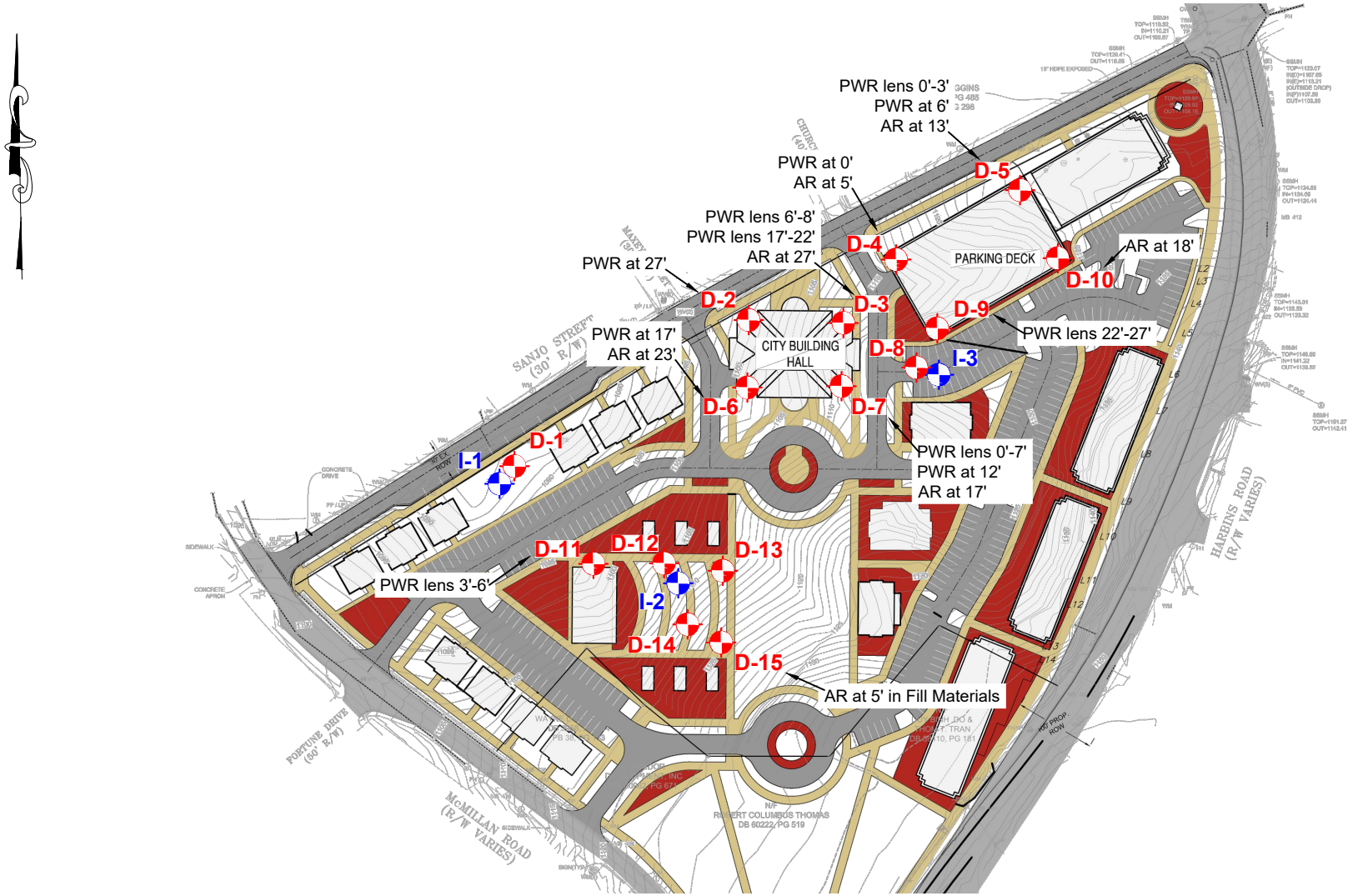
Approximate Scale: 1"=200'

LEGEND: Soil Test Boring

Infiltration Test Location

Figure 2: Boring Location Plan

New Dacula Facilities Campus - Sanjo Road
Dacula, Georgia
Geo-Hydro Project Number 241895.20



LEGEND:
- Soil Test Boring
- Infiltration Test Location

PWR: Partially Weathered Rock
AR: Auger Refusal

Figure 3: Boring Location Plan with Auger Refusal and PWR Annotations

New Dacula Facilities Campus - Sanjo Road
Dacula, Georgia
Geo-Hydro Project Number 241895.20

Symbols and Nomenclature

Symbols

▌	Thin-walled tube (TWT) sample recovered
▯	Thin-walled tube (TWT) sample not recovered
●	Standard penetration resistance (ASTM D1586)
50/2”	Number of blows (50) to drive the split-spoon a number of inches (2)
65%	Percentage of rock core recovered
RQD	Rock quality designation - % of recovered core sample which is 4 or more inches long
GW	Groundwater
	Water level at least 24 hours after drilling
	Water level one hour or less after drilling
ALLUV	Alluvium
TOP	Topsoil
PM	Pavement Materials
CONC	Concrete
FILL	Fill Material
RES	Residual Soil
PWR	Partially Weathered Rock
SPT	Standard Penetration Testing

Penetration Resistance Results	Number of Blows, N	Approximate Relative Density
Sands	0-4	very loose
	5-10	loose
	11-20	firm
	21-30	very firm
	31-50	dense
	Over 50	very dense

	Number of Blows, N	Approximate Consistency
Silts and	0-1	very soft
Clays	2-4	soft
	5-8	firm
	9-15	stiff
	16-30	very stiff
	31-50	hard
	Over 50	very hard

Drilling Procedures

Soil sampling and standard penetration testing performed in accordance with ASTM D 1586. The standard penetration resistance is the number of blows of a 140-pound hammer falling 30 inches to drive a 2-inch O.D., 1.4-inch I.D. split-spoon sampler one foot. Rock coring is performed in accordance with ASTM D 2113. Thin-walled tube sampling is performed in accordance with ASTM D 1587.

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D-1

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1087**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1087	0			Topsoil (Approximately 2 inches)	
1085	2			Firm to very firm red-brown slightly micaceous silty fine sand (SM) with rock fragments (RESIDUUM)	21
	5				21
1080					17
	10			Boring Terminated at 10 feet	18
1075					
	15				
1070					
	20				
1065					
	25				
1060					
	30				
1055					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-2

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **25 feet**	G.S. Elev: **1099**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1095	5			Topsoil (Approximately 2 inches) Firm to very firm red-brown slightly micaceous silty fine to medium sand (SM) with rock fragments (RESIDUUM)	30 19 16
1090	10				11
1085	15			Loose red-brown and black micaceous silty fine to medium sand (SM)	10
1080	20				9
1075	25	▽			7
1070	30			Partially weathered rock sampled as tan silty fine sand (SM) Boring Terminated at 30 feet	50/2"
1065	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-3

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1110**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	Description	N
		Topsoil (Approximately 2 inches)	
		Very stiff red-brown slightly micaceous fine to medium sandy silt (ML) (RESIDUUM)	25
1105	5		27
		Partially weathered rock sampled as red-brown slightly micaceous fine to medium sandy silt (ML)	50/1"
		Firm to very firm brown and purple slightly micaceous silty fine to medium sand (SM)	
1100	10		24
1095	15		18
		Partially weathered rock sampled as purple and tan slightly micaceous silty fine to medium sand (SM)	
1090	20		50/3"
		Dense purple, tan, and white slightly micaceous silty fine to medium sand (SM)	
1085	25		33
		Auger Refusal at 27 feet	
1080	30		
1075	35		

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-4

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1114**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1110	5			Topsoil (Approximately 2 inches) Partially weathered rock sampled as brown silty fine to medium sand (SM) (RESIDUUM) No Sample Recovered at 5 feet	50/4"
				Initial Auger Refusal at 3 feet Offset 5 feet southeast Auger Refusal at 5 feet	50/2"
1105	10				
1100	15				
1095	20				
1090	25				
1085	30				
1080	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-5

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1125**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
				Topsoil (Approximately 2 inches)	
				Partially weathered rock sampled as red-brown slightly micaceous silty fine to coarse sand (SM) (RESIDUUM)	50/4"
1120	5			Very firm purple and tan slightly micaceous silty fine to coarse sand (SM)	26
				Partially weathered rock sampled as purple and tan slightly micaceous silty fine to coarse sand (SM)	50/3"
1115	10				50/2"
				Initial Auger Refusal at 11 feet	
1110	15			Offset 5 feet southeast	
				Auger Refusal at 13 feet	
1105	20				
1100	25				
1095	30				
1090	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-6

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1101**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1100	0			Topsoil (Approximately 2 inches)	
				Very firm to dense red-brown silty fine to coarse sand (SM) (RESIDUUM)	24
1095	5				31
					22
				Firm to very firm red-brown slightly micaceous silty fine to medium sand (SM)	
1090	10				18
1085	15				24
				Partially weathered rock sampled as tan silty fine sand (SM)	
1080	20				50/3"
				Auger Refusal at 23 feet	
1075	25				
1070	30				
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-7

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1112**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1110	0			Topsoil (Approximately 2 inches)	
				Partially weathered rock sampled as purple-tan silty fine to coarse sand (SM) (RESIDUUM)	50/1"
	5			No Sample Recovered at 7 1/2 feet	50/5"
1105					50/0"
				Very stiff pink-purple fine sandy silt (ML)	
	10				27
1100				Partially weathered rock sampled as purple-tan slightly micaceous silty fine sand (SM)	
	15				50/4"
1095				Initial Auger Refusal at 5 feet	
				Offset 10 feet south	
	20			Auger Refusal at 17 feet	
1090					
	25				
1085					
	30				
1080					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-8

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1122**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1122	0			Topsoil (Approximately 2 inches)	
				Very stiff purple-tan fine to coarse sandy silt (ML) (RESIDUUM)	16
1120					
	5				18
1115					14
				Firm purple-tan slightly micaceous silty fine to medium sand (SM)	
	10			Boring Terminated at 10 feet	14
1110					
	15				
1105					
	20				
1100					
	25				
1095					
	30				
1090					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-9

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1120**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
				Topsoil (Approximately 2 inches)	
				Loose red-purple slightly micaceous silty fine to coarse sand (SM) (RESIDUUM)	7
1115	5			Firm to very firm red-purple and tan slightly micaceous silty fine to coarse sand (SM) with rock fragments	21
					16
1110	10				19
1105	15				18
1100	20				14
				Partially weathered rock sampled as black and tan micaceous silty fine to medium sand (SM)	
1095	25				50/4"
				Very firm tan, purple and black micaceous silty fine to medium sand (SM)	
1090	30			Boring Terminated at 30 feet	26
1085	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-10

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1123**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N	Standard Penetration Test (Blows/Foot)
1120	0			Topsoil (Approximately 2 inches)		
				Firm to very firm red-purple micaceous silty fine to medium sand (SM) (RESIDUUM)	22	
	5				21	
1115					19	
	10				19	
1110						
	15				21	
1105				Auger Refusal at 18 feet		
	20					
1100						
	25					
1095						
	30					
1090						
	35					

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-11

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1098**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1098	0			Topsoil (Approximately 2 inches)	
				Dense red-brown slightly micaceous silty fine to medium sand (SM) (RESIDUUM)	33
1095	3			Partially weathered rock sampled as red-brown silty fine to coarse sand (SM) with rock fragments	50/4"
	5			Firm brown silty fine to coarse sand (SM) with rock fragments	18
1090	8			Firm red-purple slightly micaceous silty fine to medium sand (SM)	14
	10			Boring Terminated at 10 feet	
1085	13				
	15				
1080	18				
	20				
1075	23				
	25				
1070	28				
	30				
1065	33				
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-12

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1105**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1105	0			Topsoil (Approximately 2 inches)	
				Very firm to dense red-brown slightly micaceous silty fine to medium sand (SM) (RESIDUUM)	31
1100	5				22
					25
				Firm red-brown micaceous silty fine to medium sand (SM)	
1095	10			Boring Terminated at 10 feet	14
1090	15				
1085	20				
1080	25				
1075	30				
1070	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-13

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1112**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1112	0			Topsoil (Approximately 2 inches)	
				Firm to very firm red-brown silty fine to coarse sand (SM) (RESIDUUM)	30
1110					
	5				28
1105					12
	10			Boring Terminated at 10 feet	11
1100					
	15				
1095					
	20				
1090					
	25				
1085					
	30				
1080					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-14

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1113**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1113	0			Topsoil (Approximately 2 inches)	
				Firm to very firm red-brown slightly micaceous silty fine to medium sand (SM) (RESIDUUM)	22
1110	5				19
				Loose to firm red-brown slightly micaceous silty fine to medium sand (SM)	10
1105	10			Boring Terminated at 10 feet	13
1100	15				
1095	20				
1090	25				
1085	30				
1080	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-15

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1119**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1119	0			Topsoil (Approximately 2 inches)	
				Red-brown silty fine to coarse sand (SM) with organics and rock fragments (FILL) **	50/4"
1115	5				50/2"
				Initial Auger Refusal at 5 feet	
				Offset 5 feet north	
1110	10			Auger Refusal at 5 feet	
1105	15				
1100	20				
1095	25				
1090	30				
1085	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks: **Standard penetration test resistances not considered representative due to rock fragments in the fill

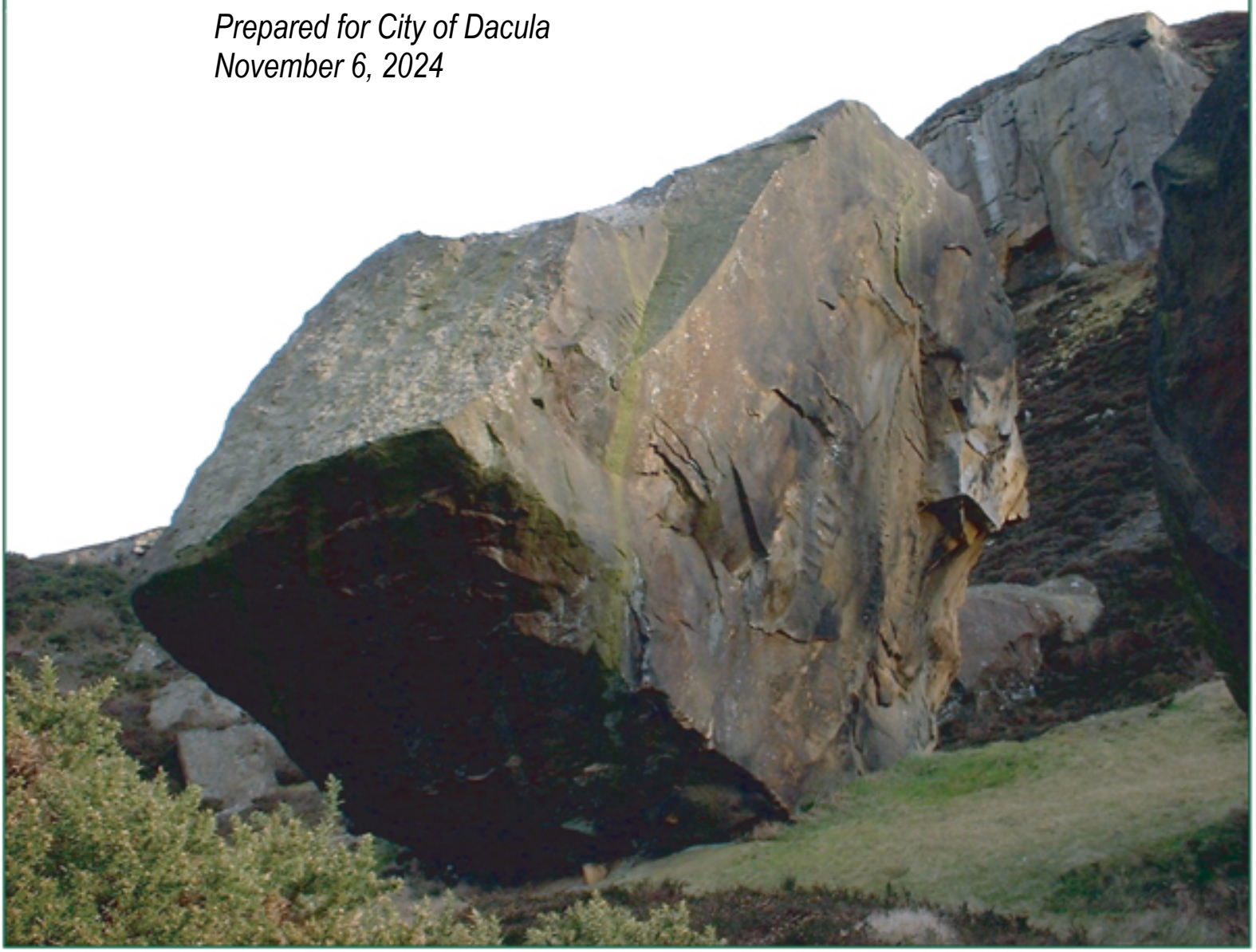
TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

GEO HYDRO ENGINEERS

Report of Supplemental Subsurface Exploration and Geotechnical Engineering Evaluation

New Dacula Facilities Campus
Sanjo Street
Dacula, Georgia
Geo-Hydro Project Number 241895.21

Prepared for City of Dacula
November 6, 2024



Ms. Brittni Nix, AICP
City of Dacula
442 Harbins Road, PO Box 400
Dacula, Georgia 30019

November 6, 2024

Report of Supplemental Subsurface Exploration and Geotechnical Engineering Evaluation
New Dacula Facilities Campus
Sanjo Street
Dacula, Georgia
Geo-Hydro Project Number 241895.21

Dear Ms. Nix:

Geo-Hydro Engineers, Inc. has completed the authorized supplemental subsurface exploration and geotechnical engineering evaluation for the above referenced project. The scope of services for this project was outlined in our proposal number 241895.P1 dated September 16, 2024.

Geo-Hydro previously performed a subsurface exploration for the project, the results of which can be found in our *Report of Subsurface Exploration and Geotechnical Engineering Evaluation* dated August 8, 2024. As presented, this supplemental report supersedes and replaces our initial report.

PROJECT INFORMATION

The project site is located on the triangular-shaped tract south of Sanjo Street, west of Harbins Road, and northeast of McMillian Road in Dacula, Georgia. Figure 1 in the Appendix shows the approximate site location.

We understand that the City of Dacula is planning a new facilities campus that will include a city hall building, a public parking deck, amphitheater, access drives, parking lots, and other city buildings. We have assumed that the new city hall will be a two- to three-story structure with a structural steel frame and/or masonry walls. We have assumed that the public parking deck will be a three- to four-story cast-in-place or precast concrete structure. Based on the information provided to us, the city hall building will have a maximum column load of 450 kips and we have assumed that wall loads will be no greater than 14 kips per lineal foot. We understand that the public parking deck will have a maximum column load on the order of 821 kips with wall loads no greater than 35 kips per lineal foot.

The property is an approximately 14-acre tract composed of multiple properties. The site is generally wooded with single-family homes in the southern limits of the site and the northeast corner. The ground surface within the property generally slopes up from west to east with about 50 feet of vertical relief across the prospective construction area. The annotated aerial photograph to the right shows the approximate property limits and current site conditions.

EXPLORATORY PROCEDURES

Soil Test Borings

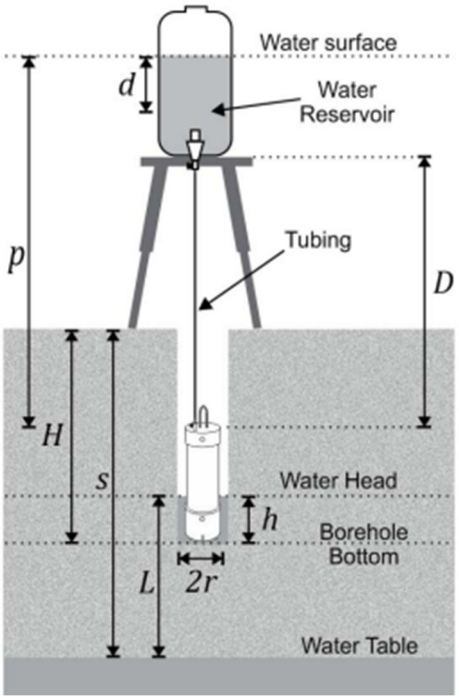
The supplemental subsurface exploration consisted of 19 machine-drilled soil test borings performed at the approximate locations shown on Figure 2 in the Appendix. The test borings were located in the field by Geo-Hydro using a handheld GPS unit with preloaded coordinates. The ground surface elevations shown on the test boring records were interpolated from the *Schematic Design – Grading and Drainage Plan - COD - Plaza and Administrative Building* "Boring Plan" dated May 14, 2024, prepared by Bowman Consulting. The elevation data is not certified as correct by this engineer, and users of the data do so at their own risk. In general, the boring locations and elevations should be considered approximate.

Standard penetration testing, as provided for in ASTM D1586, was performed at select depth intervals in the soil test borings. Soil samples obtained from the drilling operation were examined and classified in general accordance with ASTM D2488 (Visual-Manual Procedure for Description of Soils). Soil classifications include the use of the Unified Soil Classification System described in ASTM D2487 (Classification of Soils for Engineering Purposes). The soil classifications also include our evaluation of the geologic origin of the soils. Evaluations of geologic origin are based on our experience and interpretation and may be subject to some degree of error.

Descriptions of the soils encountered, groundwater conditions, standard penetration resistances, and other pertinent information are provided in the test boring records included in the Appendix.

Infiltration Tests

The supplemental field exploration also included six infiltration tests performed at the approximate locations shown on Figure 2 in the Appendix. We advanced test boreholes using a drill rig and continuous flight augers producing an approximately 8-inch diameter borehole. The tests were then performed using an Aardvark constant head permeameter to measure the saturated hydraulic conductivity (K_{sat}) of the soil. The Aardvark Permeameter estimates soil hydraulic conductivity using the amount of supplied water measured at equal time intervals, which is the equivalent to the amount of water that was infiltrated by the soil. The tests were performed until the soil-water infiltration rate reached a steady value that did not change over time. Soil hydraulic conductivity (K_{sat}) was then calculated using this steady flow rate (Q). The test procedure and model components are shown in the figure to the right.



Saturated hydraulic conductivity was calculated using the Reynolds and Elrick Method. The saturated hydraulic

conductivity of a soil under steady flow from a borehole was calculated using the following equation:

$$K_S = \frac{Q_S C_0}{6000(2\pi(h^2) + (C_0\pi(r^2)) + (2\pi(h/\alpha)))}$$

Where $\mathbf{Q_S}$ is the steady flow rate in volume of water (cm^3) per time (min), **h** is the height of water ponded in the borehole (cm), **r** is the radius of the hole (cm), **α** is the soil macroscopic capillary length (cm), and $\mathbf{C_0}$ is a unitless geometric factor. The values of **α** and $\mathbf{C_0}$ are dependent on the texture and structure of the soil, and are fixed values predetermined by Reynolds and Elrick (1992)[1].

REGIONAL GEOLOGY

The project site is located in the Southern Piedmont Geologic Province of Georgia. Soils in this area have been formed by the in-place weathering of the underlying crystalline rock, which accounts for their classification as "residual" soils. Residual soils near the ground surface that have experienced advanced weathering frequently consist of red brown clayey silt (ML) or silty clay (CL). The thickness of this surficial clayey zone may range up to roughly 6 feet. For various reasons, such as erosion or local variation of mineralization, the upper clayey zone is not always present.

With increased depth, the soil becomes less weathered, coarser grained, and the structural character of the underlying parent rock becomes more evident. These residual soils are typically classified as sandy micaceous silt (ML) or silty micaceous sand (SM). With a further increase in depth, the soils eventually become quite hard and take on an increasing resemblance to the underlying parent rock. When these materials have a standard penetration resistance of l00 blows per foot or greater, they are referred to as partially weathered rock. The transition from soil to partially weathered rock is usually a gradual one, and may occur at a wide range of depths. Lenses or layers of partially weathered rock are not unusual in the soil profile.

Partially weathered rock represents the zone of transition between the soil and the indurated metamorphic rocks from which the soils are derived. The subsurface profile is, in fact, a history of the weathering process that the crystalline rock has undergone. The degree of weathering is most advanced at the ground surface, where fine-grained soil may be present. Conversely, the weathering process is in its early stages immediately above the surface of relatively sound rock, where partially weathered rock may be found.

The thickness of the zone of partially weathered rock and the depth to the rock surface have both been found to vary considerably over relatively short distances. The depth to the rock surface may frequently range from the ground surface to 80 feet or more. The thickness of partially weathered rock, which overlies the rock surface, may vary from only a few inches to as much as 40 feet or more.

[1] Reynolds and Elrick (1992). *Advances in measurement of soil physical properties: Bringing theory into practice* (Vol. 30, pp. 1-24). Soil Science Society of America.

CONSOLIDATED SOIL TEST BORING SUMMARY

Starting at the ground surface, all borings encountered approximately 1 to 2 inches of topsoil. The borings were performed in freshly cleared access trails from which most of the topsoil was removed. The topsoil thickness at the site should be expected to vary. On wooded or overgrown sites, it is not unusual for the grading contractor to report an average topsoil thickness of 10 to 12 inches following the intermixing of topsoil, leaves, and branches during tree removal. Topsoil thicknesses will be greater in or near low-lying areas and drainage features. For planning purposes, we suggest a topsoil thickness of 12 inches.

Beneath the topsoil, borings D-15, S-1 through S-5, S-7, S-9, S-10, S-11, S-15, S-17, and S-18 encountered fill materials extending to a depths ranging from about 3 to 6 feet. The fill was classified as silty sand and clayey sand with varying amounts of mica, organics, and rock fragments. Standard penetration test resistances recorded in the fill ranged from 9 to over 100 blows per foot. It should be noted that rock fragments and other hard inclusions will typically amplify the standard penetration test resistances. Such artificially inflated values should not be considered representative of the consistency or engineering properties of fill the materials. Boring D-15 and an offset of D-15 encountered auger refusal within fill materials at a depth of 5 feet.

Beneath the surface materials or fill materials, all borings except D-15 encountered residual soils or partially weathered rock typical of the Piedmont Region. The residual soils were classified as sandy silt, clayey sand, and silty sand with varying mica content a rock fragments. Standard penetration test resistances recorded in the residual soils ranged from 4 to 76 blows per foot.

Partially weathered rock was encountered in borings D-2, D-3, D-4, D-5, D-6, D-7, D-9, D-11, S-1, S-6, S-7, S-12, S-13, S-15, S-16, S-17, and S-19 at depths ranging from just below the surface materials to about 30 feet. Partially weathered rock is locally defined as residual material having a standard penetration test resistance of 100 blows per foot or greater.

Materials causing auger refusal in the residual profile were encountered in borings D-3, D-4, D-5, D-6, D-7, D-10, S-12, S-13, S-16, and S-19 at depths ranging from 5 to 27 feet. Auger refusal is the condition that prevents advancement of the boring using conventional soil drilling techniques. The residual material causing auger refusal may consist of a boulder, a lens or layer of rock, the upper surface of relatively massive rock, or other hard material. Boring D-15 and an offset encountered auger refusal within fill materials at a depth of about 5 feet. The fill material causing auger refusal may consist of debris within the fill, a structure, a boulder, or other hard material.

At the time of drilling, groundwater was encountered in borings D-2, S-2, and S-4 at a depth of approximately 25 feet. It should be noted that groundwater levels will fluctuate depending on yearly and seasonal rainfall variations and other factors, and may rise in the future.

For more detailed descriptions of subsurface soil conditions, please refer to the test boring records included in the Appendix.

Summary of Subsurface Conditions

Boring	Approx. Current Ground Elevation	Bottom of Fill		Groundwater**		Top of PWR		Auger Refusal		Boring Termination	
		Depth (feet)	Elev.	Depth (feet)	Elev.	Depth (feet)	Elev.	Depth (feet)	Elev.	Depth (feet)	Elev.
D-1	1087	NE	---	NE	---	NE	---	NE	---	10	1077
D-2	1099	NE	---	25	1074	27	1072	NE	---	30	1069
D-3	1110	NE	---	NE	---	6*, 17	1104*, 1093	27	1083	27	1083
D-4	1114	NE	---	NE	---	0	1114	3, 5	1111, 1109	5	1109
D-5	1125	NE	---	NE	---	0*, 7	1125*, 1118	11, 13	1114, 1112	13	1112
D-6	1101	NE	---	NE	---	17	1084	23	1078	23	1078
D-7	1112	NE	---	NE	---	0*, 12	1112*, 1100	5, 17	1107, 1095	17	1095
D-8	1122	NE	---	NE	---	NE	---	NE	---	10	1112
D-9	1120	NE	---	NE	---	22	1098	NE	---	30	1090
D-10	1123	NE	---	NE	---	NE	---	18	1105	18	1105
D-11	1098	NE	---	NE	---	3	1095	NE	---	10	1088
D-12	1105	NE	---	NE	---	NE	---	NE	---	10	1095
D-13	1112	NE	---	NE	---	NE	---	NE	---	10	1102
D-14	1113	NE	---	NE	---	NE	---	NE	---	10	1103
D-15	1119	5	1114	NE	---	NE	---	5, 5	1114	5	1114
S-1	1097	6	1091	NE	---	22	1075	NE	---	25	1072
S-2	1092	6	1086	25	1067	NE	---	NE	---	25	1067
S-3	1094	6	1088	NE	---	NE	---	NE	---	20	1074
S-4	1092	6	1086	25	1067	NE	---	NE	---	30	1062
S-5	1093	6	1087	NE	---	NE	---	NE	---	20	1073
S-6	1100	NE	---	NE	---	8	1092	NE	---	20	1080
S-7	1111	6	1105	NE	---	17	1094	NE	---	20	1091
S-8	1133	NE	---	NE	---	NE	---	NE	---	20	1113
S-9	1101	6	1095	NE	---	NE	---	NE	---	20	1081
S-10	1100	6	1094	NE	---	NE	---	NE	---	20	1080
S-11	1113	6	1107	NE	---	NE	---	NE	---	20	1093
S-12	1119	NE	---	NE	---	0	1119	6	1113	6	1113
S-13	1124	NE	---	NE	---	0*, 8	1124, 1116	16	1108	16	1108
S-14	1125	NE	---	NE	---	NE	---	NE	---	20	1105
S-15	1133	6	1127	NE	---	22	1111	NE	---	25	1108
S-16	1122	NE	---	NE	---	6	1116	12	1110	12	1110
S-17	1129	3	1126	NE	---	3*, 22	1126, 1107	NE	---	25	1104
S-18	1132	6	1126	NE	---	NE	---	NE	---	25	1107
S-19	1133	NE	---	NE	---	3	1130	12	1121	12	1121

All Depths and Elevations in this Summary Table are Approximate

NE: Not Encountered

PWR: Partially Weathered Rock

* Lens of PWR initially encountered

**Groundwater level measured at the time of drilling

INFILTRATION TEST RESULTS AND SUMMARY

The following table presents the results of the infiltration tests.

Test Location	Ground Surface Elevation (feet)	Test Depth (feet)	Test Elevation (feet)	Infiltration Rate (inches/hour)
I-1	1097	10	1087	1.34
I-2	1040	10	1030	0.17
I-3	1092	10	1082	0.49
I-4	1093	10	1083	0.40
I-5	1090	10	1080	0.22
I-6	1110	10	1090	3.65

All depths and elevations in this table are approximate

All of the infiltration tests were performed in residual soil or partially weathered rock classified as silty sand. It is important to note that infiltration properties can vary horizontally and vertically, and the results of the infiltration tests may not be representative of the entire area where infiltration is intended. Based on our experience, the infiltration rate measured in test I-6 likely represents the upper end of the infiltration properties of soil in this area. We suggest using a maximum infiltration rate of 2 inches per hour for design of any infiltration feature. Appropriate judgement should be used when selecting values for design.

EVALUATIONS AND RECOMMENDATIONS

The following evaluations and recommendations are based on the information available on the proposed construction, the data obtained from the test borings, and our experience with soils and subsurface conditions similar to those encountered at this site. Because the test borings represent a statistically small sampling of subsurface conditions, it is possible that conditions may be encountered during construction that are substantially different from those indicated by the test borings. In these instances, adjustments to the design and construction may be necessary.

Geotechnical Considerations

The following geotechnical characteristics of the site should be considered for planning and design:

- Fill materials were encountered in 13 borings extending to a depths ranging from about 3 to 6 feet. The fill materials contained varying amounts of organics and rock fragments. We expect that any fill encountered on site during construction will be highly variable, and it is likely that some management of poor-quality or loose fill will be necessary during construction. Any loose, unstable fill material that cannot be readily densified in place should be removed and replaced with well compacted structural fill.

- Partially weathered rock (PWR) was encountered in 17 borings at depths ranging from the ground surface to about 27 feet. Large equipment capable of ripping and the use of impact hammers are typically required to facilitate excavation of PWR, and in some cases blasting is required to excavate very dense PWR.

- Materials causing auger refusal in the residual profile were encountered in ten borings at depths ranging from 5 to 27 feet. For planning purposes, we recommend considering that blasting will be necessary to remove material below the depth of auger refusal. Based on the results of the test borings, it is likely that difficult excavation conditions will be encountered during mass grading and trench excavations. The elevations at which partially weathered rock and auger refusal were encountered in the borings should be considered when developing a final grading and drainage plan for the site.

- Boring D-15 and an offset of D-15 encountered auger refusal within fill materials at a depth of 5 feet. It is important to note that auger refusal conditions in fill are not necessarily indicative of difficult excavation. However, large debris within fill materials such as larger dimensions concrete rubble may require either the use if impact hammers to reduce the size of the debris or the use of excavators with a grappling bucket to facilitate handling of larger dimension materials.

- Based on the results of the soil test borings, excavated residual soils should be reusable as structural fill. Whether excavated fill materials can be reused will depend on the composition of the fill. Organic debris and other refuse may render the excavated materials unsuitable if the debris cannot be segregated. Additionally, organic material such as topsoil in excess of about 5 to 6 percent by weight will also make excavated materials unsuitable for reuse. Routine adjustment of moisture content will be required to facilitate the reuse of excavated fill and residual soils. If generated during construction, excavated partially weathered rock materials will be suitable for reuse as structural fill only if they break down into a reasonably well-graded material that can be satisfactorily compacted. For initial planning purposes, blast rock should be considered unsuitable for reuse as structural fill.

- At the time of drilling, groundwater was encountered in borings D-2, S-2, and S-4 at a depth of approximately 25 feet. It is important to note that the groundwater level will fluctuate over time depending on local rainfall amounts and other factors and may be encountered at higher elevations. Depending on final grades and utility inverts, groundwater may be encountered during utility installation and construction.

- Based on the results of the test borings and in accordance with the 2018 International Building Code (Chapter 20, ASCE 7-16), we recommend using a seismic *Site Class* of *C*. The mapped and design spectral response accelerations are as follows: S_S=0.192, S_1=0.086, S_{DS}=0.166, S_{D1}=0.086.

- Based on the results of the soil test borings, it is our opinion that the planned city hall building can be supported using conventional shallow foundations. For planning and design purposes, we recommend using an allowable bearing pressure of 3,000 psf for column loads no greater than 450 kips and wall loads not exceeding 14 kips per lineal foot.

- The city hall building foundations will be supported on a combination of residual soils, variable partially weathered rock, and possibly mass bedrock. These variable materials and conditions will create the potential for contrasting differential settlement and could result in visible gaps at construction joints or cracking of the building veneer. The building foundations supported by rock or partially weathered rock will experience very little settlement while the footings supported on residual soils will settle as all conventional shallow foundation will normally settle. To reduce the differential

settlement between footings, we recommend planning for the installation of a 1-foot thick "cushion" in foundations excavated into partially weathered rock or mass rock.

- Based on the results of the soil test borings, it is our opinion that the planned public parking deck cannot be supported using conventional shallow foundations alone. The variable bedrock profile within the parking deck footprint will require a mix of conventional shallow foundations supported on partially weathered rock/rock and aggregate piers. Aggregate piers will be required to control foundation settlement in areas of the structures underlain by a deeper residual soil profile. For initial evaluation of this option, an allowable bearing pressure of 5,000 psf can be used for a subsurface profile improved by aggregate piers. However, under a design-build arrangement, the actual design bearing pressure will be determined by the specialty geotechnical contractor engaged to install aggregate piers.

The following sections provide recommendations regarding these issues and other geotechnical aspects of the project.

Existing Fill Materials

Fill materials were encountered in 13 borings extending to depths ranging from about 3 to 6 feet. The fill materials contained varying amounts of organics and rock fragments. We expect any fill encountered on site during construction to be highly variable, and it is likely that some management of poor-quality or loose fill will be necessary during construction. Any loose, unstable fill material that cannot be readily densified in place should be removed and replaced with well compacted structural fill.

There are several important facts that should be considered regarding existing fill materials and the limitations of subsurface exploration.

- The quality of existing fill materials can be highly variable, and test borings are often not able to detect all of the zones or layers of poor-quality fill materials.

- Layers of poor-quality fill materials that are less than about 2½ to 5 feet thick may often remain undetected by soil test borings due to the discrete-interval sampling method used in this exploration.

- The interface between existing fill materials and the original ground surface may include a layer of organic material that was not properly stripped off during the original grading. Depending on its relationship to the foundation and floor slab bearing surfaces, an organic layer might adversely affect support of footings and floor slabs. If such organic layers are encountered during construction, it may be necessary to "chase out" the organic layer by excavating the layer along with overlying soils.

- Subsurface exploration is simply not capable of disclosing all conditions that may require remediation.

General Site Preparation

Any vegetation, roots, topsoil, demolition debris, pavements, sidewalks, and other deleterious materials should be completely removed from the construction area. Clearing, grubbing, and stripping should be performed only during dry weather conditions. Operation of heavy equipment on the site during wet conditions could result in excessive rutting and mixing of debris or topsoil with underlying soils. All excavations resulting from rerouting of underground utilities or demolition of foundations or other underground structures should be backfilled in accordance with the *Structural Fill* section of this report.

We recommend that areas to receive structural fill be proofrolled wherever possible. Proofrolling should be performed using a loaded, tandem-axle dump truck weighing at least 18 tons. Proofrolling with multiple passes in at least two directions should be observed by Geo-Hydro to determine if remedial measures are necessary. Proofrolling must be avoided within 10 feet of existing structures, hardscapes to remain, or rights-of-way. Weak areas showing "pumping" will require remedial measures. Depending on the severity of the problem, unstable soils may be treated in place by densification, or by removal and replacement with stable fill materials or crushed stone.

For evaluation purposes, we recommend considering that approximately 20 percent of the planned aggregate construction area (building footprints, pavement areas, and hardscapes) will require undercutting and replacement with new structural fill extending to a depth of about 2 feet. *The suggested approach to quantify ground stabilization is intended only as a budgeting tool to facilitate the allocation of funds for ground stabilization. The need for, actual location, extent, and method used to manage unstable subgrade materials will depend on site conditions at the time of construction. In-place stabilization using geosynthetics (geofabric or geogrid) and crushed stone may be used instead of excavation and replacement if cost and site conditions are conducive to this approach.*

Items related to old homesteads which can be of concern for site development include domestic water wells and septic system tanks and drain fields. Water wells, if encountered, must be abandoned in accordance with the requirements of the Georgia Water Well Standards Act of 1985. The owner of the property is responsible for plugging the well in accordance with the requirements outlined in Circular 13, "Grouting and Plugging of Domestic Water Wells in Georgia" published by the Georgia Department of Natural Resources, Environmental Protection Division and the Georgia Geologic Survey. A water well contractor licensed to practice in Georgia must perform the actual work of plugging the well. Additionally, any existing septic systems and drain fields must be removed, and the resulting excavation should be backfilled in accordance with the recommendations in the Structural Fill section of this report.

During site preparation, burn pits or trash pits may be encountered. On sites with previous agricultural use, which includes most of the state's landmass, pits used to dispose of tree refuse or farm animal carcasses may also be encountered. All too frequently such buried material occurs in isolated areas which are not detected by the soil test borings. Any buried debris or trash found during the construction operation should be thoroughly excavated and removed from the site.

Groundwater

At the time of drilling, groundwater was encountered in borings D-2, S-2, and S-4 at a depth of approximately 25 feet. It is important to note that the groundwater level will fluctuate over time depending on local rainfall amounts and other factors and may be encountered at higher elevations. Depending on final grades and utility inverts, groundwater may be encountered during utility installation and construction. Regardless of groundwater conditions, the contractor should be prepared to manage runoff during wet weather conditions and subsurface drainage will be necessary behind all below-grade structures including foundation walls.

We recommend that the construction documents include a minimum *performance* specification for dewatering. The specification should require specific results from dewatering rather than dictate a dewatering method. Exhibit "A" as follows provides a minimum guide specification that may be used to develop a dewatering performance specification suitable for this project. In our opinion, Exhibit "A" represents the minimum specification for a project of this scope.

EXHIBIT "A"

Minimum Guide Specification for Dewatering

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NOTE: The following specifications are for use as a guide for development of actual specifications. The guide is not intended for direct use as a construction specification without modifications to reflect specific project conditions.

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Control of groundwater shall be accomplished in a manner that will preserve the strength of the foundation soils, will not cause instability of the excavation slopes, and will not result in damage to existing structures. Where necessary for these purposes, the water level shall be lowered in advance of excavation, utilizing trenches, sumps, wells, well points or similar methods. The water level, as measured in piezometers, shall be maintained a minimum of 3 feet below the prevailing excavation level. Open pumping from sumps and ditches, if it results in boils, loss of soil fines, softening of the ground or instability of slopes, will not be permitted. Wells and well points shall be installed with suitable screens and filters so that continuous pumping of soil fines does not occur. The discharge shall be arranged to facilitate collection of samples by the Engineer.

Adapted from Construction Dewatering - A Guide to Theory and Practice, John Wiley and Sons.

Excavation Characteristics

Partially weathered rock (PWR) was encountered in 17 borings at depths ranging from the ground surface to about 27 feet. Partially weathered rock will require ripping to pre-loosen the material and facilitate excavation. Due to the leverage required to pre-loosen partially weathered rock, it is often impractical to

rip partially weathered rock in trench excavations. In some instances, partially weathered rock having very high standard penetration resistances (50/0" to 50/2") may require the use of hydraulic impact hammers or blasting to achieve excavation.

Materials causing auger refusal in the residual profile were encountered in 10 borings at depths ranging from 5 to 27 feet. For planning purposes, we recommend considering that blasting will be necessary to remove material below the depth of auger refusal. Based on the results of the test borings, it is likely that difficult excavation conditions will be encountered during mass grading and trench excavations.

Boring D-15 and an offset of D-15 encountered auger refusal within fill materials at a depth of 5 feet. It is important to note that auger refusal conditions in fill are not necessarily indicative of difficult excavation. However, large debris within fill materials such as larger dimensioned concrete rubble may require either the use if impact hammers to reduce the size of the debris, or the use of excavators with a grappling bucket to facilitate handling of larger dimension materials.

Overburden soils with standard penetration test resistances of less than 100 blows per foot should be readily removeable with conventional grading equipment such as loaders and backhoes. It is important to note that the depth to partially weathered rock and rock can vary drastically over relatively short distances. It would not be unusual to encounter rock or partially weathered rock between the test borings at elevations above those shown on the test boring records. The results of the soil test borings should be considered when developing a final grading plan for site.

For construction bidding and field verification purposes it is common to provide a verifiable definition of rock in the project specifications. The following are typical definitions of mass rock and trench rock:

- Mass Rock: Material which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rated at 56,000 pounds (Caterpillar D-8K or equivalent), and occupying an original volume of at least one cubic yard.

- Trench Rock: Material occupying an original volume of at least one-half cubic yard which cannot be excavated with a hydraulic excavator having a minimum flywheel power rating of 123 kW (165 hp); such as a Caterpillar 322CL, John Deere 230C LC, or a Komatsu PC220LC-7; equipped with a short tip radius bucket not wider than 42 inches.

The foregoing definitions are based on large equipment typically utilized for mass grading. Subsequent excavations for building foundations, retaining walls, and underground utilities are often performed with smaller equipment such as rubber-tired backhoe/loaders or even mini-excavators. Contractors will often request additional payment for mobilizing larger equipment than that which was anticipated during preparation of their construction bid. The amount of additional compensation, if any, and the minimum equipment size necessary to qualify for any additional compensation should be defined before the start of construction.

Blasting

In most cases rock excavation is performed by blasting. Standard blasting procedures include drilling through the materials to be blasted to introduce the explosives and covering up the area to be blasted to prevent flying debris. The area to be blasted is typically covered with several feet of soil or a blast mat. Alternatively, the existing soil overburden can be left in place, which in most cases will eliminate the need for a soil cover or a blast mat.

Blasting generates ground vibrations that can be detrimental to adjacent structures. Research by the United States Bureau of Mines and other organizations provides limits for safeguarding adjacent structures during blasting operations. A peak particle velocity of 2 inches per second is generally recognized as a conservative limit, and is the maximum peak particle velocity allowed by the Georgia Blasting Standards Act of 1978.

State and local laws require that precondition surveys of neighboring properties be performed prior to conducting blasting activities. Typical requirements are to conduct a precondition survey of structures and facilities within a 1,000-foot radius of the blast site. Vibration monitoring is also required in all four compass directions at the nearest structure not owned by the developer/owner. Some municipalities have variations of these requirements, and the local requirements should be reviewed prior to beginning blasting activities.

Reuse of Excavated Materials

Based on the results of the soil test borings, residual soils should be reusable as structural fill. Whether excavated fill materials can be reused will depend on the composition of the fill. Organic debris and other refuse may render the excavated materials unsuitable if the debris cannot be segregated. Additionally, organic material such as topsoil in excess of about 5 to 6 percent by weight will also make excavated materials unsuitable for reuse. Soft, unstable fill soils free of deleterious materials may be reusable after routine moisture adjustment. Routine adjustment of moisture content will be required to facilitate the reuse of excavated fill and residual soils.

It is important to establish as part of the construction contract whether soils having elevated moisture content will be considered suitable for reuse. We often find this issue to be a point of contention and a source of delays and change orders. From a technical standpoint, soils with moisture contents wet of optimum as determined by the standard Proctor test (ASTM D698) can be reused provided that the moisture is properly adjusted to within the workable range. From a practical standpoint, wet soils can be very difficult to dry in small or congested sites, and such difficulties should be considered during planning and budgeting. A clear understanding by the general contractor and grading subcontractor regarding the reuse of excavated soils will be important to avoid delays and unexpected cost overruns.

If generated during construction, excavated partially weathered rock materials will be suitable for reuse as structural fill only if they break down into a reasonably well-graded material that can be satisfactorily compacted. The presence of cobble size or boulder size material, which does not break down under the action of compaction equipment, will limit the suitability of partially weathered rock materials.

Engineering judgment will be required in the field to evaluate the acceptability of partially weathered rock materials for reuse as structural fill.

For planning purposes, any blast rock generated during construction should be considered unsuitable for reuse as structural fill.

Structural Fill

Materials selected for use as structural fill should be free of organic matter, waste construction debris, and other deleterious materials. In general, the material should not contain rocks having diameters over 4 inches. It is our opinion that the following soils represented by their USCS group symbols will typically be suitable for use as structural fill and are commonly found in abundance in the Piedmont region: (CL), (SM), and (ML). The following soil types are typically suitable but are not abundant in the Piedmont region: (SW), (SP), (SC), (SP-SM), and (SP-SC). The following soil types are considered unsuitable: (MH), (CH), (OL), (OH), and (Pt).

Laboratory Proctor compaction tests should be performed on representative samples of proposed fill materials to provide data necessary to determine acceptability and for quality control. Soils having a standard Proctor maximum dry density of less than 90 pcf should be considered unsuitable unless laboratory evaluations of their stress-strain characteristics indicate that they will perform acceptably. The moisture content of suitable borrow soils should generally be no more than 3 percentage points above or below their optimum moisture content at the time of compaction. Tighter moisture limits may be necessary with certain soils.

Suitable fill material should be placed in thin lifts. Lift thickness depends on the type of compaction equipment; but in general lifts of 8 inches loose measurement are recommended. The soil should be compacted by heavy compaction equipment such as a self-propelled sheepsfoot roller. If highly micaceous soils exist at finished subgrade elevation, a smooth-drum, steel-wheeled roller can often be used to compact loose surface soils. Within small excavations, such as those in utility trenches or around manholes, we recommend the use of “wacker packers” or “Rammax” compactors to achieve the specified compaction. Loose lift thicknesses of 4 to 6 inches are recommended in small area fills.

We recommend that structural fill be compacted to at least 95 percent of the standard Proctor maximum dry density (ASTM D698). The upper 12 inches of floor slab subgrade soils should be compacted to at least 98 percent of the standard Proctor maximum dry density (ASTM D698). Following Georgia DOT guidelines, the upper 12 inches of pavement subgrade soils should be compacted to at least 100 percent of the standard Proctor maximum dry density. Geo-Hydro should perform density tests during fill placement.

Earth Slopes

Temporary construction slopes should be designed in strict compliance with OSHA regulations. The exploratory borings indicate that within the likely excavation depths for this project, soil types A, B, and C as defined in 29 CFR 1926 Subpart P will be encountered. Temporary construction slope gradients will

vary from 1.5H:1V to ¾H:1V depending on the material forming the slope. Based on OSHA rules, temporary slope gradients for each material are as follows:

Material Classification	Maximum Slope Gradient for Excavations Less Than 20 Feet Deep
Type A – Partially Weathered Rock	¾H:1V
Type B – Residual Soil	1H:1V
Type C – Fill Materials, or Any Material Type Below the Groundwater Level	1.5H:1V

Excavations should be closely observed on a daily basis by the contractor's "competent person" for signs of mass movement: tension cracks near the crest, bulging at the toe of the slope, etc. The responsibility for excavation safety and stability of construction slopes should lie solely with the contractor.

We recommend that extreme caution be observed in trench excavations. Several cases of loss of life due to trench collapses in Georgia point out the lack of attention given to excavation safety on some projects. We recommend that applicable local and federal regulations regarding temporary slopes, and shoring and bracing of trench excavations be closely followed.

Formal analysis of slope stability was beyond the scope of work for this project. Based on our experience, permanent cut or fill slopes should be no steeper than 2H:1V to maintain long term stability and to provide ease of maintenance. The crest or toe of cut or fill slopes should be no closer than 10 feet to any foundation. The crest or toe should be no closer than 5 feet to the edge of any pavements. Erosion protection of slopes during construction and during establishment of vegetation should be considered an essential part of construction.

Earth Pressure (Cast-in-Place Structures)

Three earth pressure conditions are generally considered for retaining wall design: "at rest", "active", and "passive" stress conditions. Retaining walls which are rigidly restrained at the top and will be essentially unable to rotate under the action of earth pressure (such as basement walls or loading dock walls) should be designed for "at rest" conditions. Retaining walls which can move outward at the top as much as 0.5 percent of the wall height (such as free-standing walls) may be designed for "active" conditions. For the evaluation of the resistance of soil to lateral loads the "passive" earth pressure must be calculated. It should be noted that full development of passive pressure requires deflections toward the soil mass on the order of 1.0 percent to 4.0 percent of total wall height.

Earth pressure may be evaluated using the following equation:

$$p_h = K\,(D_w Z + q_s) + W_w(Z-d)$$

where: p_h = horizontal earth pressure at any depth below the ground surface (Z)
W_w = unit weight of water
Z = depth to any point below the ground surface
d = depth to groundwater surface

D_w = wet unit weight of the soil backfill (depending on borrow sources). The wet unit weight of most residual soils may be expected to range from approximately 115 to 125 pcf. Below the groundwater level, D_w must be the buoyant weight.

q_s = uniform surcharge load (add equivalent uniform surcharge to account for construction equipment loads)

K = earth pressure coefficient as follows:

Earth Pressure Condition	Coefficient
At Rest (K_o)	0.53
Active (K_a)	0.36
Passive (K_p)	2.8

The groundwater term, $W_w(Z-d)$, should be used if no drainage system is incorporated behind retaining walls. If a drainage system is included which will not allow the development of any water pressure behind the wall, then the groundwater term may be omitted. The development of excessive water pressure is a common cause of retaining wall failures. Drainage systems should be carefully designed to ensure that long term permanent drainage is accomplished.

The above design recommendations are based on the following assumptions:

- Horizontal backfill
- 95 percent standard Proctor compactive effort on backfill (ASTM D698)
- No safety factor is included

For convenience, equivalent fluid densities are frequently used for the calculation of lateral earth pressures. For "at rest" stress conditions, an equivalent fluid density of 66 pcf may be used. For the "active" state of stress an equivalent fluid density of 45 pcf may be used. These equivalent fluid densities are based on the assumptions that drainage behind the retaining wall will allow *no* development of hydrostatic pressure; that native sandy silts or silty sands will be used as backfill; that the backfill soils will be compacted to at least 95 percent of standard Proctor maximum dry density; that backfill will be horizontal; and that no surcharge loads will be applied.

For analysis of sliding resistance of the base of a cast-in-place concrete retaining wall, the coefficient of friction may be taken as 0.4 for the soils at the project site. This is an ultimate value, and an adequate factor of safety should be used in design. Customarily, retaining wall design includes a factor of safety which affects the global design. Using that design approach, it is not necessary to reduce the coefficient of friction as a design input. Such a reduction, coupled with the global factor of safety applied to the wall design, would place an unreasonable reduction in the calculation of the frictional resistance. The force that resists base sliding is calculated by multiplying the normal force on the base by the coefficient of friction. Full development of the frictional force could require deflection of the base of roughly 0.1 to 0.3 inches.

Foundation Design - City Hall Building - Conventional Shallow Foundations

After general site preparation and site grading have been completed in accordance with the recommendations of this report, it is our opinion that the proposed city hall building can be supported using conventional shallow foundations. We recommend that footings be designed for an allowable soil bearing pressure of 3,000 psf. This allowable bearing pressure is contingent upon column loads not exceeding 450 kips and wall loads not exceeding 14 kips per lineal foot.

In addition, we recommend a minimum width of 24 inches for column footings and 18 inches for continuous wall footings to prevent general bearing capacity failure. Footings should bear at a minimum depth of 18 inches below the prevailing exterior ground surface elevation to avoid potential problems due to frost heave.

The recommended allowable soil bearing pressure is based on an estimated maximum total foundation settlement no greater than approximately 1 inch, with anticipated differential settlement between adjacent columns not exceeding about ½ inch. If the architect or structural engineer determine that the estimated total or differential settlement cannot be accommodated by the proposed structure, please contact us.

The city hall building foundations will be supported on a combination of residual soils, variable partially weathered rock, and possibly mass bedrock. These variable materials and conditions will create the potential for contrasting differential settlement and could result in visible gaps at construction joints or cracking of the building veneer. The building foundations supported by rock or partially weathered rock will experience very little settlement while the footings supported on residual soils will settle as all conventional shallow foundation will normally settle. To reduce the differential settlement between footings, we recommend planning for the installation of a 1-foot thick “cushion” in foundations excavated into partially weathered rock or mass rock. We recommend using GDOT compliant graded aggregate base (GAB) as the cushion materials. GAB should be compacted to at least 95 percent of the modified Proctor maximum dry density (ASTM D1557).

Foundation bearing surface evaluations should be performed in all footing excavations prior to placement of reinforcing steel. Geo-Hydro should perform these evaluations to confirm that the design allowable soil bearing pressure is available. Foundation bearing surface evaluations should be performed using a combination of visual observation, hand augering, and portable dynamic cone penetrometer testing (ASTM STP-399).

Because of natural variation, it is possible that some of the soils at the project site may have an allowable bearing pressure less than the recommended design value. Likewise, existing fill materials can be highly variable, and may have an allowable bearing pressure less than the recommended design value. Therefore, foundation bearing surface evaluations will be critical to aid in the identification and remediation of these situations.

Remedial measures should be based on actual field conditions. However, in most cases we expect the use of the stone replacement technique to be the primary remedial measure. Stone replacement involves the removal of soft or loose soils, and replacement with well-compacted graded aggregate base (GAB) meeting

GDOT specifications for gradation. Stone replacement is generally performed to depths ranging from a few inches to as much as 2 times the footing width, depending on the actual conditions. For budgetary purposes, we suggest considering that as much as 20 percent of the foundation excavations will require overexcavation and stone replacement extending to a depth of 3 feet below bearing elevation. GAB should be compacted to at least 95 percent of the modified Proctor maximum dry density (ASTM D1557). The actual quantity of stone replacement will be different and may exceed the provided estimate.

Foundation Design - Parking Deck - Combination of Aggregate Piers and Conventional Shallow Foundations

It is our opinion that two different foundation support modes will be required for the parking deck. The subsurface materials below the foundations across the parking deck footprint will be a combination of residual soils, variable partially weathered rock, and possibly mass bedrock. Based on the results of the test borings and a maximum column load of 821 kips, it is our opinion that conventional shallow foundations alone cannot be used to support the parking deck without great risk of excessive total and differential foundation settlement. The planned parking deck can be supported using a combination of conventional shallow foundations bearing on rock or weathered rock, and conventional shallow foundations bearing on a subsurface profile improved by aggregate piers.

Shallow Foundations on Rock or Weathered Rock

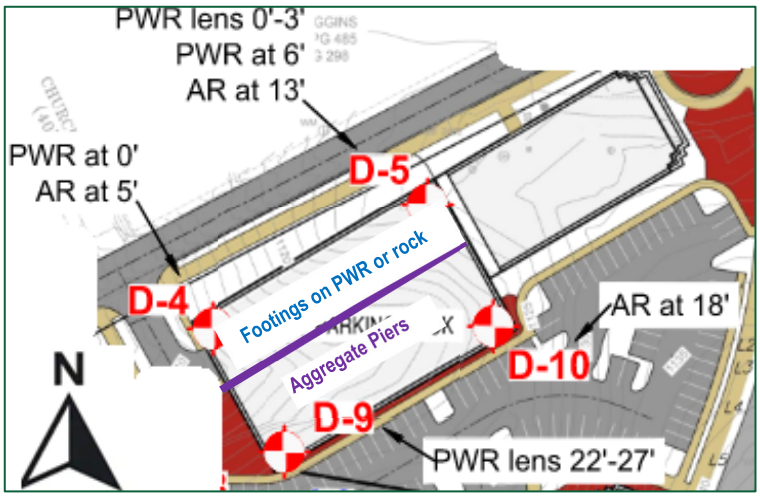
The soil test borings indicate that part of the proposed parking deck can be supported on conventional shallow foundations bearing on weathered rock or rock. Shallow foundations can be designed using an allowable bearing pressure of 5,000 psf. This allowable bearing pressure relies on the fact that mass rock or continuous weathered rock for part of the building footprint will be encountered above the lower level finished floor elevation. However, dissimilar bearing materials at planned foundation bearing elevation may be encountered which will require overexcavation and replacement with concrete.

The recommended allowable bearing pressure is based on an estimated maximum total foundation settlement no greater than 1 inch, with anticipated differential settlement between adjacent columns not exceeding about ½ inch.

Foundation bearing surface evaluations should be performed in all footing excavations prior to placement of reinforcing steel. These evaluations should be performed by Geo-Hydro to confirm that the design allowable bearing pressure is available and that the materials at bearing elevation conform with the design assumptions (rock or weathered rock). Foundation bearing surface evaluations should be performed using a combination of visual observation, hand probing, and probe holes extending at least 8 feet below the foundation bearing surface elevation. The contractor must be prepared to assist in the evaluation of foundation excavations by advancing an 8-foot deep probe hole within each foundation excavation under Geo-Hydro's observation.

In certain areas of the site the foundation excavations will have to be extended below the planned foundation bearing elevation to reach suitable weathered rock or continuous rock. In such instances, the required overexcavation must be backfilled with concrete. A relatively low-strength concrete mix (1,500 psi) will be sufficient for this purpose.

We recommend performing a supplemental subsurface exploration consisting of additional soil test borings and pneumatic-percussive drilling (air-track drilling) advanced at staked foundation locations and load-bearing wall alignments to define the locations and areas where overexcavation and concrete replacement will be required. The supplemental exploration will also allow the development of more accurate cost estimates for foundation construction activities.



Shallow Foundations on Aggregate Piers

To allow the use of conventional shallow foundations and keep foundation settlement within acceptable limits, it will be necessary to install aggregate piers within areas of the site where the subsurface profile includes a greater thickness of soil and deeper rock and weathered rock. Our initial evaluation indicates that aggregate piers will be required in the southeastern portion of the building. The limits of the area where aggregate piers will be required should be identified once design is further developed and additional subsurface exploration is collected and evaluated as suggested on the previous section.

Aggregate piers are a ground modification technique used to improve the stress-strain characteristics of the materials within the foundation influence zone. This improvement allows an increase in the allowable soil bearing pressure and reductions in total foundation settlement, which should make the foundation settlement behavior compatible with the section of the building which will be supported on rock or weathered rock.

The installation of aggregate piers involves drilling cylindrical shafts within foundation footprints and compacting or vibrating crushed stone into the resulting open shafts. Currently, aggregate piers are proprietary systems that are procured on a design-build basis. GeoPier Foundation Company and Keller are the dominant aggregate pier specialty contractors in north Georgia, with Wurster Engineering and Construction and Berkel & Company recently entering the Georgia market for installation of aggregate piers.

An allowable bearing pressure of 5,000 psf should be attainable for foundations supported on a subsurface profile improved by aggregate piers and can be used for schematic design and budgeting purposes. However, the actual design bearing pressure will be determined by the specialty aggregate pier design-build contractor selected for the project and may be greater than 5,000 psf. The project structural engineer should work directly with the selected aggregate pier firm to ensure a suitable design for foundation support.

It will be the sole responsibility of the selected design-build specialty contractor to verify that the available subsurface information is suitable and sufficient to develop their aggregate pier design and that their design

will perform in accordance with their own calculations, predictions, and owner expectations. Although we understand the principles involved in the design of aggregate piers to control foundation settlement, Geo-Hydro cannot be responsible for the performance of a proprietary, design-build ground improvement system.

If the aggregate piers encounter shallow refusal, it will be necessary to excavate the overburden and expose the material causing auger refusal. If the shallow obstruction cannot be removed, or if the obstruction is encountered at a depth greater than can reasonably be excavated, the pier configuration will have to be redesigned to allow additional elements to be installed. It is possible that obstructions may be encountered that may not allow practical redesign.

Seismic Design

Based on the results of the test boring and following the calculation procedure in the 2018 International Building Code (Chapter 20, ASCE 7-16), the seismic *Site Class* for the site is *C*. The mapped and design spectral response accelerations are as follows S_S=0.192, S_1=0.086, S_{DS}=0.166, S_{D1}=0.086.

Based on the information obtained from the soil test borings, it is our opinion that the potential for liquefaction of the residual soils at the site due to earthquake activity is relatively low.

Floor Slab Subgrade Preparation

The soil subgrade in the area of concrete slab-on-grade support is often disturbed during foundation excavation, plumbing installation, and superstructure construction. We recommend that the floor slab subgrade be evaluated by Geo-Hydro immediately prior to beginning floor slab construction. If low consistency soils are encountered that cannot be adequately densified in place, such soils should be removed and replaced with well-compacted fill material placed in accordance with the *Structural Fill* section of this report or with well-compacted graded aggregate base (GAB).

Assuming that the top 12 inches of floor slab subgrade soils are compacted to at least 98 percent of the standard Proctor maximum dry density, we recommend that a modulus of subgrade reaction of 120 pci be used for design. This value is suitable only for light floor loads (no greater than 150 psf) and transient loads, and should not be used for designing thickened slab sections or floors supporting permanent or semi-permanent loads such as those from equipment and storage racks. For design of floor areas supporting permanent or semi-permanent loads from floor storage, storage racks, etc., we recommend using a modulus of subgrade reaction of 70 pci for design purposes.

Moisture Control for Concrete Slabs

To prevent water vapor transmission from adversely affecting the concrete slab-on-grade floor and to provide a stable surface for floor support, we recommend that slab-on-grade floors be underlain by a minimum 4 inches of #57 stone. The stone must be covered by a vapor retarder. We suggest polyethylene sheeting at least 10 mils thick as a minimum vapor retarder. A more robust vapor retarder may be used

depending on construction sequencing and the potential for damaging or tearing the plastic sheeting during construction.

For floor areas that will be subjected to relatively heavy wheel loads from vehicles, lift platforms, or other similar equipment, we recommend that slab-on-grade floors be underlain by a minimum 5-inch thickness of GDOT compliant graded aggregate base (GAB) compacted to at least 100 percent of the modified Proctor maximum dry density (ASTM D1557). The GAB must be covered by a vapor retarder as suggested above.

A crushed stone capillary break course will be required in enclosed or occupied areas of the lower parking deck level (storage closets, offices, etc.). As discussed above, slab-on-grade floors in enclosed or climate-controlled areas should be underlain by a minimum 4-inch thickness of open-graded stone. Use of #57 crushed stone meeting Georgia DOT specifications for gradation is suggested. To avoid piecemeal work, graded aggregate base similar to the required for concrete pavement may be used in moisture-sensitive areas of the lower parking deck level. Both #57 stone and GAB must be covered by a vapor retarder.

Flexible Pavement Design

Based on our experience with similar projects, assuming standard pavement design parameters, and contingent upon proper pavement subgrade preparation, we recommend the following pavement sections:

Entrance/Exit Driveways, Traffic Corridors, and Truck Traffic Areas

Material	Thickness (inches)
Asphaltic Concrete 9.5mm Superpave Type II	2
Asphaltic Concrete 19mm Superpave	2
Graded Aggregate Base (GAB) (Base Course)	8
Subgrade compacted to at least 100% standard Proctor maximum dry density (ASTM D698)	12

Automobile Parking and Automobile Traffic Only

Material	Thickness (inches)
Asphaltic Concrete 9.5mm Superpave Type II	2
Graded Aggregate Base (GAB) (Base Course)	6
Subgrade compacted to at least 100% standard Proctor maximum dry density (ASTM D698)	12

A concrete thickness of 7 inches is recommended for the approach and collection zone in front of any dumpster, in loading/unloading zones, and in any designated truck turn-around areas. Please refer to the *Concrete Pavement* section of this report for concrete pavement recommendations.

The top 12 inches of pavement subgrade soils should be compacted to at least 100 percent of the standard Proctor maximum dry density (ASTM D698). Scarification and moisture adjustment will likely be required to achieve the recommended subgrade compaction level. Allowances for pavement subgrade preparation should be considered for budgeting and scheduling.

GAB must be compacted to at least 100 percent of the modified Proctor maximum dry density (ASTM D1557).

All pavement construction should be performed in general accordance with Georgia DOT specifications. Proper subgrade compaction, adherence to Georgia DOT specifications, and compliance with project plans and specifications, will be critical to the performance of the constructed pavement.

Concrete Pavement

A rigid Portland cement concrete pavement may be considered. Although usually more costly, a Portland cement concrete pavement is typically more durable and requires less maintenance throughout the life cycle of the facility. Concrete thicknesses of 5 inches in automobile parking areas and 6 inches in driveways and truck traffic areas are recommended for this project. A concrete thickness of 7 inches is recommended for the approach and collection zone in front any dumpster, in loading/unloading zones, and in any designated truck turn-around areas. A 600-psi flexural strength concrete mix (approximately 4,500 psi compressive strength) with 4 to 6 percent air entrainment should be used. The concrete pavement should be underlain by no less than 5 inches of compacted graded aggregate base (GAB). GAB should be compacted to at least 100 percent of the modified Proctor maximum dry density (ASTM D1557). The top 12 inches of soil subgrade should be compacted to at least 100 percent of the standard Proctor maximum dry density (ASTM D698).

The concrete pavement may be designed as a "plain concrete pavement" with no reinforcing steel, or reinforcing steel may be used at joints. Construction joints and other design details should be in accordance with guidelines provided by the Portland Cement Association and the American Concrete Institute.

In general, all pavement construction should be in accordance with Georgia DOT specifications. Proper subgrade compaction, adherence to Georgia DOT specifications, and compliance with project plans and specifications will be critical to the performance of the constructed pavement.

Pavement Design Limitations

The pavement sections discussed above are based on our experience with similar type facilities. After traffic information has been developed, we recommend that you allow us to review the traffic data and revise our recommendations as necessary.

Pavement Materials Testing

To aid in verifying that the pavement system is installed in general accordance with the design considerations, the following materials testing services are recommended:

- Density testing of subgrade materials.
- Proofrolling of pavement subgrade materials immediately prior to placement of graded aggregate base (GAB). This proofrolling should be performed the same day GAB is installed.

- Density testing of GAB and verification of GAB thickness. In-place density should be verified using the sand cone method (ASTM D1556) or nuclear density gauge method (ASTM D6938).

- Coring of the pavement to verify thickness and density (asphalt pavement only).

- Preparation and testing of beams and cylinders for flexural and compressive strength testing (Portland cement concrete only). The total number of test specimens required will depend on the number of concrete placement events necessary to construct the pavement.

* * * * * * *

We appreciate the opportunity to serve as your geotechnical consultant for this project and are prepared to provide any additional services you may require. If you have any questions concerning this report or any of our services, please call us.

Sincerely,

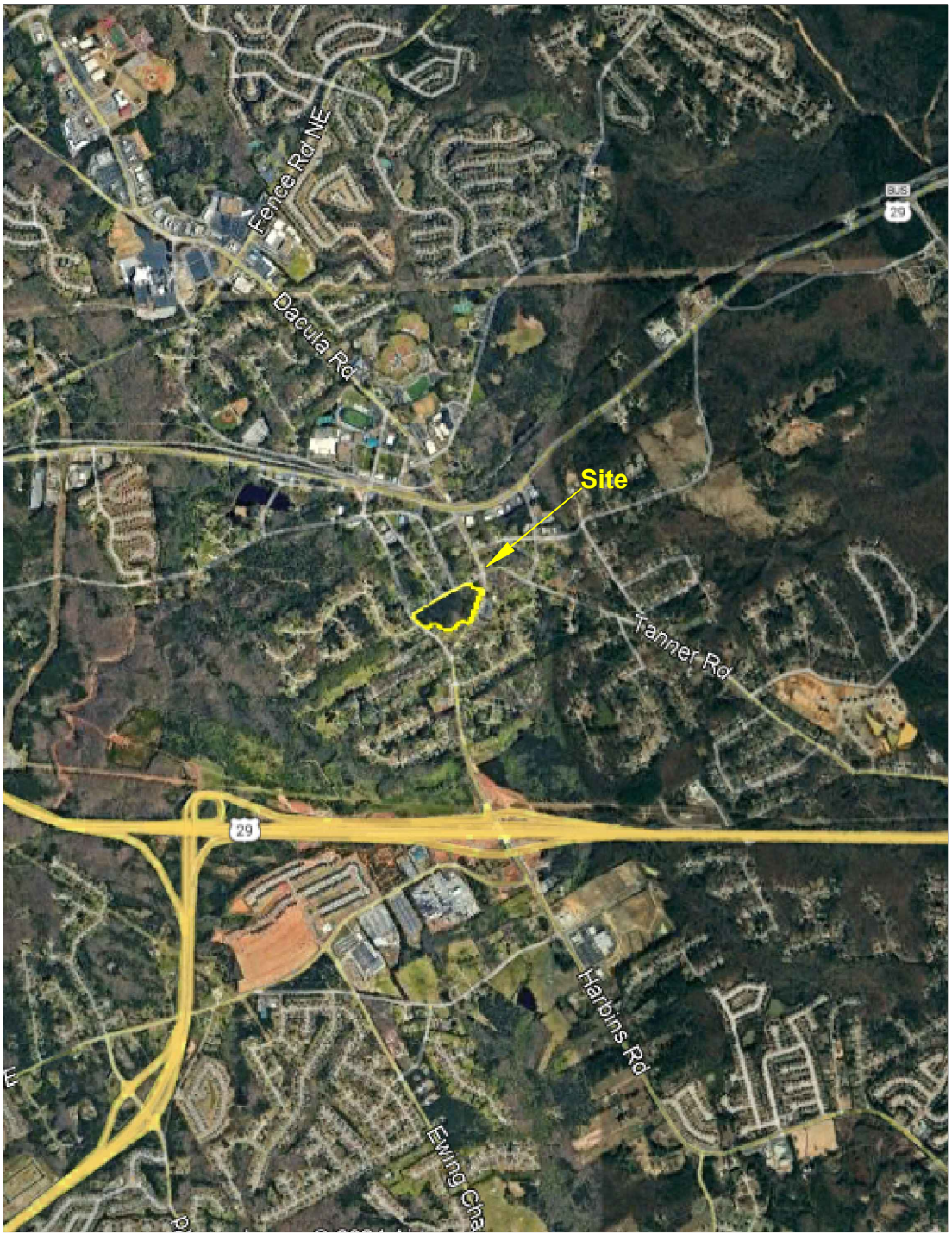
GEO-HYDRO ENGINEERS, INC.

Kaylin D. James, P.G.
Senior Project Geologist
kjames@geohydro.com

Luis E. Babler, P.E.
Chief Engineer
luis@geohydro.com

KDJ/LEB/241895.21 -Dacula Facilities Campus - Supplemental Exploration - Report leb2.docx

APPENDIX



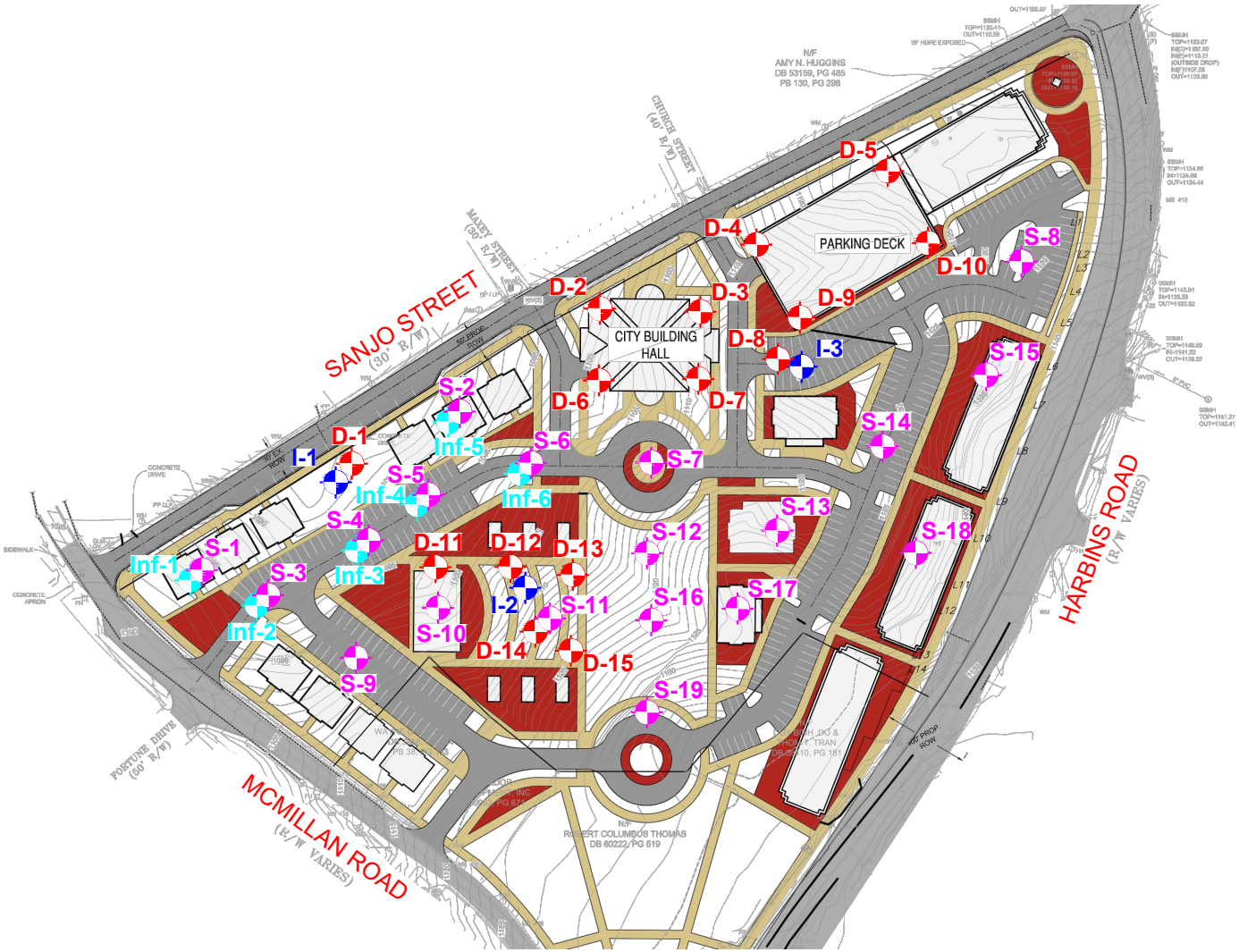
0 0.25 0.5 1 1.5

Approximate Scale, Miles

Figure 1: Site Location Plan

New Dacula Facilities Campus - Sanjo Road
Dacula, Georgia
Geo-Hydro Project Number 241895.21

GEO HYDRO ENGINEERS



0 100 200 400 600

Approximate Scale: 1"=200'

LEGEND:
- Soil Test Boring (July 2024)
- Infiltration Test (July 2024)
- Soil Test Boring (October 2024)
- Infiltration Test (October 2024)

Figure 2: Boring Location Plan

New Dacula Facilities Campus - Sanjo Road
Dacula, Georgia
Geo-Hydro Project Number 241895.21

Symbols and Nomenclature

Symbols

▌	Thin-walled tube (TWT) sample recovered
▯	Thin-walled tube (TWT) sample not recovered
●	Standard penetration resistance (ASTM D1586)
50/2”	Number of blows (50) to drive the split-spoon a number of inches (2)
65%	Percentage of rock core recovered
RQD	Rock quality designation - % of recovered core sample which is 4 or more inches long
GW	Groundwater
	Water level at least 24 hours after drilling
	Water level one hour or less after drilling
ALLUV	Alluvium
TOP	Topsoil
PM	Pavement Materials
CONC	Concrete
FILL	Fill Material
RES	Residual Soil
PWR	Partially Weathered Rock
SPT	Standard Penetration Testing

Penetration Resistance Results	Number of Blows, N	Approximate Relative Density
Sands	0-4	very loose
	5-10	loose
	11-20	firm
	21-30	very firm
	31-50	dense
	Over 50	very dense

	Number of Blows, N	Approximate Consistency
Silts and	0-1	very soft
Clays	2-4	soft
	5-8	firm
	9-15	stiff
	16-30	very stiff
	31-50	hard
	Over 50	very hard

Drilling Procedures

Soil sampling and standard penetration testing performed in accordance with ASTM D 1586. The standard penetration resistance is the number of blows of a 140-pound hammer falling 30 inches to drive a 2-inch O.D., 1.4-inch I.D. split-spoon sampler one foot. Rock coring is performed in accordance with ASTM D 2113. Thin-walled tube sampling is performed in accordance with ASTM D 1587.

GEO HYDRO ENGINEERS

S-1

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1097**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1095	0			Topsoil (Approximately 2 inches)	
				Very firm red slightly micaceous clayey fine sand (SC) (FILL)	24
	5				29
1090				Loose to firm red-brown and pink micaceous silty fine to medium sand (SM) with rock fragments (RESIDUUM)	13
	10				14
1085					
	15				6
1080					
	20				11
1075				Partially weathered rock sampled as brown and pink micaceous silty fine to medium sand (SM)	
	25			Boring Terminated at 25 feet	50/3"
1070					
	30				
1065					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-2

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **25 feet**	G.S. Elev: **1092**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1090	0			Topsoil (Approximately 2 inches)	
				Loose brown clayey fine sand (SC) with rock fragments and organics (FILL)	9
	5				10
1085				Firm red clayey fine sand (SC) with rock fragments (RESIDUUM)	15
				Loose tan-brown and purple slightly micaceous silty fine sand (SM)	10
1080	10				
					8
1075	15				
					8
1070	20				
				Very firm tan micaceous silty fine sand (SM)	
	25	▽		Boring Terminated at 25 feet	23
1065					
	30				
1060					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-3

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1094**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1094	0			Topsoil (Approximately 2 inches)	
				Firm to very firm red-brown slightly micaceous clayey fine sand (SC) with rock fragments and organics (FILL)	24
1090	5				20
				Loose to firm brown slightly micaceous silty fine to medium sand (SM) (RESIDUUM)	11
1085	10				10
1080	15				7
1075	20			Boring Terminated at 20 feet	10
1070	25				
1065	30				
1060	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-4

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **25 feet**	G.S. Elev: **1092**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	Description	N
1090	0	Topsoil (Approximately 2 inches)	
		Firm brown clayey fine to coarse sand (SC) with trace organics (FILL)	19
	5		20
1085		Very firm red clayey fine sand (SC) with rock fragments (RESIDUUM)	24
		Firm red slightly micaceous silty fine sand (SM)	
	10		15
1080		Very loose to loose purple, brown, and black micaceous silty fine sand (SM)	
	15		10
1075			
	20		4
1070			
	25	▽	4
1065			
	30	Boring Terminated at 30 feet	5
1060			
	35		

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-5

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1093**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1093	0			Topsoil (Approximately 2 inches)	
				Firm red-brown clayey fine to coarse sand (SC) with trace organics (FILL)	17
1090	5				20
				Loose to firm red and tan micaceous silty fine sand (SM) (RESIDUUM)	13
1085					
	10				12
1080					
	15				7
1075				Dense red-brown and black slightly micaceous silty fine sand (SM)	
	20			Boring Terminated at 20 feet	32
1070					
	25				
1065					
	30				
1060					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-6

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1100**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
				Topsoil (Approximately 2 inches)	
				Firm red clayey fine to coarse sand (SC) with rock fragments (RESIDUUM)	20
1095	5			Dense red, gray, and tan silty fine to coarse sand (SM) with rock fragments	33
					50
1090	10			Partially weathered rock sampled as tan slightly micaceous silty fine to coarse sand (SM)	50/3"
1085	15				50/2"
1080	20			Boring Terminated at 20 feet	50/2"
1075	25				
1070	30				
1065	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-7

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1111**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1110	0			Topsoil (Approximately 2 inches)	
				Firm brown silty fine to coarse sand (SM) with trace organics (FILL)	18
	5				19
1105				Firm to very firm purple and brown slightly micaceous silty fine sand (SM) (RESIDUUM)	21
	10				19
1100				Loose purple and brown micaceous silty fine sand (SM)	
	15				9
1095				Partially weathered rock sampled as brown slightly micaceous silty fine to medium sand (SM)	
	20			Boring Terminated at 20 feet	50/1"
1090					
	25				
1085					
	30				
1080					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-8

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1133**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1133	0			Topsoil (Approximately 1 inch)	
				Firm to very firm red, purple, and brown slightly micaceous silty fine to coarse sand (SM) (RESIDUUM)	20
1130	5				19
					18
1125					
	10				23
1120					
	15				15
1115					
	20				17
				Boring Terminated at 20 feet	
1110					
	25				
1105					
	30				
1100					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-9

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1101**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1100	0			Topsoil (Approximately 2 inches)	
				Firm red-brown clayey fine sand (SC) with trace organics (FILL)	15
	5				17
1095				Loose to firm purple and brown micaceous silty fine to medium sand (SM) (RESIDUUM)	11
	10				9
1090					
	15				6
1085					
	20			Boring Terminated at 20 feet	10
1080					
	25				
1075					
	30				
1070					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-10

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1100**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
				Topsoil (Approximately 2 inches)	
				Very firm red-brown and white clayey fine to coarse sand (SC) with rock fragments (FILL)	27
1095	5				21
				Loose to firm red, purple, and brown micaceous silty fine to medium sand (SM) (RESIDUUM)	11
1090	10				12
1085	15				9
1080	20			Boring Terminated at 20 feet	8
1075	25				
1070	30				
1065	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-11

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1113**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1113	0			Topsoil (Approximately 2 inches)	
				Firm to very firm red-brown slightly micaceous clayey fine sand (SC) with trace organics (FILL)	21
1110	5				12
				Loose to firm red, purple, and brown slightly micaceous silty fine to coarse sand (SM) (RESIDUUM)	10
1105	10				13
1100	15				7
1095	20			Boring Terminated at 20 feet	18
1090	25				
1085	30				
1080	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-12

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1119**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N	Standard Penetration Test (Blows/Foot) 0 10 20 30 40 50 60 70 80 90 100
1119	0			Topsoil (Approximately 2 inches)		
				Partially weathered rock sampled as red-brown silty fine sand (SM) (RESIDUUM)	50/0"	
1115	5				50/1"	
				Auger Refusal at 6 feet		
1110	10					
1105	15					
1100	20					
1095	25					
1090	30					
1085	35					

Remarks:

S-13

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1124**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1120	0			Topsoil (Approximately 2 inches)	
				Partially weathered rock sampled as red and tan silty fine to medium sand (SM) (RESIDUUM)	50/0"
	5				50/1"
				Firm red and tan silty fine to medium sand (SM)	15
1115				Partially weathered rock sampled as red and tan silty fine to medium sand (SM)	
	10				50/3"
1110					
	15				50/1"
				Auger Refusal at 16 feet	
1105	20				
1100	25				
1095	30				
1090	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-14

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1125**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
				Topsoil (Approximately 2 inches)	
				Firm to very firm purple, tan, and orange slightly micaceous silty fine sand (SM) (RESIDUUM)	12
1120	5				13
					20
1115	10				22
				Very firm to dense purple, tan, and orange slightly micaceous silty fine sand (SM)	
1110	15				32
1105	20			Boring Terminated at 20 feet	23
1100	25				
1095	30				
1090	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-15

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1133**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1133	0			Topsoil (Approximately 2 inches)	
				Firm red-brown clayey fine sand (SC) (FILL)	15
1130	5				14
				Firm to very firm purple, tan, and red slightly micaceous silty fine sand (SM) (RESIDUUM)	18
1125	10				24
1120	15				21
1115	20				12
1110	25			Partially weathered rock sampled as purple, tan, and red slightly micaceous silty fine sand (SM)	50/0"
				Boring Terminated at 25 feet	
1105	30				
1100	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-16

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1122**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1122	0			Topsoil (Approximately 2 inches)	
				Firm orange and tan silty fine sand (SM) (RESIDUUM)	13
1120	2				
	5				18
1117	5			Partially weathered rock sampled as orange and tan silty fine sand (SM)	
1115	7				50/0"
	10				50/1"
1110	12			Auger Refusal at 12 feet	
1105	17				
1100	22				
1095	27				
1090	32				
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-17

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1129**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
				Topsoil (Approximately 2 inches)	
				Brown silty fine sand (SM) with trace organics (FILL)	50/1"**
1125	5			Partially weathered rock sampled as tan and orange silty fine sand (SM) (RESIDUUM)	50/3"
					50/0"
1120	10				50/0"
				Loose tan and orange slightly micaceous silty fine sand (SM)	
1115	15				10
				Very firm tan and orange slightly micaceous silty fine sand (SM)	
1110	20				22
				Partially weathered rock sampled as tan-brown silty fine to medium sand (SM)	
1105	25			Boring Terminated at 25 feet	50/1"
1100	30				
1095	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks: Standard penetration test resistance not representative due to rock fragments in the fill.

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-18

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1132**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	Description	N
1132	0	Topsoil (Approximately 2 inches)	
		Firm red-brown clayey fine sand (SC) (FILL)	16
1130			
	5		15
1127		Very firm orange and tan micaceous silty fine sand (SM) (RESIDUUM)	
1125			22
		Loose to firm purple, tan, and red micaceous silty fine sand (SM)	
	10		18
1120			
	15		11
1115			
	20		10
1110			
1107		Very firm purple, tan, and red micaceous silty fine sand (SM)	
	25		21
		Boring Terminated at 25 feet	
1105			
	30		
1100			
	35		

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

GWT

Symbol

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

S-19

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus - Supplemental**		Project No: **241895.21**
Location: **Sanjo Road, Dacula, Georgia**		Date: **10/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1133**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **BGS**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1133	0			Topsoil (Approximately 2 inches)	
				Very firm orange and tan silty fine sand (SM) (RESIDUUM)	22
1130				Partially weathered rock sampled as orange and tan silty fine sand (SM)	
	5				50/1"
				Very dense purple, tan, and gray silty fine sand (SM)	
1125					56
	10				76
1120				Auger Refusal at 12 feet	
	15				
1115					
	20				
1110					
	25				
1105					
	30				
1100					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS NEW.GPJ GEO HYDRO.GDT 11/5/24

July 2024 Soil Test Borings

GEO HYDRO ENGINEERS

D-1

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1087**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1087	0			Topsoil (Approximately 2 inches)	
1085	2			Firm to very firm red-brown slightly micaceous silty fine sand (SM) with rock fragments (RESIDUUM)	21
	5				21
1080					17
	10			Boring Terminated at 10 feet	18
1075					
	15				
1070					
	20				
1065					
	25				
1060					
	30				
1055					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-2

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **25 feet**	G.S. Elev: **1099**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1095	5			Topsoil (Approximately 2 inches) Firm to very firm red-brown slightly micaceous silty fine to medium sand (SM) with rock fragments (RESIDUUM)	30 19 16
1090	10				11
1085	15			Loose red-brown and black micaceous silty fine to medium sand (SM)	10
1080	20				9
1075	25	▽			7
1070	30			Partially weathered rock sampled as tan silty fine sand (SM) Boring Terminated at 30 feet	50/2"
1065	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-3

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1110**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	Description	N
		Topsoil (Approximately 2 inches)	
		Very stiff red-brown slightly micaceous fine to medium sandy silt (ML) (RESIDUUM)	25
1105	5		27
		Partially weathered rock sampled as red-brown slightly micaceous fine to medium sandy silt (ML)	50/1"
		Firm to very firm brown and purple slightly micaceous silty fine to medium sand (SM)	
1100	10		24
1095	15		18
		Partially weathered rock sampled as purple and tan slightly micaceous silty fine to medium sand (SM)	
1090	20		50/3"
		Dense purple, tan, and white slightly micaceous silty fine to medium sand (SM)	
1085	25		33
		Auger Refusal at 27 feet	
1080	30		
1075	35		

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-4

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1114**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1110	5			Topsoil (Approximately 2 inches) Partially weathered rock sampled as brown silty fine to medium sand (SM) (RESIDUUM) No Sample Recovered at 5 feet	50/4"
				Initial Auger Refusal at 3 feet Offset 5 feet southeast Auger Refusal at 5 feet	50/2"
1105	10				
1100	15				
1095	20				
1090	25				
1085	30				
1080	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-5

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1125**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
				Topsoil (Approximately 2 inches)	
				Partially weathered rock sampled as red-brown slightly micaceous silty fine to coarse sand (SM) (RESIDUUM)	50/4"
1120	5			Very firm purple and tan slightly micaceous silty fine to coarse sand (SM)	26
				Partially weathered rock sampled as purple and tan slightly micaceous silty fine to coarse sand (SM)	50/3"
1115	10				50/2"
				Initial Auger Refusal at 11 feet	
1110	15			Offset 5 feet southeast	
				Auger Refusal at 13 feet	
1105	20				
1100	25				
1095	30				
1090	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-6

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1101**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1100	0			Topsoil (Approximately 2 inches)	
				Very firm to dense red-brown silty fine to coarse sand (SM) (RESIDUUM)	24
1095	5				31
					22
				Firm to very firm red-brown slightly micaceous silty fine to medium sand (SM)	
1090	10				18
1085	15				24
				Partially weathered rock sampled as tan silty fine sand (SM)	
1080	20				50/3"
				Auger Refusal at 23 feet	
1075	25				
1070	30				
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-7

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1112**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1110	0			Topsoil (Approximately 2 inches)	
				Partially weathered rock sampled as purple-tan silty fine to coarse sand (SM) (RESIDUUM)	50/1"
	5			No Sample Recovered at 7 1/2 feet	50/5"
1105					50/0"
				Very stiff pink-purple fine sandy silt (ML)	
	10				27
1100				Partially weathered rock sampled as purple-tan slightly micaceous silty fine sand (SM)	
	15				50/4"
1095				Initial Auger Refusal at 5 feet	
				Offset 10 feet south	
	20			Auger Refusal at 17 feet	
1090					
	25				
1085					
	30				
1080					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-8

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1122**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1122	0			Topsoil (Approximately 2 inches)	
				Very stiff purple-tan fine to coarse sandy silt (ML) (RESIDUUM)	16
1120					
	5				18
1115					14
				Firm purple-tan slightly micaceous silty fine to medium sand (SM)	
	10			Boring Terminated at 10 feet	14
1110					
	15				
1105					
	20				
1100					
	25				
1095					
	30				
1090					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-9

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1120**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
				Topsoil (Approximately 2 inches)	
				Loose red-purple slightly micaceous silty fine to coarse sand (SM) (RESIDUUM)	7
1115	5			Firm to very firm red-purple and tan slightly micaceous silty fine to coarse sand (SM) with rock fragments	21
					16
1110	10				19
1105	15				18
1100	20				14
				Partially weathered rock sampled as black and tan micaceous silty fine to medium sand (SM)	
1095	25				50/4"
				Very firm tan, purple and black micaceous silty fine to medium sand (SM)	
1090	30			Boring Terminated at 30 feet	26
1085	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-10

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/23/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1123**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N	Standard Penetration Test (Blows/Foot)
1120	0			Topsoil (Approximately 2 inches)		
				Firm to very firm red-purple micaceous silty fine to medium sand (SM) (RESIDUUM)	22	
	5				21	
1115					19	
	10				19	
1110						
	15				21	
1105				Auger Refusal at 18 feet		
	20					
1100						
	25					
1095						
	30					
1090						
	35					

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-11

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1098**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1098	0			Topsoil (Approximately 2 inches)	
				Dense red-brown slightly micaceous silty fine to medium sand (SM) (RESIDUUM)	33
1095	3			Partially weathered rock sampled as red-brown silty fine to coarse sand (SM) with rock fragments	50/4"
	5			Firm brown silty fine to coarse sand (SM) with rock fragments	18
1090	8			Firm red-purple slightly micaceous silty fine to medium sand (SM)	14
	10			Boring Terminated at 10 feet	
1085	13				
	15				
1080	18				
	20				
1075	23				
	25				
1070	28				
	30				
1065	33				
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-12

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1105**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1105	0			Topsoil (Approximately 2 inches)	
				Very firm to dense red-brown slightly micaceous silty fine to medium sand (SM) (RESIDUUM)	31
1100	5				22
					25
				Firm red-brown micaceous silty fine to medium sand (SM)	
1095	10			Boring Terminated at 10 feet	14
1090	15				
1085	20				
1080	25				
1075	30				
1070	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-13

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1112**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1112	0			Topsoil (Approximately 2 inches)	
				Firm to very firm red-brown silty fine to coarse sand (SM) (RESIDUUM)	30
1110					
	5				28
1105					12
	10			Boring Terminated at 10 feet	11
1100					
	15				
1095					
	20				
1090					
	25				
1085					
	30				
1080					
	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-14

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1113**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1113	0			Topsoil (Approximately 2 inches)	
				Firm to very firm red-brown slightly micaceous silty fine to medium sand (SM) (RESIDUUM)	22
1110	5				19
				Loose to firm red-brown slightly micaceous silty fine to medium sand (SM)	10
1105	10			Boring Terminated at 10 feet	13
1100	15				
1095	20				
1090	25				
1085	30				
1080	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

D-15

Test Boring Record

GEO HYDRO ENGINEERS

Project: **New Dacula Facilities Campus**		Project No: **241895.20**
Location: **Sanjo Road, Dacula, Georgia**		Date: **7/24/24**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **1119**
Driller: **FD (Auto-Hammer)**	GWT at 24 hrs: **N/A: Boring Backfilled**	Logged By: **KK**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
1119	0			Topsoil (Approximately 2 inches)	
				Red-brown silty fine to coarse sand (SM) with organics and rock fragments (FILL) **	50/4"
1115	5				50/2"
				Initial Auger Refusal at 5 feet	
				Offset 5 feet north	
1110	10			Auger Refusal at 5 feet	
1105	15				
1100	20				
1095	25				
1090	30				
1085	35				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks: **Standard penetration test resistances not considered representative due to rock fragments in the fill

TEST BORING RECORD LOGS.GPJ GEO HYDRO.GDT 8/8/24

SECTION 00220

SOIL INVESTIGATION DATA

1.0 GENERAL

1.1 SUBSURFACE INVESTIGATION:

A. Geotechnical Investigations of the project site subsurface conditions have been conducted by Geo-Hydro Engineers, entitled "Report of Subsurface Exploration and Geotechnical Engineering Evaluation (Project #241895.20 dated 08-08-2024)" and "Report of Supplemental Subsurface Exploration and Geotechnical Engineering Evaluation (Project #241895.21 dated 11-06-2024)".

The investigation and subsequent analysis are published in report form.

B. A copy of this report is included herewith for the review of the Contractor.

C. The information included in the report is made available for the convenience of the Contractor and is not to be construed as warranties of accuracy. The City and/or the City's Engineer are not responsible for interpretations or conclusions drawn by the Contractor from information concerning subsurface and seismic conditions.

END OF SECTION

SECTION 00310

BID PROPOSAL FORM

TO: CITY OF DACULA
P.O. Box 400
Dacula, Georgia 30019

Date:_____

Gentlemen:

Having carefully examined the Contract Documents, Forms, General Conditions, Drawings, and Project Manual, all entitled "Site Work for Administration Building Complex Project" for City of Dacula, Georgia, dated December 5, 2024, and Addendum (a) No. (s) _____, and having examined the site and conditions affecting the work, including availability of materials and labor, the undersigned hereby proposes to start construction within ten (10) days of Notice to Proceed and to furnish all materials, labor, tools, equipment, machinery, transportation, supervision, administration and services necessary and incidental to construct and substantially complete the work called for by them in accordance with said documents within the time set forth herein, as follows:

1. Base Bid; excluding item 2 below:

($_____Dollars)

2. Total Unit Price Allowances, Listed in Paragraph "A" Below:

($_____Dollars)

3. TOTAL BASE BID INCLUDING:
(Items 1 and 2 above):

($_____Dollars)

4. MAJOR SUBCONTRACTORS (Not to be changed by G.C. once submitted with Bid; however, can be noted on Bid envelope):

a. _____
b. _____
c. _____
d. _____
e. _____

The undersigned bidder must submit with this proposal Unit Price Allowances listed in Section A for quantities specified as part of the Base Bid. Unit Prices listed in Section B are amounts to be used for work that will be added to or deleted from the Contract by Change Order in the event that such additional work may be required. Unit Prices are complete for labor, equipment, material, the hauling-in of needed material and the hauling-off and disposal of excess and unsuitable material, installation, applicable taxes, overhead and profit and all other incidental costs. City reserves the right to accept or reject these unit prices or require the Work to be performed on a time and material basis with complete daily breakdowns and logs submitted. Applicable Unit Prices may be equitably adjusted by the Engineer if the quantities originally contemplated are so altered in a proposed Change Order that application of the agreed Unit Prices to the quantity of work proposed will cause substantial inequity to the City or the Contractor.

A. UNIT PRICE ALLOWANCES (ITEMS IN BASE BID):

Description	Unit Prices	Amount of Allowance
A. Mass Rock excavation and hauled off-site: (Allow 5000 cu. yd.)	$_____ per yd^3 =	$_____
B: Trench Rock excavation, rock hauled off site: (Allow 1500 cu. yd.)	$_____ per yd^3 =	$_____
C. Excavate material determined to be unsuitable by the City's Testing Agency and removed from site: (Allow 5,000 cu. yd.)	$_____ per yd^3 =	$_____
D. Bring in suitable soil from Off-site and compacted In-place to replace excavated Rock or unsuitable soil/material And/or to be used as structural fill: (Allow 5,000 cu. yd.)	$_____ per yd^3 =	$_____
E. Allow $55,000 to cover possible additional costs for asphalt paving (per square		

yard) at the originally scheduled date of installation. Compensation for asphalt paving at that time, based on the current Asphalt Cement Index, will be adjusted up or down accordingly.
Allowance = $ 55,000 $xxxx

F. Haul-in topsoil from off-site and spread on site:
(Allow 250 cu. yd.) $_____ per yd^3 = $_____

Total Allowances in Base Bid: $_____

B. UNIT PRICE ITEMS NOT IN BASE BID:

	Description	Unit Prices
1.	Dewatering trench consisting of 42"W x 12"D cross section lined with "Mirafi" filter fabric filled with #57 stone and 6" diameter perforated Schedule 40 PVC piping backfilled and compacted in accordance with Earthwork Specification Section:	$_____ per lf
2.	Furnish and install a woven geotextile fabric suitable for heavy-duty traffic over earth subgrade in conjunction with stone stabilization:	$_____ per yd^2
3.	Furnish and install stone stabilization base materials, including:	
	a. Graded Aggregate Base:	$ _____ per ton
	b. No. 57 Stone:	$ _____ per ton
	c. No. 4 Stone:	$ _____ per ton
	d. Surge Stone:	$ _____ per ton
4.	Furnish and install storm/sanitary sewer clean-out outside of pavement area:	$ _____ per vf
5.	Furnish and install storm/sanitary sewer clean-out within pavement area:	$ _____ per vf
6.	Furnish and install pipe materials, including:	
a.	3"ø class 50 ductile iron pipe:	$ _____ per lf
b.	4"ø class 50 ductile iron pipe:	$ _____ per lf
c.	6"ø class 50 ductile iron pipe:	$ _____ per lf
d.	8"ø class 50 ductile iron pipe:	$ _____ per lf
e.	6"ø Schedule 40 PVC pipe:	$ _____ per lf
f.	8"ø Schedule 40 PVC pipe:	$ _____ per lf
g.	10"ø Schedule 40 PVC pipe:	$ _____ per lf
h.	12"ø Schedule 40 PVC pipe:	$ _____ per lf

i.	18″ø CMP:	$ _____	per lf
j.	24″ø CMP:	$ _____	per lf
k.	30″ø CMP:	$ _____	per lf
l.	36″ø CMP:	$ _____	per lf
m.	18″ø RCP:	$ _____	per lf
n.	24″ø RCP:	$ _____	per lf
o.	30″ø RCP:	$ _____	per lf
p.	36″ø RCP:	$ _____	per lf
q.	2″ Type K copper pipe:	$ _____	per lf

* All pipe shall be Aluminized Steel Type II Pipe (AST-2) or RCP as illustrated on the Drawings. CMP shall only be used if approved by Owner and shall be fully asphalt coated or aluminized as per Section 02720. All RCP shall be Class IV. Cost shall include all appurtenances, including fittings, bands, wyes, etc. and all appurtenant details.

7. Furnish and Install:

a.	Pre-cast 48″ø concrete storm drainage structure:	$ _____	per vf
b.	Pre-cast 60″ø concrete storm drainage structure:	$ _____	per vf
c.	Pre-cast 96″ø concrete storm drainage structure:	$ _____	per vf
d.	48″ø brick storm drainage structure	$ _____	per vf
e.	Heavy-duty cast iron grate and frame:	$ _____	per set
f.	Pre-cast 48″ø sanitary sewer manhole per City of Dacula Public Utilities Standards:	$ _____	per vf
g.	Cast iron ring and cover as per City of Dacula Public Utilities Standards:	$ _____	per set

8. Furnish and Install GA DOT Type C Erosion Control Fencing: $ _____ per lf

9. Erosion control matting: $ _____ per yd^2

10. Furnish and Install:

a.	24″ curb & gutter:	$ _____	per lf
b.	4″ thick concrete walk:	$ _____	per sf
c.	8″ thick heavy-duty concrete paving:	$ _____	per sf

11. Demolish and Remove:
    a. 24" curb & gutter: $ _____ per lf
    b. 4" thick concrete walk: $ _____ per sf
    c. 8" thick heavy-duty concrete paving: $ _____ per sf
    d. Sawcut and remove asphalt pavement: $ _____ per sy

Unit Prices for additional money shall only be applicable for work required to be performed which is in addition to the original requirements of the Contract Documents based on the recommendations of the geotechnical testing agency relating to concealed/unsuitable materials to be excavated. If the Allowance quantities specified are not used, the Contractor shall provide a credit to the City for the unused amount at the Unit Prices stipulated on the contractor's bid form.

When questionable materials are encountered during excavation, the Contractor shall immediately notify the Engineer and the geotechnical testing agency. A field engineer of the testing agency shall witness the entire removal of the materials in question and shall verify the volume and structural capacity of the materials excavated. If the materials are determined to be unsuitable to be used as structural fill by the Testing agency, the contractor shall consult the Engineer. The Engineer shall then direct the Contractor to remove the materials from the site or redistribute the materials on the site in an area designated by the City. Sequencing of all events relating to work involving Unit Prices shall be coordinated by the Contractor.

Failure to comply with these requirements shall result in the Engineer making determinations as to fair and reasonable amounts due on such additional work.

Unsuitable materials shall be defined as:

1) Substances not capable of being compacted to the density specified.
2) Rock material as specified in Earthwork Section of these specifications.
3) Debris and organic materials.
4) Materials which are not suitable for use on this project.
5) Unsuitability for sale of materials to third parties is not included in this definition.

Soil material which is too wet to achieve the specified compaction but is still suitable to be used in structural capacity (once dried) based on the recommendations of the geotechnical testing agency, shall be spread and permitted to dry in an area designated by the Engineer. The Contractor shall assist drying by discing, harrowing or pulverizing until the soil moisture content is reduced to the specified value. Only excavation of soil, which is wet due to a concealed condition, including but not limited to, underground springs, high water table and leaking pipes, shall be addressed as a potential additive Change Order. Suitable soils which are wet due to precipitation as determined by the City's testing agency shall be dried as specified and reused at

no additional cost to the City. The undersigned bidder agrees to provide additional work, if added, or to delete specified work, if requested, at the Unit Prices stipulated unless such prices have been equitably adjusted by the Engineer as previously stated. The Unit Prices include cost of materials, delivery, charges for fees, layout, supervision (both field and home office), general expenses, taxes, insurance, labor burden, fringe benefits, and any other costs other than General Contractor profit and overhead.

A Notice to Proceed will be issued after the Pre-Construction Meeting as soon as all required paperwork such as Contracts, Bonds, Insurance, etc. are submitted and determined to be in order. The Contractor shall mobilize in ten (10) days of Notice to Proceed.

City reserves the right to waive any informalities and any technicalities, and to reject any or all bids. There will be a Mandatory Pre-Bid Meeting at Dacula City Hall, 442 Harbins Road, Dacula, GA 30019 at **2:30 PM** local time on **Tuesday, January 7th, 2025**. All bidders must attend this meeting in order to bid the project. City reserves the right to waive any informalities and any technicalities, and to reject any or all bids. All questions concerning this project shall be submitted in writing by email to Bowman (City's Representative – Kevin D. Whigham, P.E.) 4174 Silver Peak Parkway, Suwanee, Georgia 30024, phone number 770-932-6550,email kwhigham@bowman.com no later than **Thursday, January 9th, 2025, by 4:00 PM.**

Contractor shall visit site to observe, document, and measure all scope items for preparing his own Bid for the project.

Attention of Bidders is particularly called to the requirements regarding conditions of employment and minimum wage rates to be paid on this project, and that the contractor and subcontractor must comply with all Federal, State, and local requirements. Minority and female owned firms are encouraged to participate in this project. Procurement will be in compliance with the Uniform Administrative Requirements, 2 CFR 200.318-326. Potential respondents are particularly called to the requirements of Title VI; Civil Rights Act of 1964 and 24 CFR 570.602; and Executive Order 11246 - Equal Employment Opportunity and Affirmative Action.

** The **Base Bid** amount shall consist of Work Items more particularly described in Section 01010, Project Scope & Performance Specifications. The Contractor shall be responsible for all labor, equipment, materials, operations, details, insurance, supervision, coordination, administration, overhead and profit, plus all necessary incidental costs associated with the complete function of the Work Scope in context of the project. The low bidder shall be determined as the contractor with the lowest Base Bid Amount plus any allowances.

Notice to Proceed will be issued during the Pre-Construction Meeting. All required paperwork such as Performance and Payment bonds for 100% of the Contract amount which will be submitted to the City along with a Schedule of Values (Unit Prices), Certificate of Insurance, Contractor's Security and Immigration Affidavit, a list of Subcontractors to be used on the

project and Subcontractor's Security and Immigration Affidavits shall be provided to the City at City Hall located on Harbins Road, in Dacula, Georgia before construction begins.

The Contractor will have *Nine Months (270) consecutive calendar days* from the "Notice to Proceed" to finish and complete the project. The City of Dacula will charge the Contractor Five-Hundred Dollars and no cents ($500.00) per day for liquidated damages for every day past the completion of the Contract.

The undersigned agrees that this proposal may not be revoked or withdrawn after the time set for the opening of bids but shall remain open for acceptance for a period of 60 days following such time. The undersigned, upon receipt of written notice of the acceptance of this bid, agrees to execute within ten (10) days a Contract for the work for the above stated compensation, and to furnish and deliver to City at the same time as the Contract, the required Performance Bonds, and a Labor and Materials Payment Bond, for General Contractor in amount to equal 100% of the Contract Sum. These bonds shall be written on forms provided by a company acceptable to the City and licensed to do business in the State of Georgia at the time the bonds are written, and that is listed on "Department of the Treasury Circular 570."

If this proposal is accepted within 60 days after the date set for the opening of bids and the undersigned fails to execute the Contract within ten (10) days after written notice of such acceptance or if he fails to furnish the Performance Bonds and the Labor and Material Payment Bond, the obligation of the Bid Bond will remain in full force and effect and the money payable thereon shall be paid into the funds of the City as liquidated damages for such failure; otherwise, said Bid Bond shall be returned to the undersigned upon completion of such obligations.

The undersigned has checked carefully all the foregoing figures and understands that the City will not be responsible for any errors or omissions on the part of the undersigned in making this bid. The undersigned also acknowledges receipt of the following Addenda, listed by number and date as issued appearing on each:

Addendum No.	Date
_____	_____
_____	_____

IN COMPLIANCE WITH THE ATTACHED CONTRACT DOCUMENTS AND SPECIFICATIONS, THE UNDERSIGNED OFFERS AND AGREES, IF THIS BID IS ACCEPTED BY THE CITY OF DACULA, GA WITHIN SIXTY (60) DAYS OF THE DATE OF BID OPENING, TO FURNISH ANY OR ALL OF THE ITEMS UPON WHICH PRICES ARE QUOTED, AT THE PRICE SET OPPOSITE EACH ITEM, DELIVERED TO THE DESIGNATED POINT(S) WITHIN THE TIME SPECIFIED IN THE BID SCHEDULE. THE SUCCESSFUL CONTRACTOR SHALL PROVIDE A SCHEDULE OF VALUES WITH UNIT PRICES FOR A BREAKDOWN OF THEIR LUMP SUM BID.

Respectfully submitted,

Signature of an Individual _____

Doing Business as: _____

Business Address: _____

If a Partnership:

By: _____ Member of Firm

_____ Member of Firm

Business Address:

_____

_____

_____

If a Corporation:

By: _____ Title _____

Business Address:

_____

_____

_____

(Seal - If bid is by Corporation)

_____
DATE OF BID

END OF SECTION

SECTION 00500

"DRAFT" CONTRACT

THIS AGREEMENT, made this_____, day of _____, 2025, by and between the City of Dacula, Georgia, herein called "Owner", acting herein through its Mayor, Hon. Hugh D. King, III, and _____ , County of_____, and State of Georgia, herein called "Contractor".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the OWNER, the CONTRACTOR hereby agrees with the OWNER to commence and complete the construction of "Site Work for the Administration Building Complex Project" for the City of Dacula described as follows:

A. BASE BID –

The Work to be completed for this Project includes, but is not limited to furnishing all labor, materials, grading and earthwork, construction operations, details, supervision, and coordination of all trades, utility suppliers, governmental inspections, and approvals to complete the construction, installation, and coordination for the City of Dacula "Site Work for the Administration Building Complex Project" as follows:

A) The scope of work includes mass grading of the entire site for the construction of the Dacula Administration Building Complex. Construction and installation of the Underground Stormwater Management System (StormPrism Concrete Vaults), Storm Sewer System, Sanitary Sewer System, Water Distribution System, Concrete Retaining Walls, Electrical Service Lines and Conduits, Rigid Paving and Site Concrete, Flexible Paving, Erosion, Sedimentation, and Pollution Control Measures and other items are all part of the Scope of Work for the project as illustrated on the Drawings.

   Contractor is responsible for complying with all regulations and providing all documents as per City of Dacula and Gwinnett County Regulations.

   Geo-technical data and information is performed and provided by Geo-Hydro Engineers – Report of Subsurface Exploration and Geotechnical Engineering Evaluation (Project #241895.20 dated 08-08-2024) and Report of Supplemental Subsurface Exploration and Geotechnical Engineering Evaluation (Project #241895.21 dated 11-06-2024).

   The overall project for the City of Dacula Administration Building Complex will be performed in two phases; (1) Site Work Phase for which this scope of work and bid applies; (2) Building/Finished Site Work Phase that will be Bid out separately in first quarter of 2025. There are also several residential properties that the City has not purchased or does not completely control yet that will be phased out until acquired for future construction. The Contractor shall

not disturb or access private residential property at the following addresses: 1) #456 McMillan Road (5301 212) and 2) #426 McMillan Road (5301 004). Property at #446 McMillan Road (5301 006) in owned by City of Dacula but is in a living trust so no disturbance within the property is allowed without prior written permission from City of Dacula.

Grading and earthwork scope of the project will consist of mass grading the Phased Site as illustrated on the Drawings for construction and installation of the Underground Stormwater Management System, Storm Sewer System, Sanitary Sewer System, Water Distribution System, Concrete Retaining Walls, building pads, lawn areas, amphitheater building and seating areas, and drives and parking lots, etc. All earthwork operations and quantities either haul-in or haul-off is the responsibility of the Contractor shall be included in their overall Lump Sum Bid. The Site is not balanced.

Utility construction and installation, as mentioned above and as illustrated on the Drawings shall include but is not limited to: Underground Stormwater Management System; Storm Sewer System; Sanitary Sewer System; Water Distribution System; conduit installation for electrical, lighting, and other utilities; and sleeving for irrigation.

The paving scope will consist of Medium-Duty and Heavy-Duty pavement sections that meet or exceed the Geo-Technical Engineers Flexible Pavement recommendations that are detailed and illustrated on the Drawings. It will include a combination of the following: subgrade compacted to at least 100% standard proctor maximum dry density (ASTM D698), Graded Aggregate base (GAB) for base course, Asphaltic Concrete 19mm Superpave (Binder Course), and Asphaltic Concrete 25mm Superpave (Binder Course) depending on whether it applies to Medium Duty or Heavy Duty Paving. Surface/Topping Course will not be installed during this phase of work and shall not be included in the bid. Curb and Gutter will be installed along with the paving installation for all areas as illustrated on the Drawings and in the specifications.

The Contractor will also be required to install four (4) new entrances to the Site. Two (2) entrances will be installed and tie-in flush with McMillan Road; one across from Maple Creek Park Entrance and one across from Fortune Drive. Contractor will install a four way stop condition at the entrance across from the park. The other two entrances will be along Sanjo Street across from Maxey Street and Church Street. Sanjo Street is also being widened by the City as a separate project, so the Contractor will be required to coordinate with the other Contractor for this project when grading slopes and installing entrances which tie-in to Sanjo Street and its right-of-way.

Construction of entrances, material deliveries, and staging are the responsibility of the Contractor and shall be coordinated with the City prior to any disruption of traffic along McMillan Road and Sanjo Street. Contractor must maintain one lane of traffic and access to any impacted residential driveways at all times while performing entrance work and material deliveries. Traffic Safety devices such as signage, barricades, etc., and the protection of the public-at-large, and the Contractor's personnel is part of this contract and is the Contractor's sole responsibility.

B) Clean-up of the entire project site.

C) Submission of all close-out documents.

The Contractor will have *Nine Months (270) consecutive calendar days* from the "Notice to Proceed" to finish and complete the Site Work for this project.

All materials and appurtenances required to complete this Scope of Work is the responsibility of the Contractor and shall be provided in his overall Bid. Contractor with winning Bid is required to submit a schedule of values at the Pre-construction meeting.

Bidder will prepare Asphalt prices for bid based on the current GDOT Asphalt Cement Price Index listed at the time of bid opening. The successful Contractor's pay request will list the current GDOT Asphalt Cement Price Index at the time of purchase. The difference in price between the GDOT Asphalt Cement Price Index at bid and at purchase will either be a change order to the Contractor or a Credit to the Owner. The GDOT Asphalt Cement Price Index is in accordance with Special Provision 109 (dated 2008), Section 400.5.01 Adjustments, the asphalt price index for the month of the Letting posted on the Georgia Department of Transportation Website.

Additional items within Scope of Work

A. A site visit must be made by Contractor and subcontractors to determine the exact nature and scope of the work to be done. Contractor is responsible for hauling off all demolition materials (asphalt, concrete, etc.) to a State approved disposal facility at no additional cost to the Owner.

B. If any unforeseen sub-grade conditions arise, then the Contractor shall immediately notify the City, Geotechnical Engineer, and City's Engineer before proceeding with any work to determine the course of action. The Contractor shall coordinate with and have the City's Geotechnical Engineer (Geo-Hydro Engineers) perform all testing at the required intervals, milestones, and times to qualify and quantify all areas and determine the method of sub-grade repair in coordination with the City and/or City's Engineer on a case-by-case basis. Geotechnical Engineer will also monitor, observe, test, and report on all grading and earthwork operations as City's representative. All testing and inspections will be paid for by the City but shall be coordinated with the Geotechnical Engineer by the Contractor.

C. The limits of work for this project are limited to the Site illustrated in the Project Drawings and the right-of-way of City of Dacula. Any disturbance outside of the site boundary and right-of-way of the City of Dacula shall be repaired in kind to existing condition at no additional cost to City.

D. Contractor is responsible to locate horizontally and vertically all existing utilities within limits of disturbance and protect throughout duration of project. Utilities present, include water, sewer, gas, electrical, fiber, CATV, AT&T, etc., but may not be limited to these within the limits of disturbance.

E. Contractor shall have a Site Superintendent on-site at all times while work is in progress to monitor, direct, and control construction activities. Superintendent in-charge shall be available to City, Geotechnical Engineer, and City's Engineer at all times.

Attention of Bidders is particularly called to the requirements regarding conditions of employment and minimum wage rates to be paid on this project, and that the contractor and subcontractor must comply with all Federal, State, and local requirements. Minority and female owned firms are encouraged to participate in this project. Procurement will be in compliance with the Uniform Administrative Requirements, 2 CFR 200.318-326. Potential respondents are particularly called to the requirements of Title VI; Civil Rights Act of 1964 and 24 CFR 570.602; and Executive Order 11246 - Equal Employment Opportunity and Affirmative Action.

CONTRACTOR shall perform the above scope of work, hereinafter called the "Project", for a lump sum, total fixed price of _____ Dollars, ($_____); which includes Base Bid plus Total Unit Price Allowances as submitted in the Bid Form by the bidder on January 16, 2025. It shall also include all extra work in connection therewith, under the terms as stated in the Contract Bid Documents; and at his (its or their) own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Bid Proposal.

CONTRACTOR shall provide OWNER with Certificate of Insurance and Performance and Payment Bonds as required by these Contract Documents.

This is a lump sum, fixed price Contract. Notwithstanding any other provision of this Contract, the amount to be paid to Contractor by the City shall not exceed _____ _____Dollars ($_____) without the prior written approval of the Mayor and Council of the City of Dacula. Any change order which increases the Contract price by more than $15,000.00 must be approved in advance by a formal vote of the Mayor and City Council of the City of Dacula at a duly called meeting.

A. *BASE BID PLUS ALLOWANCES* – "Site Work for the Administration Building Complex Project" *LUMP SUM AMOUNT*

**Bidder agrees to perform all of the Improvements described in the specifications and represented by the project drawings for the SUM OF :

_____($_____)

(Amounts shall be shown in both * words and figures).

* In case of discrepancy, the amounts shown in words will govern.

**Please note that successful Bidder will be required to submit a Unit Price Breakdown of items used in determining the Lump Sum Bid Proposal Price for this work.

** The **Base Bid** amount plus Allowances shall consist of Work Items more particularly described in Section 01010, Project Scope & Performance Specification. The Contractor shall be responsible for all labor, equipment, materials, operations, details, insurance, supervision, coordination, administration, overhead and profit, plus all necessary incidental costs associated with the complete function of the Work Scope in context of the project.

Notice to Proceed will be issued during the Pre-Construction meeting. All required paperwork such as Performance and Payment bonds for 100% of the Contract amount which will be submitted to the City along with a Schedule of Values (Unit Prices), Certificate of Insurance, Contractor's Security and Immigration Affidavit, a list of Subcontractors to be used on the project and Subcontractor's Security and Immigration Affidavits shall be provided to the City at City Hall located on Harbins Road, in Dacula, Georgia before construction begins.

The OWNER is subject to the requirements of the Georgia Security and Immigration Compliance Act. Accordingly, the requirements of O.C.G.A. '13-10-91 and Georgia Department of Labor Rule 300-10-1-.02 are conditions of this Contract. Compliance with these requirements shall be attested by the execution of the Contractor Affidavit attached hereto, which shall become a part of the awarded contract. In the event the Contractor employs or contracts with any subcontractor(s) in connection with the awarded contract, the Contractor shall secure from such subcontractor(s) attestation of the subcontractor's execution of the Subcontractor Affidavit attached hereto, which shall also become a part of the awarded contract and also a part of the contractor/subcontractor agreement. Contractor shall maintain records of such attestation for inspection by The City of Dacula at any time. Contractor shall be required to provide copies to the City of Dacula upon request. Failure to comply with these rules will result in the rejection of the bid proposal and/or termination of any awarded contract where it is subsequently determined that there has been a violation of any provision of the Act or implementing rules and regulations.

CONTRACTOR hereby agrees to commence work under this Contract on or before a date to be specified in a written "Notice to Proceed" of OWNER and to a fully complete the Project within *Nine Months (270) consecutive calendar days* from the "Notice to Proceed" to finish and

complete the project. Contractor shall mobilize within ten (10) days of Notice to Proceed as issued by the City of Dacula or other date agreed upon and to commit adequate forces on site to substantially complete all Work including punch list items and clean-up for the Base Bid plus Allowances within the time specified. The City of Dacula will charge the Contractor Five-Hundred Dollars and no cents ($500.00) per day for liquidated damages for every day past the completion of the Contract.

The undersigned agrees that this proposal may not be revoked or withdrawn after the time set for the opening of bids but shall remain open for acceptance for a period of 60 days following such time. The undersigned, upon receipt of written notice of the acceptance of this bid, agrees to execute within ten (10) days a Contract for the work for the above stated compensation, and to furnish and deliver to Owner at the same time as the Contract, the required Performance Bonds, and a Labor and Materials Payment Bond, for General Contractor in amount to equal 100% of the Contract Sum. These bonds shall be written on forms provided by a company acceptable to the Owner and licensed to do business in the State of Georgia at the time the bonds are written, and that is listed on "Department of the Treasury Circular 570."

The undersigned has checked carefully all the foregoing figures and understands that the City will not be responsible for any errors or omissions on the part of the undersigned in making this bid.

Any dispute arising under this Contract shall be heard in the Superior Court of Gwinnett County, Georgia, and the parties' consent to jurisdiction and venue in that Court. The parties waive any defense that may have to lack of jurisdiction or improper venue and agree to have all disputes resolved in the Superior Court of Gwinnett County.

The Owner agrees to pay the Contractor in current funds for the performance of the Contract, subject to additions and deductions, on completion of the project and final inspection of the Owner.

Termination for Cause: The City may terminate this Contract for cause upon ten (10) days prior written notice to the Consultant of the Consultant's default in the performance of any term of this Contract. Such termination shall be without prejudice to any of the City's rights or remedies provided by law.

Termination for Convenience: The City may terminate this Contract for its convenience upon 30 days written notice to the Consultant. In the event of the City's termination of this Contract for convenience, the Consultant will be paid for those services actually performed. Partially completed performance of the Contract will be compensated based upon a signed statement of completion to be submitted by the Consultant, which shall itemize each element of performance.

IN WITNESS WHEREOF, the parties to these presents have executed this Contract in two (2) counterparts, each of which shall be deemed an original, in the year and day first above mentioned. (Seal)

ATTEST: CITY OF DACULA

_____ By:_____

(City Administrator)

ATTEST:
(Seal)

_____

(Contractor)

_____ By:_____

(Witness)

SECTION 00600

BONDS AND CERTIFICATES

1.0 GENERAL

1. BID BOND: A bid bond in the amount of 5% of the base bid shall accompany the bid. The Attorney in-fact who signs the bid bond must file with the bid bond a certified copy of his Power of Attorney to sign such bond.

2. PAYMENT & PERFORMANCE BOND: Contractor shall furnish both a Performance Bond and Payment Bond, each in the amount of 100% of the Contract Sum, unless otherwise directed by the Owner. The surety must be one which is authorized to do business in the State of Georgia and is listed on "Department of the Treasury Circular 570". Bonds must be accompanied by letter stating company's current rating for verification prior to acceptance by the Owner and execution of the formal Owner/Contractor agreement. It shall be specifically understood that the performance Bond fully protects the Owner and guarantees the completion of the project in accordance with all Bid Documents. After award of contract, submit a properly executed "Performance Bond" and "Labor and Material Payment Bond".

3. CERTIFICATE OF INSURANCE: After award of contract, Contractor shall submit a properly executed "Certificate of Insurance" to Owner.

4. LIST OF SUBCONTRACTORS: After award of contract, but prior to Pre-Construction Conference, submit a properly executed "List of Subcontractors".

END OF SECTION

SECTION 00700

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

PART 1 - GENERAL

1. The following City of Dacula "The General Conditions for the Contract for Construction", dated 12/05/2024, Articles 1 through 17 inclusive, Pages 1 through 43, are included herein, as part of this Contract, and 1997 Edition, with modifications as called out in Section 00 801 - Supplementary Conditions, is hereby made a part of these documents to the same extent as if herein written out in full.

2. Articles 1 through 17 inclusive, Pages 2 through 44, dated 12/05/2024 shall overrule 1997 Edition, with modifications as called out in Section 00 801 - Supplementary Conditions if conflicts arise.

CITY OF DACULA - GENERAL CONDITIONS

ARTICLE 1
GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consists of the Agreement between Owner and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Engineer. Unless specifically enumerated in the Agreement, the Contract Documents do not include other documents such as bidding requirements (advertisement or invitation to bid, instructions to Bidders, sample forms, the Contractor's bid or portions of addenda relating to bidding requirements).

1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Engineer and Contractor, (2) between the Owner and a Subcontractor or Sub-Subcontractor, or (2) between any persons or entities other than the Owner and Contractor. The Engineer shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Engineer's duties.

1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by separate contractors.

1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and wherever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.

1.1.7 THE PROJECT MANUAL

The Project Manual is the volume usually assembled for the Work, which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 The Contract Documents shall be signed by the Owner and Contractor as provided in the Agreement. If either the Owner or Contractor or both do not sign all the Contract Documents, the Engineer shall identify such unsigned Documents upon request.

1.2.2 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

1.2.3 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contractor Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results.

1.2.4 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

1.2.5 Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

ARTICLE 2
OWNER

2.1 DEFINITION

2.1.1 The Owner is the City of Dacula. The term "Owner" means the Owner or the Owner's authorized representative (City Engineer).

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project and a legal description of the site.

2.2.2 Except for permits and fees which are the responsibility of the Contractor under the Contract Documents, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

2.2.3 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid delay in orderly progress of the Work.

2.2.4 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, twenty copies of Drawings and Project Manuals.

2.2.5 The foregoing is in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to Article 6 (Construction by Owner or by Separate Contractors), Article 9 (Payments and Completion) and Article 11 (Insurance and Bonds).

2.3 OWNER'S RIGHTS TO STOP THE WORK

2.3.1 If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents as required by Paragraph 12.2 or persistently fails to carry out Work in accordance with the Contract Documents, the Owner, by written order signed personally, or by an agent specifically so empowered by the Owner in writing may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise the right for the benefit of the Contractor or any other entity, except to the extent required by Subparagraph 6.1.3.

2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

2.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a forty-eight-hour period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may after such forty-eight-hour period give the Contractor a second written notice to correct such deficiencies within a second forty-eight

hour period. If the Contractor within such second forty-eight-hour period after receipt of such second notice fails to commence and continue to correct any deficiencies, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Construction Change Directive shall be issued deducting from payments then or thereafter due the Contractor the actual cost of correcting such deficiencies, including compensation for the Engineer's additional services and expenses made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Engineer. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

2.4.2 If, in the opinion of the Engineer, it is evident that the Contractor has not completed or will not be able to substantially complete the Work in accordance with the contract documents due to default, negligence, or failure on the part of the Contractor, or their subcontractors, the Owner may, at its option, without prejudice, after the expiration of the second of two forty-eight hour written notices to the Contractor, complete certain portions of the Work as may be necessary, or augment the forces of the Contractor with additional manpower as may be required to complete the Work by the contracted completion date. In such case, an appropriate deductive Construction Change Directive shall be written, deducting from the contract price the actual costs incurred by the Owner to complete or augment the Work. Amount charged to the Contractor will be subject to the approval of the Engineer. Such action, if taken by the Owner, shall not be interpreted by the Contractor as a termination of the contract as per Article 16 and the Contractor shall continue to carry out the Work or portions of the Work as may be required by the contract during this time frame.

ARTICLE 3
CONTRACTOR

3.1. DEFINITION

3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative.

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.1 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner pursuant to Subparagraph 2.2.2; and shall at once report to the Engineer errors, inconsistencies or omissions discovered. The Contractor shall not be liable to the Owner or Engineer for damage resulting from errors, inconsistencies or omissions in the Contract Documents unless the Contractor recognized such error, inconsistency or omission and knowingly failed to report it to the Engineer. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to the Engineer, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction.

3.2.2 The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be reported to the Engineer at once.

3.2.3 The Contractor shall perform the Work in accordance with the Contract Documents and submittals approved pursuant to Paragraph 3.12.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless Contract Documents give other specific instructions concerning these matters.

3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, subcontractors and their agents and employees, and other persons performing portions of the Work under a contract with the Contractor.

3.3.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Engineer in the Engineer's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

3.3.4 The Contractor shall be responsible for inspection of portions of Work already performed under this Contract to determine that such portions are in proper condition to receive subsequent Work.

3.3.5 The Contractor shall make daily reports of activities onsite and shall submit copies of these reports with each monthly Application for Payment. Each daily report shall include the following information as a minimum:

· Project name
· Contractor
· Date
· Weather/temperature
· Number of persons present for each trade working on-site
· Number of Contractor’s own forces present on-site
· Equipment present on-site
· Activity and work performed on-site
· Visitors on-site

3.4 LABOR AND MATERIALS

3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper

execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

3.4.2 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

3.5 WARRANTY

3.5.1 The Contractor warrants to the Owner and Engineer that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

3.6 TAXES

3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by the Contractor which are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely schedule to go into effect.

3.7 PERMITS, FEES AND NOTICES

3.7.1 The contractor shall secure and pay for all required governmental permits, fees, licenses, inspections, and utility costs (such as water metering devices) for the proper execution and completion of the work. The only exceptions shall be the payment of impact fees, permit fees, and development fees.

3.7.2 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authorities bearing on performance of the Work.

3.7.3 It is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations. However, if the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Engineer and Owner in writing, and necessary changes shall be accomplished by appropriate Modification.

3.7.4 If the Contractor performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Engineer and Owner, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs.

3.8 ALLOWANCES

3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents,

items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities against which the Contractor makes reasonable objection.

3.8.2 Unless otherwise provided in the Contract Documents:

3.8.2.1 materials and equipment under an allowance shall be selected promptly by the Owner to avoid delay in the Work;

3.8.2.2 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

3.8.2.3 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum and not in the allowances;

3.8.2.4 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Clause 3.8.2.2 and (2) changes in Contractor's costs under Clause 3.8.2.3.

3.9 SUPERINTENDENT

3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

3.9.2 The Superintendent shall have supervised past projects of equal size and scope and have excellent performance references from the Owners for a minimum of three projects within a period of five years maximum. Contractors who and first and second apparent low bidders shall submit their appointed superintendent and project manager and references for review by the Owner and Engineer within ten (10) days from the bid date and prior to contract signing. Owner and Engineer shall have the right to reject any superintendent or project manager that does not, in their opinion have the required performance history to be in charge of this project.

3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Engineer's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

The schedule shall be a time-scaled, critical path method (CPM) network diagram showing critical path and

float for each activity.

3.10.2 The Contractor shall prepare and keep current, for the Engineer's approval, a schedule of submittals which is coordinated with the Contractor's construction schedule and allows the Engineer reasonable time to review submittals. This schedule shall be submitted to the Engineer prior to the first application for payment.

3.10.3 The Contractor shall conform to the most recently approved construction and submittal schedules.

3.10.4 The Owner shall be able to conduct classes without disruption or interference, move buses in and out on paved surfaces; and secure, heat, cool, light the building, and deliver food.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

3.11.1 The Contractor shall maintain at the site for the Owner one record copy of the Drawings, Specifications, addenda, Change Orders and other Modifications, in good order and marked currently to record changes and selections made during construction, and in addition approved Shop Drawings, Product Data, Samples and similar required submittals including all underground utilities. These shall be available to the Engineer and shall be delivered to the Engineer for submittal to the Owner upon completion of the Work.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

3.12.3 Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review by the Engineer is subject to the limitations of Subparagraph 4.2.8.

3.12.5 The Contractor shall review, approve and submit to the Engineer Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals made by the Contractor which are not required by the Contract Documents may be returned without action.

3.12.6 The Contractor shall perform no portion of the Work requiring submittal and review of Shop

Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Engineer. Such Work shall be in accordance with approved submittals.

3.12.7 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

3.12.8 The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Engineer's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Engineer in writing of such deviation at the time of submittal and the Engineer as given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Engineer's approval thereof.

3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Engineer on previous submittals.

3.12.10 Informational submittals upon which the Engineer is not expected to take responsible action may be so identified in the Contract Documents.

3.12.11 When Professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the Engineer shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

3.12.12 The Contractor shall provide upon the Engineer's request a shop drawing or submittal for any item, component, or system being furnished under the contract.

3.13 USE OF SITE

3.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

3.14 CUTTING AND PATCHING

3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

3.15 CLEANING UP

3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from and about the Project waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.

3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so, and the cost thereof shall be charged to the Contractor.

3.16 ACCESS TO WORK

3.16.1 The Contractor shall provide the Owner and Engineer access to the Work in preparation and progress wherever located.

3.17 ROYALITIES AND PATENTS

3.17.1 The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of patent rights and shall hold the Owner and Engineer harmless from loss on account thereof but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Engineer.

3.18 INDEMNIFICATIONS

3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Engineer, Engineer's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting there from, but only to the extent caused in whole or in part by negligent acts or omissions of the Contractor, Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Paragraph 3.18.

3.18.2 In claims against any person or entity indemnified under this Paragraph 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by

them or anyone for whose acts they may be liable, the Indemnification obligation under this Paragraph 3.18

shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

3.18.3 The obligations of the Contractor under this Paragraph 3.18 shall not extend to the liability of the Engineer, the Engineer's consultants, and agents and employees of any of them arising out of (1) the preparation of approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Engineer, the Engineer's consultants, and agents and employees of any of them provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 4
ADMINISTRATION OF THE CONTRACT

4.1 ENGINEER

4.1.1 The Engineer is the person lawfully licensed to practice Engineering or an entity lawfully practicing Engineering identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Engineer" means the Engineer or the Engineer's authorized representative.

4.1.2 Duties, responsibilities and limitations of authority of the Engineer as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Engineer. Consent shall not be unreasonably withheld.

4.1.3 In case of termination of employment of the Engineer, the Owner shall appoint an Engineer against whom the Contractor makes no reasonable objection and whose status under the Contractor Documents shall be that of the former Engineer.

4.2 ENGINEER'S ADMINISTRATION OF THE CONTRACT

4.2.1 The Engineer will provide administration of the Contract as described in the Contract Documents and will be the Owner's representative (1) during construction, (2) until final payment is due and (3) with the Owner's concurrence, from time to time during the correction period described in Paragraph 12.2. The Engineer will advise and consult with the Owner. The Engineer will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified by written instrument in accordance with other provisions of the Contract.

4.2.2 The Engineer shall visit the site at least once a week to inspect and familiarize himself with the progress and quality of the Work and to determine if the Work is proceeding in accordance with the Contract Documents. However, the Engineer will not be required to make exhaustive or continuous on-site inspections to check quality or quantity of the Work. On the basis of on-site inspections as an Engineer, the Engineer will keep the Owner informed of progress of the Work and will endeavor to guard the Owner against defects and deficiencies in the Work.

4.2.3 The Engineer will not have control over or charge of and will not be responsible for construction means,

methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's responsibility as provided in Paragraph 3.3. The Engineer will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Engineer will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or of any other persons performing portions of the Work.

4.2.4 Inspection Does Not Relieve Contractor. Under the Contract Documents the Contractor has assumed the responsibility of furnishing all services, labor and materials for the entire Work in accordance with such documents. No provisions of this Article nor any inspection of the Work by the Owner, representatives of the Owner, engineers employed by the Engineer, representatives of the Engineer, or the Engineer shall in any way diminish, relieve, or alter said responsibility and undertaking of the Contractor; nor shall the omission of any of the foregoing to discover or to bring to the attention of the Contractor the existence of any Work or materials injured or done not in accordance with said Contract Documents in any way diminish, relieve, or alter such obligation of the Contractor nor shall the aforesaid omission diminish or alter the rights or remedies of the Owner as set forth in the Contract Documents.

4.2.5 Communications Facilitating Contract Administration. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate through the Engineer. Communications by and with the Engineer's consultants shall be through the Engineer. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

4.2.6 Based on the Engineer's inspections and evaluations of the Contractor's Applications for Payment, the Engineer will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

4.2.7 The Engineer will have authority to reject Work which does not conform to the Contract Documents. Whenever the Engineer considers it necessary or advisable for implementation of the intent of the Contract Documents, the Engineer will have authority to require additional inspection or testing of the Work in accordance with Subparagraphs 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Engineer nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Engineer to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons performing portions of the Work.

4.2.8 The Engineer will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for concept expressed in the Contract Documents. The Engineer's action will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor or separate contractors, while allowing sufficient time in the Engineer's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for concept expressed in the Contract Documents. The Engineer's action will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor or separate contractors, while allowing sufficient time

in the Engineer's professional judgment to permit adequate review. Review of such submittals is not

conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Engineer's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Paragraphs 3.3, 3.5 and 3.12. The Engineer's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Engineer, of any construction means, methods, techniques, sequences or procedures. The Engineer's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

4.2.9 The Engineer will prepare Change Orders and Construction Change Directives and may authorize minor changes in the Work as provided in Paragraph 7.4.

4.2.10 The Engineer will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion, will receive and forward to the Owner for the Owner's review and records written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final certificate for Payment upon compliance with the requirements of the Contract Documents.

4.2.11 If the Owner and Engineer agree, the Engineer will provide one or more project representatives to assist in carrying out the Engineer's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

4.2.12 The Engineer will be the interpreter of the requirements of the Contract Documents and the judge of the performance there under by both the Owner and Contractor.

4.2.13 The Engineer will render interpretations necessary for the proper execution or progress of the Work, with reasonable promptness and in accordance with any time limit agreed upon. Either party to the Contract may make written request to the Engineer for such interpretations.

4.2.14 All interpretations and decisions of the Engineer shall be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. In his capacity as interpreter and judge, he will endeavor to secure faithful performance by both the Owner and the Contractor.

4.2.15 The Engineer's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

4.3 CLAIMS AND DISPUTES

4.3.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract items, payment of money, extension of time or other relief with respect to the items of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. Claims must be made by written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.

4.3.2 The Contractor shall assert claims solely on the basis of (a) principles of logic and (b) principles of law

to which the Contractor, itself, subscribes. It shall not protest a decision or request a conference on the ground that a Subcontractor, materialman, or supplier has protested to the Contractor. Accordingly, the Contractor shall file no claim, nor shall it make a request for a conference with the Owner regarding a claim except as it shall be for the purpose of asserting in the exercise of the Contractor's best judgment such views, requests, and legal propositions as it deems the Contractor is entitled to maintain independently of any right of any Subcontractor, materialman, or supplier against the Contractor.

4.3.3 Decision of Engineer. Claims, including those alleging an error or omission by the Engineer shall be referred initially to the Engineer for action as provided in Paragraph 4.4. A decision by the Engineer, as provided in Subparagraph 4.4.4, shall be required as a condition precedent to litigation of a Claim between the Contractor and Owner as to all such matters arising prior to the date final payment is due, regardless of (1) whether such matters relate to execution and progress of the Work or (2) the extent to which the Work has been completed. The decision by the Engineer in response to a Claim shall not be a condition precedent to litigation in the event (1) the position of Engineer is vacant, (2) the Engineer has not received evidence or has failed to render a decision within agreed time limits, (3) the Engineer has failed to take action required under Subparagraph 4.4.4 within thirty (30) days after the claim is made, (4) forty-five (43) days have passed after the Claim has been referred to the Engineer or (5) the Claim relates to a mechanic's lien.

4.3.4 Time Limits on Claims. Claims by either party must be made within twenty-one (21) days after occurrence of the event giving rise to such Claim or within twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims must be made by written notice. An additional Claim made after the initial Claim has been implemented by Change Order will not be considered unless submitted in a timely manner.

4.3.5 Continuing Contract Performance. Pending final resolution of a Claim unless otherwise agreed in writing the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

4.3.6 Waiver of Claims: Final Payment. The making of final payment shall constitute a waiver of Claims by the Owner except those arising from:

4.3.6.1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;

4.3.6.2 failure of the Work to comply with the requirements of the Contract Documents; or

4.3.6.3 terms of special warranties required by the Contract Documents.

4.3.7 Claims for Concealed or Unknown Conditions. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents, or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than twenty-one (21) days after the first observance of the conditions. The Engineer will promptly investigate such conditions and, if they

differ materially and cause an increase or decrease in the Contractor's cost of, or time required for,

performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Engineer determines that the conditions at the sire are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Engineer shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within twenty-one (21) days after the Engineer has given notice of the decision. If the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Engineer for initial determination, subject to further proceedings pursuant to Paragraph 4.4.

4.3.8 Claims for Additional Cost. If the Contractor wishes to make Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Paragraph 10.3. If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Engineer, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Engineer, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension or (7) other reasonable grounds. Claim shall be filed in accordance with the procedure established herein.

4.3.9 CLAIMS FOR ADDITIONAL TIME

4.3.9.1 If the Contractor wishes to make Claim for an increase in the Contract Time, written notice shall be given within twenty-one (21) days. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.

4.3.9.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time and could not have been reasonably anticipated, and that weather conditions had an adverse effect on the scheduled construction.

4.3.10 Injury or Damage to Person or Property. If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, of any of the other party's employees or agents, or of others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding twenty-one (21) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a Claim for additional cost or time related to this Claim is to be asserted, it shall be filed as provided in Subparagraphs 4.3.7 or 4.3.8.

4.4 RESOLUTION OF CLAIMS AND DISPUTES

4.4.1 The Engineer will review Claims and take one or more of the following preliminary actions within ten (10) days of receipt of a Claim: (1) request additional supporting data from the claimant, (2) submit a schedule to the parties indicating when the Engineer expects to take action, (3) reject the Claim in whole or in part, stating reasons for rejection, (4) recommend approval of the Claim by the other party or (5) suggest a compromise. The Engineer may also, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim.

4.4.2 If a Claim has been resolved, the Engineer will prepare or obtain appropriate documentation.

4.4.3 If a Claim has not been resolved, the party making the Claim shall, within ten (10) days after the Engineer's preliminary response, take one or more of the following actions: (1) submit additional supporting data requested by the Engineer, (2) modify the initial Claim or (3) notify the Engineer that the initial Claim stands.

4.4.4 If a Claim has not been resolved after consideration of the foregoing and of further evidence presented by the parties or requested by the Engineer, the Engineer will notify the parties in writing that the Engineer's decision will be made within seven (7) days, which decision shall be final and binding on the parties but subject to litigation. Upon expiration of such time period, the Engineer will render to the parties the Engineer's written decision relative to the Claim, including any change in the Contract Sum or Contract Time or both. If there is a surety and there appears to be a possibility of a Contractor's default, the Engineer may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

ARTICLE 5
SUBCONTRACTORS

5.1 DEFINITIONS

5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Document as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Engineer the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Engineer will promptly reply to the Contractor in writing stating whether or not the Owner or the Engineer, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner to Engineer to reply promptly shall constitute notice of no reasonable objection.

5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Engineer has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

5.2.3 If the Owner or Engineer has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Engineer has no reasonable objection.

5.2.3 If the Owner or Engineer has reasonable objection to a person or entity proposed by the Contractor,

the Contractor shall propose another to whom the Owner or Engineer has no reasonable objection.

5.2.4 The Contractor shall not change a Subcontractor, person or entity previously selected if the Owner or Engineer make reasonable objection to such change.

5.3 SUBCONTRACTURAL RELATIONS

5.3.1 By appropriate agreement, written where legally required for validity, the Contractor shall require such Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by items of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner and Engineer. Each subcontract agreement shall preserve and protect the rights of the Owner and Engineer under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement, which may be at variance with the Contract Documents. Subcontractors shall similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:

5.4.1.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Paragraph 14.2 and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor in writing; and

5.4.1.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

5.4.2 If the Work has been suspended for more than thirty (30) days, the Subcontractor's compensation shall be equitably adjusted.

ARTICLE 6
CONSTRUCTION BY OWNER
OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the

Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided elsewhere in the Contract Documents.

6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule and Contract Sum deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford the Owner and separate contractors' reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

6.2.2 If part of the Contractor's Work depends for proper execution of results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Engineer apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor to report shall constitute an acknowledgment that the Owner's or separate contractors completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

6.2.3 Costs caused by delays or by improperly timed activities or defective construction shall be borne by the party responsible, therefore.

6.2.4 The Contractor shall promptly remedy damage wrongfully caused by the Contractor to completed or partially completed construction or to property of the Owner or separate contractors as provided in Subparagraph 10.2.5.

6.2.5 Claims and other disputes and matters in question between the Contractor and a separate contractor shall be subject to the provisions of Paragraph 4.3 provided the separate contractor has reciprocal obligations.

6.3 OWNER'S RIGHT TO CLEAN UP

6.3.1 If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility

under their respective contracts for maintaining the premises and surrounding area free from the waste materials and rubbish as described in Paragraph 3.15, the Owner may clean up and allocate the cost among those responsible as the Engineer determines to be just.

ARTICLE 7
CHANGES IN THE WORK

7.1 CHANGES

7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Engineer; a Construction Change Directive requires agreement by the Owner and Engineer and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Engineer alone.

7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

7.1.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are so changed in a proposed Change Order or Construction Change Directive that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

7.1.5 All Changes in the Work shall be executed in a timely manner.

7.2 CHANGE ORDERS

7.2.1 A Change Order is a written instrument prepared by the Engineer and signed by the Owner, Contractor and Engineer, stating their agreement upon all of the following:

7.2.1.1 a change in the Work;

7.2.1.2 the amount of the adjustment in the Contract Sum, if any; and

7.2.1.3 the extent of the adjustment in the Contract Time, if any.

7.2.2 Methods used in determining adjustments to the Contract Sum may include those listed in Subparagraph 7.3.3.

7.2.3 In making proposals for consideration of Change Orders, the allowance for overhead and profit combined, included in the total cost to the Owner, shall be based upon the following schedule:

7.2.3.1 To the Contractor for Work which he performs with his own forces not to exceed twenty percent

(20%) of his net additional cost.

7.2.3.2 To a Subcontractor for Work which he performs with his own forces not to exceed twenty percent (20%) of his net additional cost.

7.2.3.3 To the Contractor for Work which is performed by a Subcontractor not to exceed seven and one-half percent (7½%) of the amount due the Subcontractor.

7.2.4 Pending final determination of cost to the Owner, amounts not in dispute may be included in Applications for Payment. The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Engineer. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

7.2.5 If the Owner and Contractor do not agree with the adjustment in Contract Time or the method for determining it, the adjustment or the method shall be referred to the Engineer for determination.

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.1 A Construction Change Directive is a written order prepared by the Engineer and signed by the Owner and Engineer, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

7.3.3.1 mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

7.3.3.2 unit prices stated in the Contract Documents or subsequently agreed upon;

7.3.3.3 in the case of Paragraph 2.4 above, actual costs incurred by Owner.

7.3.4 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Engineer of the Contractor's agreement of disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

7.3.5 A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor

therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

7.4 MINOR CHANGES IN THE WORK

7.4.1 The Engineer will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be affected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 8
TIME

8.1 DEFINITIONS

8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

8.1.2 The date of commencement of the Work is the date established in the Agreement. The date shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible.

8.1.3 The date of Substantial Completion is the date certified by the Engineer in accordance with Paragraph 9.8.

8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

8.1.5 The term "working day" as used in the contract documents shall mean a day when premium pay is not required.

8.2 PROGRESS AND COMPLETION

8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor. The date of commencement of the Work shall not be changed by the effective date of such insurance.

8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

8.2.4 The Owner will require that the Contractor increase his work effort to achieve a six (6) day, ten (10)

hour per day work week upon the determination that the construction progress is two (2) weeks behind the construction schedule as required by the General Conditions.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 If the Contractor is delayed at any time in progress of the Work by an act or neglect of the Owner or Engineer, or of an employee of either, or of a separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, or by other causes which the Engineer determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Engineer may determine.

8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Paragraph 4.3.

8.4 DELAYS DUE TO ADVERSE WEATHER

8.4.1 Completion time will not be extended for normal bad weather. The time for completion as stated in the Contract Documents includes due allowance for days on which Work cannot be performed out-of-doors. For the purpose of this contract, the Contractor agrees that he may expect to lose working days to weather in accordance with the following table:

January-14 days May-6 days September-3 days
February-14 days June-4 days October-4 days
March-10 days July-4 days November-7 days
April-7 days August-4 days December- 10 days

8.4.2 If the total accumulated number of working days lost to the weather from the start of Work until the building is enclosed exceeds the total accumulated number to be expected for the same period from the table above, time for completion will be extended by the number of calendar days needed to include the excess number of working days lost. No extension will be made for days of bad weather occurring after the building is enclosed. Furthermore, should a project fall behind the Contractor's original construction schedule, no extensions will be given for inclement weather days beyond the scheduled dry-in date plus any additional days due Contractor during such originally scheduled period. No changes in the Contract Sum will be authorized because of adjustment of Contract Time due to weather.

ARTICLE 9
PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

9.1.1 The Contract Sum is stated in the Agreement, and including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

9.2.1 Before the first Application for Payment, the Contractor shall submit to the Engineer a Schedule of Values properly allocated to various portions of the Work, prepared in the format shown in the project manual and supported by such data to substantiate its accuracy as the Engineer may require. Upon receipt, the Engineer/Engineer shall review and examine the Contractor's Schedule of Values, together with any supporting documentation or data which the Owner or the Engineer/Engineer may require from the Contractor. The purpose of such review and examination shall be to protect the Owner from an unbalanced Schedule of Values which allocates greater value to certain elements of the Work than is indicated by such supporting documentation or data, or than is reasonable under the circumstances. If the Schedule of Values is not found to be appropriate, or if the supporting documentation or data is deemed to be inadequate, and unless the Owner directs the Engineer/Engineer to the contrary in writing, the Schedule of Values shall be returned to the Contractor for revision or supporting documentation or data. After making such examination, if the Schedule of Values is found to be appropriate as submitted, or if necessary, as revised, the Engineer/Engineer shall sign the Schedule of Values thereby indicating its informed belief that the Schedule of Values constitutes a reasonable, balanced basis for payment of the Contract Price to the Contractor. This Schedule shall be used as a basis for reviewing the Contractor's Applications for Payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 Application for payment with supporting data shall be delivered to the Engineer on or before the first day of the month. The form of the Application for Payment shall be DE Form 0263, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet with schedule of values, and DE Form 0264 Summary of Materials Stored Affidavit. This procedure shall be followed in order for the Engineer to review the Work and approve payment in time for the Owner to make payment on the first Friday following the fifteenth of the same month. The Owner shall make progress payments on account of the Contract for 90% (10% will be retained) of the value of the Work properly performed, based on the Contract Sum, including Owner approved and signed Change Orders, and materials suitably stored at the site thereof, all as estimated by the Engineer, less the aggregate of previous payments, until one-half (50%) of the Contract Sum is due (including all Owner approved and signed Change Orders).

9.3.2 Provided that:

9.3.2.1 the Work is not behind schedule;

9.3.2.2 the Work is being performed in a satisfactory manner in compliance with the Contract as determined by the Engineer; and,

9.3.2.3 there are no outstanding claims on the property; (Contractor shall submit, with payment application, a lien release form for each subcontractor requesting payments.)

Further payments shall be made in the amount of 100% of the value of the Work properly performed and of materials suitably stored at the site thereof.

9.3.3 If:

9.3.3.1 the Work falls behind the progress schedule by as much as 10%;

9.3.3.2 the Work is being performed in an unsatisfactory manner or is non-compliant with the Contract Documents as determined by the Engineer; or

9.3.3.3 there are outstanding claims on the property,

the Owner shall reinstate the 10% retainage on all progress payments to be paid while one or more of such conditions continues to exist. The Contractor shall be given written notice by the Engineer of the reinstatement of the retainage. If the Contractor's actual progress becomes more than 10% behind the Contractor's anticipated progress, the Owner may direct the withholding of payments to the Contractor in amounts equal to the percentage behind the Contractor's anticipated progress, in addition to the 10% described in all Items of Article 9.

9.3.4 If the Contractor recovers all lost time and puts the Work back on schedule and remedies all breaches referenced in Subparagraph 9.3.3, further payments shall be as described in Subparagraph 9.3.2.

9.3.5 Such applications for payment shall not include amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason.

9.3.6 If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably store off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

9.3.7 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment, all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

9.4 CERTIFICATES FOR PAYMENT

9.4.1 The Engineer will, within seven (7) days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Engineer determines is properly due or notify the Contractor and Owner in writing of the Engineer's reasons for withholding certification in whole or in part as provided in Subparagraph 9.5.1.

9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Engineer to the Owner, based on the Engineer's inspection at the site and the data comprising the Application for Payment, that the Work has progressed to the point indicated and that, to the best of the Engineer's knowledge, information and belief, quality of the Work is in accordance with the Contract Documents. The issuance of

Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in

the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Engineer has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

9.5 DECISIONS TO WITHOLD CERTIFICATION

9.5.1 The Engineer may decide not to certify payment and may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Engineer's opinion the representations to the Owner required by Subparagraph 9.4.2 cannot be made. If the Engineer is unable to certify payment in the amount of the Application, the Engineer will notify the Contractor and Owner as provided in Subparagraph 9.4.1. If the Contractor and Engineer cannot agree on a revised amount, the Engineer will promptly issue a Certificate for Payment for the amount for which the Engineer is able to make such representations to the Owner. The Engineer may also decide not to certify payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Engineer's opinion to protect the Owner from loss because of:

9.5.1.1 Defective Work not remedied;

9.5.1.2 third party claims filed or reasonable evidence indicating probably filing of such claims;

9.5.1.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

9.5.1.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

9.5.1.5 damage to the Owner or another contractor;

9.5.1.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

9.5.1.7 persistent failure to carry out the Work in accordance with the Contract Documents.

9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

9.6 PROGRESS PAYMENTS

9.6.1 After the Engineer has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents and shall so notify the Engineer.

9.6.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out

of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require such Subcontractor to make payments to Sub-subcontractors in similar manner.

9.6.3 The Engineer will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Engineer and Owner on account of portions of the Work done by such Subcontractor.

9.6.4 Neither the Owner nor Engineer shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

9.6.5 Payment to material suppliers shall be treated in a manner similar to that provided in Subparagraphs 9.6.2, 9.6.3 and 9.6.4.

9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

9.6.7 There are not outstanding claims or liens on the property; (Contractor shall submit, with pay request, a lien release form for each subcontractor requesting payments. See Exhibit B.)

9.7 FAILURE OF PAYMENT

9.7.1 If the Engineer does not issue a Certificate for Payment, through no fault of the Contractor, within seven (7) days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven (7) days after the date established in the Contract Documents the amount certified by the Engineer, then the Contractor may, upon seven (7) additional days' written notice to the Owner and Engineer, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately, and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut down, delay and start-up, which shall be accomplished as provided in Article 7.

9.7.2 The contractor shall be entitled to interest on any payment not made within the time limits set forth in the contract documents. The interest rate shall be 4 percent per annum, compounded daily.

9.8 SUBSTANTIAL COMPLETION

9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.

9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Engineer a comprehensive list of items to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility

of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the

Contractor's list, the Engineer will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Engineer's inspection discloses any item, whether or not included on the Contractor's list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Engineer. The Contractor shall then submit a request for another inspection by the Engineer to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Engineer will prepare a Certificate of Substantial Completion which shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate.

9.8.3 Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Engineer, the Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof as provided in the Contract Documents.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Subparagraph 11.3.1 and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Engineer as provided under Subparagraph 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Engineer.

9.9.2 Immediately prior to such partial occupancy of use, the Owner, Contractor and Engineer shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

9.10 FINAL COMPLETION AND FINAL PAYMENT

9.10.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Engineer will promptly make such inspection and, when the Engineer finds the Work acceptable under the Contract Documents and the Contract fully performed, the

Engineer will promptly issue a final Certificate for Payment stating that to the best of the Engineer's

knowledge, information and belief, and on the basis of the Engineer's inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in said final Certificate is due and payable. The Engineer's final Certificate for Payment will constitute a further representation that conditions listed in Subparagraph 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Engineer (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing the insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least thirty (30) days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner.

9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Engineer so confirms, the Owner shall, upon application by the Contractor and certification by the Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Engineer prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that is shall not constitute a waiver of claims. The making of final payment shall constitute a waiver of claims by the Owner as provided in Subparagraph 4.3.6.

9.10.4 Project close-out is to be obtained no later than 60 days after the date of Substantial Completion. If, in the opinion of the Owner and Engineer, it is evident that the Contractor is unwilling to bring the project to a close within the allotted time frame, and upon the issuance of two, 48-hour notices as set forth in Article 2, Paragraph 2.4.1, the Owner will then complete all unfinished work and/or assign a value to any incomplete
work and documentation. The final application for payment will be adjusted accordingly.

9.10.5 Acceptance of final payment by the Contractor, a Subcontractor of material supplier shall constitute a waiver of claims by the payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

10.1.2 The Contractor shall comply with provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from Work arising out of and in the course of employment on Work under the Contract. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any damage which may result from their improper construction, maintenance, or operation. He shall erect and properly maintain at all times as required by the conditions and progress of the Work proper safeguards for the protection of workmen and the public and shall post danger warnings against any hazards created by the construction operations.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:

10.2.1.1 employees on the Work and other persons who may be affected thereby;

10.2.1.2 The Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and

10.2.1.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

10.2.2 The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods

are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

10.2.4.1 The Contractor shall notify the Engineer and the Owner in writing that explosives or other hazardous materials, equipment, or unusual methods must be used in the execution of the Work, indicating precisely what, how, where, and when explosives, hazardous materials, equipment, or unusual methods will be used.

10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Clauses 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Engineer or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Paragraph 3.18.

10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Engineer.

10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

10.3 EMERGENCIES

10.3.1 In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Paragraph 4.3 and Article 7.

ARTICLE 11
INSURANCE BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 The Contractor shall purchase from and maintain in a company, or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. In addition, the company furnishing the insurance shall have an A.M. Best Company rating of at least a Class "A" with a financial size of VI or greater. Insurance Certificates shall be

accompanied by a letter stating company's current rating for verification, prior to acceptance by the Owner

and execution of the formal Owner/Contractor agreement.

11.1.1.1 claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed;

11.1.1.2 claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;

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

11.1.1.4 claims for damages insured by usual personal injury liability coverage which are sustained (1) by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor, or (2) by another person;

11.1.1.5 claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting there from;

11.1.1.6 claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle; and

11.1.1.7 claims involving contractual liability insurance applicable to the Contractor's obligations under Paragraph 3.18.

11.1.2 The insurance required by paragraph 11.1.1 shall be written for not less than any limits of liability listed below or required by law, whichever is greater, and shall include contractual liability insurance as applicable to the Contractor's obligations under Paragraph 3.18.

11.1.2.1 The Contractor agrees that, prior to the beginning of any Work by the Contractor or any Subcontractor, as the case may be, he (the Contractor) will furnish the following to the Owner for himself, and will obtain, and retain in his files for the duration of the construction period, like certificates for each Subcontractor. Certificate from insurance company showing coverage of Workmen's Compensation Insurance for the state of Georgia or a certificate from Georgia Workmen's Compensation Board showing proof of ability to pay compensation directly.

11.1.2.2 Original certificate from insurance company showing coverage for the Contractor for the following:

11.1.2.3 Contractor's Protective and Public Liability Insurance: Taken out in the name of the Contractor.

11.1.2.4 Personal Injury, including death - minimum limits of $500,000 for each person and $1,000,000 for each accident.

11.1.2.5 Property Damage, minimum limits of $300,000 for each accident and $500,000 for aggregate of operations.

11.1.2.6 Disposition: Certificate of insurance must be sent to Owner prior to commencement of Work. See

following for endorsement required on this certificate.

11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These certificates shall contain a statement on every policy or certificate, as the case may be, that "The insurance company agrees that Policy No._____ shall not be canceled, changed, or allowed to lapse until thirty (30) days after the Owner and the Engineer have received written notice as evidenced by return receipt of registered letter."

11.2 PROPERTY INSURANCE

11.2.1 The Contractor shall purchase and maintain property insurance upon the entire Work at the site, to the full (100%) insurable value thereof. This insurance shall include the interest of the Owner and the Contractor in the Work and shall insure against the perils of fire, extended coverage, and shall include all risk insurance for physical loss or damage including, without duplication of coverage, theft, vandalism, and malicious mischief.

11.2.2 If the property insurance requires minimum deductibles, the Contractor shall pay costs not covered because of such deductibles.

11.2.3 Unless otherwise provided in the Contract Documents, this property insurance shall cover portions of the Work stored off the site after written approval of the Owner at the value established in the approval and also portions of the Work in transit.

11.2.4 Not used.

11.2.5 Loss of Use Insurance. The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

11.2.6 If the Contractor requests in writing that insurance for risks other than those described herein or for other special hazards be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

11.2.7 Waivers of Subrogation. The Owner and Contractor waive all rights against (1) each other and any of their Subcontractors, Sub-subcontractors, agents and employees, each of the other, and (2) the Engineer, Engineer's consultants, separate contractors described in Article 6, if any, and any of their Subcontractors, Sub-subcontractors, agents and employees, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Paragraph 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Engineer, Engineer's consultants, separate contractors described in Article 6, if any, and the Subcontractors, Sub-subcontractors, agents and employees of any of them by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though

that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay

the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

11.2.8 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interests may reach. If after such loss no other special agreement is made, replacement of damaged property shall be covered by appropriate Change Order.

11.2.9 The Owner as fiduciary shall have power to adjust and settle a loss with insurers.

11.2.10 Partial occupancy or use in accordance with Paragraph 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

11.3 PERFORMANCE BOND AND PAYMENT BOND

11.3.1 Contractor shall furnish both a Performance Bond and Payment Bond, each in the amount of 100% of the Contract Sum, unless otherwise directed by the Owner. The surety shall be one which is authorized to do business in the State of Georgia and is listed on the current "Department of the Treasury Circular 570" with an underwriting limitation not less than the Contract Sum. In addition, company furnishing bonds shall have an A.M. Best Company rating of at least a Class "A" with a financial size of VI or greater. Bonds shall be accompanied by a letter stating company's current rating for verification, prior to acceptance by the Owner and execution of the formal Owner/Contractor agreement.

ARTICLE 12
UNCOVERING AND CORRECTION OF WORK

12.1 UNCOVERING WORK

12.1.1 If a portion of the Work is covered contrary to the Engineer's request or to requirements specifically expressed in the Contract Document, it must, if required in writing by the Engineer, be uncovered for the Engineer's observation and be replaced at the Contractor's expense without change in the Contract Time.

12.1.2 If a portion of the Work has been covered which the Engineer has not specifically requested to observe prior to its being covered, the Engineer may request to see such Works and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work is not in accordance with the Contract Documents, the Contractor shall pay such costs unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

12.2 CORRECTION OF WORK

12.2.1 The Contractor shall promptly correct Work rejected by the Engineer or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear costs of correcting such rejected Work, including additional testing and inspections and compensation for the Engineer's services and expenses made necessary thereby.

12.2.2 If within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Subparagraph 9.8.2, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. This period of one year shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work. This obligation under this Subparagraph 12.2.2 shall survive acceptance of the Work under the Contract and termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

12.2.3 The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

12.2.4 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Paragraph 2.4. If the Contractor does not proceed with correction of such nonconforming Work within a reasonable time fixed by written notice from the Engineer, the Owner may remove it and store the salvageable materials or equipment at the Contractor's expense. If the Contractor does not pay costs of such removal and storage within ten (10) days after written notice, the Owner may upon ten (10) additional days' written notice sell such materials and equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including compensation for the Engineer's services and expenses made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne, the Contract Sum shall be reduced by the deficiency. If payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

12.2.5 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contracts caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

12.2.6 Nothing contained in this Paragraph 12.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the time period of one (1) year as described in Subparagraph 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

12.3 ACCEPTANCE OF NONCONFORMING WORK

12.3.1 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13
MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

13.1.1 The Contract shall be governed by the law of the State of Georgia.

13.2 SUCCESSORS AND ASSIGNS

13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

13.3 WRITTEN NOTICE

13.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

13.3.2 Written notice transmitted via facsimile (FAX) shall NOT be accepted by the owner.

13.4 RIGHTS AND REMEDIES

13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

13.4.2 No action or failure to act by the Owner, Engineer or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

13.5 TESTS AND INSPECTIONS

13.5.1 Tests, inspections and approvals of portions of the Work required by the Contract Documents or by

laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an

appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Engineer timely notice of when and where tests and inspections are to be made so the Engineer may observe such procedures. The Owner shall bear costs of tests, inspections or approvals which do not become requirements until after bids are received or negotiations concluded.

13.5.2 If the Engineer, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Subparagraph 13.5.1, the Engineer will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Engineer of when and where tests and inspections are to be made so the Engineer may observe such procedures. The Owner shall bear such costs except as provided in Subparagraph 13.5.3.

13.5.3 If such procedures for testing, inspection or approval under Subparagraphs 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, the Contractor shall bear all costs made necessary by such failure, including those of repeated procedures and compensation for the Engineer's services and expenses.

13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Engineer.

13.5.5 If the Engineer is to observe tests, inspections or approvals required by the Contract Documents, the Engineer will do so promptly, and where practicable, at the normal place of testing.

13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

13.6 DRUG-FREE WORKPLACE ACT

13.6.1 The Contractor acknowledges that he is fully aware of the contents and requirements of Chapter 24 of Title 50 of the Official Code of Georgia Annotated. The Contractor, upon submission of a bid or proposal in connection with the Contract, does thereby certify that he and his Subcontractors are in compliance with the Drug-Free Workplace Act.

13.7 PUBLIC EMPLOYEE HAZARDOUS CHEMICAL AND RIGHT TO KNOW ACT OF 1988

13.7.1 The Contractor acknowledges that it is fully aware of the contents and requirements of Chapter 22 of Title 43 of the Official Code of Georgia Annotated. The Contractor by submitting a bid or proposal does thereby certify that it and its Subcontractors are in compliance with the aforesaid provisions of the law.

13.8 SECURITY AND IMMIGRATION COMPLIANCE

13.8.1 Contractor shall comply with the provisions of the Georgia Security and Immigration Compliance Act of 2006 (O.C.G.A. §§ 13-10-90 & 13-10-91) and the Rules of the Georgia Department of Labor implementing

the Georgia Security and Immigration Compliance Act of 2006 (Rules 300-10-1-.01 through 300-10-1-.09).

Contractor's obligations under this section shall include, but not be limited to, the following:

A. Contractor agrees to execute and comply with the Contractor Affidavit and Agreement attached hereto as Affidavit A and incorporated herein by reference.

B. Prior to the execution of this Agreement, Contractor must check the appropriate category below identifying the number of people employed by the Contractor. In the event the number of employees employed by the Contractor changes such that it would change the category identified below, Contractor agrees to notify the Owner in writing of such change within ten (10) days.

Number of people employed by the Contractor (check one):

500 or more employees _____
100 or more employees _____
Fewer than 100 employees _____

C. Contractor agrees to insure that all subcontractors performing work under this Agreement will comply with the requirements of the Georgia Security and Immigration Compliance Act of 2006 (O.C.G.A. §§ 13-10-90 & 13-10-91) and the Rules of the Georgia Department of Labor implementing the Georgia Security and Immigration Compliance Act of 2006 (Rules 300-10-1-.01 through 300-10-1-.09). Contractor agrees to require all subcontractors performing work under this Agreement to identify in writing the number of people employed by the subcontractor pursuant to the categories set forth in subsection 8 of this section. Contractor further agrees to maintain records of the Subcontractor Affidavit(s) and to make such Subcontractor Affidavit(s) available for inspection by the Owner at any time. See attached Affidavit B." 13.8.2 Contractor shall complete and submit a SAVE Affidavit/Affidavit Verifying Status of Public Benefit and a copy of a Secure and Verifiable Document. A sample SAVE Affidavit is attached hereto as Affidavit C."

13.9 EQUAL OPPORTUNITY

13.9.1 The Contractor shall maintain policies of employment as follows:

13.9.1.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

13.9.1.2 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin."

ARTICLE 14

14.1 TERMINATION BY THE CONTRACTOR

14.1.1 If the Owner repeatedly fails to perform its material obligations to the Contractor for a period of thirty (30) days after receiving written notice from the Contractor of its intent to terminate hereunder, the Contractor may terminate performance under this Contract by written notice to the Owner and the Engineer. In such event, the Contractor shall be entitled to recover from the Owner as though the Owner had terminated the Contractor's performance under this Contract for convenience pursuant to Subparagraph 16.1.1.1 hereunder.

ARTICLE 15

15.1 OWNER'S RIGHT TO SUSPEND CONTRACTOR'S PERFORMANCE

15.1.1 The Owner shall have the right at any time to direct the Contractor to suspend its performance, or any designated part thereof, for any reason whatsoever, or without reason. If any such suspension is directed by the Owner, the Contractor shall immediately comply with same;

15.1.2 In the event the Owner directs a suspension of performance under this Article 15, through no fault of the Contractor, the Owner shall pay the Contractor as full compensation for such suspension the Contractor's reasonable costs, actually incurred and paid, of:

(1) demobilization and remobilization, including such costs paid to subcontractors;

(2) preserving and protecting Work in place;

(3) storage of materials or equipment purchased for the Project, including insurance thereon;

(4) performing in a later, or during a longer, time frame than that contemplated by this Contract.

ARTICLE 16

16.1 TERMINATION BY THE OWNER

16.1.1 The Owner may terminate this Contract in accordance with the following terms and conditions:

16.1.1.1 The Owner may, for any reason whatsoever, terminate performance under this Contract by the Contractor for convenience. The Owner shall give written notice of such termination to the Contractor specifying when termination becomes effective. The Contractor shall incur no further obligations in connection with the Work and the Contractor shall stop Work when such termination becomes effective. The Contractor shall also terminate outstanding orders and subcontracts. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders. The Owner may direct the Contractor to assign the Contractor's right, title and interest under termination orders or subcontracts to the Owner or its designee. The Contractor shall transfer title and deliver to the Owner such completed or partially completed Work and materials, equipment, parts, fixtures, information and Contract rights as the Contractor has. When terminated for convenience, the Contractor shall be compensated as follows:

(1) The Contractor shall submit a termination claim to the Owner and the Engineer specifying the amounts due because of the termination for convenience together with costs, pricing or other data required by the Owner or the Engineer. If the Contractor fails to file a termination claim within one (1) year from the effective date of termination, the Owner shall pay the Contractor, an amount derived in accordance with Subparagraph (3) below;

(2) The Owner and the Contractor may agree to the compensation, if any, due to the Contractor hereunder;

(3) Absent agreement to the amount due to the Contractor, the Owner shall pay the Contractor the following amounts:

(a) Contract prices for labor, materials, equipment and other services accepted under this Contract;

(b) Reasonable costs incurred in preparing to perform and in performing the terminated portion of the Work, and in terminating the Contractor's performance, plus a fair and reasonable allowance for direct jobsite overhead and profit thereon (such profit shall not include anticipated profit or consequential damages); provided however, that if it appears that the Contractor would have not profited or would have sustained a loss if the entire Contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss, if any;

(c) Reasonable costs of settling and paying claims arising out of the termination of subcontracts or orders pursuant to Subparagraph 16.1.1.1 of this Paragraph. These costs shall not include amounts paid in accordance with other provisions hereof.

(d) The total sum to be paid the Contractor under this Subparagraph 16.1.1.1 shall not exceed the total Contract Price, as properly adjusted, reduced by the amount of payments otherwise made, and shall in no event include duplication of payment

16.1.1.2 If the Contractor does not perform the Work, or any part thereof, in a timely manner, supply adequate labor, supervisory personnel or proper equipment or materials, or if it fails to timely discharge its obligations for labor, equipment and materials, or proceeds to disobey applicable law, or otherwise commits a violation of a material provision of this Contract, then the Owner, in addition to any other rights it may have against the Contractor or others, may terminate the performance of the Contractor and assume possession of the Project site and of all materials and equipment at the site and may complete the Work. In such case, the Contractor shall not be paid further until the Work is complete. After final completion has been achieved, if any portion of the Contract Price, as it may be modified hereunder, remains after the cost to the Owner of completing the Work, including all costs and expenses of every nature incurred, has been deducted by the Owner, such remainder shall belong to the Contractor. Otherwise, the Contractor shall pay and make whole the Owner for such cost. This obligation for payment shall survive the termination of the Contract. In the event the employment of the Contractor is terminated by the Owner for cause pursuant to this Subparagraph 16.1.1.2 and it is subsequently determined by a Court of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination for Convenience under Subparagraph 16.1.1.1 and the provisions of Subparagraph 16.1.1.1 shall apply.

ARTICLE 17

17.1 LEGAL JURISDICTION

This agreement is made and delivered in the City of Dacula, Gwinnett County, Georgia. The Contractor and the Owner consent and agree that the Superior Court of Gwinnett County, Georgia shall have jurisdiction and venue over any action between the parties listed in the City of Dacula on Standard Form of Agreement Between Owner and Contractor.

Affidavit A

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 Dacula, has registered with and is participating in a federal work authorization program (any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603), in accordance with the applicability provisions and deadlines established in O.C.G.A. 13-10-91.

The undersigned further agrees that, should it employ or contract with any subcontractor(s) in connection with the physical performances of services pursuant to this contract with the City of Dacula, Contractor will secure from such subcontractor(s) similar verification of compliance with O.C.G.A. 13-10-91 on the Subcontractor Affidavit provided in Rule 300-10-01-.08 or a substantially similar form. Contractor further agrees to maintain records of such compliance and provide a copy of each such verification to the City of Dacula at the time the subcontractor(s) is retained to perform such services.

_____
Employment Eligibility Verification
User Identification Number

_____ _____
By: Date
Title:
Entity:

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE
_____ DAY OF _____, 2025.

_____
Notary Public

My Commission Expires:

_____

Affidavit B

SUBCONTRACTOR AFFIDAVIT AND AGREEMENT

By executing this Affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. 13-10-91, stating affirmatively that the individual firm, or corporation which is engaged in the physical performance of services under a contract with _____ has registered with and is participating in a federal work authorization program (any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603), in accordance with the applicability provisions and deadlines established in O.C.G.A. 13-10-91.

_____
Employment Eligibility Verification
User Identification Number

_____ _____
By: Authorized Officer or Agent Date
Subcontractor Name:

_____
Title of Authorized Officer or Agent
of Subcontractor

_____
Printed Name of Authorized Officer
or Agent

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE
_____DAY OF _____, 2025.

_____
Notary Public

My Commission Expires:

_____

Affidavit C

O.C.G.A. § 50-36-1(e)(2) SAVE Affidavit

By executing this affidavit under oath, as an applicant for a public benefit, as referenced in O.C.G.A. § 50-36-1, from the City of Dacula, the undersigned applicant verifies one of the following with respect to the application for a public benefit:

1) _____ I am a United States citizen.
2) _____ I am a legal permanent resident of the United States.
3) _____ I am a qualified alien or non-immigrant under the Federal Immigration and Nationality Act with an alien number issued by the Department of Homeland Security or other federal immigration agency.

My alien number issued by the Department of Homeland Security or other federal immigration agency is: _____.

The undersigned applicant also hereby verifies that he or she is 18 years of age or older and has provided at least one secure and verifiable document, as required by O.C.G.A. § 50-36-1(e)(1), with this affidavit.

The secure and verifiable document provided with this affidavit can best be classified as:

_____.

In making the above representation under oath, I understand that any person who knowingly and willfully makes a false, fictitious, or fraudulent statement or representation in an affidavit shall be guilty of a violation of O.C.G.A. § 16-10-20, and face criminal penalties as allowed by such criminal Statute.

Executed in _____ (City), _____ (State).

_____
Signature of Applicant

_____
Printed Name of Applicant
SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE
___ DAY OF _____, 2025.

_____
Notary Public

My Commission Expires:

_____

SECTION 00801

SUPPLEMENTARY CONDITIONS (1997)

he following supplements modify, delete, or add to the "General Conditions of the Contract for Construction, 1997 Edition". Where any article, paragraph or sub-paragraph in the General Conditions is supplemented by one of the following paragraphs, the provisions of such article, paragraph, or sub-paragraph shall remain in effect and the supplemental provisions shall be considered added thereto. Where any article, paragraph, or sub-paragraph, in the General Conditions is amended, voided, or superseded by any of the following paragraphs, the provisions of such article, paragraph or sub-paragraph not so amended, voided, or superseded shall remain in effect.

I. ARTICLE 1 - GENERAL PROVISIONS

A. Add to paragraph 1.1.1: The Drawings and Specifications shall include the Instructions to Bidders, Invitation to Bid, Sample Forms, Contractor's Bid, and all Addenda items relating to Bidding.

B. Add to paragraph 1.1.7: The term "Project Manual" as used in these conditions is the volume which includes the Bidding Drawings and Specifications, the Agreement Between Owner and Contractor, the Conditions of the Contract, the Specifications, and all Addenda issued prior to, and all Modifications issued after execution of Contract.

II. ARTICLE 2 - OWNER

A. Add paragraph 2.1.4: The Owner is the City of Dacula, Georgia. All contact with the Owner shall be made to and through the Owner’s Representative (Engineer), Kevin D. Whigham, P.E., Bowman, 770-932-6550 or kwhigham@bowman.com. The only other directions the Contractor may respond are those issued by the City of Dacula Council, Mayor, City Planner, or City Administrator.

B. Add to paragraph 2.2.5:

1. Sets of Construction Documents may be obtained as provided for in Advertisement to Bid, which need not be returned by the successful bidder.
2. For construction purposes, the Owner will furnish free of charge to the successful bidding Contractor a maximum of Five (5) printed sets of complete Construction Documents consisting of the Drawings, the Specifications, and all Addenda.
3. Any additional sets of complete Construction Documents or additional copies of selected sheets of Contract Drawings, or sections or pages of Specifications requested by the Contractor will be supplied and billed to the Contractor.

C. Add paragraph 2.4.2: "If, in the opinion of the Engineer, it is evident that the Contractor has not completed or will not be able to substantially complete the work in accordance with Drawings and Specifications due to default, negligence, or failure on the part of the Contractor, or their subcontractors, the Owner may, at his option, without prejudice, after the expiration of the two seven-day written notices to the Contractor, complete certain portions of the work as may be necessary, or augment the forces of the Contractor with additional manpower as may be required to complete the work by the contracted completion date. In such case, an appropriate deductive change order shall be written, deducting from the contract price the actual costs incurred by the Owner to complete or augment the work. Amount charged to the Contractor will be subject to the approval of the Engineer. Such action, if taken by the Owner, shall not be interpreted by the Contractor as a termination of the contract as per Paragraph 14.2, and the Contractor is to continue to carry out the work or portions of the work as may be required by the contract during this time frame.

III. ARTICLE 3 - CONTRACTOR

A. Add paragraph 3.2.4:

3.2.4 In case of discrepancies or conflicts in the Drawings and Specifications, the documents to hold precedence over others shall be in the following order:

3.2.4.1 The Owner-Contractor Agreement (including modifications thereto).
3.2.4.2 Change Orders - Those of a later date shall take precedence over those of an earlier date.
3.2.4.3 Written Amendments to the Contract Signed by Both Parties - Those of a later date shall take precedence over those of an earlier date.
3.2.4.4 Addenda - Those of a later date shall take precedence over those of an earlier date.
3.2.4.5 Clarifications.
3.2.4.6 Supplementary Conditions.
3.2.4.7 General Conditions.
3.2.4.8 Specifications.
3.2.4.9 Schedules.
3.2.4.10 Details - Large scale details shall control over small scale drawings.
3.2.4.11 Other drawings.
3.2.4.12 Drawings dimensioned.
3.2.4.13 Drawings not dimensioned.

B. Add paragraph 3.2.5:

3.2.5 Items of work not illustrated in the drawings or specifications or the mis-

description of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or mis-described details of the work, but they shall be performed as if fully and correctly set forth and described in the drawings and specifications.

C. Add paragraph 3.2.6 as follows:

3.2.6 MEASUREMENTS AND DIMENSIONS

3.2.6.1 The Contractor shall check and be responsible for correctness of all dimensions by taking measurements at the project site before ordering material or doing work dependent for proper size of installation upon coordination with job conditions.

3.2.6.2 The Contractor shall refer discrepancies between Drawings, Specifications, and Project Conditions to Engineer for adjustment before work affected thereby is begun.

3.2.6.3 No consideration shall be given any claim based on difference between actual dimensions and those illustrated on the drawings without first complying with 3.2.6.2 above.

D. Add paragraph 3.3.8: All grades, lines, levels, and benchmarks for the work under this Contract shall be established and maintained by the Contractor, who shall verify all grades, lines, levels, and dimensions indicated on the Drawings, and shall report all discrepancies before commencing work. The Contractor shall provide and maintain well-built batter boards at corners. He shall establish and safeguard benchmarks in at least two widely separated places. As work progresses, he shall establish and safeguard benchmarks at each level and shall establish exact locations of partitions on rough floors as a guide to trades. Any costs of corrective measure necessitated by erroneous establishment of grades, lines, levels and benchmarks shall be paid for by the Contractor.

E. Replace paragraph 3.7.1 with the following:

3.7.1 The Owner shall pay for any Permit and/or other jurisdictional fees. The Contractor shall secure and pay for all other governmental permits, fees, licenses and inspections necessary for the proper execution and completion of the work, which are customarily secured after execution of the contract, and which are legally required at the time the construction begins.

F. Add paragraph 3.7.6 Required permits, licenses, inspections, and certificates shall be

carefully preserved and prominently posted during the construction period at the project for the easy, convenient access by the various inspecting authorities.

G. Add paragraph 3.19 as follows:

3.19 PRE-CONSTRUCTION MEETING

3.19.1 A Pre-Construction Meeting shall be held prior to commencement of work. The purpose of this conference is to introduce all members of the construction team, which include the Engineer, the Contractor's Project Manager, and the Contractor's Superintendent, to review and ensure all Drawings and Specifications and Submittals are completed and in compliance with all Agreements. In addition, the Contractor shall submit 2 copies of all Post-Bid Information, as described below, for the Owner and Owners' Representative's review.

3.19.2 A schedule of values for each major item of work included in the Contract shall be submitted on schedule of values cost index sheets contract and shall define both labor and materials costs for each. Provide breakdown per divisions and sections per table of contents of these specs. See sample form included in Bid for Lump Sum Contracts.

3.19.3 A statement designating all work to be performed by the Contractor's own forces shall be submitted.

3.19.4 A list of the name of all Sub-Contractors and names of other organizations proposed for each portion of the Work shall be properly executed on "List of Subcontractor's" - and shall be submitted for Owner's and Engineers' review with 24-hour phone numbers.

3.19.5 The Performance Bond shall be properly executed on acceptable forms and submitted in duplicate, as described in Section 00 600 - Bonds and Certificates. Bond rating letter shall be included.

3.19.6 The Labor and Materials Bond shall be properly executed on acceptable forms and submitted in duplicate.

3.19.7 The Certificate for Insurance shall be properly executed on acceptable forms and submitted in duplicate.

3.19.8 A list of the names of all suppliers of principal materials and equipment shall be submitted for Owner's and Engineer's review.

3.19.9 Construction Schedule submitted to Owner within two weeks of award of contract.

3.19.10 A schedule of submittals including certifications, shop drawings, product data, samples, manuals, as built drawings and guarantees with dates of proposed submittals shall be submitted.

3.19.11 In addition to submittal of the previous items, the following topics will be discussed. The General Contractor is encouraged to have all subcontractors represented at the conference:

3.19.11.1 Introduction of all attending parties.

3.19.11.2 Channels and procedures for communication shall be discussed.

3.19.11.3 Requests for substitution shall be issued in accordance with the requirements of Section 01630.

3.19.11.4 Issuance of RFP's (Requests for Proposals) by the Engineer shall be addressed by the General Contractor within 7 calendar days of receipt thereof in accordance with Supplementary Conditions, Article 7.

3.19.11.5 Change Order compensation shall be based on figures indicated in Supplementary Conditions, Article 7.

3.19.11.6 Pre-construction submittals shall be issued as indicated in Supplementary Conditions, sub-paragraph 3.19.

3.19.11.7 Any requested shop drawings, samples and other project submittals shall be approved by Owner and Engineer.

3.19.11.8 Job Progress Meetings shall be held on an as needed basis to review the Contractor's Application(s) for Payment.

3.19.11.9 Applications for Payment shall be issued in accordance with the requirements of Article 9 of the General Conditions of the Contract for Construction and all applicable Supplementary Conditions. All Applications for Payment shall be received by the Engineer no later than the first day of each month and paid by the first Friday following the 15th day of the month. Retainage shall be as described in Supplementary Conditions, paragraphs 9.3.4, 9.6 and 9.6.6. (Retainage shall be 10 percent of the amount earned for the work in place, plus the value of stored materials up to and including 50 percent completion, then 0 percent until final

completion, thereby reducing retainage at final completion to 5 percent of the contract amount (including change orders), subject to the approval of the Owner and the Engineer. In other words, at 50 percent project completion, retainage will be 5 percent of the contract amount, plus approved change orders, until final completion is achieved. Retainage for individual subcontractors shall not be released separately as the subcontractors complete their work. Nor shall the retainage for individual subcontractors be reduced when payments beyond 50% of the individual contracts are released. Retainage shall only be reduced based on payments released in excess of 50% of the overall contract sum.

3.19.11.10 Safety precautions and programs shall be as directed by the General Contractor in accordance with the General Conditions in Section 00700.

3.19.11.11 Requests for time extension shall be issued in accordance with the requirements of the General and Supplementary Conditions, Article 8.

3.19.11.12 Discrepancies and conflicts in the Drawings and Specifications shall be resolved using the order of precedence indicated in the Supplementary Conditions, paragraph 3.2.4.

3.19.11.13 The Date of Substantial Completion shall not be achieved, and the Certificate of Substantial Completion shall not be issued prior to receipt of the official Certificate of Occupancy by the General Contractor. This requirement is indicated in Specification Section 01700, Part 1.1.A. In addition, the Certificate of Substantial Completion shall only be issued in accordance with the requirements of Section 9.8 of the General Conditions of the Contract for Construction.

3.19.11.14 Contract closeout/final payment requirements are indicated in Section 01 700. Piecemeal delivery of final closeout documents and materials is unacceptable.

3.19.11.15 Materials testing shall be conducted under a separate contract by the Owner. Contractor shall coordinate with Owner’s Geotechnical Engineer to perform all testing which will be paid for by the Owner. The General Contractor shall note that he is responsible for payment of additional testing services, if initial testing services fail.

3.19.11.16 Immediately prior to Substantial Completion, the General Contractor shall prepare a comprehensive list of items to be corrected or completed (a punch list) for the Engineer's review, in accordance with paragraph 9.8.2 of the General Conditions. The Engineer shall then add to or delete items

from the list during a Substantial Completion Inspection.

3.19.11.17 Permits, fees, licenses, etc. shall be addressed in accordance with the requirements of General Conditions, paragraph 3.7.1, all applicable Supplementary Conditions, and as follows:

A. All work and material shall be in accordance with the National Electrical Code, the Plumbing Code, and other applicable Federal, State, County, and municipal laws, ordinances, rules and regulations pertaining to construction, and nothing in these Drawings or specifications shall be construed to permit work not conforming thereto. The Contractor shall consult the Engineer on all deviations regarding possible noncompliance and provide all labor and materials to complete the work as required by laws, ordinances, rules and regulations as directed by the Owner at no increase in cost to the Owner. He shall first confer with the Engineer before making any determinations as to changes in quality, scope and/or increases in cost.

3.19.11.18 Compensation for stored materials shall be as defined in parts 6.2.1, 9.3.2, and 10.2.1.2 of the General Conditions, and as follows:

H. Material delivered for the Contractor to locations other than the site may be taken into consideration in the preparation of pay requests at the discretion of Engineer, provided the Contractor furnishes satisfactory evidence that he has acquired title to such material that it will be utilized on the project covered by this contract in the form of an affidavit stating such. Contractor must provide proof of acceptable insurance coverage on material stored off-site prior to payment for same as well as invoices for such stored materials indicating transfer of the property to the Owner.

IV. ARTICLE 4 - ADMINISTRATION OF THE CONTRACT

A. Add to paragraph 4.1.1: The Engineer referred to in the Contract, the General Conditions, Supplementary Conditions, or other documents of the Contract shall mean the "Engineer", Bowman Consulting Group, Ltd., 4174 Silver Peak Parkway, Suwanee, GA 30024.

B. Delete Paragraph 4.5 (Arbitration) in its entirety.

V. ARTICLE 7 - CHANGES IN THE WORK

A. Add to paragraph 7.1.1

No extra work is to be done without a written change order. Payment will not be

authorized for any extra or changed work for which the Contractor has failed to secure such written change order. All change orders must be signed by the Engineer and Owner.

B. Delete paragraph 7.3 "Construction Change Directives" in its entirety.

VI. ARTICLE 8 - TIME

A. Add sub-paragraph 8.1.5:

8.1.5 A working day is a day for which no premium pay is required of the Contractor for labor.

B. Add paragraph 8.2.4

8.2.4 Upon the determination that the construction progress is two (2) weeks behind the original construction schedule as required by the General Conditions as submitted at the start of the project the Owner will require that the Contractor increase his work effort to a six (6) day ten (10) hour per day work week.

C. Add sub-paragraph 8.2.5

8.2.5 When requested by the Engineer, the Contractor shall furnish reports as are reasonably desirable as to the progress, condition of the job and anticipated schedule of completing the various phases of the work.

D. Add paragraph 8.4 - Rain Days

8.4 Requests for extension shall be issued in writing by the Contractor to the Engineer within 21 calendar days of the event which causes the delay. This requirement shall be strictly enforced. Completion time will not be extended for normal bad weather. The time for completion as stated in the Drawings and Specifications includes due allowance for days on which work cannot be performed out-of-doors. Any days lost due to the weather shall be documented and verified with the National Weather Service. These days shall be reported by the Contractor at the monthly job site progress meeting.

For the purpose of this contract, the Contractor agrees that he may expect to lose working days to weather in accordance with the following table:

January - 14 days	May - 6 days	September - 2 days
February - 14 days	June - 3 days	October - 3 days
March - 10 days	July - 4 days	November - 5 days

April - 7 days August - 2 days December - 9 days

If the total accumulated number of working weekdays (Monday thru Friday) lost to the weather from the start of work until the building is enclosed, as defined by the Engineer, exceeds the total accumulated number to be expected for the same period from the table above, the contractual completion date shall be extended by the number of calendar days needed to include the excess number of days lost. No extension shall be made for days of bad weather occurring after the building is enclosed. No extension shall be allowed for days on which total precipitation volume is less than 1/10" as recorded by the National Oceanic and Atmospheric Administration, the National Weather Service, the U.S. Army Corps of Engineers, or any other source chosen to be recognized by the Engineer. No extension will be allowed for precipitation occurring on any Saturday or Sunday or nationally recognized holidays during the project life. Furthermore, should a project fall behind the Contractor's original construction schedule, no extensions will be given for inclement weather days beyond the originally scheduled dry-in date plus any additional days due Contractor during such originally scheduled period. No changes in the contract sum shall be authorized because of adjustment of contract time due to inclement weather.

VII. ARTICLE 9 - PAYMENTS AND COMPLETION

A. Add paragraph 9.2.2:

9.2.2 First Payment Application Actions and Submittals which must precede submittal of Contractor's first payment application are as follows:

B. Add paragraph 9.2.3:

9.2.3 The schedule of values shall be prepared in a line-item format on Application and Certification for Payment and on Document G703 Continuation Sheet provided in Section 01 370, providing labor and material costs for each line item. Stored materials shall be summarized on the Continuation Sheet provided in Section 01 370.

C. Delete paragraph 9.3.1 entirely and add paragraph 9.3.1:

9.3.1 The Contractor shall submit to the Engineer, on or before the first day of each month, an itemized Application for Payment, notarized by a duly registered Notary Public, supported by data substantiating the Contractor's right to payment as the Owner or the Engineer may require, and reflecting retainage, as provided elsewhere in the Drawings and Specifications. The Form of Application for Payment shall be the Certificate for Payment in Section 01 370. Supporting

data shall include Schedule of Values from each Subcontractor requesting payment, broken down by labor and materials as the Engineer requires. Copies of requisitions from subcontractors and material suppliers may be required.

D. Add to the end of subparagraph 9.3.2:

9.3.2. Values related to General Contractor's and Subcontractor's overhead and profit for stored materials shall not be paid until the products are incorporated into the project. Materials stored or installed shall not be paid for if required submittals have not been completely reviewed.

E. Add new sub-paragraph 9.3.4 as follows:

9.3.4 Each Application for Payment up to and including the Application for Payment issued at or following 50% project completion (including approved change orders) shall include a ten percent (10%) retainage of all completed and stored to date items (including approved change orders).

F. In paragraph 9.4.1, in the first sentence delete "within seven days" and add "by the eighth day of the same month".

G. Add paragraph 9.5.1.9:

9.5.1.9 It shall be understood that if the Contractor's actual progress becomes more than 10% behind Contractor's anticipated progress, the Owner may direct the withholding of payments to Contractor in amounts equal to the percent behind Contractor's anticipated progress, in addition to the normal 10% withheld.

H. At paragraph 9.6.1, delete the phrase, "In the manner and within the time provided in the Drawings and Specifications", and in its place use, "On the first Friday following the fifteenth of the same month."

I. Add new sub-paragraph 9.6.6 as follows:

9.6.6.1 It shall be understood that the Owner shall make progress payments on account of the contract prices, including Owner approved and signed change orders, of labor and materials incorporated in the work and of materials suitably stored at the site thereof, as estimated by the Engineer, less the aggregate of previous payments, until one-half (50%) of the overall contract sum is due (including all Owner approved and signed change orders) and provided that:

a. The work is not behind schedule as determined, by the Engineer only, from

the Engineer accepted, time scaled CPM schedule with monthly anticipated progress payment amounts submitted at, or before, the Pre-construction meeting;
b. The work is being performed in a satisfactory manner in compliance with the Drawings and Specifications as determined by the Engineer;
c. There are no outstanding claims or liens on the property;

9.6.6.2 Further payments beyond 50 percent of the overall contract sum as referenced in 9.6.6.1, with total compliance of Items a, b, and c. shall be made in the amount of 100% of the value of the labor and/or materials incorporated in the work and of materials suitably stored at the site thereof unless;
a. The percentage of work complete falls behind the percentage required by the Engineer accepted, time scaled construction progress schedule, as described in Item 9.6.6.1.a. by as much as 10%; or
b. The work is being performed in an unsatisfactory manner and/or non-compliant with the Drawings and Specifications as determined by the Engineer; or
c. There are outstanding claims or liens on the property.

9.6.6.3 In which event or events, the Owner shall reinstate the 10% retainage on all periodical payments to be paid while one or more of the events continue to exist. The Contractor shall be given written notice, by the Engineer, of the reinstatement of the retainage. If the Contractor's actual progress becomes more than 10% behind the Contractor's anticipated progress, as described in Item 9.6.6.1.a., the Engineer may direct the withholding of payments to the Contractor in amounts equal to the percentage behind the Contractor's anticipated progress, in addition to the 10% described in all Items of Article 9.

9.6.6.4 If the Contractor recovers all lost time and puts the work back on schedule (0% behind schedule) per schedule described in 9.6.6.1.a and remedies all breaches of 9.6.6.2.b. and 9.6.6.2.c. further payments shall be as described in 9.6.6.2; unless Items 9.6.6.1.a. or 9.6.6.2.b. and 9.6.6.2.c. recur in which event or events the Owner shall reinstate Item 9.6.6.3.

J. In paragraph 9.7.1, in the first delete "within seven days" and add "by the eighth day of the month"; in the fourth line delete "within seven days after the date established in the Drawings and Specifications" and add "as described in paragraph 9-6-1".

K. Add paragraph 9.9.4:

9.9.4 Should the Project, or any portion thereof, be incomplete for Substantial Completion or final completion at the scheduled date or dates, the Owner shall have the right to occupy any portion of the Project. In such an event,

the Contractor shall not be entitled to any extra compensation on account of said occupancy or by the Owner's normal full use of the project, nor shall the Contractor interfere in any way with said normal full use of the project. Further, the Contractor shall not be relieved of any responsibilities of the Contractor, including the required times of completion. Such occupancy by the Owner does not, in itself, constitute Substantial Completion nor Final Completion.

L. Add paragraph 9.10.6:

9.10.6 Reduction in retainage shall not be made automatically. Any reduction in retainage shall only be considered based on the condition of the project at the time of issuance of the Certificate of Substantial Completion.

M. Add paragraph 9.10.7:

9.10.7 In the event that Final Completion is not achieved within 60 days of the contracted date of Substantial Completion through no fault of the Owner or Engineer, the Contractor shall pay Owner amounts equal to the actual Owner's costs of continuing to provide administrative services on this Contract, until Final Completion.

N. Add paragraph 9.10.8:

9.10.8 Final Payment Application - Actions and submittals which must precede or coincide with submittal of contractor's final payment application are listed in Section 01700.

O. Add paragraph 9.11

9.11 Article 1 of Chapter 10 of Title 13 of the Official Code of Georgia Annotated, relating to general provisions affecting contracts for public works, is amended by adding at the end of said article a new Code section to be designated as Code Section 13-10-2, which is hereby made a part of this Contract, to read as follows:

A. As used in this Code section, the term:
1. "Contractor" means a person having a direct contract with the Owner.
2. "Lower tier subcontractor" means a person other than a contractor having a direct contract with a subcontractor.
3. "Owner" means the state, any county, municipal corporation, authority, board of education, or other public board, public body, department, agency, instrumentality, or political subdivision of the state.

4. "Engineer" means the Engineer or Engineer in charge of the project as authorized by the Owner or such other contract representative or officer as designated in the Drawings and Specifications as the party representing the Owner's interest regarding administration and oversight of the project.
5. "Subcontractor" means a person other than an owner having a direct contract with the Contractor.

B. In any contract for the performance of any construction project entered into on or after July 1, 1985, with an owner, as defined in paragraph (3) of subsection (a) of this Code section, such contract shall provide for the following:

After work has commenced at the construction site, progress payments to be made on some periodic basis, and at least monthly, based on the value of work completed as may be provided in the Drawings and Specifications, plus the value of materials and equipment suitably stored, insured, and protected at the construction site, and at the Owner's discretion such materials and equipment suitably stored, insured and protected off-site at a location approved by the Engineer when allowed by the Drawings and Specifications, less retainage; and

1. Retainage to a maximum of 10 percent of each progress payment; provided, however, that when 50 percent of the contract value, including change orders and other additions to the contract value provided for by the Drawings and Specifications is due and the manner of completion of the contract work and its progress are reasonably satisfactory to the Engineer, the Owner shall withhold no more retainage. At the discretion of the owner and with the approval of the Contractor, the retainage of each subcontractor may be released separately as the subcontractor completes his work.
2. If, after discontinuing the retention, the owner's authorized contract representative determines that the work is unsatisfactory or has fallen behind schedule, retention may be resumed at the previous level. If retention is resumed by an owner, the Contractor and subcontractors shall be entitled to resume withholding retainage accordingly.
3. At substantial completion of the work or such other standard of completion as may be provided in the Drawings and Specifications and as the Owner’s Representative determines the work to be reasonably satisfactory, the Owner shall within 30 days after invoice and other appropriate documentation as may be required by the Drawings and Specifications are provided pay the retainage to the Contractor. If at that time there are any remaining incomplete minor items, an amount equal to 200 percent of the value of each item as determined by the

Engineer shall be withheld until such item or items are completed. The reduced retainage shall be shared by the Contractor and subcontractors as their interests may appear.

4. The Contractor shall, within ten days from the contractor's receipt of retainage from the Owner, pass through payments to subcontractors and shall reduce each subcontractor's retainage in the same manner as the Contractor's retainage is reduced by the Owner, provided that the value of each subcontractor's work complete and in place equals 50 percent of his subcontract value, including approved change orders and other additions to the subcontract value and provided, further, that the work of the subcontractor is proceeding satisfactorily and the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his work including any warranty work as the Contractor in his reasonable discretion may require, including, but not limited to, a payment and performance bond.
5. The subcontractor shall, within ten days from the subcontractor's receipt of retainage from the contractor, pass through payments to lower tier subcontractors and shall reduce each lower tier subcontractor's retainage in the same manner as the subcontractor's retainage is reduced by the contractor, provided that the value of each lower tier subcontractor's work complete and in place equals 50 percent of his subcontract value, including approved change orders and other additions to the subcontract value and provided, further, that the work of the lower tier subcontractor is proceeding satisfactorily and the lower tier subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his work including any warranty work as the subcontractor in his reasonable discretion may require, including, but not limited to, a payment and performance bond.

C. This Code section shall not apply to:
   1. Any contracts let by the Department of Transportation of this state for the construction, improvement, or maintenance of roads or highways in this state or purposes incidental thereto; or
   2. Any contracts whose value or duration at the time of the award does not exceed $150,000.00 or 45 days in duration.

D. Contract and subcontract provisions inconsistent with the benefits extended to contractors, subcontractors, and lower tier subcontractors by this Code section shall be unenforceable; provided, however, that nothing in this Code section shall render unenforceable any contract or subcontract provisions allowing greater benefits to be extended to such contractors,

subcontractors, or lower tier subcontractors, the provisions and benefits of this Code section being minimal only.

E. Nothing shall preclude a payor under this Code section, prior to making a payment, from requiring the payee to submit satisfactory evidence including any or all invoices that all payrolls, material bills, and other indebtedness connected with the work have been paid.

In addition to the foregoing, before the Owner can implement the above amendment to the contract, a letter of consent from the Surety Company must be provided to the Owner ten (10) days prior to the Contractor's request to the Owner to withhold no more retainage under the terms of 13-10-2.

F. Add to paragraph above, paragraph B.,1.,a): Conditions for the reduction of retainage from 10 percent to no retainage are:

1. The work is not behind schedule as determined by the Engineer only, from the Engineer approved, time scaled CPM schedule with monthly anticipated progress payment amounts submitted at or before the Pre-construction meeting;
2. The work is being performed in a satisfactory manner in compliance with the Drawings and Specifications as determined by the Engineer;
3. There are no outstanding claims or liens on the property. Contractor shall submit, with pay request, a lien release form for each subcontractor requesting payments these lien release forms shall be properly notarized.
4. Further payments, with total compliance of B.1, B.2 and B.3 shall be made in the amount of 100% of the value of the labor and/or materials incorporated in the work and of materials suitably stored at the site thereof unless:
    a. The percentage of work complete falls behind the percentage required by the construction progress schedule, as described in B.1 by as much as 10%; or
    b. The work is being performed in an unsatisfactory manner and/or non-compliant with the Drawings and Specifications as determined by the Engineer; or
    c. There are outstanding claims or liens on the property.
    d. In which event or events, the Owner shall reinstate the 10% retainage on all periodical payments to be paid while one or more of the events continue to exist. The Contractor shall be given written notice, by the Engineer, of the reinstatement of the retainage. If the Contractor's actual progress becomes more than 10% behind the Contractor's anticipated progress, as described

in Item 9.6.6.1.a. the Engineer may direct the withholding of payments to the Contractor in amounts equal
to the percentage behind the Contractor's anticipated progress, in addition to the 10% described in all Items of Article 9.

5. If the Contractor recovers all lost time and puts the work back on schedule (0% behind schedule) per schedule described in 9.6.6.1.a. and remedies all breaches of 9.6.6.2.b and 9.6.6.2.c further payments shall be as described in 9.6.6.2; unless Items 9.6.6.1.a or 9.6.6.2.b and 9.6.6.2.c recur in which event or events the Owner shall reinstate Item 9.6.6.3.

VIII. ARTICLE 11 - INSURANCE AND BONDS

A. Delete paragraph 11.1.2 in its entirety and substitute the following:

11.1.2. The insurance required by paragraph 11.1.1 shall be written for not less than any limits of liability listed below or required by law, whichever is greater, and shall include contractual liability insurance as applicable to the Contractor's obligations under paragraph 3.18. The Contractor agrees that, prior to the beginning of any work by the Contractor or any Subcontractor, as the case may be, he (the Contractor) will furnish the following to the Owner for himself, and will obtain, and retain in his files for the duration of the construction period, like certificates for each Subcontractor. Certificate from insurance company showing coverage of Workmen's Compensation Insurance for the State of Georgia or a certificate from Georgia Workmen's Compensation Board showing proof of ability to pay compensation directly. Certificate from insurance company showing coverage for the Contractor for the following:

1. Contractor's Protective and Public Liability Insurance: Taken out in the name of the Contractor.
2. Personal Injury, including death - minimum limits of $500,000 for each person and $1,000,000 for each accident.
3. Property Damage, minimum limits of $300,000 for each accident and $500,000 for aggregated of operations.
4. Disposition: Certificate of Insurance must be sent to Engineer prior to commencement of work. See following for endorsement required on this certificate.

B. Delete paragraph 11.1.3 in its entirety and substitute the following:

11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the work. These certificates shall contain a statement on every policy or certificate, as the case may be, that "The

insurance company agrees that Policy No._____shall not be canceled, changed, or allowed to lapse until ten (10) days after the Owner and Engineer have received written notice as evidenced by return receipt of registered letter".

C. Add paragraph 11.1.1.8:

11.1.1.8 Liability insurance shall include all major divisions of coverage and shall be on a comprehensive form including:

1. Premises - Operations
2. Independent Contractor's Protective, for Owner and Contractor
3. Products and Completed Operations (in force for one year beginning at Date of Substantial Completion)
4. Contractual - including specified provisions for the Contractor's obligations under Paragraph 3.18.
5. Owned, non-owned, and hired motor vehicles
6. Broad form coverage for property damage
7. Explosion and collapse hazard
8. Underground hazard

D. Delete paragraph 11.2 in its entirety.

E. Delete paragraph 11.3 in its entirety and substitute the following:

11.3 The Contractor shall purchase and maintain property insurance upon the entire work at the site, to the full (100%) insurable value thereof. This insurance shall include the interest of the Owner and the Contractor in the work and shall insure against the perils of fire, extended coverage, and shall include "all risk" insurance for physical loss or damage including, without duplication of coverage, theft, vandalism and malicious mischief.

F. Delete Paragraph 11.4.1 in its entirety and substitute the following:

11.4.1 Contractor shall furnish both a Performance Bond and a Payment Bond, each in the amount of 100% of the Contract Sum, unless otherwise directed by the Engineer. Contractor shall also provide both Performance Bond and Payment Bond for his major subcontractors, including HVAC, electrical, plumbing, roofing, and sprinkler. The sureties must be authorized to do business in the State of Georgia and listed on "Department of the Treasury Circular 570". In addition, companies furnishing bonds shall have an A.M. Best Company rating of at least a Class "A" with a financial size of VI or better. Bonds must be accompanied by letter stating company's current rating for verification prior to acceptance by the Owner and execution of

the formal Owner/Contractor agreement.

IX ARTICLE 13 - MISCELLANEOUS PROVISIONS

A. Delete paragraph 13.5.3 entirely and replace as follows:

13.5.3

1. When initial tests indicate non-compliance with the Drawings and Specifications, all subsequent retesting caused by the non-compliance shall be performed by the same testing laboratory and the costs thereof will be deducted by the Owner from the contract sum.
2. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.
3. All specimens and samples for testing, unless otherwise provided in these Drawings and Specifications, will be taken by the testing laboratory. All sampling equipment and personnel will be provided by the testing laboratory and all deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

END OF SECTION

SECTION 00802

NOTICE OF COMMENCEMENT

Public Works

To: Clerk of Superior Court of Gwinnett County, Georgia

Pursuant to O.C.G.A. 36-82-104(f), not later than 15 days after physically commencing work, the undersigned gives Notice of Commencement of a public work including the following information:

1. _____

2. "Site Work for the Administration Building Complex Project" in the City Limits of Dacula, Georgia.

3. Name and address of the state, country, municipal corporation, or public board or body thereof which is doing the public work:

   City of Dacula
   P.O. Box 400
   Dacula, Georgia 30019

4. Name and address of the surety for the performance and payment bonds, if any:
   _____

5. Name and address of the holder of the security deposit provided pursuant to O.C.G.A. 13-10(b)(2)(B), if any: N/A

   Contractor

   Date

These documents must be filed with the Clerk of the Superior Court for the county in which the public work is located, and a copy of this document must be posted at the public work site not later than 15 days after the Contractor physically commences work on the public work.

Within ten (10) calendar days of receipt of a written request, give a copy of this Notice of Commencement to any subcontractor, materialman, or person making the request.

END OF SECTION

SECTION 00900

ADDENDA AND CLARIFICATIONS

PART 1 - GENERAL

1.1 The following changes have been incorporated in the Construction Documents dated December 5, 2024, (Released for Construction).

a. Addendum No. 1, dated _____, 2025.

b. Addendum No. 2, dated _____, 2025.

c. Addendum No. 3, dated _____, 2025.

Copies of these documents are included herein.

PART 2 - N/A

PART 3 - N/A

END OF SECTION

PROJECT SCOPE AND SUMMARY OF WORK
FOR
"SITE WORK FOR THE ADMINISTRATION BUILDING COMPLEX PROJECT"

1.0 GENERAL

1.1 DESCRIPTION:

A. Work Included: The intent and meaning of the Contract Documents is that the General Contractor, under the terms of the Contract, shall take all actions necessary and required to provide all labor, plant, materials, supplies, equipment, transportation, facilities, and appurtenances which are indicated or implied by each drawing and each section of the specifications, all of which are collectively necessary and required for the construction of the described project.

B. Description of Requirements:

1. Definitions: Specific definitions related to terminology of this section include, but are not limited to the following:
2. Work: Refer to the General Conditions.
3. Project: Refer to the General Conditions: the terms "Work" and "Project" have substantially the same meaning in these Contract Documents; because, substantially, the work of the Contract is recognized to be the complete project.
4. Other Definitions: Refer to other portions of the Contract Documents.

C. Project/Work Description: The name of the project is as listed on the title page of the drawings and project manual.

1. The work of this contract includes Drawings and Specifications referred to in the Contract Documents as prepared by: Bowman Consulting Group, dated December 5, 2024.
2. The Drawings and Specifications are further identified by the index to the Contract Documents appearing in the front of the Project Manual.

D. Summary by Reference: The work can be summarized by reference to the requirements of the various Contract Documents, which in turn make references to the requirements of other applicable provisions which control or influence the work; and these references can be summarized but are not necessarily limited to the following:

1. Executed Owner & Contractor Agreement (not bound herewith).
2. General Conditions (included).
3. Drawings (listed in a "Schedule of Drawings" as of the date of these Contract Documents) and Index on the cover sheet of the Drawings.

4. Addenda and modifications to the Contract Documents (distributed by transmittal subsequent to the binding thereof).
5. Governing regulations which have a bearing on the performance of the work. Copies can be obtained from or reviewed at the local State or Federal Agency responsible for the regulation in each case. See Section 01061 for applicable local codes.
6. Submittals, copies of which are retained by the Contractor at the site.
7. Miscellaneous elements of information having a bearing on the performance of the work, such as weather forecasts and reports of general trade union negotiations; copies must be obtained by the Contractor through normal channels of information.

E. Summary: Briefly and without force and effect on the requirements of the Contract Documents, the project and the work of the Contract can be described in summary as follows:

1. The work includes, but is not limited to sitework for a new middle school, including the following: .
a. Sitework, including, earthwork, site utilities, walks, paving and curb and gutters.
b. Clean-up of the entire project site.
c. Submission of all close-out documents.

1.1 SCOPE OF WORK

The Work to be completed for this Project includes, but is not limited to furnishing all labor, materials, grading and earthwork, construction operations, details, supervision, and coordination of all trades, utility suppliers, governmental inspections, and approvals to complete the construction, installation, and coordination for the City of Dacula "Site Work for the Administration Building Complex Project" as follows:

A) The scope of work includes mass grading of the entire site for the construction of the Dacula Administration Building Complex. Construction and installation of the Underground Stormwater Management System (StormPrism Concrete Vaults), Storm Sewer System, Sanitary Sewer System, Water Distribution System, Concrete Retaining Walls, Electrical Service Lines and Conduits, Rigid Paving and Site Concrete, Flexible Paving, Erosion, Sedimentation, and Pollution Control Measures and other items are all part of the Scope of Work for the project as illustrated on the Drawings.

   Contractor is responsible for complying with all regulations and providing all documents as per City of Dacula and Gwinnett County Regulations.

   Geo-technical data and information is performed and provided by Geo-Hydro Engineers – Report of Subsurface Exploration and Geotechnical Engineering Evaluation (Project #241895.20 dated 08-08-2024) and Report of Supplemental Subsurface Exploration and Geotechnical Engineering Evaluation (Project #241895.21 dated 11-06-2024).

The overall project for the City of Dacula Administration Building Complex will be performed in two phases; (1) Site Work Phase for which this scope of work and bid applies; (2) Building/Finished Site Work Phase that will be Bid out separately in first quarter of 2025. There are also several residential properties that the City has not purchased or does not completely control yet that will be phased out until acquired for future construction. The Contractor shall not disturb or access private residential property at the following addresses: 1) #456 McMillan Road (5301 212) and 2) #426 McMillan Road (5301 004). Property at #446 McMillan Road (5301 006) in owned by City of Dacula but is in a living trust so no disturbance within the property is allowed without prior written permission from City of Dacula.

Grading and earthwork scope of the project will consist of mass grading the Phased Site as illustrated on the Drawings for construction and installation of the Underground Stormwater Management System, Storm Sewer System, Sanitary Sewer System, Water Distribution System, Concrete Retaining Walls, building pads, lawn areas, amphitheater building and seating areas, and drives and parking lots, etc. All earthwork operations and quantities either haul-in or haul-off is the responsibility of the Contractor shall be included in their overall Lump Sum Bid. The Site is not balanced.

Utility construction and installation, as mentioned above and as illustrated on the Drawings shall include but is not limited to: Underground Stormwater Management System; Storm Sewer System; Sanitary Sewer System; Water Distribution System; conduit installation for electrical, lighting, and other utilities; and sleeving for irrigation.

The paving scope will consist of Medium-Duty and Heavy-Duty pavement sections that meet or exceed the Geo-Technical Engineers Flexible Pavement recommendations that are detailed and illustrated on the Drawings. It will include a combination of the following: subgrade compacted to at least 100% standard proctor maximum dry density (ASTM D698), Graded Aggregate base (GAB) for base course, Asphaltic Concrete 19mm Superpave (Binder Course), and Asphaltic Concrete 25mm Superpave (Binder Course) depending on whether it applies to Medium Duty or Heavy Duty Paving. Surface/Topping Course will not be installed during this phase of work and shall not be included in the bid. Curb and Gutter will be installed along with the paving installation for all areas as illustrated on the Drawings and in the specifications.

The Contractor will also be required to install four (4) new entrances to the Site. Two (2) entrances will be installed and tie-in flush with McMillan Road; one across from Maple Creek Park Entrance and one across from Fortune Drive. Contractor will install a four way stop condition at the entrance across from the park. The other two entrances will be along Sanjo Street across from Maxey Street and Church Street. Sanjo Street is also being widened by the City as a separate project, so the Contractor will be required to coordinate with the other Contractor for this project when grading slopes and installing entrances which tie-in to Sanjo Street and its right-of-way.

Construction of entrances, material deliveries, and staging are the responsibility of the Contractor and shall be coordinated with the City prior to any disruption of traffic along McMillan Road and Sanjo Street. Contractor must maintain one lane of traffic and access to

any impacted residential driveways at all times while performing entrance work and material deliveries. Traffic Safety devices such as signage, barricades, etc., and the protection of the public-at-large, and the Contractor's personnel is part of this contract and is the Contractor's sole responsibility.

B) Clean-up of the entire project site.
C) Submission of all close-out documents.

The Contractor will have *Nine Months (270) consecutive calendar days* from the "Notice to Proceed" to finish and complete the Site Work for this project.

All materials and appurtenances required to complete this Scope of Work is the responsibility of the Contractor and shall be provided in his overall Bid. Contractor with winning Bid is required to submit a schedule of values at the Pre-construction meeting.

Bidder will prepare Asphalt prices for bid based on the current GDOT Asphalt Cement Price Index listed at the time of bid opening. The successful Contractor's pay request will list the current GDOT Asphalt Cement Price Index at the time of purchase. The difference in price between the GDOT Asphalt Cement Price Index at bid and at purchase will either be a change order to the Contractor or a Credit to the Owner. The GDOT Asphalt Cement Price Index is in accordance with Special Provision 109 (dated 2008), Section 400.5.01 Adjustments, the asphalt price index for the month of the Letting posted on the Georgia Department of Transportation Website.

Additional items within Scope of Work

A. A site visit must be made by Contractor and subcontractors to determine the exact nature and scope of the work to be done. Contractor is responsible for hauling off all demolition materials (asphalt, concrete, etc.) to a State approved disposal facility at no additional cost to the Owner.

B. If any unforeseen sub-grade conditions arise, then the Contractor shall immediately notify the City, Geotechnical Engineer, and City's Engineer before proceeding with any work to determine the course of action. The Contractor shall coordinate with and have the City's Geotechnical Engineer (Geo-Hydro Engineers) perform all testing at the required intervals, milestones, and times to qualify and quantify all areas and determine the method of sub-grade repair in coordination with the City and/or City's Engineer on a case-by-case basis. Geotechnical Engineer will also monitor, observe, test, and report on all grading and earthwork operations as City's representative. All testing and inspections will be paid for by the City but shall be coordinated with the Geotechnical Engineer by the Contractor.

C. The limits of work for this project are limited to the Site illustrated in the Project Drawings and the right-of-way of City of Dacula. Any disturbance outside of the site boundary and right-of-way of the City of Dacula shall be repaired in kind to existing condition at no additional cost to City.

D. Contractor is responsible to locate horizontally and vertically all existing utilities within limits of disturbance and protect throughout duration of project. Utilities present, include water, sewer, gas, electrical, fiber, CATV, AT&T, etc., but may not be limited to these within the limits of disturbance.

E. Contractor shall have a Site Superintendent on-site at all times while work is in progress to monitor, direct, and control construction activities. Superintendent in-charge shall be available to City, Geotechnical Engineer, and City's Engineer at all times.

1.2 MEASUREMENT AND PAYMENT

A. Furnish unit prices with quantity breakdowns of all items of construction per Section 00101, Instruction for Bidders and Section 00310, Bid Proposal Form.

B. Furnish unit prices with quantity breakdowns of all items for the Erosion Control Maintenance of the project site.

C. Contractor will note that any quantities called out in the Scope of Work, Bid Documents, and/or Performance Specification are approximate. Contractor shall calculate and verify his own quantities used to formulate his bid.

PART 2 - PRODUCTS – Refer to Drawings and Specifications.

PART 3 – EXECUTION – Per the following but not limited to:

3.1 PAVING

A. City of Dacula's Engineer or designated representative shall have access at all times to all parts of the material producing plants for checking the mixing operations and materials and the adequacy of the equipment in use.

B. The Contractor is responsible for tying in flush with and maintaining the existing pavement alignments, grades, elevations and cross sections as represented by existing roadway conditions.

C. Submittals shall be in accordance with the Department of Transportation, State of Georgia, Standard Specifications, Construction of Roads and Bridges and shall include aggregate source, gradation, soundness loss, percentage of wear, and other tests required by the DOT.

D. Contractor shall submit a Job-Mix Formula per the requirements of the Department of Transportation, State of Georgia, Standard Specifications, Construction of Roads and Bridges.

E. Paving equipment, weather limitations, Job-Mix Formula, mixing, construction methods, compaction, finishing, tolerances, and protection shall conform to the requirements of the appropriate sections of the Department of Transportation, State of Georgia, Standard Specifications, Construction of Roads and Bridges for the type of materials specified.

F. Contractor to ensure that stormwater will not pond in roadway, drives, parking areas, or on adjacent shoulders or landscaped areas.

G. After demolition and removal of the existing pavement and base materials, if required, the earth sub-grade shall be proof rolled in the presence of the Owner and/or Owner's representative to determine the stability and adequacy of the earth base before proceeding with any repaving operations. The earth sub-grade and the GAB base are to be proof rolled separately. Sections of earth sub-grade and/or GAB base failing to pass the respective proof-roll test shall be replaced and/or re-compacted and may require testing by a Geotechnical Engineer if requested by the Owner or the Owner's Representative, only if required.

Proof-rolling:

1. After demolition operations, the Project area shall be proof rolled in the presence of the Owner's Representative. A Geotechnical Engineer will be selected by the Contractor and approved by the Owner for this project and paid by the Contractor to perform geotechnical and materials testing services for the project if required.

2. Proof-rolling shall consist of a minimum of four (4) complete overlapping passes in each of two perpendicular directions with a heavily loaded 18-20 ton dual tandem dump truck.

3. Proof-rolling shall be performed in the presence of the Owner's Representative.

4. Any soft or unstable sub-grade soil conditions observed shall be identified for qualification and quantification by the Geotechnical Engineer.

5. Any soft or yielding areas shall be thoroughly undercut and replaced with well-compacted structural fill. Areas shall be compacted 95% Standard Proctor with the top twelve (12") inches compacted to 98% Standard Proctor Density or as specified by the Geotechnical Report.

H. Contractor shall be responsible for providing all equipment necessary to perform proof rolling operations of earth sub-grade, GAB base, and/or existing asphalt, if required.

I. Transition between new and existing sections at intersection shall be flush and smooth. Any elevation difference shall be made up with additional asphalt surface course material. Centerline of each street shall be built up to create a positive crown in roadway sloping towards curb and gutter.

J. Placement of Asphaltic Paving Materials shall be as follows:

1. Spread material in a manner which requires the least handling.

2. Where thickness of finished paving will be 3 inches or less, spread in one layer.

3. After material has been spread to proper depth, roll until the surface is hard, smooth, unyielding, and true to the thickness and elevations as determined by Owner's Representative.

4. Roll in at least two (2) directions until no roller marks are visible.

K. Finished paving smoothness tolerance:

1. No depressions which will retain standing water. Contractor will ensure that stormwater will not pond in roadway, driveways or on adjacent shoulders or landscape areas.

2. No deviations greater than 1/8 inch in six feet.

L. All existing utility structures will be adjusted to fit flush with street surface 24 hours after resurfacing is completed in accordance with the City of Dacula Standards.

3.2 MAINTAINING TRAFFIC

A. Sections of newly finished pavement and patching areas shall be protected from traffic until the traffic will not mar the surfaces or alter the surface textures.

B. All traffic control and detouring equipment, methods and techniques shall conform to the latest edition of the M.U.T.C.D. and all supplements thereto.

C. Maintain one (1) lane (12' wide minimum for school bus access) open at all times.

D. Maintain local traffic access to all streets, all intersections and all private driveways during construction period and at all times. Contractor shall not perform any work that will impact the flow of traffic without approval of Owner's Representative.

E. Contractor shall take necessary precautions to secure the construction sites to maintain a safe environment for the public.

F. Contractor, vendors and all sub-contractors shall observe speed limits at all times.

3.3 EROSION CONTROL

A. Install and maintain a comprehensive system of Soil Erosion Control measures

throughout the duration of the projects in conformity with the "Manual for Erosion and Sediment Control in Georgia", 6th Edition, 2014 by the Georgia Soil and Water

Conservation Commission and any supplements thereto.

B. Contractor shall contain all soil erosion from the existing construction areas. Erosion control measures are required for any disturbed areas outside of edge-of-pavement limits such as regraded ditch work, culvert replacement, and storm sewer system installation.

C. Erosion control includes, but is not limited to Rip Rap, Erosion Control Matting, Temporary and Permanent Grassing. Other BMP's may include Temporary Sediment Traps "F' (w/ filter fabric) and "P" (pigs-in-blanket), and Haybale & Rock Check dams. Temporary Grassing and Permanent Grassing is required where Contractor disturbs any area outside limits of repaving. Sod shall be replaced in kind where disturbed in property owner's yards.

3.4 CLEAN-UP

A. Contractor shall remove all debris, rubbish, and excess material from the work sites.

B. Areas along roadways will be dressed, grassed, and mulched.

C. All excess material from demolition and/or construction activities will be hauled off and legally disposed of.

3.5 GUARANTEE

A. Contractor shall guarantee all improvements from material and/or craftsmanship defects for a period of one (1) year from date of final acceptance of Work.

END OF SECTION

SECTION 01040

COORDINATON

1.0 GENERAL: This section covers General Project Coordination.

2.0 PROJECT COORDINATION

2.1 The Contractor shall afford subcontractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall see that all work is properly connected and coordinated.

2.2 The Contractor shall cooperate with the representatives and employees of the Engineer, with subcontractors and with any other contractors on the premises who may be employed by the Owner to expedite the construction of the entire facility.

2.3 If any part of the work depends for its proper execution or completion upon the work of others, the Contractor shall report within five (5) days in writing to the Engineer and Owner any defects in the work of others or other causes that interfere with the proper execution or completion of the work. Failure to do so would constitute a waiver of claim against the Owner except for latent defects not reasonably noticeable at the time the Contractor commenced that part of the work.

2.4 Whenever work being done by the Owner's forces, or by other Contractors is contiguous to work covered by this contract, the various rights of the various interests involved shall be established by the Engineer.

3.0 SUB-CONTRACTORS' COORDINATION

3.1 It shall be the responsibility of the General Contractor to coordinate the project as a whole, and the construction operations included in all Sections of these Specifications. Contractor shall coordinate construction operations included under different Sections that depend on each other for proper installation, connection and operation.

3.2 Contractor shall require the installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until satisfactory conditions have been corrected in an acceptable manner.

END OF SECTION

SECTION 01061

PERMITS

1.0 GENERAL

1.1 DESCRIPTION:

A. Work included: So that bidders shall be fully informed regarding the procedure for filing applications for permits. Bowman has submitted for permit with the following agencies:

1.2 JURISDICTIONS APPLICABLE TO THE PROJECTS:

A. City of Dacula (Site LDP Permit)
Planning & Development
442 Harbins Road, Dacula, Ga. 30019

B. Gwinnett County Fire Marshall: (Fire and ADA)
Gwinnett County Department of Planning & Development Fire Plan Review Section
One Justice Square
446 West Crogan St., Suite 300
Lawrenceville, Georgia 30046
Telephone: (678) 518-6000

C. Gwinnett County Department Public Utilities: (Water & Sewer)
Gwinnett County Department of Planning & Development Plan Review Section
One Justice Square
446 West Crogan St., Suite 300
Lawrenceville, Georgia 30046
Telephone: (678) 518-6000

D. GSWCC – Georgia Soil Water Conservation Commission for Erosion, Sedimentation, and Pollution Control measures.
4310 Lexington Road
Athens, Georgia 30605
Telephone: (706) 552-4470

1.3 ACTS, CODES AND EXECUTIVE ORDERS:

A. The Contractor, by signing the contract, acknowledges that he is aware of and familiar with the contents and requirements of the following acts, codes, and executive orders:

1. High Voltage Act - Georgia Law 1966, pp. 181-183
2. Underground Gas Pipe Law - Georgia Law 1969, pp. 50-57.
3. Williams Steiger Occupational Safety and Health Act of 1979.
4. Safety Glass Act of 1970 - Georgia Legislature
5. The nondiscrimination clause contained in Section 202 Executive Order 11246 as amended by Executive Order 11375 relative to Equal Employment Opportunity for all persons without regard to race, color, religion, sex or national origin and implementing rules and regulations described by the Secretary of Labor are incorporated.
6. Title 40, Code of Federal Regulations, Part 61, National Emissions Standards for Hazardous Air Pollutants, Subparts A and B., U.S. Environmental Protections Agency Regulations for Asbestos.
7. Title 29, Code of Federal Regulations, Section 1910, 1001.
   Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.
8. Georgia Security and Immigration Compliance Act OCGA13-10-90.

B. Applicable Codes and Standards:
1. ASTM - American Society for Testing and Materials
2. ANSI - American National Standards Institute.
3. ADA - Americans with Disabilities Act - Guidelines for Accessibility.

2.0 PRODUCTS

(No Products are required in this Section)

3.0 PERMITS

3.1 SEPARATE PERMITS MUST BE OBTAINED FOR: *Bowman has submitted for these permits.

A. Fire and ADA Improvements from Gwinnett County Planning and Development.

B. Water and Sanitary sewer from Gwinnett County Department of Public Utilities.

C. LDP – Land Disturbance Permit from City of Dacula.

D. GSWCC – Georgia Soil Water Conservation Commission for Erosion, Sedimentation, and Pollution Control measures.

3.2 APPLICATIONS:

A. Applications must be filed with the government identity having jurisdiction.

3.3 COST:

A. Cost of permits is determined by a formula applied to cost of each element of the work as outlined in 3.1 above. Refer to GCPS General Conditions Item No. 3.7.1 for permits required to be secured and paid by the General Contractor.

B. It is suggested that each bidder contact each jurisdiction to determine the cost of permits sufficiently in advance of the bid date to avoid last minute rushes.

3.4 CONTROL:

A. A copy of all pertinent permits listed in this section must be submitted to the Owner through the Project Engineer before Notice to Proceed will be issued. The Contractor(s) is/are again reminded that contract time starts running according to the schedule in Section 00210; however, the Contractor will not be allowed to proceed until all required documents are on file with the Engineer and Owner.

3.5 CONTRACTOR'S LICENSE:

A. Contractors planning to bid the projects in the above jurisdictions that are not already licensed therein must take out a business license before they will be permitted to perform their work therein.

END OF SECTION

SECTION 01200

GENERAL REQUIREMENTS

1.0 GENERAL

1.1 COMPLIANCE WITH FEDERAL CLEAN WATER ACT:

A. To maintain compliance with the Federal Clean Water Act, the requirements of Georgia's NPDES General Permit for construction are to be met in the following manner:
   1. Engineer shall prepare and submit designed Erosion, Sedimentation and Pollution Control Plan which conveys required BMPs (Best Management Practices) to GSWCC during the permitting phase of each project. For all NPDES forms and procedures, the Owner shall be listed as the primary permittee and the Operator/Contractor of record shall be listed as the operator.
   2. NOI, or Notice of Intent, shall be prepared by the ENGINEER and forwarded to the Operator/Contractor for signature. NOI shall then be returned to Owner for further processing. Owner will forward executed forms, along with payment of fees, to the EPD as required. NOI shall be submitted fourteen (14) days prior to the commencement of construction on site.
   3. An Erosion, Sedimentation and Pollution Control Plan shall be developed by ENGINEER and installed and maintained by the Operator/Contractor for each construction site.
   4. ENGINEER shall make initial inspection and report of initial sediment storage requirements and perimeter control BMPs within seven (7) days after installation and shall provide periodic inspections as required to ensure that site work proceeds as indicated by contract documents.
   5. Monitoring of the plan and weekly inspections shall be provided by the Owner's soil engineering firm of record on each site. The ENGINEER shall coordinate with the soils engineer as to sampling locations, any required changes to the plan, etc. The ENGINEER shall make all changes to the plan.
   6. NOT, or Notice of Termination, shall be prepared by the ENGINEER and forwarded to the Operator/Contractor for signature. NOT shall then be returned to the Owner for further processing. Owner will forward executed forms as required.

1.2 WORK AT WITHIN THE CITY:

A. In all cases, a construction fence shall be provided by the contractor to enclose the work area, storage areas, and contractor and his employee parking.

B. The Owner reserves the option to retain any removed materials and equipment they

select. The Contractor shall disconnect, remove and deliver items selected to a Owner as required. The Contractor shall be required to remove and dispose of all other material.

C. All workmen shall be fully clothed and shall be expected to exhibit acceptable behavior. Smoking is prohibited on all on City properties.

F. Contractor shall notify free underground utility locator service at 1-800-282-7411 before any excavations are begun.

1.3 SCHEDULES AND PAYMENTS:

A. A construction progress schedule shall be submitted at the Pre-Construction Meeting and updated on a monthly basis.

A. A schedule of values shall be submitted as required by the General Conditions. Separate schedule of values will be required to correspond with the Bid Proposal breakdown indicated in Section 00310, Bid Proposal Form.

B. The initial Application for Payment will not be approved until the progress schedule and the schedule of values has been received and approved by the Engineer.

C. Initial Payment Application: Action and submittals, which must precede submittal of contractor's first payment application:
   1. Listing of Subcontractors.
   2. Schedule of values.
   3. Progress schedule.
   4. Schedule of submittals.
   5. Listing of Contractor's staff assignments and principal consultants.

D. Monthly Payment Application: Actions and submittals which must be included with each monthly payment application: Required forms can be discussed with the City at the Pre-Construction Meeting.
   1. DE Form 0263 cover sheet, with AIA Form G703 as back-up.
   2. Summary of Materials Stored, DE Form 0264, with invoices.
   3. Schedule of Change Orders, DE Form 0265.
   4. Subcontractor back-up for work claimed on payment application.
   5. Completed "Lien Waiver and Release" form, if requested by Owner. See attached copy of this form, Exhibit "A".

F. Final Payment Application: Actions and submittals which must precede or coincide with submittal of contractor's final payment.
   1. Completion of project closeout requirements.
   2. Completion of items specified for completion beyond the time of substantial completion.

3. Completion of incomplete work.
4. Transmittal of required project construction records to Owner.
5. Removal of temporary facilities, services, surplus materials, rubbish, and similar elements.

1.4 SHOP DRAWINGS:

A. Owner shall be included on all distribution for all final APPROVED or APPROVED AS NOTED shop drawings, brochures, catalog cut sheets, etc. Provide one copy each during the course of construction as they are approved.

1.5 PROJECT SIGN:

A. Project sign shall be included in the contract documents and shall be discussed at the Pre-Construction Meeting as to size and verbiage.

B. Signs shall be painted with a minimum of two coats of exterior paint. Contractor shall employ professional sign painter to paint all lettering. Contractor may use vinyl, heat-applied lettering in lieu of painted letters.

C. This sign shall be the only free-standing sign permitted on the project site. Location to be determined by the Owner.

D. All wording shall be verified and approved through shop drawing submittals by the ENGINEER and Owner prior to fabrication and installation on project site.

1.6 RECORD DOCUMENT SUBMITTALS:

A. Record Drawings: Maintain a record set of prints of contract drawings and shop drawings in a clean, undamaged condition. Mark-up the set of record documents to show the actual installation. When shop drawings are used for mark-up, record a cross-reference at the corresponding location on the working drawings. Give particular attention to concealed work that would be difficult to measure and record at a later date.
   1. Mark record sets with red erasable pencil and, where feasible, use other colors to distinguish between variations in separate categories of work.
   2. Note related change order numbers where applicable.
   3. Note change order in green erasable pencil.

B. Record Specifications: Maintain one complete copy of the Project Manual, including specifications and addenda, and one copy of other written construction documents such as change orders and similar modifications issued in printed form during construction.

   Mark these documents to show substantial variations in the actual work performed.

1.7 PREREQUISITE FOR FINAL ACCEPTANCE:

A. Submit the any permit or inspection reports to the City Administrator – Brittni Nix at Dacula City Hall.

B. Certificate which warrants that all materials, products and assemblies incorporated in this project are totally free of asbestos, PCB, or other such hazardous material.

C. Owner, after completion of project, may elect and pay to use services of an independent testing agency to test for asbestos content. If asbestos materials are found to exist in work performed by the Contractor for the project, the Contractor shall pay for the additional testing and shall replace the asbestos containing material at no cost to the Owner.

D. General Contractor, and Subcontractors, shall be required to submit completed "Certificate of the Contractor / Statutory Affidavit" forms on each project. See attached copy of this form, Exhibit "B".

E. Final acceptance of the project shall not be granted until General Contractor has submitted all the required "as-built" documents to the ENGINEER, Owner, and Gwinnett County Department of Public Utilities, etc.

END OF SECTION

EXHIBIT "A"

LIEN WAIVER AND RELEASE

_____

Person / Company Supplying the Work or Improvement

Name of Project: _____

Project Address: _____

Name of Owner: _____

ACKNOWLEDGEMENT AND RELEASE FOR PRIOR PAYMENTS RECEIVED

The undersigned hereby acknowledges that the undersigned has received prior payment(s) for labor / services / equipment and /or material furnished to the above-designated project through _____, 2025 and does hereby release pro tanto any mechanic's lien, stop notice, equitable lien or labor and material bond rights that the undersigned has to the above extend only and does not cover any retention of items furnished after that date. This release is for the benefit of and may be relied upon by the owner, the prime contractor, the Engineer, and the principal and surety on any labor and material bond posted for the project.

NOTICE: THIS DOCUMENT WAIVES RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGNED, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL RELEASE FORM.

_____ Date: _____

Title: _____

EXHIBIT "B"

CERTIFICATE OF THE CONTRACTOR / STATUTORY AFFIDAVIT

TO: City of Dacula

Contract entered into the _____day of _____, 2025, between the above-mentioned parties for the construction of:

_____

KNOW ALL MEN BY THESE PRESENTS:

1. The undersigned hereby certifies that all work required under the above contract has been performed in accordance with the terms thereof, that all material men, subcontractors, mechanics, and laborers have been paid and satisfied in full, and that there are no outstanding claims of any character (including disputed claims or any claims which the contractor has or will assert and defense) arising out of the performance of the contract which have not been paid and satisfied in full except as listed herein below:

2. The undersigned further certifies that to the best of his knowledge and belief there are no unsatisfied claims for damages resulting from injury or death to any employees, subcontractors, or the public at large arising out of the performance of the contract, or any suits or claims for any other damage of any kind, nature, or description which might constitute a lien upon the property of the owner.

3. The undersigned makes this affidavit for the purpose of receiving final payment in full settlement of all claims against the owner arising under or by virtue of the contract, an acceptance of such payment is acknowledged as a release of the owner from any and all claims arising under or by virtue of the contract.

Signed this _____day of _____, 2025

_____
(Signature)

_____
(Title)

_____
(Firm)

COUNTY OF _____ STATE OF _____ Personally before me, the

undersigned authority, appeared _____, who is known to me to be an

official of the firm of _____. Who, after being duly sworn, stated

on his oath that he had read the above statement and that the same is true and correct.

_____ My commission expires: _____
(Notary Public)

SECTION 01300

SUBMITTALS

1.0 GENERAL

1.1 DESCRIPTION:

A. Submittals: General term including samples, shop drawings and product data, as applicable and as defined by the General Conditions.

B. General Provisions:
1. Provisions in this section are mandatory procedures for review, approval and submitting samples, shop drawings and product data in accordance with the General Conditions.
2. Submittals which are received directly from sources other than through the General Contractor's office will be returned to the General Contractor "without action".
3. Job delays occasioned by requirement of re-submission of samples, shop drawings and product data not in accord with Contract Documents and/or submittals sequenced contrary to the agreed schedule are Contractor's responsibility and will not be considered valid justification for extension of contract time or increase in the contract sum.
4. Submittals shall be submitted with a designation that includes a chronological reference and a reference to the spec section identifying the material. For example: 06100-001, 06100-002, etc. Resubmittals shall be submitted with the original submittal number followed by a reference to the resubmittal. For example: 06100-001-R1, 06100-001-R2, etc.
5. Submittals must be complete for individual spec sections. Piece-meal submittals for the same spec section will not be accepted. Submittals containing materials for multiple spec sections will not be accepted.
6. Materials ordered and installed prior to the Engineers approval is solely at the risk of the Contractor. The Owner and Engineer reserve the right to change or modify specified materials until the submittal is approved by the Engineer.

1.2 SHOP DRAWING PREPARATION:

A. Drawings shall conform to the following requirements:
1. Number sheets consecutively.
2. Indicate working and erection dimensions and relationships to adjacent work.
3. Show arrangements and sectional views, where applicable.

4. Indicate material, gauges, thicknesses, finishes and characteristics.
5. Provide drawings reproducible by normal blackline printing.
6. Provide 6" x 6" clean space in the lower right hand area for entry of approval stamps.
7. Cross-reference drawing details and specification paragraphs applicable to the submittal data.

B. Engineering CAD files: The Engineer will provide AutoCad files as required. However, because data stored in electronic media can be altered, either intentionally or unintentionally, by transcription, machine error, environment factors, or by operators, it is agreed the Recipient shall indemnify, defend, save harmless the Engineer, the Engineer's consultants, and the officers and employees of any of them against any and all claims, liabilities, damages, and costs, including but not limited to cost of defense, arising out of changes or modifications to the data in the electronic media form in the Recipient's possession or released to others by the Recipient and for any use of the electronic media and printed hard copy drawings and specifications outside the license granted by this provision.

C. Form: Submit one (1) electronic PDF and one (1) set of hard copies of each set of shop drawings, stamped by the Contractor. The Engineer's approval stamp will be inserted and only the electronic PDF will be returned to the Contractor.
1. File name for electronic PDF files shall include the job name, specification section and date of the submittal.

1.4 PRODUCT DATA PREPARATION:

A. Include product manufacturer's standard printed material, dated, with product description and installation instructions indicated. Data not related to this project shall be deleted or marked "VOID" as applicable.

B. Form: Submit one (1) electronic PDF and one (1) set of hard copies of all product data, stamped by the Contractor. The Engineer's approval stamp will be inserted and the only electronic PDF will be returned to the Contractor.
1. File name for electronic PDF files shall include the job name, specification section and date of the submittal. Submittals for specification sections requiring multiple equipment/ product data components shall be make in one PDF file. Submittals containing multiple items must include a table of contents with hyperlinks to the cover page for each item.

. Scanned material shall be:
1. Legible.
2. Sized no larger than 8-1/2" x 11", suitable for opaque reproduction.
3. Stamped (either on a clean area space or the reverse side) with the Contractor's approval action.

C. All submitted data shall bear the Contractor's approval action stamp plus his review notes, comments, and corrections as required.

1.5 CONTRACTOR'S REVIEW:

A. Review submittals and stamp with approval prior to submission to the Engineer; Contractor's stamp shall bear the Contractor's name, the word "Approved", the signed initials of the approving agent, and the date of his approval action. By so noting, the Contractor indicates that he has reviewed and approves the materials, quantities, and dimensions represented by the particular submittal.

B. Where work is indicated "By Others", Contractor shall indicate responsibility for providing and coordinating such work.

C. Submissions made without Contractor's approval indicated thereon will be returned without being reviewed for compliance with this requirement.

D. Date each submittal and indicate name of Project, Engineer, Contractor, Sub-Contractor, as applicable, description or name of equipment, material or product and identify location at which it is to be used in the Work. Cross-reference to specific drawing and specification references.

E. Accompany submittal with transmittal letter containing project name, Contractor's name, number of samples or drawings, titles and other pertinent data. Transmittal shall outline deviations, if any, in submittals from requirements of Contract Documents.

1.6 ENGINEER'S REVIEW AND APPROVAL:

A. Engineer's Review will be in accordance with the General Conditions.

B. Engineer will return only the following submittal data to the Contractor for his further reproduction and distribution.
   1. One electronic PDF of shop drawings.
   2. One electronic PDF of product data.
   3. Samples less two retained by the Engineer and Owner.

1.7 RESUBMISSION:

A. Make corrections and changes indicated for unapproved submissions and resubmit in same manner as specified above, until Engineer's approval is obtained.

B. In resubmission transmittal direct specific attention to revisions other than corrections

requested by Engineer on previous submissions, if any.

C. Contractor shall be responsible for bearing all costs associated with the review and approval process of resubmitted (and/or substituted) submittal data.

1.8 DISTRIBUTION:

A. Contractor is responsible for obtaining and distributing copies of submittals to his subcontractors and material suppliers after, as well as before, final approval. Prints of reviewed shop drawings shall be made from electronic PDFs which carry the Engineer's appropriate stamp.

B. Contractor shall maintain a file of approved submittals for duration of project, which shall be delivered to Owner as a part of project close-out documents.

C. The Contractor shall maintain a file (electronic file is acceptable) of all approved submittals, bearing the Stamp of the Engineer, at the project site. In the event the Engineer or Owner should question the installation of any aspect of the work requiring approved submittal data, the inability of the Superintendent to produce the required approved submittal data upon demand shall constitute cause for a "stop work" order to be issued on that particular questioned aspect of the work and all relevant appurtenant work. The cause shall be equal to the Contractor's not having received required approval of the submittal data. If so issued, such "stop orders" shall not be considered valid justification for extensions of contract time and/or claims for additional monetary compensation.

1.9 SCHEDULE OF SUBMITTALS:

A. The Contractor shall, within ten (10) calendar days following execution of the Contract, submit his proposed schedule of submittals to the Engineer for review.
B. The purpose of the schedule is to:
   1. Demonstrate that all submittals, shop drawings, data, etc. required for the Work are addressed by the Contractor.
   2. Demonstrate consistency with the Contractor's proposed Construction Schedule.
   3. Assist the Engineer in scheduling timely review/approval action of submittals.
C. The schedule shall contain the description of the submitted item, the proposed date of submittal and the proposed date of requested return by the Engineer.
D. After the Engineer's receipt of the Contractor's submittal schedule, the Engineer and the Contractor shall jointly review the schedule and mutually agree to acceptability or necessary modifications.
E. Contractor shall submit his final accepted schedule within five (5) calendar days after the date of the joint review.

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULES

1.0 GENERAL

1.1 DESCRIPTION: This section covers provisions for construction schedules.

1.2 RELATED REQUIREMENTS:

A. Schedule of Values: General Conditions.

B. Progress Meetings: General Conditions.

C. Submittals: Section 01300 - Submittals.

1.3 GENERAL:

A. Contractor's working schedules used to plan, organize, and execute work; record and report actual performance, progress and cost; and demonstrates how Contractor plans to complete remaining work.

B. Contractor's Responsibility: Nothing in these requirements shall be deemed to be usurpation of Contractor's authority and responsibility to plan and schedule work as he sees fit, subject to all other requirements of Contract Documents.

1.4 SCHEDULES:

A. Prepare a Preliminary Schedule and an As-Planned Schedule.

B. Preliminary Schedule: At time of Preconstruction Conference, submit preliminary schedule to Owner's project representative for Owner's review and comment.
   1. Reflect intended detailed sequence and duration of work activities for period commencing with Notice to Proceed and continuing through first ninety (90) calendar days.
   2. Schedule in sufficient detail to clearly portray work activities, including procurement and submittals sequence of activities, along with phasing, and milestones associated with this period. Sitework activities to be clearly distinguished from the building's activities.
   3. Schedule shall be consistent with As-Planned Schedule specified below.
   4. Schedule will be reviewed by Owner for acceptability of form and format only.
   5. Progress Payments: Submittal and acceptance of Preliminary Schedule is a

prerequisite for Contractor's first progress payment.

C. As-Planned Schedule: No later than thirty (30) calendar days after Notice to Proceed submit As-Planned schedule to Owner's project representative for Owner's review and comment. Schedule will be reviewed by Owner for acceptability of form and format only. Submit four (4) copies and one (1) digital copy for Owner's use.

1. Schedule shall reflect intended detail of work activities for entire period of contract performance commencing with Notice to Proceed of work on-site and continuing through Contract Completion.
2. Schedule in sufficient detail to clearly portray all work activities and entire cycle of submittal, approval, fabrication and delivery as related to significant items of design, material, and permanent equipment fixtures. Schedule to indicate separately sitework activities from building activities. With respect to the building, schedule should group interior activities distinctly from exterior shell and structural activities that are required to be completed prior to building being weathertight.
3. Schedule shall be a fully detailed and submitted in form of time network diagram(s) (plotted with early start dates).
4. The Schedule shall reflect the number of normal bad weather days as stated for each month in the General Conditions.
5. The Schedule shall reflect the project cost breakdown as submitted in the applications for payment including Change Orders as separate line items.
6. Progress Payments:
    a. Initial acceptance of As-Planned Schedule and submittal of Schedule Updates shall be prerequisite for progress payments commencing with second progress payment after Notice to Proceed and continuing to Contract Completion.
    b. The Contractor shall show on the complete Schedule the work-in-place cost for each activity. The cumulative amount for all activities shall equal the total contract price. Overhead and profit shall be pro-rated on all activities for the entire project length.

1.5 UPDATING AND REPORTING:

A. Schedule Updates: Update Schedule monthly based on actual progress. Reflect actual start and/or finish dates of activities along with percentage of completion for activities started and not yet complete.

B. Monthly Status Reports: Submit Monthly Status Report to Owner's project representative and Owner. Summarize work performed during preceding month, indicate milestones achieved and update Schedule of Values. Include separate listing of activities which are causing delay to work progress. Include narrative to define problem areas, anticipate delays and impact on schedule. Report corrective action

taken, or proposed, and its effect, including effect of changes on schedules of separate contractors. Include items which the Contractor perceives as being Owner or Engineer delays to the timely completion of the project.

C. Progress Meetings: Discuss progress of project in conjunction with Schedule at progress meetings. Include:
   1. Actual completion dates for work items completed since last meeting.
   2. Actual start dates for work items started since last meeting.
   3. Estimating remaining durations for work items in progress.
   4. Estimated start dates for work items scheduled to start before next meeting.
   5. Changes in durations of work items.
   6. Identification of current and most critical paths to required completion dates.
   7. Discussion on narrative report (See B. above).
   8. Submission of weekly "Look Ahead" report and statement indicating what achievements are anticipated prior to the next meeting.
   9. Discussion on procurement schedules, material and equipment fabrication and/or shipping updates.

D. Work Progress:
   1. Should any activity fail to be completed with fifteen (15) days after indicated schedule date, Contractor shall expedite completion of activity by whatever means Owner deems appropriate and necessary without additional compensation to Contractor.
   2. Should any activity be thirty (30) or more days behind schedule, Owner shall have the right to perform activity or have activity performed by whatever method Owner may deem appropriate. Costs incurred by Owner in this activity shall be deducted from Contract Price.
   3. It is expressly understood and agreed that failure by Owner to exercise option to expedite activity shall not be construed as precedent for any other activities or as waiver of Owner's rights to exercise his rights on subsequent occasions.
   4. Contract Extensions: Float time is not time for exclusive benefit of either Owner or Contractor.
      a. Extensions of time for contract performance as specified in contract will be granted only to the extent that equitable time adjustments to affected work items exceed total float time along affected paths of accepted computer printout report in effect at that time and are in accordance with General and Supplementary Conditions.
      b. Slippage of work items will not be basis for time extension to contract unless and until such slipped work items are resolved in accordance with General and Supplementary Conditions.

1.6 SUBMITTALS:

A. Submit updated schedules monthly concurrent with pay application, accurately

depicting progress to first day of each month.

B. Submit on reproducible transparency for Engineer's review.

C. Distribute reviewed schedules to:
   1. The Owner.
   2. The job site file.
   3. The sub-contractors.
   4. The Engineer.

D. Documentation: At completion of project, submit as-built computer printout report and time-scaled network diagram reflecting project as-built critical paths. Four (4) copies are required together with schedule on one external drive.

END OF SECTION

SECTION 01312

PROJECT MEETINGS

1.0 GENERAL

1.1 SUMMARY:

A. Owner and Engineer Project Meetings:
   1. Owner and Engineer will conduct regular meetings throughout project life for discussion and resolution of project issues. These meetings will be held on a frequency related to project status, ie., weekly, bi-weekly, monthly, or others as set by the Owner.
   2. Attendance by the Contractor, Owner or Owner's Engineer is mandatory. Contractor's subcontractors, suppliers, and others are to attend on an as-needed basis or as directed by Engineer.
   3. Suggested agenda:
      a. Progress review.
      b. Schedule.
      c. Submittal's status.
      d. Change Order status.
      e. RFI status
      f. Other business.

B. Contractor's Project Meetings: Requirements below are intended for Contractor, subcontractors, sub-subcontractors, and material suppliers for discussion and resolution of Project specific situations. Attendance by Owner, Engineer, or consultants is not mandatory.
   1. Meetings between Contractor, Owner, Engineer, or any combination of the three for purpose of discussing Project progress of resolving problems are delineated above.
   2. Owner and Engineer may attend meetings to ascertain work is expedited consistent with Contract Documents and construction schedules.
   3. Contractor requirements include:
      a. Schedule and administer pre-construction meeting. Periodic progress meetings, and specially called meetings throughout work progress.
      b. Prepare agenda for meetings.
      c. Distribute written notice of each meeting four days in advance of meeting date.
      d. Make physical arrangements for meetings.
      e. Preside at meetings.
      f. Record minutes; include significant proceedings and decisions.

g. Reproduce and distribute copies of minutes within three days after each meeting as follows:
   1) One copy to each participant in meeting.
   2) One copy to parties affected by decisions made at meeting.
   3) Three copies of minutes to Engineer.
   4) One copy to Owner's representative.

4. Representatives of contractors, subcontractors, and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

C. Related Sections:
1. Section 01310: Construction Schedules.
2. Section 01300: Submittals.

D. Pre-construction Meeting:
1. Schedule within 10 days after date of Notice of Award.
2. Location: Dacula City Hall directly across the street from the project site.
3. Attendance:
   a. Owner's Representative.
   b. Engineer and professional consultants.
   c. Contractor's Project Manager.
   d. Contractor's Superintendent.
   e. Major subcontractors.
   f. Major suppliers.
   g. Others, as appropriate.
4. Suggested agenda:
   a. Distribution and discussion of:
      1) List of Major subcontractors and suppliers.
      2) Projected Construction Schedules.
   b. Critical work sequencing.
   c. Major equipment deliveries and priorities.
   d. Project coordination: Designation of responsible personnel.
   e. Procedures and processing of:
      1) Field decisions.
      2) Proposal requests.
      3) Submittals.
      4) Change Orders.
      5) Applications for Payments.
   f. Adequacy of distribution of Contract Documents.
   g. Procedures for maintaining Record Documents.
   h. Use of premises:
      1) Office, work and storage areas.
      2) Owners requirements.
   i. Temporary facilities, controls, and construction aids.

j. Temporary utilities.
k. Safety and first-aid procedures.
l. Security procedures.
m. Housekeeping procedures.
n. Other: _____

E. Progress Meetings:
1. Schedule regular periodic meetings as required, but not less than one meeting monthly unless Owner requires more.
2. Hold called meetings as required by progress of work.
3. Meeting's locations: Project field office of Contractor.
4. Attendance:
a. Subcontractor, as appropriate to agenda.
b. Suppliers, as appropriate.
c. Engineer and professional consultants, as needed or required.
d. Others.
5. Suggested agenda:
a. Review approval of minutes of previous meeting.
b. Review of work in progress since previous meeting.
c. Field observation, problems, conflicts.
d. Problems which impede Progress Schedule.
e. Review of off-site fabrication, delivery schedules.
f. Corrective measures and procedures to regain projected schedule.
g. Revisions to Progress Schedule.
h. Progress; schedule, during succeeding work period
i. Coordination of schedules.
j. Review submittal schedules; expedite as required.
k. Maintenance of quality standards.
l. Pending changes and substitutions.
m. Review proposed changed for effect on:
1) Progress schedule and on completion dates
2) Other contracts of Project.
n. Monthly Pay Applications.

END OF SECTION

SECTION 01370

APPLICATION FOR PAYMENT

PART 1 - GENERAL

1.1 Contractor shall submit Application and Certification for Payment in format ***similar*** to that of the AIA Document G702 and the AIA Document G703, Continuation Sheet. (Example formats are hereby made a part of these documents. (Exhibits follow)

1.2 Contractor will need to submit all requested documentation with each pay application as discussed with City at Pre-Construction Meeting.

1.3 Contractor shall submit weekly Wage Hour Payrolls and Section 3 Monthly Reports in accordance with Davis-Bacon requirements and any other paperwork required by the City's funding sources. Once the City receives these documents and approval of same, and submitted Application for Payment, then the City will remit payment to Contractor within thirty (30) days.

1.4 The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract. The payrolls submitted shall set out accurately and completely all the information required to be maintained under 29 CFR 5.5 (a)(3)(i).

1.5 Each payroll submitted shall be accompanied by a "Statement of Compliance", signed by the Contractor or Subcontractor or his or her agent who pays or supervised the payment of the persons employed under the contract and shall certify the following:

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

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

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

1.6 If the Contractor or Subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the Contractor, Sponsor, Applicant,

or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Failure to submit the required records upon request may be grounds for debarment action pursuant to 29 CFR 5.12.

PART 2 - PRODUCTS – N/A

PART 3 - EXECUTION – N/A

END OF SECTION

APPLICATION AND CERTIFICATE FOR PAYMENT

TO OWNER:

PROJECT:

APPLICATION NO.:
PERIOD TO:
PROJECT NOS.:

Distribution to:
☐ OWNER
☐ ARCHITECT
☐ CONTRACTOR
☐ ENGINEER
☐

FROM CONTRACTOR:

VIA ENGINEER:

CONTRACT DATE:

CONTRACT FOR:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.

1. **ORIGINAL CONTRACT SUM** . . . . . $_____
2. **Net change by Change Orders** . . . . . $_____
3. **CONTRACT SUM TO DATE** (Line 1 ± 2) . . . . . $_____
4. **TOTAL COMPLETED & STORED TO DATE** . . . . . $_____
   (Column G on G703)
5. **RETAINAGE:**
   a. _____% of Completed Work $_____
   (Columns D + E on G703)
   b. _____% of Stored Material $_____
   (Column F on G703)
   Total Retainage (Line 5a + 5b or
   Total in Column I of G703) . . . . . $_____
6. **TOTAL EARNED LESS RETAINAGE** . . . . . $_____
   (Line 4 less Line 5 Total)
7. **LESS PREVIOUS CERTIFICATES FOR PAYMENT**
   (Line 6 from prior Certificate) . . . . . $_____
8. **CURRENT PAYMENT DUE** . . . . . $
9. **BALANCE TO FINISH, INCLUDING RETAINAGE**
   (Line 3 less Line 6) $_____

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner		
Total approved this Month		
TOTALS		
NET CHANGES by Change Order		

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:
County of:
Subscribed and sworn to before
me this day of

Notary Public:
My Commission expires:

ENGINEER'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Engineer certifies to the Owner that to the best of the Engineer's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED . . . . . $_____

(Attach explanation if amount certified differs from the amount applied for. Initial all figures on this Application and on the Continuation Sheet that are changed to conform to the amount certified.)

ENGINEER:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CONTINUATION SHEET

(Instructions on reverse side)

APPLICATION AND CERTIFICATE FOR PAYMENT,
containing Contractor's signed Certification, is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO.:
APPLICATION DATE:
PERIOD TO:
ENGINEER' PROJECT NO.:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C − G)	RETAINAGE (IF VARIABLE) RATE)
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD					

SECTION 01400

QUALITY CONTROL

PART 1 - GENERAL

1.1 ON SITE OBSERVATIONS

A. All work and materials shall be subject to review by Owner's Representative and Owner.

B. Contractor shall fully cooperate and shall furnish all reasonable facilities for the inspections of all parts of the work during the entire construction period.

C. All testing and inspections shall be performed by the Owner's Geotechnical Engineer shall follow 1.2 – 1.5 below as well as Sections 01410 and Section 01415 to follow.

1.2 TESTING SERVICES

A. All materials upon which the strength and durability of the work may depend, shall be subject to inspection and testing to establish conformance with City of Dacula, Gwinnett County D.O.T. and Georgia D.O.T. Standards. Contractor shall submit Asphalt Pavement Job Mix Formulas to Owner's Representative for review prior to installation of paving courses.

B. A Geotechnical Engineer will be selected by and paid for by the Owner, to perform geotechnical and materials testing services for the project.

C. It is the responsibility of the Contractor to implement the services of the Owners Geotechnical Engineer and testing company by ordering those services at the appropriate time in the work, as described below, if required. The Contractor must provide at least 24 hours notice to the testing company for required testing work. Failure to provide adequate notification may result in the requirement for more complex after-the-fact testing, for which the Contractor will be liable.

D. Testing required shall be coordinated by the Contractor and paid for by the Owner, to be witnessed by the appropriate local inspection agencies as well as by Owner's Representative. The Contractor will secure and maintain evidence of having completed and obtained successful results for those tests, to be transmitted to the Owner and Owner's Representative no later than twenty-four (24) hours by handwritten draft, faxed or emailed; and fifteen (15) days for each report following testing.

1.3 SUMMARY OF REQUIRED NOTIFICATIONS

A. Contractor's Geotechnical Engineer shall monitor subgrade demolition/preparation and shall observe all earthwork operations, compaction, proof rolling, paving operations, utility installation, underground detention pond installation, and concrete installation. Contractor shall notify Owner and Owner's Representative at least 24 hours in advance of any testing, inspections, proof rolling, paving and/or concrete pouring operations.

B. Proof rolling, if required by Owner:
   1. After milling operations, a portion of the Project area shall be proof rolled as directed by the Owner. This shall be done for portions indicated by the Owner and for all other subgrade issues if they arise. If problems are encountered, it will be the Contractor's responsibility to call in the Contractor's Geotechnical Engineer.
   2. Proof rolling shall consist of a minimum of four (4) complete overlapping passes in each of two perpendicular directions with a heavily loaded 18–20-ton dual tandem dump truck.
   3. Proofrolling shall be performed in the presence of the Owner and Owner's Representative.
   4. Any soft or unstable sub-grade soil conditions observed shall be identified for qualification and quantification by the Geotechnical Engineer.
   5. Any soft or yielding areas shall be thoroughly undercut and replaced with well-compacted structural fill. Areas shall be compacted 95% Standard Proctor with the top twelve (12") inches compacted to 98% Standard Proctor Density or as specified by the Geotechnical Report.

C. Material to be placed in a qualified manner as defined by the Contract Documents shall be tested to confirm that the required conditions are met. The testing shall also indicate the type of material observed, the location of the test, the material moisture content, and the current weather. Delivery and compaction of material shall be made during the presence of the testing company's representative and shall be subject to his approval. The inspection by no means absolves the Contractor from responsibility of compaction as specified.

D. Unless material is covered with finish surfaces (paving) immediately following procedures described in B2 and B3 above, the material shall be observed by Owner's Representative again prior to the placement of those finished surfaces. The purpose of this final review is to preclude deterioration of the required conditions from continuing construction, water, or similar causes.

1.4 CODE COMPLIANCE TESTING

A. Inspections and tests required by codes or legal ordinances, or by plan approval

authority, shall be the responsibility of the Contractor, unless otherwise provided in the Contract Documents.

1.5 CONTRACTOR'S CONVENIENCE TESTING

A. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

1.0 GENERAL (*ONLY APPLIES TO SITE RELATED TESTING AND INSPECTIONS FOR THIS PHASE OF WORK).

1.1 DESCRIPTION:

A. An independent Testing Laboratory will be provided by the Owner or their representative to inspect and test the materials and methods of construction as hereinafter specified for compliance with the specification requirements of the Contract Documents and to perform such other specialized technical services as may be required by the Owner or his representative.

B. The Owner will pay for the initial laboratory services for testing of materials for compliance with the requirements of the Contract Documents. The Contractor will pay for testing and all re-testing of materials that do not comply with the requirements of the Contract Documents.

C. Tests and Inspections shall be conducted in accordance with specified requirements, and if not specified, in accordance with the applicable standards of the American Society for Testing and Materials (ASTM) or other recognized and accepted authorities in the field.

D. Work Included:
1. Earthwork.
2. Cast-in-place Concrete.
3. Asphaltic concrete.
4. Storm Installation
5. Sanitary Sewer Installation
6. Underground Detention Vault Installation
7. Special Inspections – Chapter 17, 2018 Edition of the International Building Code (IBC), with Georgia Amendments.

1.2 QUALIFICATION OF LABORATORY:

A. The Testing Laboratory selected should meet the basic requirements of ASTM E329 "Standard of Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction", shall be inspected and approved by the ELF, FC & PA Joint Technical Committee, Inc. or by an equivalent recognized national authority and shall submit to the Owner, Engineer, and the Engineer, a copy of the report of inspection of their facilities.

B. The Testing Laboratory selected shall meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, as published by the "American Council of Independent Laboratory Qualification".

C. Testing machines shall be calibrated at intervals not exceeding 12 months by devices of accuracy traceable to the National Bureau of Standards or accepted values of natural physical constants. The testing laboratory shall submit a copy of certificate of calibration made by an accredited calibration agency.

D. The Testing Laboratory is only required to have testing facilities for work included in this project.

E. The agent of the Testing Laboratory performing field sampling and field testing of concrete shall be certified by the American Concrete Institute as a Concrete Field-Testing Technician - Grade 1, or by an equivalent recognized national authority for an equivalent level of competence or shall be a Licensed Professional Engineer.

1.3 AUTHORITIES AND DUTIES OF THE LABORATORY:

A. The Testing Laboratory shall obtain and review the project Drawings and specifications with the Engineer and Engineer prior to the start of construction. The Laboratory shall attend pre-construction meetings with the Engineer, General Contractor, and Material Suppliers, to coordinate materials inspection and testing requirements with the planned construction schedule. The Laboratory will participate in such conferences throughout the course of the project.

B. The Testing Laboratory shall be responsible for outlining a written detailed testing program conforming to the requirements as specified in the Contract Documents and in consultation with the Owner and Engineer. The testing program shall contain an outline of inspections and tests to be performed with reference to applicable sections of the specifications or drawings and a list of personnel assigned to each portion of the work. Such testing program shall be submitted to the Owner and Engineer five (5) weeks in advance of the start of construction so as not to delay the start of construction. It shall be the Testing Laboratory's responsibility that such program conforms to the requirements of the Specifications and falls within the Owner's budget for testing laboratory services. If the allocated budget is not sufficient to cover the services as outlined in the Specifications, it shall be the responsibility of the Laboratory to notify the Engineer and Owner, so the start of Laboratory services can be modified accordingly prior to the start of construction. Furthermore, the Testing Laboratory shall monitor its expenditures throughout the course of the job and notify immediately the Owner and Engineer, of any significant deviation from the planned testing program and budget.

C. The Contractor shall maintain copies of all Laboratory test reports in the job trailer sorted by type of report and in chronological order.

D. The Laboratory shall cooperate with the Engineer, Engineer, and Contractor, and provide qualified personnel promptly on notice.

E. The Laboratory shall perform the required inspections, sampling, and testing of materials as specified under each section and observe methods of construction for compliance with the requirements of the Contract Documents.

F. The Laboratory shall notify the Engineer and Contractor first by telephone, and then in writing, of observed irregularities and deficiencies of the work and other conditions not in compliance with the requirements of the Contract Documents.

G. The Laboratory shall submit copies of all reports of inspections and test promptly and directly to the parties named below. All reports shall contain at least the following information:
   1. Project Name.
   2. Date report issued.
   3. Testing Laboratory name and address.
   4. Name and signature of inspector.
   5. Date of inspection and sampling.
   6. Date of Test.
   7. Identification of product and Specification section.
   8. Location in the project.
   9. Identification of inspection or test.
   10. Record of weather conditions and temperature (if applicable).
   11. Results of test regarding compliance with Contract Documents.

H. The Laboratory shall send certified copies of test and inspection reports to the following parties:
   1. Two (2) copies to the Owner or his representative.
   2. Two (2) copies to the General Contractor.
   3. One (1) copy to the Engineer.
   4. One (1) copy to the Engineer of responsibility.
   5. One copy to the Supplier of the material tested.

I. Upon completion of the job, the Testing Laboratory shall furnish to the Owner and Engineer of responsibility, a statement certified by a Notary Public that all required tests and inspections were made in accordance with the requirements of the Contract Documents.

J. The Testing Laboratory is not authorized to revoke, alter, relax, enlarge upon, or release any requirements of the Specifications or to approve or accept any portion of

the work or to perform any duties of the General Contractor and his Subcontractors.

1.4 CONTRACTOR'S RESPONSIBILITY:

A. The Contractor shall cooperate with Laboratory personnel, provide access to the work, and to manufacturer's operations.

B. The Contractor shall provide to the Laboratory representative, samples of materials proposed for use in the work in quantities sufficient for accurate testing as specified.

C. The Contractor shall maintain copies of all Laboratory test reports in the job trailer, sorted by type of report and in chronological order.

D. The Contractor shall furnish casual labor, equipment, and facilities as required for sampling and testing by the Laboratory and otherwise facilitate all required inspections and tests.

E. The Contractor shall be responsible for notifying the Testing Laboratory sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.

F. The Contractor shall arrange with the Testing Laboratory and pay for any additional samples and tests above those required by the Contract Documents as requested by the Contractor for his convenience in performing the work.

G. The Contractor shall pay for any additional inspections, sampling, testing, and re-testing as required when initial tests indicate work does not comply with the requirements of the Contract Documents.

H. The Contractor shall furnish and pay for the following items:
   1. Soil survey of the location of borrow soil materials, samples of existing soil materials, and delivery to the Testing Laboratory.
   2. Samples of concrete aggregates and delivery to the Testing Laboratory.
   3. Concrete Coring, tests of below-strength concrete, and load tests, if ordered by the Owner and/or Engineer.
   4. Certification of Portland cement.
   5. Tests, samples, and mock-ups of substitute material where the substitution is requested by the Contractor, and the tests are necessary in the opinion of the Owner or Engineer to establish equality with specified items.
   6. Any other tests when such costs are required by the Contract Documents to be paid by the Contractor.

I. The Contractor shall be responsible for notifying the Owner, the Engineer, and the Testing Laboratory when the source of any material is changed after the original tests

or inspections have been made.

J. If, in the opinion of the Owner or Engineer, any of the work of the Contractor is not satisfactory, the Contractor shall make all tests that the Owner, Engineer, or Engineer deem advisable to determine its proper construction. The Owner shall pay all costs if the tests prove the questioned work to be satisfactory.

1.5 EXTENT OF SERVICES FOR EARTHWORK:

A. Tests of Proposed Fill Material:
1. The Testing Laboratory shall establish the suitability of any proposed fill material by determining the required engineering properties. These tests shall include soil classification by the Atterberg Limit Tests ASTM D423 and D424, and grain size determination by ASTM D422 Particle Size Analysis of Soils.

B. Tests of Subgrade to Determine Suitability for Chemical Stabilization:
1. If chemical stabilization is suggested or recommended in the Soil Report, the Testing Laboratory shall sample and evaluate the subgrade in accordance with established criteria to determine if cement can be successfully used as a chemical stabilizing agent. These tests will include Atterberg Limit determinations of the raw soil and evaluations of Plasticity Index and/or strength with varying amounts of stabilizing additive according to ASTM D423 (Liquid Limit of Soils) and ASTM D424 (Plastic Limit and Plasticity Index of Soils).

C. Moisture Density Relationship for Natural and Fill Materials:
1. The Testing Laboratory will provide one (1) optimum moisture density curve for each type of soil, natural, imported fill, or on-site fill, encountered in subgrade and fills under building slabs and paved areas. Curves shall be generated in accordance with ASTM D698.

D. Quality Control Testing Required During Construction:
1. The Testing Laboratory shall inspect and approve the following subgrades and fill layers before further construction work is performed thereon:
a. Paved Areas Subgrade: Make at least one (1) field density test of the natural density test of the natural subgrade for every 2,500 square feet of paved area, but in no case less than three (3) tests. In each compacted fill layer, make one (1) field density test for every 2,500 square feet on paved area, but in no case less than three (3) tests.
b. Foundation Wall Backfill: Make at least one (1) field density test for each 200 lineal feet of all with a minimum of four (4) tests for each wall and a minimum of one (1) test for every other type of foundation wall on the site. Tests shall be at random locations and elevations for each wall.
2. Field Density Tests shall be run according to ASTM D1556 (Density of Soil in Place by the Sand Cone Method), ASTM D2167) (Density of Soil in Place by

the Rubber Balloon Method) or ASTM D2922 (Density of Soil and Soil Aggregate in Place by Nuclear Methods) as applicable.

3. The results of field density tests by the Testing Laboratory will not be considered satisfactory unless their value meets the required density.
4. The Testing Laboratory shall submit all moisture density curves and results of field density tests to the parties listed under Section 1.03G.
5. If reports by the Testing Laboratory indicate field densities lower than specified above, additional tests will be run by the Testing Laboratory with at least the frequencies scheduled above on re-compacted fill and/or natural subgrade. The Testing Laboratory shall notify the Contractor on a timely basis for any required re-testing so as not to delay the work. The costs of such tests shall be borne by the Contractor.
6. The Geotechnical Engineer shall provide inspection service of each dug footing subgrade prior to pouring foundation concrete. Such inspection shall verify that field conditions are consistent with soil report test results and that the foundation is being installed in the proper soil strata at the proper elevation. The Geotechnical Engineer shall submit written field inspection reports promptly after inspection to all parties listed in 1.3 G and report his findings after each inspection by telephone to the Structural Engineer.
7. The Geotechnical Engineer shall provide inspection services and testing based on the Schedule of Special Inspection Services as outlined in Chapter 17 of the 2012 Edition of the International Building Code (IBC), with Georgia Amendments.

1.6 EXTENT OF SERVICE FOR CONCRETE MATERIALS AND POURED IN-PLACE CONCRETE:

A. Test of Portland Cement: Portland cement shall be tested for compliance with the requirements of ASTM C150.
   1. Mill certificates certifying that the cement has been tested and meets the requirements of the Specifications will be acceptable as test results, provided the cement proposed for use can be identified with test lots. Mill certificates shall be submitted by the Contractor prior to use of any such material.
   2. Re-testing of cement will be required if:
      a. In the opinion of the Owner or Engineer, the cement has been damaged in storage or transit or is in any way defective.
      b. The cement has been in storage at the mixing site for over 30 days.
   3. Compressive strength cube specimens shall be made at the start of the job and at a frequency of one (1) set per 250 tons of cement or whenever the source or brand of cement changes so that the quality of cement can be observed throughout the project.

B. Tests of Aggregates:
   1. The Testing Laboratory shall verify that concrete aggregates proposed for use conform to one of the following specifications:

a. "Specification for Concrete Aggregates" (ASTM C33).

b. "Specification for Lightweight Aggregates for Structural Concrete" (ASTM C330).

2. Tests of aggregates by the Testing Laboratory shall be made before the concrete mix is established and thereafter as the character of the aggregate changes and whenever the service of materials is changed.

The following tests will be required:

a. Sampling: The Testing Laboratory shall secure samples of aggregate in accordance with ASTM D75 from the concrete supplier. The proposed aggregate shall not be used until the pit source has been approved by the Laboratory and the plant capacity and ability to produce uniform products has been verified.

b. Sieve Analysis: ASTM C136.

c. Organic Impurities: ASTM C40.

d. Soundness: ASTM C88.

e. Abrasion of Concrete Aggregate: ASTM C131.

f. Specific Gravity: ASTM C127 (coarse aggregate) ASTM C128 (fine aggregate).

g. Deleterious Materials: ASTM C33.

h. Materials Passing No. 200 Sieve: ASTM C177.

Suppliers record of such tests run on the proposed material will be adequate provided a written affidavit is furnished as a shop drawing submittal.

C. Concrete Mix Designs: The Contractor shall submit for approval within two (2) weeks following the start of construction, concrete mix designs for each class of concrete indicated on the Structural Drawings and in the Specifications.

1. The Contractor acting in conjunction with his Concrete Supplier and the Testing Laboratory shall submit in writing with his mix designs, whether the concrete is to be proportioned by either of the following methods as outlined in ACI 318:

a. Field Experience Method.

b. Laboratory Trial Batch Method.

When field experience methods are used to select concrete proportions, establish proportions as specified in ACI 301 and ACI 211.

When laboratory trial batches are used to select concrete proportions, the procedure as outlined in ACI 318-83 shall be followed. Prepare test specimens in accordance with ASTM C192 and conduct strength tests in accordance with ASTM C39.

2. Required types of concrete and compressive strengths shall be as indicated on the Structural Drawings and as specified in the various sections of the Specifications.

3. All mix designs shall state the following information:
   a. Mix design number or code designation by which the Contractor shall order the concrete from the Supplier.
   b. Structural member for which the concrete is designed (i.e. columns, shear walls, footings, etc.).
   c. Type of concrete whether normal weight or light weight.
   d. 28-day compressive strength.
   e. Aggregate type, source, size, gradation, fineness modulus.
   f. Cement type and brand.
   g. Fly ash type and brand (if any).
   h. Admixtures including air entrainment, water reducers, accelerators, and retarders.
   i. Slump.
   j. Proportions of each material used.
   k. Water cement ratio and maximum allowable water content.
   l. Method by which the concrete is intended to be placed (bucket, chute or pump).
   m. Performance information at higher temperatures.

4. The concrete supplier's past record of quality control shall be used in the design of the concrete mixes to determine the amount by which the average concrete strength f'c should exceed the specified strength f'c as outlined in ACI 318. If a suitable record of test results is not available, the average strength must exceed the design strength by 1200 PSI as specified in ACI 318.

   After sufficient data becomes available from the job, the statistical methods of ACI 214 may be used to reduce the amount by which the average strength must exceed f'c as outlined in ACI 318.

5. Admixtures:
   a. Admixtures to be used in concrete shall be subject to the approval of the Engineer and Testing Laboratory.
   b. Quantities of admixtures to be used shall be in strict compliance with the manufacturer's instructions.
   c. Admixtures containing chloride ions shall not be used in prestressed concrete, in concrete containing galvanized or aluminum embedments, or in metal deck floors or roofs.
   d. Air entraining admixtures shall conform to "Specification for Air Entraining Admixtures for Concrete" ASTM C260.
   e. Water reducing admixtures, retarding admixtures, accelerating admixtures, water reducing and retarding admixtures, and water reducing and accelerating admixtures shall conform to "Specification for Chemical Admixtures for Concrete" ASTM C494.

f. Fly ash or other pozzolons, used as admixtures, shall conform to Specification for Fly Ash and Raw or Calcined Natural Pozzolon for use in Portland Cement Concrete" ASTM C618.

g. Use amounts of admixtures as recommended by the manufacturer for climatic conditions prevailing at the time of placing. Adjust quantities of admixtures as required to maintain quality control.

6. Slump Limits: Unless shown otherwise on the Structural Drawings, proportion and design mixes to result in concrete slump at the point of placement as follows:
   a. Ramps and sloping surfaces - 3".
   b. Foundation concrete - 3" to 6".
   c. All other concrete - 3" to 5".
7. Lightweight Structural Concrete:
   a. Comply with the requirements of ACI 211 and ACI 301.
   b. Lightweight concrete aggregate shall conform to the "Specification for Lightweight Aggregates for Structural Concrete" ASTM C330.
   c. Provide concrete with a dry unit weight of not more than 116 pounds per cubic foot and not less than 95 pounds per cubic foot or as specified on the Structural Drawings.
8. Adjustments of Concrete Mixes: Mix design adjustments may be requested by the Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant. Such mix design adjustments shall be provided at no additional cost to the Owner. Any adjustments in approved mix designs, including changes in admixtures, shall be submitted in writing to the Engineer and Testing Laboratory for approval prior to field use.

D. Concrete Test Cylinders:
1. Cylinders for strength tests shall be molded and laboratory cured in accordance with ASTM C31 "Method of Making and Curing Concrete Test Cylinders in the Field" and tested in accordance with ASTM C39 "Method of Testing for Compressive Strength of Cylindrical Concrete Specimens".
2. Field samples for strength tests shall be taken in accordance with ASTM C172 "Method of Sampling Fresh Concrete".
3. Frequency of Testing: Each set of test cylinders shall consist of a minimum of four (4) standard test cylinders. A set of test cylinders shall be made according to the following frequency:
   a. One (1) set for each class of concrete taken not less than once a day.
   b. For walls and floors, one (1) set for each 100 cubic yards or fraction thereof not less than one (1) set for each 5,000 square feet of surface area.
   c. For columns, one (1) set for each 150 cubic yards or fraction thereof with a minimum of two (2) sets per floor.
   d. For all other concrete, a minimum of one (1) set for each 100 cubic yards or fraction thereof.
   e. No more than one (1) set of cylinders at a time shall be made from any single

truck.

f. If the total volume of concrete is such that the frequency of testing as specified above would provide less than five (5) strength tests for a given class of concrete, tests shall be made from at least five (5) randomly selected batches or from each batch if fewer than five batches are used.
g. The above frequencies assume that one (1) batch plant will be used for each pour. If more than one (1) batch plant is used, the frequencies cited above shall apply for each plant used.

The cylinders shall be numbered, dated, and the point of concrete placement in the building recorded. Of the four (4) cylinders per set, break one at seven days, two at 28 days, and one automatically at 56 days if either 28-day cylinder break is below required strength. One (1) additional cylinder per set will be required for formed slab and pan joist floors for the purpose of evaluating the concrete strength at the time of form stripping.

This cylinder shall be stored on the floor where form removal is to occur under the same exposure conditions as the floor concrete.

This cylinder shall be cured under field conditions in accordance with ASTM C31 "Method of Making and Curing Concrete Test Specimen in the Field". Field cured test cylinders shall be molded at the same time and from the same samples as laboratory cured test specimens. This cylinder shall be broken at the time of form removal as directed by Contractor.

4. For concrete with design strength in excess of 5,000 PSI, the Contractor shall be responsible for providing a temperature controlled and protected concrete cylinder storage box at a point on the job site mutually agreeable with the Testing Laboratory for the purpose of storing concrete cylinders until they are transported to the Laboratory.
5. The Testing Laboratory shall be responsible for transporting the cylinders to the Laboratory in a protected environment such that no damage or ill effect will occur to the concrete cylinders.
6. The Testing Laboratory shall make and distribute concrete test reports after each job cylinder is broken. Such reports shall contain the following information:
   a. Truck number and ticket number.
   b. Concrete Batch Plant.
   c. Mix design number.
   d. Accurate location of pour in the structure.
   e. Strength requirement.
   f. Date cylinders made and broken.
   g. Technician making cylinders.
   h. Concrete temperature at placing.
   i. Air temperature at point of placement in the structure.
   j. Amount of water added to the truck at the batch plant and at the site.

k. Slump.
l. Unit weight.
m. Air content.
n. Cylinder compressive strengths with type of failure if concrete does not meet Specification requirements. Seven (7) day breaks are to be flagged if they are less than 70% of the required 28-day strength. 28-day breaks are to be flagged if either cylinder fails to meet Specification requirements.

E. Other Tests of Concrete Required by the Testing Laboratory:
1. Slump tests (ASTM C143) shall be made at the beginning of concrete placement for each batch plant and for each set of test cylinders made.
2. Air entrainment (ASTM C233) tests shall be made at the same time slump tests are made as cited above.
3. Concrete Temperature at placement at the same time slump tests are made as cited above.
4. The Testing Laboratory shall provide inspection services and testing based on the Schedule of Special Inspection Services as outlined in Chapter 17 of the 2012 Edition of the International Building Code (IBC), with Georgia Amendments.

F. Evaluation and Acceptance of Concrete:
1. A strength test shall be defined as the average strength of two (2) 28-day cylinder breaks from each set of cylinders.
2. The strength level of an individual class of concrete shall be considered satisfactory if both of the following requirements are met:
a. The average of all sets of three (3) consecutive strength tests equal or exceed the required f'c.
b. No individual strength tests (average of two (2) 28-day cylinder breaks) fall below the required f'c by more than 500 PSI.

If either of the above requirements is not met, the Testing Laboratory shall immediately notify the Engineer by telephone. Steps shall immediately be taken to increase the average of subsequent strength tests.

G. Investigation of Low Strength Concrete Test Results:
1. If any strength test of laboratory cured cylinders fall below the required f'c by more than 500 PSI, the Contractor shall take steps immediately to assure that the load carrying capacity of the structure is not jeopardized.
2. The Testing Laboratory shall, under the direction of the Engineer, perform non-destructive field test of the concrete in question using Swiss Hammer, Windsor Probe, or other appropriate methods and report the results the same as for cylinder test reports.
3. If the likelihood of low strength concrete is confirmed and computations

indicate that the load carrying capacity of the structure has been significantly reduced, tests of cores drilled from the area in question under the direction of the Engineer will be required in accordance with ASTM C42 (Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete). In such case, three (3) cores shall be taken for each strength test more than 500 PSI below required f'c. If concrete in the structure will be dry under service conditions, cores shall be air dried (temperature 60° to 80°, relatively humidity less than 60 percent) for seven (7) days before test and shall be tested dry. If concrete in the structure will be more than superficially wet under service conditions, cores shall be immersed in water for at least 48 hours and tested wet. The Contractor shall fill all holes made by drilling cores with an approved dry-pack concrete.

4. Concrete in an area represented by core test shall be considered structurally adequate if the average of three (3) cores is equal to at least 85% of f'c and if no single core is less than 75% of f'c. To check testing accuracy, locations of erratic core strengths may be re-tested.
5. If the above criteria are not met, and the structure adequacy remains in doubt, the Engineer may order a load test, as specified in ACI 318 for the questionable portion of the structure.
6. If the structural adequacy of the affected portion of the structure remains in doubt, the Engineer may order the structure to be strengthened by an appropriate means or torn down and re-built.
7. The costs of all investigations of low strength concrete shall be borne by the Contractor.

H. Job Site Inspection by the Testing Laboratory: The scope of the work to be performed by the inspector on the job site shall be as follows:

1. Verify that air temperatures at the point of placement in the structure are within acceptable limits defined in Section J prior to ordering of concrete by the Contractor.
2. Inspect concrete upon arrival to verify that the proper concrete mix number, type of concrete, and concrete strength is being placed at the proper location.
3. Inspect plastic concrete upon arrival at the job site to verify proper batching. The responsibility for adding water to trucks at the job site shall rest only with a duly appointed representative mutually agreeable to the Contractor, Owner, and Engineer, prior to the start of any concrete operations.
4. Obtain concrete test cylinders as specified in Sections D.1 and D.2.
5. Perform slump tests and air entrainment tests as specified in Section D.6.
6. Record information for concrete test reports as specified in Section D.6.
7. Verify that all concrete being placed meets job Specifications. Reject concrete not meeting the requirements of Section K and immediately notify the Contractor, Batch Plant Inspector, Engineer, and Owner.
8. Pick up and transport to Laboratory, cylinders cast the previous day.

9. Check concrete placing techniques to determine that concrete deposited is uniform and that vertical drop does not exceed six feet.
10. The job site inspector shall report any irregularities that occur in the concrete at the job site or test results to the Contractor, Owner, and Engineer.

I. Causes for Rejection of Concrete Delivered to the Site:

A duly appointed representative agreeable to the Owner and Engineer, shall reject all concrete delivered to the site for any of the following reasons:

1. Wrong class of concrete (incorrect mix design number).
2. Air Temperature: Air temperature limits shall be as follows:
   a. Cold Weather: Air temperature must be 40°F. and rising.
   b. Hot Weather: Air temperature must be cooler than 100°F.
      Concrete may be placed at other air temperature ranges only with approval to the duly appointed representative.
3. Concrete with temperatures exceeding 95°F. may not be placed in the structure without approval of the job inspector for the Testing Laboratory or other duly appointed representative.
4. Air contents outside the limits specified in the mix designs.
5. Slumps outside the limits specified in Section C.6 or the mix designs.
6. Excessive Age: Concrete shall be discharged within 90 minutes of plant departure or before it begins to set if sooner than 90 minutes unless approved by the Laboratory job inspector or other duly appointed representative.

1.7 EXTENT OF SERVICES FOR STRUCTURAL STEEL AND RELATED WORK:

A. Contract Obligations:

1. Owner Responsibility: The Owner shall pay for all initial shop and field inspections and tests as required during the fabrication and erection of the structural steel.
2. Contractor Responsibility: The Contractor shall pay for and arrange with the Testing Laboratory for the certification of all shop and field welders. The costs of all re-testing of material or workmanship not in conformance with the Contract Documents shall be borne by the Contractor.
3. The Fabricator and Erector shall provide the laboratory inspector with access to all places where work is being done. A minimum of 24 hours notification shall be given prior to commencement of work.
4. Testing Laboratory Responsibility: The inspection of shop work by the Testing Laboratory shall be performed in the Fabricator's shop to the fullest extent possible. Such inspections shall be in sequence, timely, and performed in such a manner as to minimize disruptions in operations and to permit the repair of all non-conforming work while the materials in process in the

fabricating shop. Inspection of field work shall be completed promptly so that corrections can be made without delaying the progress of the work. The Testing Laboratory shall provide test reports of all shop and field inspections. Shop test reports shall include shop welder's certifications.

The Testing Laboratory shall provide inspection services and testing based on the Schedule of Special Inspection Services as outlined in Chapter 17 of the 2012 Edition of the International Building Code (IBC), with Georgia Amendments.

All test reports shall indicate types and locations of all defects found during inspection, the measures required and performed to correct such defects, statements of final approval of all welding and bolting of shop and field connections. In addition to the parties listed in Section 1.03.G, the fabricator and erector shall receive copies of all test reports.

5. The Engineer, Engineer, and Testing Laboratory reserve the right to reject any material or workmanship not in conformance with the Contract Documents at any time during the progress of the work. However, this provision does not allow waiving the obligation for timely, in sequence inspection.

B. Mill Tests of Structural Steel:

1. Mill Order Steel: The Fabricator shall furnish certified mill test reports and an affidavit stating that the structural steel furnished meets the requirements of the grade specified on the structural drawings for all mill order steel. In case of controversy, certified reports of tests, according to ASTM A6 or A568 as applicable, made by the Owner's Testing Laboratory, paid for by the Contractor, shall be made to verify conformity with ASTM standards.
2. Local Stock Steel: Materials taken from stock by a Fabricator for use for structural purposes must be of a quality at least equal to that required by the ASTM specifications applicable to the classification covering the intended use.
3. Certified mill test reports shall be accepted as sufficient record of the quality of materials carried in stock by the fabricator. In case of controversy, certified reports as specified for mill order steel shall be required.
4. If tests are required, test specimens shall be taken by the Contractor under the direction of the Testing Laboratory and shall be machined by the Testing Laboratory to dimensions as required by the applicable ASTM standards.

C. Shop Inspections and Tests:

The Testing Laboratory shall provide inspection at the designated fabrication shops for the designated periods of time to perform shop inspection and tests. The designated fabrication shops and time periods of inspections shall be determined in consultation with the Owner and Engineer prior to the start of

fabrication in a timely manner so as not to delay the fabrication process. The following tests and inspections shall be performed:

1. Review shop drawings and shop procedures with fabricator's supervisory personnel.
2. Request and obtain necessary mill certifications of steel and verify proper material throughout the duration of the job.
3. Review welding procedures and obtain welder certificates.
4. Check layout and dimensions of jigs and fixtures for multiple fabrication, joint preparation, and fit-up of members.
5. Verify welding electrodes to be used and other welding consumables as the job progresses.
6. Check pre-heating procedures for uniformity and thoroughness through the full thickness of the material.
7. Perform random dimensional checks of completed members.
8. Provide inspection of surface preparation for coating operations.
9. Check shipping preparation schedules and obtain copies of shipping lists.
10. Check bolted connections according to inspection procedures outlined in the "Specification for Structural Joints Using ASTM A325 or A490 Bolts".
11. Make visual inspection of welding in progress for size, length, and quality.
12. Perform non-destructive examination services for various weldments of shop fabrication determined in consultation with the Structural Engineer prior to the start of fabrication.
    a. Non-destructive examination conducted in accordance with the specific requirements for the item being examined including radiographic, ultrasonic, magnetic particle, or dye penetrant inspection.
    b. Interpret, record, and report all results of the non-destructive tests.
    c. Mark for repair, any area not meeting Specification requirements.
    d. Re-examine all repair areas and interpret, record and report the results of examinations of repair welds.

D. Field Inspections and Tests:

The Testing Laboratory shall provide inspection in the field for a period of time as determined in consultation with the Owner and Engineer prior to the start of erection in a timely manner so as to not delay the start of erection. The following tests and inspections shall be made:

1. Obtain the planned erection procedure, and review with the Erector's supervisory personnel.
2. Check the installation of base plates for proper leveling, grout type, and grout application.
3. Verify field welding procedures and obtain welder certificates.
4. Check steel as received in the field for possible shipping damage, workmanship, and piece marking.

5. Check plumbing and frame alignment as erection progresses.
6. Check required camber of floor beams.
7. Check joint preparation and fit up, backing strips, and run-outplates for welded moment connections and column splices.
8. Check pre-heating to assure proper temperature, uniformity, and thoroughness through the full material thickness.
9. Review welding sequence.
10. Visually inspect field welding for size, length, and quality.
11. Perform non-destructive examination services for various weldments of field erection determined in consultation with the Structural Engineer prior to the start of erection. The laboratory shall furnish a qualified technician with the necessary equipment to perform radiographic, ultrasonic, magnetic particle, or dye penetrant inspection as required for the item being tested and other duties as outlined for shop inspection in Section C.12.
12. Check calibration of impact wrenches used in field bolted connections.
13. Check high strength field bolted connections according to inspection procedures outlined in the "Specification for Structural Joints Using ASTM A325 or A490 Bolts". Unless specified otherwise, test one (1) bolt in 10% of the bolted connections. If that bolt is found to be improperly tightened, test all bolts in the connection.
14. Visually inspect the welding of metal deck to the structure.
15. Perform field tests on 10% of completed shear connectors according to inspection procedures outlined in AWS D1.1.

1.8 EXTENT OF SERVICES FOR SPRAYED FIREPROOFING WORK:

A. Tests by fireproofing manufacturer: Fireproofing materials shall have been tested by UL, in accordance with procedures of ASTM E119-88 and be listed in the UL “Fire Resistance Directory” for cementitious mixtures.

B. Manufacturer’s inspection: Manufacturer shall make initial inspection of surfaces and application to assure compliance with manufacturer’s product data.

C. Job Site Inspection by the Testing Laboratory: The scope of work to be performed by the inspector on the job site shall be as follows:
   1. Testing following installation shall consist of thickness and density measurements of material in accordance with ASTM E605-77.
   2. Measurement criteria shall comply with sprayed fire-resistant materials requirements of the Standard Building Code, 1994 edition with current amendments.
   3. Contractor shall advise Testing Agency in a timely manner to allow for completion of quality tests without interference with subsequent work and for assignment of personnel.
   4. Reinstall and test deficient fireproofing installations as required where testing

indicates improper or inadequate thickness or density until specified requirement are achieved at no additional costs to the Owner.

5. Testing Agency shall furnish copies of all tests and reports to the Engineer, Contractor and the Owner.

D. Thickness and detail indicated on the drawings are diagrammatic only and are primarily to show extent. Fireproofing shall be in such thicknesses and details in accordance with assembly designs to achieve the fire rating indicated.

1.9 EXTENT OF SERVICES FOR ASPHALTIC CONCRETE:

A. Make one laboratory density and stability test on each type of asphaltic concrete for each day's operation in accordance with ASTM D1559.

B. Make one extraction and gradation test on each type of asphaltic concrete for each day's operation in accordance with ASTM D2726.

1.10 EXTENT OF SERVICES FOR REINFORCING STEEL FOR CONCRETE:

A. When the Contractor or Reinforcing Steel Fabricator notifies the Testing Laboratory that a shipment of reinforcing steel is in the final stages of fabrication and ready for shipment, the Testing Laboratory will inspect the shipment to determine the following:

1. The bars should be free from injurious defects and shall have a workman-like finish.
2. Deformations shall be of the proper sizes, shapes, and spacing as detailed in ASTM A-615.
3. The bars should not have excessive rust and/or pelting.
4. The bars should not have any unusual twists or bends.

B. Identified Stock: Where job material is taken from bundles as delivered from the mill, is properly identified as to heat number and is accompanied by mill and analysis test reports, such material shall be used without further local tests provided an affidavit is given from the Supplier to the Testing Laboratory that the materials conform with the requirements of the ASTM specification as listed on the Structural Drawings. In case of controversy, the procedure as stipulated below for unidentified stock shall be followed.

C. Unidentified Stock: For all unidentified stock, the Testing Laboratory will secure samples of the reinforcing steel bars at the time of inspection. The samples will conform to the following:

1. The sample will include two (2) bars for each ten (10) tons or fraction thereof, or each bar size, heat number, and manufacturer being shipped.
2. The sample bars will be a minimum of 24 inches in length and should be identical to the material being shipped.

The Testing Laboratory will tag each of the steel bundles with the laboratory identification tag and appropriately mark the samples corresponding to the steel being inspected and shipped. The fabricator will supply shipping lists showing the weight of each bar to the Testing Laboratory for tensile strength tests and bend tests according to ASTM A615. Bend tests will not be required for #14 and #18 bars.

D. Tension Butt Splices: The Testing Laboratory shall conduct tension tests of tension butt splices of the type as specified on the Structural Drawings. The specimens to be tested shall have been made by the Contractor's personnel under field condition. The rate of testing shall be as follows:

1. Eight (8) specimens for the first 100 splices (or fraction thereof for small jobs) at the beginning of the job. Splices not meeting tension requirement shall be re-tested at the Contractor's expense until all splices meet the tension requirements.
2. Two (2) specimens for every 100 (or fraction thereof) additional splices occurring on the job. Any splices not meeting tension requirements shall be re-tested at the Contractor's expense until all splices have passed the test.
3. Test specimens should also be selected from transition splices (splices of one bar size to another bar size) (if any) with a testing frequency approximately in proportion to the number of transition splices compared to the total number of splices.

E. Compression Butt Splices: The Testing Laboratory shall provide 100%visual inspection of all compression butt splices on the job.
Inspection shall verify splice conformance with the requirements for end bearing splices set forth in ACI 318 Building Code Requirements for Reinforced Concrete as well as the manufacturer's instructions.

F. Reinforcing steel placement: Review reinforcing steel placement for foundations, walls, beams, elevated slabs, and columns for proper bar size, quantity, and clearances to formwork.

END OF SECTION

SECTION 01415

SPECIAL INSPECTIONS

1.0 GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.

1.2 SUMMARY: (*ONLY APPLIES TO SITE RELATED SPECIAL INSPECTIONS FOR THIS PHASE OF WORK).

A. Description:
   1. This Section includes the procedural requirements for quality assurance for Special Inspections.
   2. Special inspection and testing services are required to provide a detailed verification of compliance with the Construction Documents, codes and standards specified. Special Inspection services and the presence of Special Inspectors on site do not relieve the Contractor of responsibility for compliance with the Construction Document requirements.
   3. The Registered Design Professional for special inspections is typically the Engineer or Structural Engineer. Often the Engineer will take input from the Structural, Mechanical and Electrical Engineers and act as the overall Registered Design Professional in Responsible Charge of preparing and submitting the Statement of Special Inspections.

B. Related Documents and Standards:
   1. All Special Inspections on this project shall conform to the Construction Documents and referenced standards, in addition to this document. The Special Inspections Package has been submitted as part of the Construction Documents. These documents describe Contractor responsibilities, Fabricator responsibilities, required inspections/testing and inspections/testing frequency.
   2. Hold a Special Inspections preconstruction meeting at least 7 days prior to initial planned date for start of work requiring Special Inspections.
      a. Discussions shall include the following:
         1) Review of specifications and Schedule of Special Inspections for work requiring Special Inspections.
         2) Responsibilities of Contractor, Owner, Testing Agency, Special Inspector, and Registered Design Professional:
      b. Notification and reporting procedures:

3. Attendees shall include Contractor, Owner's Representative, Testing Agency, Special Inspector, and Registered Design Professionals for Structural Engineering.

C. Related Sections:
   1. Division 03 Specifications – Concrete Construction.
   2. Division 31 Specifications – Earthwork.

1.3 QUALITY CONTROL:

A. Special Inspections shall be performed by agents who have relevant experience for each category of inspections. Minimum qualifications and certifications for each category are indicated in the building code.

B. Special Inspections and Testing: Owner will engage an agency to conduct Special Inspections and Testing as described in the referenced Special Inspections documentation and as required by authorities having jurisdiction.
   1. Special Inspector and his agents will notify Registered Design Professional and Contractor of deficiencies observed in the Work.
   2. Special Inspector and his agents will submit a certified written report of each test, inspection and similar quality-control service.
   3. Special Inspector and his agents will submit a Final Report of Special Inspections at the completion of the Special Inspections stating work was completed in substantial conformance with Construction Documents. Final Report of Special Inspections shall state required inspections have been performed and itemize nonconforming work not corrected or resolved as coordinated with the Design Professional in Responsible Charge.
   4. Special Inspector and his agents will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Construction Documents.
   5. Special Inspector and his agents will retest and reinspect corrected work.
   6. Owner's selection of a Special Inspector in no way relieves the Contractor of responsibility to perform work in full compliance with Construction Documents.

B. Special Inspector and Agency Qualification Data: Inspection agencies shall submit a copy of their qualifications, including names and qualifications of each inspector and technician who will be performing inspections or tests, to the Code Enforcement Official. Special Inspector and Agency shall be acceptable to the Code Enforcement Official.

D. Reports: Special Inspectors shall submit inspection reports of each test or inspection to the Contractor, Engineer of Record, Structural Engineer of Record, Design Professional in Responsible Charge, and the Owner. Reports to be submitted on forms approved by the Design Professional in Responsible Charge. All deficiencies shall be highlighted in reports and presence of deficiencies shall be noted within the

report title.

E. Permits, Licenses, and Certificates: For Owner's records, submit copies of certifications, inspection reports, releases, deficiencies, Engineer sketches regarding deficiencies, correspondence, records, and similar documents established for compliance with the Special Inspections program documented by the Special Inspection Statement and Schedule.

F. Owner shall provide all completed Special Inspection forms and schedule of Special Inspections to Special Inspector(s) with all Construction Documents and document changes.

2.0 PRODUCTS (NOT USED)

3.0 EXECUTION

3.1 SPECIAL INSPECTION FORMS:

A. Statements of Special Inspections: The attached Statements of Special Inspections, completed by the registered Design Professional in Responsible Charge, shall be submitted to the Building Official at the time of permit application. Copies of the forms, approved by the Building Official, shall be kept by the Contractor at a central location on the project site and submitted to the Design Professional in Responsible Charge.

B. Schedule of Special Inspections: The Schedule of Special Inspections shall be submitted to the Building Official at the time of permit application. Special Inspectors shall initial and date each item in the "Completed" column when the inspections for the specific scope of work are completed. A copy of the Schedule of Special Inspections containing signatures for all tasks requiring inspection shall be submitted to the Design Professional in Responsible Charge with the Final Reports of Special Inspections.

C. Contractor's Statement of Responsibility: Contractor shall review the Statements of Special Inspections and Schedule of Special Inspections. Contractor shall complete the Contractor Statement of Responsibility and submit the statement to the Design Professional in Responsible Charge.

D. Fabricator's Certificate of Compliance: Contractor shall forward one copy of Fabricator's Certificate of Compliance to each Fabricator who provides fabrication materials noted for Special Inspection in the schedule and who is exempt from Special Inspection per Section 1704.2.5.2 of the Building Code. Contractor shall submit all Certificates to the Design Professional in Responsible Charge.

E. Final Report of Special Inspections: The Final Report of Special Inspections shall be submitted to the Building Official when all Special Inspection requirements for the project are completed and there are no outstanding deficiencies in work scheduled for inspections/testing. Each Special Inspection agency noted in the Schedule is

required to submit a copy of this form for their scope of work.

3.2 OWNER RESPONSIBILTIES:

A. Owner will engage and pay for services of Special Inspector and his agents.
B. Owner will engage either the Engineer or one of his consultants to act as the Design Professional in Responsible Charge and pay for services of administrating this program.

3.3 CONTRACTOR RESPONSIBILITIES:

A. Contractor to whom building permit is issued shall have and maintain responsibility to manage, direct, and control construction activities on Project for which building permit is issued.
B. Contractor shall designate a representative who shall be the direct point-of-contact with the Special Inspector(s) during each phase of work. Designated representative will work with the Special Inspector(s) and Design Professional in Responsible Charge to communicate and coordinate for corrective actions required for discrepancies noted during work progress.
C. Contractor shall review the Schedule of Special Inspections to become familiar with all of the required testing and inspections and shall cooperate with Special inspector(s) to provide access to construction activities and manufacturer's operations that are to be tested/inspected.
D. Provide required copies of product test reports to Special Inspector(s).
E. Secure and deliver to Special Inspector(s) adequate quantities of representative material samples that require testing/inspection as part of the Schedule of Special Inspections.
F. Provide incidental labor and facilities:
    1. To facilitate tests and inspections that are required by Special Inspections and noted in the Schedule of Special Inspections.
    2. To provide access to construction activities to be tested.
    3. To obtain and handle samples at Project site or at source of product to be tested.
    4. For storage and curing of test samples.
G. Notify Special Inspector(s) and his agents at least 48 hours in advance of required inspection or test:
    1. When tests or inspections cannot be performed after such notice, immediately notify Special Inspector to discuss alterations of work and subsequent inspection(s) to allow for required testing/inspection by Special Inspector(s).
    2. If the Special Inspector is not notified in time to cancel and reschedule any required inspection, the Contractor shall reimburse Owner through Change Order procedure for Special Inspector(s) personnel and travel expenses incurred. Contractor, Special Inspector, and Owner shall develop procedures and associated costs for the Change Order procedure noted.
H. Contractor is responsible for retesting where results of inspections, tests, or other

quality-control services prove unsatisfactory and indicate noncompliance with Construction Document requirements, regardless of whether original test was Contractor's responsibility.

I. Cost of construction related to retesting, deficiencies, corrective work, revised or replaced by Contractor, is Contractor's responsibility where required tests performed on original construction indicated noncompliance with Construction Document requirements.

J. Contractor shall be solely responsible for construction site safety.

3.4 SPECIAL INSPECTOR(S) RESPONSIBILITES:

A. Review all Special Inspection statements and the Schedule of Special Inspections and become familiar with the structural design for the project and construction requirements, such that the Inspector(s) and his agents may provide adequate verification observations to assure conformance with Construction Documents.

B. Review Construction Documents and reference documents cited in sufficient detail that he may assure himself that conformance is provided.

C. Contact local Enforcement Agency/Building Official and Design Professional in Responsible Charge to determine requirements for testing/inspection report and nonconformance log formatting and frequency. Determine if all reporting will be transmitted to the Design Professional in Responsible Charge or if any of the reporting must also be transmitted directly from the Special Inspector(s) to the local Enforcement Agency/Building Official.

D. Consult with the Design Professional in Responsible Charge for clarification regarding questions from the site, deficiencies, and misinterpretations of the work.

E. Attend preconstruction meetings and routine job conferences called by Contractor.

F. Provide on-site testing, inspections, and observations of phases of work in accordance with frequencies noted for each type of inspection in the Schedule of Special Inspections and to assure himself Contractor is performing work in accord with Construction Documents.

G. Receive and review required Contractor submittals for verification of conformance to Construction Documents.

H. Provide local Enforcement Agency/Building Official and Design Professional in Responsible Charge with periodic Special Inspection reports, all testing/inspection documentation, and reports of outstanding/resolved nonconformances with report formats and report frequencies coordinated at the start of the Special Inspections program.

3.5 LIMITS ON AUTHORITY:

A. Special Inspector and his agents shall not release, revoke, alter, or enlarge on requirements of Construction Documents.

B. Special Inspector and his agents shall not have control over Contractor’s means and methods of construction.

C. Special Inspector and his agents shall not have authority to stop work.

3.6 COMMUNICATION:

A. Testing Agency shall immediately notify Contractor and Registered Design Professional by e-mail of test results or inspections failing to comply with requirements of the Construction Documents.
B. Special Inspector shall immediately notify Contractor of work found to be in nonconformance with the Construction Documents. If nonconforming work is not corrected while the Special Inspector is on-site, Special Inspector shall notify Registered Design Professional within 24 hours (one business day) and issue a nonconformance report.
C. If nonconforming work is not corrected at time of substantial completion of structure or other appropriate time, Special Inspector shall notify Code Enforcement Official.
D. Special Inspector and his agents submit reports within 7 days of inspection or test.

3.7 REPAIR AND PROTECTION:

A. General: Upon completion of inspection, testing, sample taking, and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes.
B. Protect construction exposed by, or for, quality control service activities, and protect repaired construction.
C. Repair and protection are Contractor's responsibility, regardless of assignment of responsibility for inspection, testing, or similar services.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

1.0 GENERAL

1.1 FACILITIES:

A. Temporary Offices: Provide sufficient space for Contractor's personnel.
   1. Provide temporary office facilities complete with lighting, heating and air conditioning and telephone service.
   2. Location of temporary office shall be subject to Engineer's acceptance.

B. Temporary Storage Facilities: Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters of fully enclosed spaces. Locations and adequacy of storage facilities shall be subject to Engineer's approval.

C. Electrical Service: Provide temporary electrical service, including extensions and connections necessary for construction work. Pay costs of installing and maintaining service for duration of project. Pay costs associated with use of permanent electrical system until Date of Substantial Completion.

D. Temporary Lighting: Provide the following minimum light levels for construction purposes.
   1. General Construction and Safety Lighting: Five (5) footcandles.
   2. Finishing Work and Testing: twenty-five (25) footcandles.

E. Temporary Heat and Ventilation:
   1. Provide temporary heat in enclosed spaces to provide minimum temperatures of 40°F. until time finishing work begins.
   2. After building is totally enclosed and installation of finishes begins, maintain spaces in a temperature range of 60°F. to 80°F. at all times, except as may otherwise be required by product manufacturers for proper product installation and performance. Maintain until Date of Substantial Completion.
   3. Maintain relative humidity in a range of 50% to 65% in enclosed spaces after building is enclosed and installation of finishes begin; except as may otherwise be required by product manufacturers for proper product installation and performance.
   4. Provide ventilation to prevent accumulation of dust, fumes or gases and to properly cure materials and disperse humidity.

F. Telephone Service: Provide temporary telephone service to temporary offices for

duration of project. Pay costs for installation and for local services. Toll calls shall be paid for by person making call.

G. Water Service: Provide temporary water for construction purposes, including extensions and connections necessary for work. Pay costs of installation and maintaining service for duration of project. Pay costs associated with use of permanent water system until Date of Substantial Completion.

H. Sanitary Toilet Facilities: Provide and maintain temporary toilet facilities for construction personnel. Permanent new facilities may not be used by personnel. During work at existing facilities, under no circumstances will workmen be allowed to use any student or teacher toilet facility within the building.

I. Relocate temporary facilities during construction as required by progress of the Work at no additional cost to the Owner.

J. Where work is performed with-in an existing building, water, electrical and gas will be paid for by the owner (where possible to use convenience outlets with-in the building without disturbing school operations).

K. At completion of Work, or at time of permanent utility connections, as applicable, remove temporary facilities, including connections and debris resulting from temporary installation.

1.2 STAGING AREA:

A. The Contractor shall be responsible for establishing staging areas WITHIN the designated Limit of Work area for this Contract; no staging or materials storage will be permitted outside the Limit of Work area.

B. The Contractor is solely responsible for all security, protection, safeguards, etc. of materials and personnel within the established staging area (areas).

1.3 TEMPORARY CONTROLS:

A. Noise Control: Contractor shall make every effort to affect a satisfactory noise abatement program during school hours. Use sound deadening materials where required to reduce disturbances to classroom in session.

B. Dust Control: Where cutting or removing materials which will generate dust and dirt, the Contractor shall provide temporary dust curtains, solid barricades, or the like, to retain and control dust relative to the area in which work is occurring. Clean areas of dust as practicable so as not to allow its spread by pedestrian traffic.

1.4 CONTRACTOR'S USE OF PREMISES: The Contractor is reminded that the Project is limited by its nature to certain physical areas of each facility. The facilities may be fully occupied (except as provided for work areas) while the work progresses. Therefore, restrict personnel to areas of each facility where their presence is required by the work to be performed. The Contractor's personnel shall not fraternize with students and school personnel.

1.5 PROJECT SIGN:

A. Refer to Section 01200 General Requirements for Project Sign information. Owner will discuss size, type, and verbiage with Contractor at Pre-Construction Meeting.

END OF SECTION

SECTION 01630

SUBSTITUTIONS

1.0 GENERAL

1.1 REQUIREMENTS INCLUDED: Substitutions for products specified shall be allowed only under the conditions stated in this section.

1.2 PRODUCT OPTIONS:

A. Products are specified by reference standards, performance, description and manufacturer's name and model number or trade name.
   1. When specified only by reference standard or performance, Contractor may select any product meeting specified standards or performance requirements, by any manufacturer.
   2. When specified in descriptive manner without listing manufacturer's name, model number or trade name, provide product complying with specified characteristics and Contract requirements.
   3. When several products or manufacturers are specified as being acceptable, Contractor has the option of choosing among those named.
   4. When proprietary products are specified, substitutions will be allowed only by substitution provisions specified herein.

1.3 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.

   Requests for substitution shall reach the Engineer not less than ten (10) days prior to the date for opening of bids. Requests received by the Engineer after this date will not be considered.

1.4 SUBMITTALS:

A. Submit a separate request for each substitution. Support each request with:
   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 recommendations 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, sources of replacement materials.

B. If a proposed substitution is approved by the Engineer, an addendum will be issued to prospective bidders not less than five (5) days prior to the date set for opening bids. If a substitution does not appear in an addendum, it shall mean that the Engineer has not approved the product, and the successful bidder shall be responsible for furnishing materials and products in accordance with the Contract Documents. Following the receipt of bids, no further requests for substitution of products or materials will be considered.

1.5 CONTRACTOR'S REPRESENTATION: In connection with the use of any substitute item approved by the Engineer 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 substitutions which may subsequently become apparent.`

1.6 PRODUCT EVALUATIONS:

A. In making formal request for substitution the party submitting the request represents that:
   1. He has investigated proposed product and has determined that it is equal to or superior in all respects to that specified.
   2. He shall provide same warranties or bonds for substitution as for product

specified.

3. He shall coordinate installation of accepted substitution into the Work and will make such changes as may be required for the Work to be completed in all respects.

1.7 MATERIALS CONTAINING HAZARDOUS SUBSTANCES:

A. The intent of the Contract Documents is to exclude all materials which contain known hazardous substances, including materials containing asbestos, polychlorinated biphenyl (PCB), or any other known substances determined to be a health hazard by the United States Environmental Protection Agency (EPA) and other recognized agencies. In studying the Contract Documents and at any time during execution of the Work, the Contractor shall at once report to the Engineer any materials containing hazardous substances that he may discover. Do not proceed with installation of materials containing known hazardous substances.

B. Where products are specified by product name, by manufacturer, by reference standard or in descriptive manner without manufacturer's name, model number or trade name, Contractor shall select materials meeting specified requirements which do not contain known hazardous substances in any form.

C. Neither the Contractor, nor his material suppliers, nor his subcontractors shall install or otherwise incorporate any materials containing asbestos, PCB or other hazardous materials within the boundaries of the Project. No soil found on site, or transported to the site from remote locations, shall be used for fill, backfill or landscape topsoil, if such soils are contaminated with material containing asbestos, PCB, Radon, gasoline, fuel oil, diesel fuel or other similar fossil fuels.

D. The Contractor shall require that each of his Subcontractors and material suppliers warrants to Owner and Engineer that all materials, products, and assemblies incorporated, or submitted for incorporation into this Project, are totally free of asbestos, PCB, or other such hazardous materials.

E. If the Contractor or his Subcontractors or material suppliers have knowledge that, or believe that an item, component, material or accessory within a product or assembly may contain asbestos, PCB or other hazardous material, it is the Contractor’s sole responsibility to secure a written certification from the manufacturer of any suspected material stating this material is totally free of asbestos, PCB or other hazardous materials. A copy of the written certification shall be submitted to the Owner and Engineer.

E. In making requests for substitution, Contractor shall be responsible for determining that materials requested for substitution are free of known hazardous substances in any form.

END OF SECTION

SECTION 01630

PROJECT RECORD DOCUMENTS

1.0 GENERAL

1.1 REQUIREMENTS INCLUDED:

A. Maintain at Project Site for Owner, one (1) record copy of:
   1. Drawings.
   2. Project Manual/Specifications.
   3. Addenda.
   4. Change Orders and other Modifications to Contract.
   5. Field Orders or written instructions.
   6. Approved and Approved As Noted Shop Drawings, Product Data and Samples.
   7. Field Test Records.
   8. NPDES NOI (Notice of Intent Permit) and rainfall/sampling monitoring records.

B. Make Record Documents available to Engineer.

C. Submit final Record Documents with Closeout Documents.

1.2 QUALITY ASSURANCE:

A. Make entries within twenty-four (24) hours after receipt of information except note dimensional corrections and new dimensional data immediately upon determination.

B. Do not permit record sets to be used for any other purpose.

1.3 RECORD DOCUMENTS:

A. Field Record Drawings: One complete set of Drawings upon which all changes to Work are recorded daily with colored pencil to provide accurate, factual information relative to Work as constructed, both visible and concealed.
   1. Identify entry by "cloud" type circle around affected Work. Initial and date each entry.
   2. Record the following:
      a. Horizontal location and elevation of underground portions of Work.
      b. Location, size and arrangement of concealed items of Work.
      c. Location, size and arrangement of exposed items of Work.
      d. Changes and corrections to dimensions.
      e. Changes to materials and products.

f. Changes and deviations in Work from that indicated in Contract Documents.

3. Mark record sets with red erasable pencil and, where feasible, use other colors to distinguish between variations in separate categories of work.
4. Note related change order numbers where applicable. Note change order in green erasable pencil.

B. Final Record Drawings: One complete set of colored copies and color scanned electronic PDF files on compact disk of the Field Record Drawings.

C. Field Record Specifications: One complete set of Project Manual/Specifications within which changes to materials, products, equipment, and systems are recorded; also, note which specified manufacturer was used. Make corrections with colored pencil and mark the Manual "Record Specifications" on outside back binding.

D. Final Record Specifications: Either Field Record Specifications volume or new set of Specifications bearing all changes transferred from Field Record Specifications. Also provide color scanned electronic PDF files on compact disk of the Final Record Specifications.

END OF SECTION

SECTION 01700

CONTRACT CLOSE-OUT

1.0 GENERAL

1.1 DEFINTIIONS

Closeout is hereby defined to include the general requirements near the end of the Contract Time, in preparation for final acceptance, final payment, normal termination of the Contract, occupancy by the Owner and similar actions evidencing completion of the work. The time of closeout is recognized to be directly related to "Substantial Completion", and therefore may be either a single time period for the entire work or a series of time periods for individual parts of the work which have been certified as substantially complete at different dates.

After the Contractor receives an executed copy of "A Notice of Substantial Completion" of the project, he shall prepare, assemble and transmit the documents, brochures and drawings herein required in one package.

1.2 CERTIFICATION OF SUBSTANTIAL COMPLETION: Prior to requesting Engineer's inspection for certification of Substantial Completion (for either the entire work or portions thereof), complete the following and list all known exceptions in the request:

A. Submit last progress-payment request, with sworn statement showing 100 percent completion of the work, complete with associated releases, consents and supports.

B. Advise Owner of pending insurance change-over requirements, if required.

1.3 CERTIFICATION OF FINAL ACCEPTANCE: Prior to requesting Engineer's final inspection for certification of final acceptance and final payment, as required by the General Conditions, complete the following and list known exceptions (if any) in request:

A. Submit final payment request with final releases and supports not previously submitted and accepted.

B. Submit record drawings, maintenance manuals, and similar final record information.

C. Submit record documents, special guarantees, warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

D. Submit copy of Engineer's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance.

E. Complete the final cleaning.

1.4 SUBMITTALS:

A. General: Specific requirements for submittal documents are indicated in individual Sections of these Specifications. The general requirements are indicated in this Section.

B. Form: Submit three (3) electronic sets of PDF files of all close-out documents unless noted otherwise below.

C. Warranties:

1. Warranty-Contractor and Subcontractors: Reference is hereby made to the General Conditions in which the one (1) year warranty of the General Contractor and each subcontractor (the subcontractor's warranty shall be made to the General Contractor, not the Owner) is required to be submitted.
2. The words "Warranty" and "Guarantee" as used anywhere in the text of the Contract Documents shall be interchangeable and synonymous meaning "a legally binding guarantee".
3. Specific warranties do not diminish implied warranties, and shall not deprive the Owner of actions, rights and remedies otherwise available to him for the General Contractor's failure to fulfill requirements of the Contract Documents. Periods of warranties shall not be interpreted as limitations on the time in which the Owner can pursue actions, rights or remedies.
4. Coincidental product warranties which are in conflict with the requirements of the Contract Documents will be rejected.
5. All warranties shall commence on the Date of Substantial Completion.
6. All warranties shall cover all costs for necessary material and labor to promptly replace or restore the failing unit of work and other work damaged from its failure.

C. Statutory and Non-Influence Affidavits (General Contractor and Subcontractor): Before final acceptance of the Work, the General Contractor shall furnish Statutory and Non-Influence Affidavits on the forms attached.

D. Certificate of Substantial Completion and Certificate of Completion (Final):
A Certificate of Substantial Completion on AIA Form No. G704, for the project will be prepared by the Engineer for the purpose of establishing a date when the project is substantially complete, identification of a punch list and terminating liquidated damages. Submit a Certificate of Completion (Final) on final inspection of the project verifying that punch list items are complete, and all closing documents are in order, as shown by the accompanying project close-out check off list, and that all final payments are in order and establishing a date of final acceptance. Sample form attached.

E. Record Documents and As-Built Record Drawings: (Refer to Section 01650). Submit two (2) color scanned PDF files on digital media.

G. As-Built Underground Stormwater Detention Facility: On projects incorporating new or modified detention facilities, the Contractor shall secure the Engineer's Certificate, executed on the form attached to this Section, and submit triplicate copies thereof to the Engineer prior to the Engineer's issuance of the Substantial Completion Certificate.

H. Maintenance Manuals: Organize maintenance and operating manual information into suitable sets of manageable sizes and bind into individual binders identified and indexed (thumb-tabbed); examples: Water Quality Units. Include inspection procedures, shop drawings, product data, and similar applicable information. Bind each manual of each set in a heavy duty 3-ring vinyl-covered binder and include pocket folders for folded sheet information. Legibly mark identification on both the front and spine of each binder. SUBMIT THREE (3) COPIES AND ONE (1) SCANNED PDF FILE ON COMPACT DISK OF EACH.

2.0 PRODUCTS

There are no products in this Section.

3.0 EXECUTION

3.1 CLOSEOUT PROCEDURES:

A. General Maintenance Instructions: Prior to requesting Engineer's inspection for certification of Substantial Completion, arrange for each installer of work requiring maintenance (by the Owner) or operation, to meet with the Owner's personnel, in the Engineer's presence, at the project site, to provide basic instructions needed for proper operation and maintenance of the entire Work. Include instructions by manufacturer's representatives where installers are not expert in the required procedures. Review maintenance manuals and record documentation. Review maintenance and operations in relation with applicable guarantees and warranties.

1. PUNCH LIST

A. When the project is substantially complete Contractor shall notify Owner’s Representative in writing at least five (5) days before the date of request for punch list inspection. Contractor shall arrange for the presence of all subcontractors whose work is involved, if required by Owner’s Representative.

1. Owner and/or Owner’s Representative shall prepare a "Punch List" as a

convenience to Contractor for items not completed and work not meeting the requirements of the Contract Documents. The "Punch List" is not to be construed to be a final or complete listing of project requirements but is intended only to assist in the completion of the project. Contractor shall make a diligent effort to complete all work in conformance with the requirements of the Contract Documents before requesting a "Punch List".

2. Correction of items noted on the "Punch List" does not relieve Contractor from conforming to all requirements of the Contract Documents.

B. Contractor shall furnish three copies of the following:
   1. Consent of Surety for final payment.
   2. Warranty
   3. Final and Retainage Applications for payment.
   4. Contractor's Statutory Affidavit ensuring no liens.
   5. Subcontractor Statutory Affidavits ensuring no liens, only if required by City.
   6. Substantial Completion Letter.
   7. Certificate of Insurance.
   8. List of all Subcontractors.

C. Warranties
   1. Contractor shall warrant all work executed by his forces and his subcontractors under this contract, and any additional modifications and change orders, to be absolutely free of all defects of workmanship and materials for a period of one year beginning on date of Substantial Completion. Contractor shall repair all such defects, resulting damages and repair any damage to other work caused by subsequent repair work to Owner's and Owner's Representatives' satisfaction no later than 30 days following written notification by Owner that remedial repairs are required.
   2. At the end of the one (1) year warranty period, Contractor shall inspect the project with Owner for deficiencies. At that time, a correction list shall be prepared by Owner and Contractor shall make the necessary repairs and corrections immediately and as directed by Owner.
   3. Contractor shall provide additional guarantees (in excess of one year) where specifically required by pertinent specification sections.

3. FINAL CLEANING

A. Prior to the Date of Substantial Completion, remove all debris, excess dirt, etc., for all portions of job site.

B. Final Inspection

   1. When the work is completed in accordance with the Contract Documents and the requirements of Paragraph A above and General and Supplemental Conditions have been satisfied, Contractor shall notify Owner's Representative,

in writing, that the work shall be ready for final inspection on a definite date which shall be stated in such notice. The notice shall be forwarded to Owner through Owner's Representative, who will attach his endorsement as to whether or not he concurs in Contractor's statement that the work will be ready for final inspection on the established date. Such endorsement shall not relieve Contractor of his responsibility in this matter.

2. Final inspection will be made by Owner and/or Owner's Representative when Contractor deems that the work has been completed in accordance with the Contract Documents and when he has requested a final inspection be made as outlined above.

C. Removal of Protection:

1. Except as otherwise indicated or requested by the Engineer, remove temporary protection devices and facilities which were installed during the course of the work to protect previously completed work or hazardous conditions during the remainder of the construction period.
2. Temporary silt fence and erosion control devices shall remain in place until one year following Substantial Completion, after which date they shall be removed by the Contractor and the surrounding areas dressed up as required.

D. Compliances: Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at the site or bury debris or excess materials on the Owner's property or discharge volatile or other harmful or dangerous materials into drainage systems; remove waste materials from the site and dispose of in a lawful manner satisfactory to City of Dacula. Where extra materials of value remaining after completion of the associated work have become the Owner's property, dispose of these to Owner's best advantage as directed.

3.3 CONTINUING INSPECTIONS: Except as otherwise required by special guarantees, warranties, agreements to maintain, workmanship bonds, and similar continuing commitments, comply with the Owner's requests to participate in inspections at the end of each time period of such continuing commitments. Participate in the general inspection(s) of the work approximately one year beyond the date(s) of Substantial Completion.

4.0 CHECK-OFF LIST AND FORMS

PROJECT CLOSE-OUT
CHECK-OFF LIST

	DOCUMENT	NO. COPIES	DATE RECEIVED
1.	Contractors Warranty	_____	_____
2.	Subcontractors' Warranty	_____	_____
3.	Special Extended Warranties beyond l year, if required.	_____	_____
4.	Certificate of Contractor/ Statutory Affidavit	_____	_____
5.	Non-Influence Affidavit	_____	_____
6.	As-Built Drawings and Record Documents	_____	_____
7.	Schedule of Contacts	_____	_____
8.	Punch List Items Completed	_____	_____
9.	Hazardous Materials Certificate	_____	_____
10.	Engineer's Certificate (As-Built Underground Stormwater Detention Facility)	_____	_____
11.	Certificate of Substantial Completion AIA G704	_____	_____
12.	Consent of Surety to Final Payment AIA G707	_____	_____
13.	Contractors Affidavit of Payment of Debts and Claims, AIA G706	_____	_____
14.	Certificate of Final Payment to Contractor	_____	_____

I certify that, being familiar with the Contract Documents for this project, to the best of my knowledge, the items checked off herein above constitute all that are applicable to this project.

_____ _____
Contractor's Signature Date Submitted to the Engineer
(For Submitting to the Engineer)

_____ _____
Engineer's Signature Date Submitted to the Owner
(For Submitting to the Owner)

WARRANTY BY GENERAL CONTRACTOR

OWNER: CITY OF DACULA

JOB NAME: _____

PROJECT NO.: _____

ADDRESS: _____

COUNTY OF: GWINNETT_____ STATE OF: GEORGIA _____

DATE: _____

_____, as General Contractor on the above job do hereby guarantee that all work executed under the Drawings and Specifications will be free from defects of materials and/or workmanship for a period of: _____YEAR

beginning _____, and ending _____,
(Substantial Completion Date)

and that all defects occurring within the warranty period shall be replaced or repaired at no cost to the Owner.

This guarantee covers all work as shown on the Drawings and specified in the Specifications and Contract Documents.

Nothing in the above shall be deemed to imply that this guarantee shall apply to any work which has been abused or neglected by the Owner.

Legal Name of Contractor:

_____

By: _____

Title: _____

_____
Notary Public

This _____ day of _____ 20_____

My Commission Expires: _____

WARRANTY BY SUBCONTRACTOR TO GENERAL CONTRACTOR

GENERAL CONTRACTOR: _____

SUBCONTRACTOR: _____

OWNER: CITY OF DACULA _____

JOB NAME: _____

PROJECT NO.: _____

ADDRESS: _____

COUNTY OF: GWINNETT _____ STATE OF: GEORGIA _____

DATE: _____

as Subcontractor on the above job do hereby guarantee that all work executed under the Drawings and Specifications will be free from defects of materials and/or workmanship for a period of: _____YEARS.

beginning _____, and ending _____,
(Substantial Completion Date)

and that all defects occurring within the warranty period shall be replaced or repaired at no cost to the Owner.

This guarantee covers all work as shown on the Drawings and specified in the Specifications and Contract Documents for _____.

Nothing in the above shall be deemed to imply that this guarantee shall apply to any work which has been abused or neglected by the Owner.

Legal Name of Contractor:

_____

By: _____

Title: _____

_____
Notary Public

This _____ day of _____ 20_____

My Commission Expires: _____

SPECIAL EXTENDED WARRANTY

OWNER: CITY OF DACULA

PROJECT NAME: _____

PROJECT NO: _____

PROJECT ADDRESS: _____

COUNTY OF: GWINNETT STATE OF: GEORGIA

DATE: _____

_____,
(Insert name of PRIME WARRANTOR above and circle appropriate source below) as (SUPPLIER) (MANUFACTURER) (SUBCONTRACTOR) on the above referenced project for:

_____

_____
(Insert description of work or materials provided on the line above)

and the General Contractor (co-signed below) do hereby guarantee that the above executed under the criteria of the Contract Drawings and Specifications will be free of defects in material and workmanship for a period of: _____ YEARS

beginning _____ , and ending _____
(Substantial Completion Date)

and that all defects occurring within the above warranty period shall be promptly replaced or repaired at no cost to the Owner.

This warranty covers all work as shown on the Contract Drawings and Contract Specifications with warranty criteria outlined in

Specification Section / Paragraph (Insert the Technical Specification Section and Paragraph requiring the warranty)

Nothing in the above shall be deemed to imply that this warranty shall apply to any work or materials which has been abused or neglected by the Owner.

_____ _____
Legal name of Prime Warrantor Legal name of General Contractor

_____	_____
By (Officer)	By (Officer)
_____	_____
Title	Title

_____
Notary Public

This _____ day of _____, 20_____

My Commission Expires: _____

CONTRACTOR STATUTORY AFFIDAVIT

STATE OF GEORGIA, COUNTY OF _____

FROM: _____
(Contractor)

TO: CITY OF DACULA _____

RE: Contract entered into the _____ day of _____, 20_____, between the above-mentioned parties for the construction of a

_____

_____

_____

KNOW ALL MEN BY THESE PRESENTS:

1. The undersigned hereby certifies that all work required under the above contract has been performed in accordance with the terms thereof, that all materialmen, subcontractors, mechanics, and laborers have been paid and satisfied in full and that there are no outstanding claims of any character arising out of the performance of the contract which have not been paid and satisfied in full.
2. The undersigned further certifies that to the best of his knowledge and belief there are no unsatisfied claims for damages resulting from injury or death to any employees, subcontractors, or the public at large arising out of the performance of the contract, or any suits or claims for any other damage of any kind, nature, or description which might constitute a lien upon the property of the Owner.
3. The undersigned makes this affidavit as provided by law and for the purpose of receiving final payment in full settlement of all claims arising under or by virtue of the contract, and acceptance of such payment is acknowledged as a release of the Owner from any and all claims under or by virtue of the contract.

IN WITNESS WHEREOF, the undersigned has signed and sealed this instrument the _____ day of _____, 20 _____,

_____ _____
(Legal Signature) (Title)

_____
(Name of Contractor)
SUBSCRIBED AND SWORN BEFORE ME ON THIS THE _____ day of _____, 20_____

_____ (NOTARY SEAL)
Notary Public

My commission expires _____

SUBCONTRACTOR STATUTORY AFFIDAVIT

STATE OF GEORGIA, COUNTY OF _____

FROM: _____
(SubContractor)

TO: CITY OF DACULA _____

RE: Contract entered into the _____ day of _____, 20_____, between the above-mentioned parties for the construction of a

_____

_____

_____

KNOW ALL MEN BY THESE PRESENTS:

1. The undersigned hereby certifies that all work required under the above contract has been performed in accordance with the terms thereof, that all Subcontractor materialmen, mechanics, and laborers have been paid and satisfied in full and that there are no outstanding claims of any character arising out of the performance of the contract which have not been paid and satisfied in full.
2. The undersigned further certifies that to the best of his knowledge and belief there are no unsatisfied claims for damages resulting from injury or death to any Subcontractor's employees, or the public at large arising out of the performance of the contract, or any suits or claims for any other damage of any kind, nature, or description which might constitute a lien upon the property of the Owner.
3. The undersigned makes this affidavit as provided by law and for the purpose of receiving final payment in full settlement of all claims arising under or by virtue of the contract, and acceptance of such payment is acknowledged as a release of the Owner from any and all claims under or by virtue of the contract.

IN WITNESS WHEREOF, the undersigned has signed and sealed this instrument the _____ day of _____, 20 _____,

_____ _____
(Legal Signature) (Title)

_____
(Name of Contractor)
SUBSCRIBED AND SWORN BEFORE ME ON THIS THE _____ day of _____, 20_____

_____ (NOTARY SEAL)
Notary Public

My commission expires _____

NON-INFLUENCE AFFIDAVIT

COUNTY OF: _____

STATE: _____

I do solemnly swear on my oath that as to the contract dated

_____, 20_____, for

_____ _____
City of Dacula Project Project No.

between

_____

and the City of Dacula, I have no knowledge of the exertion of any influence or the attempted exertion of any influence on the firm on behalf of which this affidavit is made in any way, manner, or form in the purchase of materials, equipment, or other items involved in the construction, manufacture or employment of labor under the aforesaid contract, by any employee of the City of Dacula, or any person connected with the State Government of Georgia in any way whatsoever.

This _____ day of _____, 20_____,

_____
Name (Typed or Legibly Printed)

_____
Signature

_____
Title

_____
Firm

_____
County of

_____
State of

Personally, before me, the undersigned, appeared

_____

who is known to me to be an official of the firm of

_____

who, after being duly sworn, stated on his oath that he had read the above statement and that the same is true and correct.

_____

Notary Public

This _____ day of _____, 20_____,

My commission expires _____

_____ County, GA

HAZARDOUS MATERIALS CERTIFICATE

CERTIFICATE OF GENERAL CONTRACTOR

OWNER: _____

PROJECT NAME: _____

ADDRESS: _____

COUNTY OF GWINNETT

STATE OF GEORGIA

DATE:

_____

_____, as General Contractor on the above job, does hereby certify that all materials, products and assemblies supplied and installed in this project and on the site are totally free of asbestos, PCB or other hazardous materials.

This certificate covers all materials required by the contract documents.

Nothing in the above shall be deemed to imply that this certificate shall apply to materials furnished by the Owner or installed by the Owner.

LEGAL NAME OF CONTRACTOR:

_____

BY: _____

TITLE: _____

_____
NOTARY PUBLIC

THIS _____ DAY OF _____ , 20_____.

My commission expires _____

CITY OF DACULA

*** * * * ENGINEER'S CERTIFICATE * * * ***

AS-BUILT STORMWATER DETENTION FACILITY

I,_____,
a registered Professional Engineer in the State of Georgia, hereby certify that the stormwater detention facility (facilities) for the project known as

_____
(Project Name)

lying in Land Lot _____ of the

District, Gwinnett County, has (have) been constructed to approved Drawings and specifications and in accordance with City of Dacula requirements.

This is the _____ day of _____ , 20_____.

Georgia Registration No. _____

SECTION 01743

GEORGIA SECURITY AND IMMIGRATION AFFIDAVIT

PART 1- GENERAL

1.1 The Contractor Affidavit and Agreement example is attached. The Contractor is required to state affirmatively that the individual, firm or corporation which is contracting with the City of Dacula has registered with and is participating in a federal work authorization program. Place this form on Company Letterhead before verifying compliance with federal work authorization program. Upon execution the completed forms shall be returned to the Owner's Representative before entering into a Contract.

1.2 The Subcontractor Affidavit and Agreement example is attached. The Contractor is required to obtain affirmations from the individuals, firms or corporations which are participating as subcontractors in this Contract with the City of Dacula. These Subcontractors must verify that they are registered with and are participating in a federal work authorization program. Place this form on Company Letterhead before verifying compliance with federal work authorization program. Upon execution the completed forms shall be returned along with the Contractor's Affidavit referenced in 1.1 above to the Owner's Representative before entering into a Contract.

GEORGIA SECURITY AND IMMIGRATION CONTRACTOR AFFIDAVIT

STATE OF GEORGIA
CITY OF DACULA

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 Dacula, Georgia has registered with and is participating in a federal work authorization program* (i.e., any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603), in accordance with the applicability provisions and deadlines established in O.C.G.A. § 13-10-91.

The undersigned further agrees that, should it employ or contract with any subcontractor(s) in connection with the physical performance of services pursuant to this contract with The City of Dacula, Georgia, contractor shall secure from such subcontractor(s) similar verification of compliance with O.C.G.A. § 13-10-91 on the Subcontractor Affidavit provided in Rule 300-10-01-.08 or a substantially similar form. Contractor further agrees to maintain records of such compliance and provide a copy of each such verification to The City of Dacula, Georgia at the time the subcontractor(s) is retained to perform such service.

_____
EEV/Basic Pilot Program* User Identification Number

_____ _____
BY: Authorized Officer or Agent Date
(Contractor Name)

_____
Title of Authorized Officer or Agent of Contractor

_____
Printed Name of Authorized Officer or Agent

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE
DAY OF _____, 2025.

_____
Notary Public
My Commission Expires:

*As of July 1, 2007, the applicable federal work authorization program is the "EEV/Basic Pilot Program" operated by the U.S. Citizenship and Immigration Services Bureau of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration (SSA).

GEORGIA SECURITY AND IMMIGRATION SUB-CONTRACTOR AFFIDAVIT

STATE OF GEORGIA -
CITY OF DACULA

SUBCONTRACTOR AFFIDAVIT

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract with _____ _____(name of contractor) on behalf of The City of Dacula, Georgia has registered with and is participating in a federal work authorization program* (i.e., any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603), in accordance with the applicability provisions and deadlines established in O.C.G.A. § 13-10-91.

_____
EEV/Basic Pilot Program* User Identification Number

_____ _____
BY: Authorized Officer or Agent Date
(Subcontractor Name)

_____
Title of Authorized Officer or Agent of Subcontractor

_____
Printed Name of Authorized Officer or Agent

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE
DAY OF _____, 2025.

_____
Notary Public
My Commission Expires:

*As of July 1, 2007, O.C.G.A. § 13-10-91, the applicable federal work authorization program is the "EEV/Basic Pilot Program" operated by the U.S. Citizenship and Immigration Services Bureau of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration (SSA).

END OF SECTION

SECTION 02050

COMMON WORKS FOR EXTERIOR IMPROVEMENTS

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Furnished Topsoil
   2. Water
   3. Soil Amendments
   4. Mulch.
   5. Compost
   6. Graded Aggregate Base (GAB)
   7. Coarse Sand
   8. ASTM Aggregates
   9. Drain Rock
   10. Geotextiles

1.2 REFERENCE SPECIFICATIONS AND DOCUMENTS

A. Georgia Department of Transportation (GDOT)
   1. Department of Transportation, State of Georgia Standard Specifications, Construction of Roads and Bridges, 2013 Edition. Unless otherwise noted, conform with GDOT Standard Specifications for materials.

B. American Society for Testing Materials (ASTM)
   1. ASTM D1557- laboratory compaction characteristics of soil using Modified Effort.

1.3 SUBMITTALS

A. Product data for material proposed for the work.

B. Copies of all soil testing results for lawn and landscape planting areas, including but not limited to the following data:
   1. Include the recommended ratio and amounts (lbs. per 1000 sq-ft) of fertilizing.
   2. Amendments of lime, organic matter.

1.4 SITE CONDITIONS

A. Store materials only in areas designated for Contractor's use.

2.0 PRODUCTS

2.1 FURNISHED (IMPORT) TOPSOIL

A. Furnished Topsoil is adapted to the sustenance of plant life and harvested from fields or development sites. Manufactured topsoil where components such as sand, organic matter, and chemicals are added to mineral soil are not acceptable. Furnished topsoil shall reasonably achieve the following characteristics:
   1. Texture – USDA loam, sandy clay loam, or sandy loam with clay between 15 and 25% and combined clay and silt content no more than 55%.
   2. Organic Material – 2.0 to 20% by mass
   3. pH - between 5 and 7.
   4. Uniform quality and free from foreign material such as hard clods, sod, stiff clay, hard pan, stones larger than 1 inch diameter, lime cement, ashes, slag, concrete, tar residues, tarred paper, boards, chips, sticks, or other undesirable materials. It shall also be reasonably free from weeds and objectionable plant material.

B. All sources of Furnished (Import) Topsoil shall be approved by the Design Professional prior to delivery to site. Test proposed topsoil and submit test results for approval, along with a minimum 1 gallon labeled soil sample.

C. Stockpiled existing topsoil at the site meeting the above criteria may be acceptable.

D. Furnished Topsoil shall be screened.

2.2 WATER

A. Furnish and pay for water used in this work. Furnish watering trucks, hoses, and other temporary watering equipment (sprinklers, stands. etc.) required for work.

B. When used for plant irrigation, water shall be suitable and free from ingredients harmful to plant life.

2.3 SOIL APPURTENANCES (AMMENDMENTS)

A. Mulches and Composts: See separate Articles this specification.

B. Ground Limestone: Lime shall be ground limestone (Dolomite) containing not less than 85 percent of total carbonates and ground to such a fineness that 50 percent will pass through a 200-mesh sieve and 90 percent will pass through a 20-mesh sieve. Coarser material will be acceptable, provided the specified rates of application are increased proportionately on the basis of quantities passing through the 100-mesh sieve.

C. Sand: Clean, washed sand, free of toxic materials.

D. Sawdust: Rotted sawdust, free of chips, stones, sticks, soil, or toxic substances and with 7.5 lbs. nitrogen fertilizer uniformly mixed into each cubic yard of sawdust.

E. Peat Moss: granulated sphagnum free of woody substances, brown in color, free of stones and mineral matter, air dry condition.

F. Peat Humus: When shown, provide a domestic product of peat humus consisting of partially decomposed vegetable matter of natural occurrence. It shall be brown, clean, low in content of mineral and woody material, mildly acid, and granulated or shredded.

G. Commercial Fertilizer: Fertilizer formula complying with State and Federal fertilizer laws. Deliver fertilizer to the site in original, unopened containers bearing the manufacturer's certificate of compliance covering analysis and primary nutrient (N, P, K) concentrations. To protect public health and waterways, do not over apply any fertilizer. Unless otherwise shown on the Drawings or specified in other Sections, fertilizer application is as follows:
   1. Lawns: Provide nutrients in ratios and quantities (lbs. per 1000 sq-ft, or lbs. per acre) as recommended from soil testing. Provide nitrogen in a form that will be available to lawn during initial growth period (approximately 50% fast release) as well as in slow-release organic forms (approximately 50%).
   2. Trees and shrubs (planting beds): Provide in the ratios and quantities (lbs. per 1000 sq-ft, or lbs. per cubic yard of soil) in accordance with results of soil tests.

H. Ammonium Nitrate: Use where specified or where a fast release nitrogen fertilizer is required. Commercial product in dry granular form of recent manufacture (within last 6 months) and delivered in the original, unopened containers each bearing the manufacturer's guaranteed statement of analysis, containing not less than 33.0% percent Nitrogen.

I. Pre-emergent Weed Control: shall be Scotts Pro Grow Ornamental Herbicide 2 (granular) and Pro Turf Southern Weed Grass Control #83204 (or approved equal) as manufactured by Scotts Pro Grow, Marysville, Ohio 43041.

2.4 MULCHES FOR GRASSING AND EROSION

A. Provide mulches of the types and depths shown, that are clean and free from debris, and reasonably free of weeds. Mulches may include, but are not limited to:
   1. Bermuda grass hay.
   2. Threshed wheat rye or oat straw.

2.5 COMPOST

A. Use compost that meets the following:
   1. Composed of decomposed organic material.
   2. Organic material is disinfected through composting (minimum 9 months) or similar technologies.
   3. Stabilized so it is beneficial to plant growth.
   4. Mature, dark brown or black in color and have an earthy odor.
   5. Contain no human pathogens.
   6. pH range of 5 to 8.
   7. Contains not more than 25% by volume wood shavings, sawdust, or refuse.

B. Submit all ingredient in the compost mix, and their relative proportions.

2.6 NUTRIENT GRADE COMPOST

A. Provide nutrient grade compost manufactured from a composter enrolled in the Untied State Compost Council Seal of Testing Assurance (STA) Program. When shown, provide EARTH Food as distributed by: Exceptional Products, Inc, 402 Line Creek Dr., Peachtree City, GA 30269, (or approved Equal) that meets the following parameters as tested by an STA approved lab:

Plant Nutrient	% dry weight basis	TMECC Method
Nitrogen	>1.2	4.02D
Phosphorus	>.50	Calc.
Potassium	>.50	Calc.
Calcium	>.90	4.05
Magnesium	>.20	4.05
Organic Matter Content	>50%	5.07-A
Soluble Salts dS/m (mmhos/cm)	<4.0	4.08-A
Particle Size % under 9.5 mm	95% or greater	2.02-B
Stability Indicator (respirometry) C02 Evolution mg C02-C/g OM/day	<2	5.08-F777
Maturity Indicator (bioassay) Percent Emergence	85% or greater	5.05A
Select Pathogens (pass/fail per US EPA Class A standard, 40 CFR 8503.32 (a)) Method 9221E	Pass	Standard

2.7 GRADED AGGREGATE BASE (GAB)

A. GAB material shall be composed of well graded crushed stone consisting of hard, durable rock fragments free from clay and reasonably free from flat, elongated, or soft pieces of organic matter.

B. GAB shall achieve the following gradation:

Sieve Size	Percent Passing by Weight
2 in	100
1-1/2 in	97-100
3/4 in	60-95
No. 10	25-50
No. 60	10-35
No. 200	7-15

2.8 COARSE SAND

A. Clean, washed, sand free of toxic materials free of limestone, shale, and slate particles, complying with ASTM C-33 fine aggregate for concrete.

B. Coarse sand shall achieve the following gradation:

Sieve Size	Percent Passing by Weight
3/8 in	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	10-30
No. 100	2-10
No. 200	2-5

2.9 COARSE AGGREGATES

A. Refer to TABLE 800.1 GDOT Standard Specifications for No's 3, 4, 5, 6, and 57 stone, respectively.

2.10 CONTROLLED LOW STRENGTH FLOWABLE FILL

A. Flowable fill where required shall meet the requirements of GDOT Std. Spec Section 600.3.03 for Excavatable mix design. The mix design shall produce a consistency that will result in a flowable self-leveling product at time of placement.

Property or Content	Quantity
Cement Type 1	75-100 lbs. / yd3
Air	15-35%
28-Day Compressive Strength	Maximum 100 psi
Unit Weight	90-100 lbs. / ft3

2.11 GEOSYTHETICS

A. Separation fabric:
Woven polypropylene fabric, high modulus type with good separation capabilities conforming to the following:

Property	Test Method	Requirement
Grab Tensile Strength	ASTM D 4632	200 lbs. min.
Grab Tensile Elongation	ASTM D 4632	30% max.
Mullen Burst Strength	ASTM D 3786	400 psi min.
Trapezoid Tear Strength	ASTM D 4533	75 lbs. min.
Puncture Strength	ASTM D 3787	75 lbs. min.
CBR Puncture	ASTM D 6241	
Apparent Opening Size (AOS)	ASTM D 4751-99a	20 to 50 US Sieve

3.0 EXECUTION

3.1 AGGREGATE BASES

A. Placement
1. Maximum single layer compacted course is 8 inches.
2. If total thickness of base exceeds 8 inches, construct in 2 or more courses of equal thickness.

B. Compaction
1. Ensure moisture content is uniformly distributed and sufficient to achieve optimum moisture.
2. Uniformly roll the base to line, grade, and section and to the required percentage of maximum dry density.
3. For multiple courses, add water as necessary to achieve optimum moisture content.
4. In areas inaccessible to roller, obtain the required compaction with mechanical tampers approved by the Testing Agency or Design Professional.

C. Maintenance
1. Maintain the base until it is sufficiently ready for paving courses. Repair defects by additional watering, rolling, and blading, as necessary.

END OF SECTION

SECTION 02100

SITE CLEARING

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Clearing of vegetative matter and debris.
   2. Grubbing.
   3. Disposal of cleared and grubbed material.

B. Related Sections:
   1. 02200 "SITE PREPARATION AND GENERAL SITE WORK" for layout, public safety, protection of existing facilities, protection of vegetation, utility locates, and utility protection.

1.2 SITE CONDITIONS

A. Tree save and protection of existing vegetation: Unless approved in writing by the Design Professional clearing operations and equipment shall be limited to the "Limits Of Disturbance", and "Tree Protection Limits" as shown on the drawings. Selective removal of understory trees and brush is included in designated areas. The selective removal shall be accomplished by hand methods with the utmost care as to not damage larger trees to remain.

2.0 PRODUCTS (not used)

3.0 EXECUTION

3.1 PREPARATION

A. Verify that utilities have been disconnected and capped as necessary for clearing activities and that clearing limits and tree protection areas are plainly marked.

3.2 CLEARING

A. Strictly adhere to the Drawings for demolition and clearing and as shown on the Erosion and Sedimentation Control Drawings.

B. Clear all areas to be graded of remaining debris and extraneous materials.

C. Remove from the general construction /grading areas and proper disposal of all trees, brush, stumps, logs, grass, weeds, roots, decayed vegetable matter, refuse dumps, and all other objectionable matter resting on the original ground surface or appearing or being placed on these areas at any time before final acceptance of the work, except as provided for elsewhere.

D. Remove and properly dispose of any remaining obstructions not to be salvaged or preserved, such as fences and incidental structures within the construction area.

3.3 GRUBBING

A. Grubbing includes the removal and proper disposal of all stumps, roots, and other vegetation or perishable matter that exists below the original ground surface in cleared areas. Grubbing also includes removal of general buried obstructions, trash, and debris not otherwise removed by demolition.

B. Unless otherwise shown, grub to the following depths:
   1. All sound, unsound or decayed stumps shall be removed to a depth of 2 feet below the original ground.
   2. Under lawn and landscape areas: Grub to a depth of at least 2 feet below finish grade.
   3. Under asphalt, concrete, and gravel pavements: Grub to a depth at least 2 feet below subgrade elevation.
   4. Under proposed foundations, slabs, and structures: Grub to a depth of at least 3 feet below the foundation of proposed structures.
   5. For other areas: Remove to a depth of at least 1 feet below ground surface.

3.4 DISPOSAL OF MATERIALS

A. The removal and disposal of all cleared and grubbed materials is the responsibility of the Contractor. However, burning of organic waste is not allowed without prior approval by the Owner and Design Professional and without obtaining a local jurisdiction burn permit.

B. Contractor may utilize a tub grinder for grinding of clearing operation organic debris. Organic mulch produced may be spread and utilized on cut and fill slope upon reaching finished grade for erosion and sedimentation control purposes. All other debris from clearing and grubbing operations shall be disposed of offsite, unless approved otherwise by the Owner and Design Professional.

C. Comply with all local ordinances and obtain any necessary permits if applicable for disposal of trees, stumps, and other debris. Refer to Section 02400 “Site Demolition” for disposal of debris.

END OF SECTION

SECTION 02200

SITE PREPARATION AND GENERAL SITE WORK

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Site work layout and construction survey.
2. Protecting existing vegetation to remain.
3. Protecting existing site improvements to remain.
4. Utility locates.
5. Disposition of utilities.
6. Maintain existing utility services.
7. Spill prevention.
8. Recycling and waste management for site materials.
9. Final Cleanup

B. Related Sections:
1. 02400 “SITE DEMOLITION” for removal of site improvements including utilities.

1.2 REFERENCE SPECIFICATIONS AND DOCUMENTS

A. Manual for Erosion and Sediment Control in Georgia, 2016 Edition, by the Georgia Soil and Water Conservation Commission, “Best Management Practices”. Apply to all land disturbing activities for all phases of Work.

B. American Society of Civil Engineers (ASCE)
1. ASCE CI 38-2: Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data.

1.3 SUBMITTALS

A. Record Drawings: Record active, inactive, relocated, and abandoned utilities encountered.
1. Survey the horizontal and vertical positions, and depths to ground surface, for utilities capped, utilities uncovered during project operations and for utilities relocated. Survey shall be from established project control.

1.4 QUALITY ASSURANCE

A. Qualifications: The person in responsible charge of construction survey and survey of as-built/record drawing items shall be a Professional Land Surveyor licensed in the state of Georgia.

1.5 SITE CONDITIONS

A. Subsurface Conditions: Copies of the following subsurface investigation report(s) of the site are provided for information only:
    1. "Report of Subsurface Exploration and Geotechnical Engineering Evaluation" for New Dacula Facilities Campus Sanjo Street, Dacula, Georgia, Dated August 8, 2024, prepared by Geo-Hydro (Project Number 241895.20).
    2. "Report of Supplemental Subsurface Exploration and Geotechnical Engineering Evaluation" for New Dacula Facilities Campus Sanjo Street, Dacula, Georgia, Dated November 6, 2024, prepared by Geo-Hydro (Project Number 241895.21).

    1. Copies of the subsurface investigation report(s) are available by Bowman Consulting Group (the Engineer).
    2. Report data is not intended as a representation or warranty of conditions or continuity of conditions. Owner is not responsible for interpretation or conclusions drawn by the Contractor. The data is made available for convenience and is not guaranteed to represent conditions that may be encountered.
    3. Contractor shall examine the site and may make its own explorations at its own expense. Notify Owner prior to making any subsurface explorations.

B. Safety: Provide all safety fence barricades guards, lights and other installations required to protect persons and property during the work. This is in addition to such protection required elsewhere in the Contract documents. At a minimum, secure all work areas and staging/storage areas with temporary construction safety fencing. Maintain such safety fencing to assure a complete boundary throughout construction.

C. Locate storage sheds, temporary office, and stockpiled material to best advance the progress of work, as approved by the Design Professional or in areas otherwise designated for Contractor's use.

D. Existing conditions are shown on the drawings. Contractor shall visit the site, familiarize himself/herself with existing conditions in the field.

E. Contractor shall strictly adhere to the "Land Disturbance Construction Activity Sequence" As defined in the Phase I Erosion and Sedimentation Control Plan only

upon completion of applicable items in the sequence, shall the contractor expand clearing and grubbing operations to the entire site.

F. Items of historic or archaeological value discovered during construction operations shall remain the property of the Owner. Notify Design Professional immediately of any such type finding for instructions.

1.6 RECYCLING AND REFUSE COLLECTION CENTERS (WASTE MATERIALS)

A. The contractor shall provide appropriate refuse collection centers, which allow for glass, paper, and plastic separation. Said refuse collection centers shall be maintained on a weekly basis and transferred to an Owner-approved recycling and refuse center. The contractor shall also provide appropriate refuse containers for construction debris. Construction debris shall be recycled as possible and practical, especially in demolition and renovation situations (i.e., copper pipe, steel, concrete, glass, etc.). Illegal disposal of said materials (including littering) is subject to fines and penalties. The Contractor shall establish construction site policy and educate all construction personnel.

B. All waste materials shall be collected and stored in a securely lidded, metal dumpster. The dumpster shall be rented from and emptied by a Georgia licensed solid waste management company. The dumpster shall meet all County and State Solid Waste Management regulations and ordinances. The dumpster shall be emptied as necessary, and the material shall be hauled to a State licensed landfill. No construction debris shall be buried on the construction site. All personnel shall be informed and instructed regarding the correct procedure for waste disposal. Notices stating these procedures shall be posted in the construction office and the construction superintendent shall be responsible for ensuring that these procedures shall be followed.

1.7 HAZARDOUS WASTE

A. All hazardous waste materials shall be disposed of in a manner specified by Georgia State Solid Management regulations. All personnel shall be informed and instructed regarding the correct procedure for waste disposal. Notices stating these procedures shall be posted in the construction office and the construction superintendent shall be responsible for insuring that these procedures shall be followed.

1.8 SANITARY WASTE

A. All sanitary waste shall be collected from the portable units, as necessary, by a Georgia State licensed sanitary waste management contractor, or as required by local regulations.

1.9 TEMPORARY FUELING TANK AREA

A. Temporary fueling tanks shall have a Georgia E.P.D. approved secondary containment (liner system) basin to prevent and/or minimize site contamination. Temporary fueling tank locations shall be located remotely from drainage ways, drainage systems, and state waters (streams, springheads, etc.).

1.10 EQUIPMENT MAINTENANCE AREA

A. Equipment maintenance areas shall be clearly identified with signage. Said signage shall read as follows:

Equipment Maintenance Area

Discharge of new or used oil, fuel, lubricants, etc. is prohibited. Utilize containment/capture systems. Recycle used oils, contaminated fuels and lubricants. Illegal discharges are subject to fines and penalties.

B. Sign shall be weatherproof and have a minimum size of 36" X 36".

C. Equipment Maintenance Area(s) shall be located remotely from drainage ways, drainage systems, and state waters (streams, springheads, etc.).

2.0 PRODUCTS

2.1 CONSTRUCTION SURVEY AND LAYOUT EQUIPMENT

A. Surveyor's transit and measuring devices properly calibrated to accurately layout the work shall be used.

B. Provide stakes and batter boards of size and quality commensurate with function. Use wire or non-stretching cord to establish reference lines for site clearing and grading.

2.2 PROTECTION MATERIALS

A. Materials for protection of existing work remaining shall be of the size, strength, and extent to provide adequate protection of existing work remaining.

2.3 REPAIR MATERIALS

A. Repair materials shall be of the same or better quality and performance as materials that are to be restored. Where possible, reuse existing materials that are removed.

3.0 EXECUTION

3.1 SITE WORK LAYOUT AND CONSTRUCTION SURVEY

A. Benchmarks and Monuments: Before commencing work verify benchmarks and all reference points. If found at variance with the drawings, notify the Design Professional immediately and prior to continuing with construction activities in that area.

B. Plainly mark all benchmarks, and property corners and property lines as follows:
   1. Mark all project benchmarks and mark all property corners within 100 feet of construction limits by driving a 4-foot lath with appropriate offset (not to exceed 5 feet) from property pin or monument. Paint at least the upper 8″ of the lath a bright yellow and clearly label the label the lath with the benchmark number and elevation, or label "property corner" as applicable.
   2. Install 2' lath, label "property line", and tie a red ribbon to the lath every 50' along property lines when project work coincides within 50 feet of property boundaries.

C. Carefully maintain all benchmarks, monuments and other reference points. If disturbed or destroyed, replace as directed, at no additional cost to the owner. Establish and maintain stakes as required for drives, parking, walks, underground vaults and structures, and other site improvements.

D. Flag or stake limits of construction and tree protection areas and install tree protection fencing to protect existing trees to remain.

E. As work progresses provide construction staking for grading (including subgrade, gravel courses, finish grade), points of curvature, points of tangency, grade changes, and for structures and miscellaneous site elements. If discrepancies between actual lines, grades, and elevations exist, notify Design professional before proceeding with layout of structure.

3.2 PROTECTING EXISTING VEGETATION TO REMAIN

A. All trees and vegetation marked to be saved or relocated shall be protected by temporary barricades, be watered and maintained where necessary, and replaced if damaged by construction. Root systems cut or damaged within work area during construction shall be pruned and protected from additional damage and covered with soil as soon as possible.

B. Under no circumstance, do not remove vegetation shown on the drawings to be saved, or marked by the Design Professional or Owner to be saved.

3.3 PROTECTING EXISTING SITE IMPROVEMENTS TO REMAIN

A. Protect all existing curbs, sidewalks, buildings, utilities, and paving to remain.

B. If existing site improvements are damaged in performance of this work, restore such improvements without extra cost to the Owner.

3.4 UTILITY LOCATES

A. Utilities Protection Law (Dig Law): Comply with Georgia Utilities Protection Law. Notice must be given to the Georgia Utilities Protection Center; by dialing 8-1-1 or 800-282-7411 at least 48 hours but no more than 10 days preceding the day mechanized digging is to begin. This notice shall contain County (where project is located), Town (or closest City or Town), location (street address), type of work to be done, name of Contractor, company name and address, telephone number, which company/individual the work is being done for, date and time the Contractor is planning to dig. Locates are valid for 30 days. Renew or call for re-mark as necessary.

B. Secure the services of a private utility locator service in addition to contacting the Utilities Protection Center of Georgia. Perform Subsurface Utility Engineering (SUE) services in accordance with ASCE CI 38-02 Quality Level B: Utility Designation. Such utility designations shall be as necessary to ascertain any wet sewer lines, water supply lines, live electrical conduits, live phone lines, live gas lines and all other utilities, and shall make sure these utilities can be broken or changed without danger or disruption to any necessary service. Disconnect and de-activate all existing utilities that interfere with the new work before proceeding, except as specified above or otherwise shown on Drawings.

3.5 DISPOSITION OF UTILITIES

A. Follow rules and regulations of authorities having jurisdiction for the respective utilities in executing work under this section.

B. Carefully locate existing underground utilities by hand excavation, potholing, vacuum excavation, or other methods. If utilities are to remain in place, provide protection from damage during construction operations.

C. Active Utilities Shown on Drawings or that are Visible Onsite: Protect from damage and remove or relocate as indicated or specified. All utilities (including but not limited to: existing utility poles, guy wires, hydrants, meters, valve boxes) within the construction area that are evident from a visual inspection of the site shall be protected or relocated as necessary.

D. Active Utilities Not Shown on Drawings or Evident from Visual Inspection: Protect and/or relocate in accordance with written instructions of the Design Professional.

E. Inactive and Abandoned Utilities:
   1. Fully remove inactive and abandoned utilities only as shown.
   2. Plug, cap, abandon in place utilities as shown. In absence of specific requirements, plug or cap such utility lines at least 4 feet outside of existing building walls, excavation limits, or as required by local regulations.

F. Repair damaged utilities to satisfaction of utility owner.

G. Accurately record locations of active and inactive utilities encountered during construction operations on record drawings.

3.6 MAINTAIN EXISTING UTILITY SERVICES

A. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Do not interrupt existing utility service facilities occupied and used by Owner or others, unless written permission is given by the Design Professional and then only after temporary utility services have been provided. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to governing authorities.

B. Provide not less than 72 hours' notice to Owner if shutdown of service is required during a changeover.
   1. Arrange to shut off indicated utilities with utility companies.
   2. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity of service to other parts of the building before proceeding with selective demolition.
   3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.

3.7 DUST CONTROL

A. Keep airborne dust to a minimum by using water sprinkling or tossing and/or other suitable means to limit dust and dirt from rising and scattering in the air. Water all disturbed earth no later than 5 days from last rain or last watering.

3.8 POLLUTION AND SPILL PREVENTION

A. Control both air and water pollution. No tires, oils, asphalt, paint or coated metals are permitted in combustible waste piles. Pollutants such as fuels, lubricants, bitumen's, raw sewage and other harmful materials will not be discharged into or near rivers, streams or man-made channels.

Equipment maintenance shall be performed with containment and capture of used oil. Do not pour or drain used lubricants or other necessary mechanical fluids onto the ground. Remove from site and deliver to a recycling center. Utilize a concrete washout area and remove washed out concrete from the site.

B. Material Management Practices
   1. The following material management practices shall be used to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff. Follow good housekeeping practices onsite during the construction project.
      a. An effort shall be made to store only enough product required to do the job.
      b. All materials stored onsite shall be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
      c. Products shall be kept in their original containers with the original manufacturer's label.
      d. Substances shall not be mixed with one another unless recommended by the manufacturer.
      e. Whenever possible, all of a product shall be used up before disposing of the container.
      f. Manufacturer's recommendations for proper use and disposal shall be followed.
      g. The site superintendent shall inspect daily to ensure proper use and disposal of materials onsite.

C. Hazardous Products
   1. The Contractor shall use the following practices to reduce the risks associated with hazardous materials:
      a. Products shall be kept in original containers unless they are not resealable.
      b. Original labels and material safety data shall be retained with the product by the General Contractor. They contain important product information.
      c. Surplus products shall be disposed of following and in conformance with local and State recommended methods, NPDES permit requirements, and Federal Environmental Regulations.

D. Product Specific Practices
   1. The following product specific practices shall be followed for products stored on-site:
      a. Petroleum Products:
         1) All on-site vehicles shall be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products shall be stored in tightly sealed containers that shall be clearly labeled and stored in a clearly identified area. Any asphalt substances used on-site shall be applied according to the

manufacturer's recommendations.

b. Fertilizers:
    1) Fertilizers used shall be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer shall be worked into the soil to limit the exposure to storm water. Any fertilizers that are to be stored on-site shall be stored in a protected, securable enclosure. The contents of any partially used bags of fertilizers shall be transferred to a clearly labeled sealable plastic container to avoid spills.

c. Paints:
    1) All containers shall be tightly sealed and stored when not required for use. Excess paint shall not be discharged to the storm sewer system but shall be properly disposed of according to local and State regulations.

d. Concrete:
    1) Concrete trucks shall be allowed to wash out, discharge, and drum wash only at the identified equipment maintenance area(s). Maintenance areas shall be equipped with a discharge containment area (e.g., earth berms surrounding area). The containment area shall be cleaned up and removed from the site upon completion of concrete installation work.

E. Spill Prevention and Cleanup
1. The following practices shall be followed for spill prevention and cleanup:
    a. Local, State, NPDES, Federal Environmental, and Manufacturer's recommended methods for spill cleanup shall be clearly posted and site personnel shall be made aware of the procedures and the location of the information and cleanup supplies.
    b. Materials and equipment necessary for spill cleanup shall be kept in the material storage area on-site. Equipment and materials shall include but not be limited to brooms, dustpans, mops, rags, gloves, goggles, respirators, cat litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
    c. All spills shall be cleaned up immediately upon discovery.
    d. The spill area shall be kept well-ventilated, and personnel shall wear the appropriate protective clothing to prevent injury from contact with a hazardous substance.
    e. Spills of toxic or hazardous material shall be reported to the appropriate local and/or State government agency, regardless of size.
    f. A spill prevention plan shall be implemented or adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another one. A description of the spill, what caused

it, and the cleanup measures shall also be included.

g. The General Contractor shall be responsible for assigning personnel to be responsible for spill prevention and cleanup coordination. The General Contractor shall designate, at a minimum, three site personnel to receive spill prevention and cleanup training. These individuals shall each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel shall be posted in the material storage area and in the on-site construction office.

3.9 WASTE MANAGEMENT

A. Clean and remove trash and debris on entire site, including trash and debris deposited from previous operations.

B. During construction, maintain a clean and orderly worksite. Do not dump or store debris on any part of the property unless authorized in writing by the Owner and Design Professional. Debris may include but is not limited to: trash, construction material, cleared vegetative matter, and boulders.

3.10 FINAL CLEAN UP

A. Remove Contractors office trailer, storage shelters, stockpiled materials, and equipment from the site.

B. Remove all remaining debris, or any other extraneous material deposited during construction from the site including all graded areas, and other undisturbed areas. All debris is the property of the Contractor and shall be hauled away from the site and disposed of lawfully.

C. Clean, sweep and wash the entire site, including areas outside of the “limits of disturbance” for final inspection. Provide required lawn maintenance to provide complete and finished appearance. Leave the site in a neat and orderly fashion for use by the Owner.

END OF SECTION

SECTION 02211

GRADING

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Temporary grading or ditching to protect the site and adjoining property from water and silt damage.
2. Topsoil Stripping.
3. Grading, excavating, rock excavating, and filling to prepare subgrades for foundations, walks, pavements, grass areas, landscape areas, and general areas.
4. Excavating and backfilling trenches for utilities and pits for buried utility structures.

B. Related Sections:
1. 02200 "SITE PREPARATION AND GENERAL SITE WORK" for layout, protection of existing facilities, protection of vegetation, utility locates, and utility protection.
2. 02050 "Common Works for Exterior Improvements" for import fill, import backfill, geotextile specifications.

1.2 REFERENCE SPECIFICATIONS AND DOCUMENTS

A. Georgia Department of Transportation (GDOT)
1. Department of Transportation, State of Georgia Standard Specifications, Construction of Roads and Bridges, 2013 Edition. Unless otherwise noted, conform with GDOT Standard Specifications where referenced.
2. GDOT Test Procedures (GDT), where referenced.

B. American Society for Testing Materials (ASTM)
1. ASTM D422 - Particle Size Analysis of Soils.
2. ASTM D423 - Test for Liquid Limit of Soils.
3. ASTM D424 - Test for Plastic Limit and Plasticity Index of Soils.
4. ASTM D1556 - Test for Density of Soil In Place Sand Cone Method.
5. ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification).
6. ASTM D6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
7. ASTM D698 - Standard Test Methods For Moisture-Density Relations of Soil Using Standard Effort.

8. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

1.3 DEFINITIONS

A. Backfill is defined as fill immediately behind foundation elements or retaining walls.

B. Excavation: Removal of material encountered above subgrade elevations, and to lines and dimensions indicated, or as directed. Excavation may be classified as earth excavation, rock excavation, or sub excavation, or it may be unclassified as described below.
   1. Unclassified Excavation: Excavation of all material, including rock, regardless of its nature or the manner in which it is removed. All excavation shall be unclassified unless explicitly and otherwise shown on the Drawings, or if unit pay items are provided for Rock Excavation, Earth Excavation, or Sub Excavation.
   2. Earth excavation or simply "Excavation": Excavation of all material is except for active utilities and rock.
   3. Rock excavation: Excavation of all hard, compacted, or cemented materials that require the use of drilling, blasting or wedging equipment to remove. It shall consist of un-decomposed stone hard enough to ring under a hammer, and the amount of solid stone shall not be less than one (1) cubic yard in volume. If applicable, rock is further defined as follows:
      a. General Excavation (Mass): Any material occupying an original volume of more than one cubic yard which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 80,000 pounds (Caterpillar D-8 or larger).
      b. Trench Excavation: Any material occupying an original volume of more than one cubic yard which cannot be excavated with a hydraulic excavator having a minimum flywheel power rating of 123 kW (165 hp); such as a Caterpillar 322C L, John Deere 230C LC, or a Komatsu PC 220LC-7; equipped with a short tip radius bucket not wider than 42 inches.
   4. Sub excavation: Authorized additional excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Design Professional or Testing Agency in writing.

C. Fills: Suitable materials placed to raise existing grades. All fill material placed on site by the contractor, regardless of whether fill is from on-site or off-site sources, cannot, by its nature, be classified as unsuitable soils. Contractor is responsible for dewatering or drying out of water saturated soils to the extent necessary to satisfy the requirements for fill.
   1. General area fill: all fill in the general grading area covering banks, hollows, drain ditches, etc.
   2. Pavement fill zone: The zone occupied by materials supporting asphalt or

concrete paving supporting vehicular traffic or parking and extending for a distance of 4 feet on each side paving area measured at the finished grade (including gutter pans), thereafter tapering away at a 45° angle. Pavement fill zone for asphalt or concrete pedestrian areas are 2 feet on each side of paving area measured at finish grade and tapering down at a 45° angle.

3. Structural fill zone: The zone occupied by materials supporting floor slabs, building foundations or other structures, and extending for a distance of 10 feet on each side of said structure measured at the finished grade, thereafter, tapering away at a 45° angle.

D. Neat line: The shown, directed or described line or plane defining the limits of work. Work beyond neat line(s) is not subject to payment when included in a unit pay item.

E. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

F. Trenches: Foundation: The area beneath the bedding.
   1. Bedding: The area above the foundation and below the bottom of the pipe.
   2. Haunching: The area above the bottom of the barrel of the pipe up to a specified height above the bottom of the barrel of the pipe.
   3. Initial backfill: The area above the haunching material and below a plane 18 inches above the top of the pipe.
   4. Final backfill: The area above a plane 18-inches above the top of the barrel of the pipe.

G. Conserved Topsoil: Excavated soil material, with organics, conserved from grading areas that is suitable for growth of grass, cover crops, or planting areas. Identification and use of all conserved topsoil is subject to approval by the Testing Lab and/or Design Professional. Refer to 32 05 00 "COMMON WORKS FOR EXTERIOR IMPROVMENTS" for definition of Furnished Topsoil.

H. Unsuitable Soils: Those materials determined by the Testing Laboratory or Design Professional to be unsuitable for use in a particular application for reasons other than moisture or water content. In general, existing undisturbed soils that are highly organic or highly plastic (classified as Class IV Roadway Material per Georgia DOT Standard Specification Section 810) may be classified as unsuitable depending on application.
   1. Water saturated soils, regardless of the source of the water (rainfall, storm runoff, ground water or other sources) shall not be considered as unsuitable.

1.4 UNIT PRICES

A. Rock Excavation: Unit prices for rock excavation include replacement with approved materials. Measurement of rock excavation shall be based on the volume of rock

actually removed, measured in its original position, but not to exceed the following. (payment neat lines).

1. 2.0 ft outside of concrete forms other than at footings.
2. 1.0 ft outside of concrete forms at footings.
3. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
4. 6 inches beneath bottom of concrete slabs-on-grade.
5. 6 inches beneath pipe in trenches, and 2.0 ft wider than pipe but not less than 3.0 ft wide.

B. Sub Excavation: Unit prices for sub excavation shall include replacement of unsuitable material with geotextile for separation and approved backfill material. Volumetric measurement of sub excavation is based on neat line quantities as directed or approved by the Design Professional or Testing Agency.

C. Important Fill Material: Unit prices for import fill (structural fill, general fill when shown and not including any fill material for rock excavation or sub excavation) shall include disposing of any unsuitable material, procuring fill materials, and transporting them to the site.

1. Unless otherwise specified in the General Conditions, when mass measurements are shown on the bid form, measurement of additional import material are based on weight tickets for material delivered to the site and incorporated into the work.
2. Unless otherwise specified in the General Conditions, when volume measurements are shown on the bid form, measurement shall be based on volumes measured in the truck or transporting vehicle.

1.5 SUBMITTALS

A. Product data for materials, including but not limited to: geotextiles, utility line markers, import fill material, control density backfill.

B. Quantities of stripped and stockpiled topsoil. Provide report within 48 hours of stockpiling.

C. Backup for unit cost documentation, that may include:
1. Survey and computed quantities for Rock Excavation.
2. Delivery tickets (tonnage) for import fill incorporated into the Work.

D. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, which might be misconstrued as damage caused by earthwork operations including blasting. Submit before earth moving begins.

1.6 QUALITY ASSURANCE

A. Earthwork Testing and Inspection Services: The Owner will engage a qualified independent Testing/Inspection Agency to perform Earthwork Testing as described in this Section.

B. Blasting: Comply with applicable requirements in NFPA 495, "Explosive Materials Code," and prepare an informational blasting plan reporting the following:
   1. Types of explosive and sizes of charge to be used in each area of rock removal, types of blasting mats, sequence of blasting operations, and procedures that will prevent damage to site improvements and structures on Project site and adjacent properties.
   2. Seismographic monitoring during blasting operations.
   3. Pre-excavation photos or videotape.

1.7 SITE CONDITIONS

A. Protection:
   1. Limit grading and filling operations to within the defined clearing limits, work zones, or limits of disturbance. Do not disturb the existing terrain or trees outside these lines.
   2. Fill material placed against drainage structures or backfilled around utility pipes shall be placed and compacted by methods which will not cause any damage. Any damage which does occur shall be repaired or replaced by the Contractor at the Contractor’s expense.
   3. Graded Areas: Any settlement or washing that occurs prior to acceptance of the work shall be repaired and grades re-established to the required elevations and slopes. Fill to required subgrade levels any areas where settlement occurs.

B. Hazardous Materials:
   1. No soil found on site or transported to the site, which is contaminated with material containing asbestos, PCB's, radon, gasoline, fuel oil, or other fossil fuels, shall be used for fill, backfill or landscape topsoil.

   2. Notify Design Professional of any contaminated soil found on site. Any contaminated soil found on site shall be removed and disposed of in a lawful manner. Any unknown contaminated soil removal and disposal may be subject to Contract Change Order provisions or unit prices if present.

1.8 COORIDINATION AND SCHEDULING

A. Notify the Design Professional a minimum of 48 hours prior to the beginning of any

excavation, filling, or grading.

B. The Contractor is solely responsible for the scheduling and sequencing of the work. If necessary to maintain the contractor's schedule, removed wet soils dewater and dry out sufficiently for its application, or remove and replace with suitable fill. The dewatering or removal and replacement of water saturated soils shall be performed at the contractor's expense.

2.0 PRODUCTS

2.1 FILL OR BACKFILL MATERIALS

A. The soil used for fill or backfill material shall be free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

B. Fill or backfill for paving areas or supporting buildings shall have a maximum dry density exceeding 90 pounds per cubic foot (pcf).

C. Where specified use Graded Aggregate Base (GAB) as backfill or structural fill: Refer to 32 05 00 "Common Works for Exterior Improvements" for material properties.

D. Structural Fill: Soil Classification Groups GW, GP, GM, SM, ML, CL; SW, SP, SC, SP-SM, SP-SC. (ASTM D 2487). Additionally, Class I or Class II (but excluding Class IIB4) Roadway Materials (GDOT Section 810.01) are also acceptable for Structural Fill.

E. General Fill: Includes soils suitable for structural fill as well as other onsite nonorganic and non-expansive soils that are approved by the Design Professional or Testing Agency that will form a stable and dense mass with or without confinement.

2.2 UTILITY EARTHWORK MATERIALS

A. Foundation Material: Unless otherwise specified, Crushed stone meeting GDOT Standard Specification 800.01, Group 1 (limestone, marble, or dolomite), or Group II (quartzite, granite, or gneiss). Stone size shall be between No. 57 and No. 4, inclusive.

2.3 LINE MARKERS

A. 2" width minimum, 5 mil tape thickness with non-ferrous detectable aluminum backing and shall be printed with the description that the relevant utility is "buried below". Line marker colors according to APWA corresponding to the utility type as follows:
   1. Gas lines- yellow

2. Power – red
3. Communications - orange
4. Sanitary – green
5. Water – blue

2.4 GEOSYTHETICS

A. Refer to 02050 "Common Works for Exterior Improvements" for material properties of geotextiles for separation and stabilization.

3.0 EXECUTION

3.1 PREPARATION

A. Construction Survey: Refer to 02200 "Site Preparation and General Site Work" for layout and survey requirements. Provide construction staking as required for drives, parking, walks and other site improvements. Protect benchmarks, monuments, and other reference points.

B. Clear and grub the area of vegetation and obstructions.

3.2 EROSION CONTROL AND SEDIMENT CONTAINMENT SYSTEMS

A. Adhere to the "Land Disturbance Construction Activity Sequence" as defined in the Erosion and Sediment Control Plans.

B. Temporary Grading and Drainage: Provide effective drainage for the entire site at all times. Divert watersheds by ditching or embankments to prevent encroachment of surface water in excavations. No impoundment of water will be permitted except as provided. The Contractor is fully responsible for all water damage to the site and to the installed work.

C. Refer to 02540 "EROSION & SEDIMENT CONTROLS" for additional grading operation requirements and storm drainage system installation requirements.

3.3 CONSERVED TOPSOIL

A. After all demolition, clearing and disposal is completed, strip from the top of the existing ground all topsoil from all areas to be graded.

B. Prior to stockpiling of topsoil, screen topsoil via a mobile mechanical screening machine with a 1/2inch size sieve.

C. Stockpile topsoil in designated or approved locations with proper drainage and

where it will not interfere with the work. After topsoil has been stockpiled, quantify the stockpiled volumes. Report quantities to the Owner and Design Professional within 2 days of completing stockpiles.

D. Refer to Section 02920 "TURFS AND GRASSES" and Section 02900 "PLANTING PREPARATION" for stockpiled topsoil application requirements and additional amendment requirements for turf, lawn, and planting areas.
   1. If amount of conserved topsoil is insufficient to provide the necessary amounts as indicated in the Drawings and specifications, it is the Contractor's responsibility to furnish, pay for, and haul (from off-site sources) the necessary amount of topsoil, of the specified quality, to complete the project.

E. Excess topsoil distributed onsite: After completion of topsoil application in lawn areas, planting areas and other areas shown on the Drawings, distribute any remaining topsoil to general disturbed areas as agreeable to the Owner and Design Professional. Distribute excess topsoil to a minimum depth of 4 inch. Scarify ground to a 4" depth before placing topsoil.

F. Excess topsoil hauled off-site: After completion of topsoil application in lawn areas, planting areas and other areas shown on the Drawings, any excess topsoil becomes the property of the Contractor and shall be hauled off site at no additional cost to the Owner.

3.4 GENERAL GRADING REQUIREMENTS

A. Perform exterior grading to provide smooth transitions to and between the proposed contours and spot elevations shown on Drawings.

B. In all cases, grade to a sufficient pitch to drain water.

C. Perform earthwork as required to establish finished grades as indicated on drawings. Grades not otherwise indicated shall be uniform levels of slopes between points where elevations are given (either spot elevations or contours) or between such points and existing finished grades.

D. Excess Cut Material: If quantity of grading material is in excess of quantities necessary to provide finish grade elevations indicated on drawings or if excavated material is deemed unsatisfactory for use as compacted fill, excess material shall be spread onsite as indicated on the Plans or as directed by the Owner and/or Design Professional. Excess material that cannot be spread on site shall be hauled off site and disposed of legally. Hauling and disposal of excess cut material shall be performed at the Contractor's expense.

E. Insufficient Fill Material: If quantity of grading material is insufficient to achieve

subgrade elevations, Contractor shall obtain additional fill material of specified quality from an off-site source. Obtaining and hauling of additional fill material shall be performed at the Contractor's expense.

F. Import Fill Material for Areas Determined to be Unsuitable: If the Design Professional or Testing Agency determines that onsite excavated or grading materials are unsuitable for use as compacted fill for a given application, then import fill material shall be obtained from an off-site source. Import fill material shall conform to specifications for the given application. Disposing of unsuitable material, obtaining and hauling of import fill material shall be performed by change order based on the unit prices included within the contract.

G. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value. All moisture conditioning necessary to permit compaction to the specified density shall be performed at the Contractors expense.

H. Slope subgrade to provide positive drainage within all underdrain systems. Unless shown otherwise on the Drawings, subgrade minimum slope to underdrain collection systems is 0.5%.

I. Subgrade Elevation Tolerance: Cut, place, compact fill, and rough grade entire project area to within 0.10 feet above or below design subgrade elevations.

3.5 EXCAVATION AND EMBANKMENT SAFETY

A. Comply with all Federal, State, and Local safety laws and regulations pertaining to trenching, excavation, bracing and shoring that includes but is not limited to:
1. OSHA Excavation Standards, 29 Code of Federal Regulations (CFR) Part 1926, Subpart P - Excavations.

B. If conflict exists between safety laws, regulations, and contract requirements including these specifications, apply the most stringent requirements or standards.

C. Protect all excavations and embankments against collapse. Where possible, temporary excavations over 4 feet high shall be made at a slope not steeper than 1.5H:1V or where the soil is very sandy or wet the slope should be no steeper than 2H:1V.

D. Where it is not possible to provide a safe slope, temporarily support all banks and excavations and maintain secure until permanent support has been provided.

E. Where ditches or trenches that are over 4 feet deep, provide cross bracing and shoring to prevent collapse.

F. Provide bracing, shoring, or shielding systems designed by a Georgia Registered Professional Engineer experienced in such designs. The design drawings shall show the work and sequence in its entirety and be submitted to the Design Professional prior to commencing the work.

3.6 DEWATERING

A. Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area.

B. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.

C. Maintain groundwater a minimum of 3 feet below the bottom of any excavation associated with a foundation. Maintain all excavations free of standing water at all times.

D. Remove all mud caused by standing water from any excavation before the placing of permanent material.

E. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations.

F. No untreated sediment laden water from dewatering operations shall be allowed to enter surface water or a storm drainage system or a permanent stormwater pond.

3.7 TRENCH EARTHWORK

A. General:

1. Conform with the most stringent requirements of these specifications, the Plans, of Utility providers, and of local agency permitting authorities. Requirements may include, but are not limited to: depth of cover, minimum

trench width, bedding material, pipe zone backfill, and compaction requirements.

2. Detection wire: Bury continuous and unbroken wire directly above non-metallic piping at a distance not to exceed 12 inches above top of pipe. Terminate wire in junctions (manholes, vaults, boxes) with a minimum of 3 feet of wire coiled, remaining accessible in each manhole.
3. Line Markers: During back filling of utility lines, furnish and install continuous underground-type plastic line marker, located directly over buried utility lines at 12" below finished grade. Under pavements and slabs, bury tape 6" below top of subgrade.
4. Do not exceed 100 feet of open trench in advance of pipe laying, unless approved otherwise by the Design Professional.

B. General Trench Excavation:
1. Excavate trenches to the required depth or elevation allowing for placement of the pipe and bedding to the dimensions shown on the Drawings.
2. Grade bottom of trenches, no larger than necessary, to accommodate bell holes and other joints and junctions to provide uniform bearing along the pipe.
3. At the direction of the Design Professional or Testing Agency remove unstable or unsuitable material shall be removed from the bottom of the trench and backfilled in accordance with Article – "SUBEXCAVATION".
4. When rock is encountered, excavate to allow a minimum of 6 inches of clearance between rock and any part of the pipe barrel or structure (manhole, vault) and backfill with granular bedding material.

C. Utility Trenches (except sanitary and storm sewer):
1. Excavate to a width as necessary for sheeting and bracing and proper performance of the Work.
2. Support piping on suitable undisturbed earth unless a mechanical support is provided.
3. Bed and provide initial backfill in accordance with the Drawings, and authorities having jurisdiction.

D. Sanitary and Storm Sewer Trenches:
1. The maximum trench width below a plane 6 inches above the top of pipe is:
   a. 24 inches for pipe diameters of 12 inches or less.
   b. Equal to the sum of the outside diameter of the pipe plus 2 feet for pipe diameters greater than 12 inches.
2. Excavate the trench width to allow for the proper compaction of haunching and initial backfill material.
3. Excavate the width of trench above a plane 6 inches above the top of pipe as necessary for proper performance of the work including any sheeting, bracing, or shielding.

4. Bed bottom of pipe on suitable undisturbed soil or as otherwise shown on the Plans.
5. In haunch areas of plastic pipe, install granular fill bedding material up to the spring line of the pipe.
6. Install initial backfill in lifts not to exceed 6 inches loose, compacted to 95% of modified proctor and to a minimum depth of 12 inches above the top of pipe. Unless otherwise specified or required by authorities having jurisdiction, immediate backfill material is as follows:
   a. Class 1- Granular fill.
   b. Class 2- Suitable existing earth material (default).

E. Final Fill
1. Once outside of the initial backfill area, continue backfilling to reach subgrade elevation as follows:
   a. For utility trenches in paving and building areas:
   Provide structural backfill in 6-8" loose lifts, compacted to 95% of the Standard Proctor (ASTM D 698), and within +- 3% of optimum moisture. Except that for structural backfill (supporting structures, pavements, slabs-on-grade, and sidewalks) within 12 inches of subgrade, provide in 4" loose lifts and compact to 98% of the Standard Proctor (ASTM D 698).
   b. For utility trenches in general fill areas or grading areas: Provide general fill in 8" loose lifts, compacted to 95% of standard proctor (ASTM D 698) and within +-3 % of optimum moisture to reach subgrade elevation.

3.8 EXCAVATION

A. Excavate to lines, elevations, dimensions, and depth as indicated on the drawings with allowances made for workspace.

B. Excess Excavation: If excavations for foundations or footings of any kind are carried by the Contractor, without proper authorization, below the indicated or specified levels they shall be backfilled at the expense of the Contractor as follows:
1. In the areas of excess excavation in rock or under structure footings, the excess excavation shall be back filled with control density fill.

2. In the areas of excess excavation in other areas, backfill with approved structural or fill material and constructed in accordance with the fill articles in this Specification.

C. Earth Excavation:
1. Surface Preparation in excavated areas for foundations: scarify and uniformly recompact the upper 24 inches of soils intended to support building

foundations and floor slabs to 98% of Standard Proctor (ASTM D 698). In confined areas such as utility trenches, utilize portable compaction equipment and lifts of 3 to 4 inches to achieve the required compaction.

2. Surface Preparation in excavated areas for paving areas: scarify and uniformly recompact the upper 12 inches of soils to 95% of Standard Proctor (ASTM D 698). In confined areas such as utility trenches, utilize portable compaction equipment and lifts of 3 to 4 inches to achieve the required compaction.
3. Surface Preparation in infiltration areas, planting bed areas: unless otherwise shown, scarify and uniformly recompact the upper 12 inches of soils intended for planting areas or infiltration to 75-80% of Standard Proctor (ASTM D 698) to prevent settlement but still allow for infiltration and plant growth.
4. Do not excavate to full depth when freezing temperature may be expected. Protect excavation bottom from frost if placing of concrete or gravel is delayed. All footing excavations shall be free of pin roots.

D. Rock Excavation:
1. When potential rock is encountered, remove overburden soils and notify the Testing Lab or Design Professional prior to any rock excavation. The Testing Lab and/or Design Professional shall approve and classify all rock excavation. Once classified, survey grading sections of existing rock surface. When rock is completely removed, survey new grading sections to determine the quantity of rock removed within neat line limits.
2. Perform all blasting in accordance with local ordinances and obtain necessary permits where required.
3. Rock that is excavated is the property of the Contractor and shall be removed from the site. Except that, as allowed by the Contract Documents or as approved in writing by the Testing Agency or Design Professional, rock may be incorporated into the Work if it is processed appropriately or meets material specifications.
4. Decomposed rock and similar material removable by tractor drawn ripper or power machinery smaller than defined for rock excavation is classified as earth excavation.

3.9 PROOFROLLING

A. Proof roll surfaces when specified to check for pockets of soft material in areas associated with buildings and pavements.

B. Proof rolling subgrades within +- 3 % of optimum moisture or as approved by the Design Professional. In all cases, proof roll subgrades free of surface water which may promote degradation of an otherwise acceptable subgrade.

C. Proof roll with a loaded 20-ton dump truck, or other pneumatic-tired vehicle of similar size and weight, operated at 2 to 3 mph. For large areas such as parking lots, proof

roll with 2 complete coverages in each of two perpendicular directions.

D. Perform proof rolling under the observation of the Testing Agency or Design Professional. Provide notification 48 hours in advance of all proof rolling operations. Undercut (or sub excavate) Any areas which "pump" or permanently rut under the wheels of the loaded truck and undercut (sub excavate) to a depth and extent directed or confirmed by the Design Professional or Testing Agency.

3.10 SUBEXCAVATION

A. Perform sub excavation below existing ground elevations or subgrade elevations as and when directed by the Design Professional or Testing Agency to correct areas with unsuitable bearing capacity or materials.
   1. Remove and dispose of unsuitable soils to the extents and depth as directed by the Design Professional or Testing Agency.
   2. Level and clear the bottom of the sub excavation of loose material.
   3. Place separation geotextile with all seams overlapped at least 2 feet.
   4. In paving and foundation areas, backfill with GAB (Graded Aggregate Base) in 8-inch loose layers and compact to at least 95% of Modified Proctor.

3.11 FILLING AND BACKFILLING

A. STRUCTURAL FILL –BUILDING AND RETAINING WALLS
   1. Construct structural fills in areas supporting buildings and retaining walls to establish design subgrades.
   2. Schedule construction of structural fill as early as possible in order to allow settlements of underlying soils to occur before building and retaining wall construction commences.
   3. Surface Preparation for fill: Bench areas to receive fill to a minimum of 12 ft width, remove all loose material, and proof roll prior to beginning fill operations.
   4. Place structural fill material in 6-to-8-inch loose lifts at a moisture content at the time of compaction within 3% of the optimum moisture content. Unless otherwise shown, compact to a minimum of 98 percent of Standard Proctor (ASTM D 698). Compact the upper 24 inches to 100 percent of Standard Proctor.
   5. Carefully backfill walls. Do not utilize heavy equipment within 10 feet of any retaining wall. Use hand tampers to compact within the 10 foot backfill zone.

B. STRUCTURAL FILL – PAVED DRIVE, WALKS, AND PARKING AREAS
   1. Load, haul, place, grade, and compact all necessary structural fill to establish design grades as shown.
   2. Surface Preparation for fill: Bench to a minimum of 12 ft widths, all loose material removed, and proof roll prior to beginning fill operations.

3. Place structural fill material in 6-to-8-inch loose measure lifts with moisture content at the time of compaction within 3% of optimum. Compact to a minimum of 95% of Standard Proctor (ASTM D 698). Compact the upper 12 inches to at least 98% of Standard Proctor.
4. Proof roll completed subgrade when within 0.1 feet of final subgrade elevation.

C. GENERAL AREA FILL
1. Load, haul, place, grade, and compact all necessary general area fill in general grading area, covering banks, hollows, drain ditches, etc.
2. Place fill material in 6-to-8-inch loose lifts, compacted to a minimum of 95% of Standard Proctor (ASTM D 698) and within +- 3% of optimum moisture. Except that in landscape/planting bed areas, and infiltration areas unless otherwise specified or shown, compact the upper 12 inches of soil to 75 to 80% of standard proctor.

3.12 TESTING

A. All failing tests or retests are the responsibility of the Contractor.

B. Minimal testing requirements for Owners Quality Assurance are summarized below. Contractor may elect to collect additional samples and perform additional tests or prepare additional specimens for testing at its sole discretion in accordance with their own quality control program.
1. Observe fill and subgrades during proof-rolling to evaluate suitability of surface material to receive fill or base course. Verify soil bearing capacity assumptions. Provide recommendations to the Design Professional regarding suitability or unsuitability of areas where proof-rolling was observed. Where unsuitable results are observed, witness excavation of unsuitable material and recommend to Design Professional extent of removal and replacement of unsuitable materials and observe proof-rolling of replaced areas until satisfactory results are obtained.
2. Provide characterization and classification, testing of all fill, backfill and subgrade materials as follows:
   a. Classification: 1 per material type/source
   b. Atterberg Limits: 1 per material type/source
   c. Grain size distribution
   d. Moisture – Density (ASTM D698 Standard Proctor for fine grained material, ASTM D1557Modified for coarse grained): 1 per material type/Source
3. Perform field density and moisture tests (ASTM D6938, GDT 21 ,59). Other test methods based on material type may be proposed and are subject to approval by the Design Professional. Perform and report field density tests at the minimum frequencies listed below.

a. Building Slab: 1 test for each type of soil type on excavated surfaces. 1 test per compacted fill layer each 2500 sq.ft. of area.

b. Footings- Foundation: 1 test for each layer or type of soil present. In compacted fill layers, perform one test per 100 feet of footing length.

c. Paving Area Fill: 1 test per layer for every 2 feet of fill each 5,000 sq.ft. of area.

d. General Area Fill: 1 test per every 2 feet of fill for each 10,000 sq.ft. of area.

e. Utility trench, spread footing or retaining wall: 1 test per 2 feet of fill per 50 linear feet of trench.

3.13 MAINTENANCE AND PROTECTION

A. Maintain subgrade, in condition and at compaction levels required, until improvements (site and/or building) are completed.

1. Should subgrade or fill materials be disturbed or become water saturated, restore to the specified criteria as verified by the Design Professional.

B. Provide additional fill material, remove excess material, or redistribute material, should grades be changed from erosion or construction activities.

END OF SECTION

SECTION 02400

SITE DEMOLITION

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Demolition of buildings and below grade foundations.
   2. Selective demolition of buildings, houses, and other site features.
   3. Demolition of existing site elements.
   4. Protection of existing site elements to remain.
   5. Disposal of demolished materials.

B. Related Sections:
   1. 02200 "SITE PREPARATION AND GENERAL SITE WORK" for protection of existing facilities, protection of vegetation, utility locates, and utility protection, and maintenance of active utility service to portions of existing facilities schedule to remain open and in service during construction.

1.2 DEFINITIONS

A. Remove: Remove and legally dispose of items except those indicated to be salvaged, or to remain the Owner's property.

B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to Owner's designated storage area.

C. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Design Professional, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in the original locations.

1.3 SUBMITTALS

A. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damaged caused by demolition operations.

B. As applicable, records indicating receipt and acceptance of solid waste and hazardous

wastes by legal and licensed facilities to accept such wastes.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with hauling and disposal regulations of Georgia EPD (Environmental Protection Division) and other authorities having jurisdiction.
   2. Comply with applicable demolition requirements of local jurisdictions and the State of Georgia.

1.5 SITE CONDITIONS

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.

B. Storage or sale of removed items or materials onsite will not be permitted.

C. All existing curb and gutter, paving, structures, utilities, and all other existing items that are located where proposed items are to be built but are not shown specifically for removal, shall be removed only when approved in writing by the Owner or Design Professional.

2.0 PRODUCTS

2.1 REPAIR MATERIALS

A. Use Repair Materials Identical to Existing Materials. Except that where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible and as approved by the Engineer.

B. Additionally, use repair materials whose installed performance equals or betters that of existing materials.

3.0 EXECUTION

3.1 PREPARATION

A. Perform public and private utility locates in accordance with Section 02200 "Site Preparation and General Site Work." Disconnect and de-activate all existing utilities before proceeding with the work, except as specified herein or otherwise shown on plans.

B. Verify that utilities have been disconnected and capped.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

E. Evaluate the condition of site structures to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.

3.2 SAFETY AND PROTECTION

A. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

B. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide all barricades, guards, lights, and other installations required.
   2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
   3. Ensure safe passage of people around demolition area
   4. Protect existing site improvements, appurtenances, and landscaping to remain.

3.3 POLLUTION CONTROLS

A. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt.
   1. Do not use water to the extent that may result in damage to existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3.4 DEMOLITION

A. Demolish and remove from site the existing structures, curb & gutter, slabs, walks,

paving, steps, and any other item above or below ground that interferes with construction of the project as shown on Drawings.

B. Remove existing curbs, gutters, slabs, and concrete walkways at the nearest contraction or expansion joint.

C. Provide neat and straight saw cutting as shown on the Plans and as required to provide selective or partial demolition.

D. Where portions of concrete slabs-on-grade are to be removed, first outline the portion with a concrete saw to a depth of at least 1/3 of the thickness.

E. Completely remove below grade construction, including foundations and footings.

F. Contractor is to coordinate the subsurface demolition with any phased utility demolition and construction. The demolition of below grade items shall not interrupt any existing or proposed utility services.

3.5 FILLING BELOW-GRADE AREAS AND VOIDS

A. Completely fill below-grade areas and voids resulting from demolition of structures.

B. Use only clean, non-frozen, and approved fill material, stone, gravel, or sand that is free from deleterious materials. Refer to Section 31 22 00 "GRADING" for general fill or structural back fill.

C. Grade completed surface to drain and to meet adjacent contours.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Send recyclable waste such as asphaltic concrete, Portland cement concrete, plastic, and metals to applicable recycle centers when feasible.

C. Burning: Do not burn demolished materials.

D. Burying: Do not bury materials onsite unless approved or otherwise shown.

E. Disposal of Regulated Materials (in accordance with GDNR, EPD rules):
   1. Organic debris such as stumps, limbs, leaves, may be taken to a permitted solid waste landfill or to a permitted inert landfill.
   2. Dispose of other non-hazardous trash and debris to a municipal solid waste

landfill.

3. Dispose of oils, solvents, fuels, untreated lead paint residue and other solid hazardous wastes in properly licensed hazardous waste disposal facility.

F. Obtain all necessary permits for disposal. Transport demolished materials off Owner's property and legally dispose of them. Provide copies of disposal certificates to the Design Professional.

3.7 REPAIRS AND PATCHING

A. Repair excess demolition.

B. Employ skilled workmen to perform repair work.

C. Where installation of similar new work is included, perform repairs in manner specified for installation of new work.

D. Where similar new work is not included in the project, perform repairs using approved materials that are appropriate to the repair and, where practicable, are identical to the existing materials being repaired.

E. Restore exposed finished patched areas in a manner, which eliminates evidence of repairs.

1. Continuous surfaces: Extend refinish to nearest intersection, with a neat transition to adjacent surfaces.

3.8 CLEANING

A. Remove tools and equipment. Dispose of scrap.

B. Leave exterior areas free of debris.

C. Existing structures and site features to remain shall be returned to the condition prior to the commencement of construction.

D. Sweep remaining hard surfaces on completion of selective or partial demolition operations.

END OF SECTION

SECTION 02500

RIGID PAVING AND SITE CONCRETE

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Concrete curb and gutter.
2. Concrete walkway, flumes, and other miscellaneous cast in place elements.
3. ADA ramps.
4. Concrete paving of driveways, roadways, dumpster pads, loading dock pads, service courtyards, and parking lots, etc.

B. Related Sections:
1. 02211 "GRADING" for backfill and compaction of trench excavations prior to paving and for general subgrade preparation.
2. 02050 "COMMON WORKS FOR EXTERIOR IMPROVEMENTS" for graded aggregate base (GAB) if shown on the Drawings.

1.2 REFERENCE SPECIFICATIONS AND DOCUMENTS

A. Georgia Department of Transportation (GDOT)
1. Department of Transportation, State of Georgia Standard Specifications, Construction of Roads and Bridges, 2013 Edition. Unless otherwise noted, conform with GDOT Standard Specifications for testing, materials, and methods for bases and concrete pavements.
2. GDOT Test Procedures (GDT), where referenced.

B. American Concrete Institute (ACI)
1. ACI 301: Specifications for Structural Concrete.
2. ACI 308.1: Standard Specification for Curing concrete
3. ACI CP-1: Technical Workbook for ACI Certification of Concrete Field Testing Technician- Grade 1.

C. American Society for Testing Materials (ASTM)
1. ASTM A615: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Placement.
2. ASTM A1064: Standard Specifications for Carbon Steel Wire and Welded Wire Reinforcement.
3. ASTM C31: Standard Practice for Making and Curing Concrete Test Specimens in the Field.

4. ASTM C39: Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

5. ASTM C42: Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
6. ASTM C260: Standard Specification for Air-Entraining Admixtures for Concrete.
7. ASTM C309: Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete.
8. ASTM D698: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
9. ASTM D994: Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
10. ASTM D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
11. ASTM D2628: Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.
12. ASTM D3406: Standard Specification for Joint Sealant, Hot Applied, Elastomeric Type; for Portland Cement Concrete Pavements.
13. ASTM D5893: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.

1.3 SUBMITTALS

A. Product data for materials, including but not limited to: cementitious material, admixtures (air entraining, etc.), joint filler and sealants, reinforcing material, grout, anchors, curing compounds.

B. Concrete mix designs or job mix formulas for each proposed concrete mixture, including the following as applicable:
   1. Curbs & sidewalks, minor cast in place structures.
   2. Concrete paving areas.

C. Shop drawings for ADA detectible warning strips.

D. Joint layout plan including all proposed contraction and expansion joints.

1.4 QUALITY ASSURANCE

A. Testing Services: The Owner will engage a qualified independent testing agency to perform material evaluation tests described in this Section.
   1. Testing Agency Qualifications: Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, according to ACI

CP-1 or an equivalent certification program.

B. Ready-Mix- Concrete Manufacturer Qualifications: Manufacturer must be certified according to the National Ready Mix Concrete Association (NRMCA) Plant Certification Program.

C. Test sections. Build 10' sample test sections of walkways, curbs, and paving areas (10'x10') to demonstrate aesthetic affects and quality standards for materials and execution. Construct mockups at approved locations only. Incorporate representative control and joints according to project requirements.
   1. Notify Testing Agency and Design Professional at least 7 days in advance of mockup construction.
   2. Obtain Owner or Design Professional approval of mockup prior to commencement of the work.
   3. Mockup may be incorporated into the work with approval.
   4. Demolish and remove each mockup from the Site when directed.

D. Comply with ACI 301 – Standard Specifications for Structural Concrete, unless otherwise modified by Contract Documents.

1.5 SITE CONDITIONS

A. Store materials only in areas designated for Contractor's use.

B. Complete all underground work and raise all necessary structures prior to paving operations.

C. Verify all grades and elevations for conformance with the Drawings before proceeding with work. The Design Professional reserves the right to make minor modifications by reasonable field adjustments prior to completion of subgrade work.

1.6 WEATHER LIMITATIONS

A. Cold weather protection - Whenever the air temperature may be expected to reach the freezing point, spread straw or other blanketing material to sufficient depth to keep concrete from freezing, or provide enclosure and a heating device capable of maintaining concrete temperature of at least forty-five (45) degrees five (5) days and maintain above freezing for the entire specified curing period. The Contractor shall be responsible for removing and replacing any concrete injured by freezing or frost.

B. Placing During Hot Weather: The temperature of the concrete as placed shall not exceed 85° F, mixing water or aggregates may be cooled as necessary to maintain a satisfactory placement temperature. Do not place concrete when air temperatures exceed 95° F.

1.7 PAVEMENT DESIGN

A. Pavement sections are shown on the Drazwings and may include, but are not limited to, the following applications:
   1. Concrete Paving within the Right-of-Way.
   2. Heavy Duty Concrete Paving.
   3. Medium Duty Concrete Paving.

B. All depths shown or specified are measured after compaction or construction.

2.0 PRODUCTS

2.1 GENERAL

A. Cementitious materials. Type I or Type II Portland cement. Portland cement may be partially replaced with either fly ash or slag cement at the following maximum proportions:
   1. Fly ash, 15%
   2. Slag cement, 50%

B. Fine and coarse aggregates for concrete mixes. The ratio of fine to total aggregate shall be such as will produce a dense, homogeneous and workable mixture, which can be placed without segregation of materials and which will attain the design compressive strength. Aggregates shall comply with ASTM C33.

2.2 CONCRETE MIXTURES

A. Concrete for rigid paving (heavy duty and normal). Proportion such that the following are met:
   1. Minimum compressive strength at 28 days (f'c) = 4000 p.s.i (heavy duty); 3000 p.s.i. (normal).
   2. Air content acceptance 3.5 to 6.0%, design air content 4.0 to 5.5%.
   3. Maximum slump = 4 inches.

B. Unless otherwise shown, proportion concrete for curb, paving, walks, planters, seat walls, flumes and all other miscellaneous site work concrete to meet:
   1. Minimum compressive strength at 28 days (f'c) = 3000 p.s.i.
   2. Air content acceptance = 2.0 to 6.0%, design air content 2.5 to 6.0%.
   3. Maximum slump = 4 inches.

2.3 FILLER AND SEALER

A. Expansion joint material: 1/2 inch performed strips of cellular fiber impregnated with

suitable bituminous binder. Filler shall conform to section area and extend through section to within 1/2 inch of top surface and conforms to ASTM D1751 or D1752, unless otherwise indicated.

B. Contraction Joint Sealer Material: Only apply joint sealant when otherwise shown in the Drawings. Cold applied is the default.
   1. Cold applied silicone rubber type; ASTM D5893
   2. Hot-poured elastomeric type; ASTM D3406
   3. Single-Component Elastomeric Type (preformed); ASTM D2628

C. Elastomeric crack sealer ASTM C920 Type S, Grade NS, Class 35.

2.4 STEEL BAR, WELDED WIRE FABRIC

A. Provide steel bars and welded wire fabric of intermediate grade steel in specified sizes as shown on Drawings.

B. Plain-steel welded wire fabric: ASTM 1064, fabricated from steel wire formed into flat sheets.

C. Reinforcement bars: ASTM A615, Grade 60, deformed unless otherwise indicated. Cut bars true to length with ends square and free of burs.

D. Dowel bars: ASTM A615, Grade 60, plain steel bars unless otherwise indicated. Dowel bars shall be cut true to length with ends square and free of burs.

2.5 FORMS

A. Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
   1. Use flexible spring steel forms or laminated boards to form radius bends as required.
   2. Coat forms with a non-staining form release agent that will not discolor or deface the surface of the concrete

2.6 EPOXY RESIN GROUT

A. Epoxy adhesive used for anchors and dowel bars in accordance with Type VIII per GDOT Standard Specification 886 unless otherwise noted.

2.7 DOVETAIL ANCHOR SLOTS

A. Galvanized steel, 22 gage (0.8 mm) thick, foam filled, release tape sealed slots,

anchors for securing to concrete forms.

2.8 DETECTABLE WARNING

A. Provide tactile warning surface (truncated dome) via pavers or monolithic concrete pour systems at ADA ramps.
   1. Provide shop drawings for proposed system.
   2. Dome Size: Diameter of 0.9 inch (23 mm), height of 0.2 inch (5 mm) and a center-to-center spacing of 2.35 inches (60 mm).
   3. Visual Contrast: Contrast visually with adjoining walking surfaces either light-on-dark or dark-on-light. The material used to provide contrast shall be an integral part of the truncated dome surface.
   4. Audible Contrast: Differ from adjoining walking surfaces in resiliency or sound-on-cane contact.

3.0 EXECUTION

3.1 PREPARATION OF SUBGRADES

A. Prepare subgrades as specified in Section 31 22 00 "Grading" to bring subgrade to required lines and grade for site improvements.

B. Maintain all subgrade in satisfactory condition, protected against traffic where necessary, and properly drained until site improvements are placed. Immediately in advance of concrete, check subgrade levels with templates riding the forms, correct irregularities, and re-compact any added fill material.

3.2 STRUCTURE LOCATIONS

A. Check for correct elevation and position of all manhole covers, valve boxes, and similar structures located within areas to be poured and make any necessary adjustments in such structures.

3.3 AGGREGATE BASES

A. If shown on the Drawings- place, compact, and maintain aggregate bases in accordance with Division 32 "COMMON WORKS FOR EXTERIOR IMPROVEMENTS".

3.4 FORM CONSTRUCTION

A. Set forms to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of the work and so forms can remain in place at least 24 hours after concrete placement.

B. Check completed formwork for grade and alignment per the Tolerances paragraph of this specification.

C. Clean forms after each use, and coat with form release agent after each use and as often as required to ensure separation from concrete without damage.

3.5 MIXING AND TRANSPORTING CONCRETE

A. Ready-Mixed Concrete - Certificates and laboratory strength test data shall be furnished from the mixing plant that concrete has a 28-day compressive strength when tested in accordance with methods described in ASTM Standard C39. No change shall be made in materials or the established mix without prior approval of the Design Professional.

B. Ready-mixed concrete shall be transported to the site in transit-mix or agitator trucks having watertight drums loaded not in excess of rated capacities. Concrete shall be delivered and discharged within 1 hour after water is added to the cement. Concrete which, when delivered is not plastic and workable will be rejected.

C. Retempering of concrete that has partially hardened (remixing with or without additional cement, aggregate or water) will not be permitted.

3.6 PLACING CONCRETE

A. Subgrade- Place concrete only on a moist compacted subgrade or base, free from loose material. Place no concrete on a muddy or frozen subgrade.

B. Forms - All forms shall be free from warp, tight enough to prevent leakage of concrete, and substantial enough to maintain their shape and position without springing or settlement when concrete is placed or vibrated. Forms shall be staked, braced, and/or tied together securely. Forms shall be clean and those for surfaces to be exposed shall produce a smooth, even finish without fins or board marks. Set forms for slabs on ground at exact finished grade. Check for line and grade and correct as necessary immediately before concreting. Provide uniform bearing for such forms.

C. Reinforcement shall be accurately placed, and securely supported and fastened to prevent movement during placement of concrete.

D. Concrete shall be deposited so as to require as little rehandling as practical. Placing shall be continuous between transverse joints or in individual sections of the work. Vibrate concrete thoroughly along forms and expansion joints and work carefully into corners and around reinforcement. Tamp and screed to a dense mass. If the temperature may be expected to fall below forty (40) degrees Fahrenheit within

twenty-four (24) hours after concrete is placed, heat water and aggregates to bring the temperature of concrete mix to at least fifty (50) degrees.

E. Do not remove forms for at least 24 hours after concrete has been placed. After forms are removed, clean ends of joints and point-up any minor honeycombed areas. Remove and replace sections with major defects, as directed by Design Professional.

3.7 JOINTS

A. General: Construct expansion, control (also may be called weakened-plane or contraction, and construction joints true-to-line with face perpendicular to surface of the concrete, unless otherwise indicated. Construct transverse joints at right angles to the centerline, unless otherwise indicated.

B. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.

C. Control Joints: Provide control (contraction) joints, sectioning concrete into areas not to exceed 25 feet in length. Construct control joints for a depth equal to at least 1/4 of concrete thickness, as follows:
   1. Tooled Joints: Form control joints in fresh concrete by grooving top portion of concrete. Finish edges with a jointer. Joints in walks shall be 1/4" x 1" deep and at a spacing equal to walk width.
   2. Sawed Joints: Form control joints using powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as surface will not be torn, abraded, or otherwise damaged by cutting action.

D. Construction Joints: Place construction joints at the end of all pours and at locations where placement operations are stopped for a period of more than 1/2-hour, except where such pours terminate at expansion joints. Construct joints as shown or, if not shown, use standard metal keyway-section forms.

E. Expansion Joints: Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.

3.8 CONCRETE CURB AND GUTTER

A. Furnish and install formed concrete curb and gutter as detailed. Curb and gutter shall be accurately formed to a true, clean, straight, even profile. Unless otherwise shown:
   1. Provide expansion joints 40 feet on center. Control (tooled) joints shall be provided at 10 feet on center.

2. Finish of concrete shall be a fine broom finish.

B. All curves shall be accurately formed to detail.

3.9 CONCRETE WALKS AND FLUMES

A. Unless otherwise shown on the Drawings, concrete walks shall be:
1. 4 inches thick.
2. Provide expansion joints through walks at a maximum of 40 feet on-center and control (tooled) joints at the same intervals as the width of the walk.
3. Slope walks toward curb, driveway, or roadway.
4. Finish shall be a fine broom finish.

3.10 SAND BLAST FINISH

A. Provide abrasive blast (sand blast) finish where indicated on the Drawings.

B. Perform sand blasting 24 to 72 hours after casting when concrete strength is between 1000 and 1500 psi.

C. Surface Continuity: Perform sand blasting in a continuous manner, utilizing same crew or personnel.

D. Depth of Cut: Use an abrasive grit of proper type and gradation to expose aggregate and surrounding matrix surfaces to match the design reference sample or mock up as follows:
1. Brush: Remove cement matrix to eliminate surface sheen and expose face of fine aggregate. No reveal.
2. Light: Expose fine aggregate with occasional exposure of coarse aggregate and uniform color. Maximum reveal 1/16 inch.
3. Medium: Generally expose coarse aggregate with slight reveal. Max reveal ¼".
4. Heavy: Expose and reveal coarse aggregate to a maximum projection of one-third of its diameter, reveal ¼ to ½ inch.

E. Sand blasting: Blast corners and edges carefully, using back-up boards, to maintain uniform corner or edge line. Determine type of nozzle, nozzle pressure, and blasting techniques required to match the mockup.

F. Cleaning: After sand blasting is complete, clean surface with commercial concrete cleaner according to manufacturer instructions and recommendations. Thoroughly neutralize and flush cleaning solution from finished surface with water under pressure.

G. Protect adjacent surfaces and materials from washing and run-off.

3.11 HANDICAP RAMP

A. Locate and construct concrete handicap ramps per Plan and details. Provide tactile warning surface (truncates dome) via pavers or monolithic concrete pour systems provide shop drawings for said system. Apply a fine broom finish. Do not exceed 8 percent slope at any point.

3.12 HEAVY DUTY CONCRETE PAVING

A. Place steel reinforcing where indicated prior to placing concrete.

B. Pour heavy duty concrete mix in forms so that when consolidated struck off, compacted, and finished, paving will be to the thickness shown on the Drawings. If not shown on the Drawings, paving thickness shall be 8 inches.

C. Locate expansion joints at fixed structures and control joints at minimum of 10’ O.C. for each pavement lane.

D. Test surface for trueness with a 10' straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.

E. Compact in such a manner that aggregate is forced down and not less than 3/8 inch of mortar is left on top. Apply heavy broom finish.

3.13 CURING CONCRETE

A. Protect unhardened concrete from rain and flowing water and protect concrete against loss of moisture and rapid temperature change for at least a 7 day curing period.

C. Impervious membrane - Where applicable, concrete will be cured through the application of a transparent, impervious membrane of a type approved by the Design Professional. The liquid shall contain a fugitive dye and shall be of such composition as not to react with the concrete nor alter its color. Apply the liquid immediately after free water has disappeared from the finished surface of the concrete; apply in the form of a fine mist and in such manner as to cover the surface with a uniform film, ample to seal the surface thoroughly and without marring the concrete finish in accordance with manufacturer recommendations. Keep workmen, equipment and materials off the membrane during the curing period, except as required for joint sawing operations and surface tests.

3.14 TOLERANCES

A. Elevation tolerance for finish grade surfaces are:
   1. General areas +- 0.04 ft unless field adjustments are directed or approved by the Design Professional.

B. Formwork:
   1. Top of Forms not more than 1/8" in 10' from indicated elevation.
   2. Vertical face on longitudinal axis, not more than 1/4" in 10' from indicated alignment.

C. Cross slope, thickness, and smoothness tolerances are as follows:

Layer	Cross Slope(2)	Thickness	Smoothness(1)
Base (Aggregate or treated)	+- 1.0%	+- 1/4 in	1/2 inch
Finished Concrete Surface (Pedestrian Areas)	+- 0.5%	+- 1/4 in	5/16 inch
Curb Sections	+- 0.5%	+- 1/4 in	1/4 inch
Rigid Pavement Sections	+- 0.3%	+- 1/4 in	1/4 inch

(1) In any direction within a single plane of asphalt, do not exceed the gap below a 10 foot straightedge resting on high spots.

(2) Cross slope tolerance does not alleviate the requirement to provide positive drainage. Unless shown otherwise in the Drawings, when adjacent to driveways or roadways, sidewalks shall have a minimum 1.5% and maximum 2.5% cross slope towards the roadway or gutter line.

D. No ponding of water greater than 1/4 inch is allowed.

E. Finish joints shall not deviate more than 1/4 inch in the horizontal alignment from a straight line.

F. The curb height shall not vary from the specified height by more than +/- 1/2 inch.

G. Heave or settlement of sidewalk, relative to separate curb pour, greater than 1/2 inch shall be cause for corrective action.

3.15 TESTING- QUALITY ACCEPTANCE

A. Inspections: Prior to commencement of portions of the work, the Testing Agency shall be notified 3 days in advance to verify the following items:
   1. Subgrade preparation, stiffness (proof rolling).
   2. Subgrade profile, cross slope, and elevation.
   3. Grades, elevations, compaction, surface smoothness of base aggregate if used.

B. Prior to backfilling and after forms are removed repair honeycombed, defective, or damaged areas of concrete. Repairs shall be made within 7 days after forms are removed.

C. Replace concrete in all areas (between joints) that fail to meet requirements as specified in the Tolerances paragraph of this specification.

D. Concrete site improvements damaged during construction shall not be spot patched. Damage includes, but is not limited to: discoloration, spalling, and cracking. Replaced the entire section, associated with construction damage, between joints.

E. Appearance: Exposed surfaces of finished work shall not exhibit discoloration, form marks, or tool marks which are inconsistent from the overall appearance. Remove such deficient surfaces and replace between joints.

F. At the time of Final Acceptance, the repair of cracks as listed below shall be completed by removal and replacement of the entire section, between joints.
   1. All cracks 1/8 inch width or greater.
   2. Connected cracks, regardless of crack width.
   3. Crack that extends through a joint, regardless of crack width.
   4. Crack that exhibits vertical shifting, regardless of crack width.
   5. Longitudinal crack, regardless of crack width.
   6. Excessive transverse cracks, regardless of crack width. For the purposes of this section, excessive transverse cracking is 2 or more cracks between joints.
   7. Open cracks that are less than 1/8 inch wide, and do not meet the conditions above, at the sole discretion of the Owner or Design Professional, shall be sealed by routing 3/4 inch to 1 inch deep by 1/4 inch wide and filling with Sikaflex 1-A or approved equal.

G. Minimal testing requirements Owners Quality Assurance are summarized below. Contractor may elect to collect additional samples and perform additional tests, or prepare additional specimens for testing at its sole discretion in accordance with their own quality control program.

Material or Product	Characteristic /Test Method	Minimum Sample Frequency	Acceptance Criteria	Sampling Point
Concrete Mixture	Compressive Strength ASTM C31, ASTM C39	Min. 1 composite sample per day (2 sets of 2 standard 6"x12" cylinder), per 250 CY placed, per each class. ASTM C172	Average of three consecutive tests exceed specified strength, and no test is deficient by more than 500 psi.	Molded onsite, lab test.
	Air Content ASTM C173, or C231	(min) 2 tests per day, per class placed.	+- 0.5% of the design air content	On site
	Slump ASTM C143	(min) 2 tests per day, per 250 CY placed, per each class.	Refer to mix composition.	On site
Aggregate base courses	Gradation; max dry density, optimum moisture by modified proctor, ASTM D1557	1 per source	Gradation within limits.	Stockpile at source
	Compaction GDT 21, 59, ASTM D6938	1 per 2000 sq yards of finished concrete surface, per lift	100% of max dry density, ±2% optimum moisture *	In-place, prior to next lift

1. Deficient work that test reports and inspections indicated does not comply with this specification, shall be fully replaced. Corrective action not involving full replacement may be approved by the Engineer in writing, provided such corrective action equals or betters the original specification.

2. Additional testing (or retesting) after failing tests shall be paid for by the Contractor.

3.16 MAINTENANCE OF CONCRETE SITE IMPROVEMENTS

A. Thoroughly clean surfaces of completed concrete at the completion of the work and maintain in a clean state until Final Acceptance of the work.

END OF SECTION

SECTION 02500

FLEXIBLE PAVING

1.0 GENERAL

1.1 SUMMARY

A. Section Includes: *Refer to the Drawings for specific paving details.
1. Bituminous prime coat, if used.
2. Asphalt paving courses including binder course and surface course.
3. Bituminous tack coat.
4. Paint and thermoplastic pavement markings, if used.

B. Related Sections:
1. 02211 "GRADING" for backfill and compaction of trench excavations prior to paving and for general subgrade preparation.
2. 02050 "COMMON WORKS FOR EXTERIOR IMPROVEMENTS" for graded aggregate base (GAB) construction.

1.2 REFERENCE SPECIFICATIONS AND DOCUMENTS

A. Georgia Department of Transportation (GDOT)
1. Department of Transportation, State of Georgia Standard Specifications, Construction of Roads and Bridges, 2013 Edition. Unless otherwise noted, conform with GDOT Standard Specifications for testing, materials, and methods for bases and hot mix asphalt pavement.
2. GDOT Special Provision Sect. 828 applies to hot mix asphalt mixtures and is available at http://www.dot.ga.gov/PartnerSmart/Business/Source/special_provisions/shelf/sp828.pdf.
3. GDOT Test Procedures (GDT), where referenced.

B. American Society for Testing Materials (ASTM)
1. ASTM D1557- laboratory compaction characteristics of soil using Modified Effort.
2. ASTM D2726- Bulk specific gravity and density of compacted bituminous mixtures.
3. ASTM D2950- In place density of bituminous concrete by nuclear gage.
4. ASTM D3203- Percent air voids in compacted bituminous paving mixtures.
5. ASTM D3549- Thickness of compacted bituminous paving mixture specimens.
6. ASTM D6938- In place density and water content of soil and aggregate using

nuclear gage.

7. ASTM C150- Portland Cement.

C. MUTCD: US Department of Transportation, Manual of Uniform Traffic Control Devices for Streets and Highways, 2009 Edition with Revisions 1 and 2- dated May 2012. Unless otherwise shown or specified conform with the MUTCD on all asphalt striping and pavement marking.

1.3 SUBMITTALS

A. Product data for materials, including but not limited to: traffic paint, thermoplastic markings, prime coat, bituminous tack coat.

B. Job Mix Formula for all asphalt concrete mixtures which includes the following information:
   1. Mixture I.D. Number
   2. Source and description and proportions of materials to be used.
   3. Percentage of combined mineral aggregates passing each specified sieve.
   4. Percentage of asphalt by weight of the total mix.
   5. Single temperature at which to discharge from the plant.
   6. Theoretical specific gravity or Theoretical maximum density (Rice) of the mixture at the designated asphalt content.

C. Copy of pavement warranty and maintenance agreement for review by the Design Professional.

1.4 QUALITY ASSURANCE

A. Testing Services: The Owner will engage a qualified independent testing agency to perform material evaluation tests described in this Section.

1.5 SITE CONDITIONS

A. Store materials only in areas designated for Contractor's use.

B. Complete all underground work and raise all necessary structures prior to paving operations.

C. Verify all grades and elevations for conformance with the Drawings before proceeding with work. The Design Professional reserves the right to make minor modifications by reasonable field adjustments prior to completion of subgrade work.

D. Weather Limitations:
   1. Install base course when subgrade is sufficiently stable, not saturated, and when

air temperature is above 30° F and rising.

2. Apply prime and tack coats to dry surfaces when: rain is not imminent, temperature is above 40° F, and temperature has not been below 35° F for 12 hours immediately prior to application.
3. Construct Asphalt paving courses in dry weather when subgrade is sufficiently stable, and air temperature is above 40° F.

1.6 PAVEMENT DESIGN

A. Pavement sections are shown on the Drawings and may include, but are not limited to, the following applications:
   1. Asphalt Paving within the Right-of-Way.
   2. Heavy Duty Asphalt Paving.
   3. Medium Duty Asphalt Paving.

B. All depths shown or specified are measured after compaction.

1.7 WARRANTY

A. Pavement Warranty:
   1. (Sub) Contractor shall provide the Owner with a warranty and maintenance agreement on materials and workmanship for all hot mix asphalt paving work. Warranty and maintenance period shall be for a one-year period beginning on the established date of substantial completion on all asphalt paving.
   2. All maintenance work under the Pavement Warranty shall be performed within 30 days of notice by the Owner and in accordance with GDOT Standard Specifications.

2.0 PRODUCTS

2.1 PRIME COAT- CUTBACK ASPHALT

A. Medium curing cut back asphalts {MC-30, MC-70, MC-250, MC-800, MC-3000} and rapid curing cutback asphalts {RC-30, RC-70, RC-250, RC-800, RC-3000} material properties in accordance with GDOT Standard Specification 821.

2.2 BITUMINOUS TACK COAT

A. Performance graded asphalt cement: PG 58-22, PG 64-22, or PG 67-22 in accordance with GDOT Standard Specification 820.

2.3 SUPERPAVE ASPHALTIC CONCRETE MIXTURES

A. Asphaltic concrete shall be hot plant mix material and shall comply with requirements for Hot Mix Asphaltic Concrete Mixtures per GDOT Special Provision Sect. 828 available at the following address:

http://www.dot.ga.gov/PartnerSmart/Business/Source/special_provisions/shelf/sp828.pdf.

B. Maximum Reclaimed Asphalt Pavement (RAP) content shall not exceed 20%, if used, for non-athletic surfaces. RAP may not be used for athletic surface mixtures (i.e. tennis courts or tracks).

C. Asphalt cement: PG 64-22 or PG 67-22, unless otherwise approved by the Design Professional.

D. Design gradations for pavements typically used as asphalt binder (subsurface, intermediate, or base) courses are:

Sieve Size (1)	12.5 mm Superpave	19 mm Superpave	25 mm Superpave
	Percent Passing		
1-1/2 in (37.5mm)			100
1-in (25.0 mm) sieve	100	100	90-100
¾ in (19.0 mm) sieve	98-100	90-100	55-89
½ in (12.5 mm) sieve	90-100	60-89	50-70
3/8 in (9.5 mm) sieve	70-89	55-75	
No. 8 (2.36 mm) sieve	38-46	32-36	30-36
No. 200 (75 µm) sieve	4.5-7.0	4.0-6.0	3.5-6.0
Range for Total AC (2)	5.00- 6.25%	4.25-5.50%	4.00-5.25%

1. Refer to GDOT Special Provision 828 for mixture control tolerances applicable to each sieve and pavement.
2. Range for % AC is Original Optimum AC (OOAC) at 65 gyrations prior to the Corrected Optimum AC calculations detailed in GDOT SOP 2.

E. Volumetric mix requirements for super pavements, including work within public rights of ways.

Design Parameter	Mix Type(s)	Limits
% of Max. Specific Gravity (Gmm) at design gyrations, (Ndes)	All	96%
% Gmm at the initial number of gyrations, Ni	All	91.5% Max
% voids filled with asphalt (VFA) at Ndes	9.5 mm Type I	Min 72; Max 80
	9.5 mm Type II, 12.5 mm	Min 72; Max 76
	19 mm	Min 71; Max 76
	25 mm	Min 69; Max 76
Fines to effective asphalt binder ration (F/Pbe)	9.5 mm Type I	0.6 to 1.4
	All other types	0.8 to 1.6
Minimum Film Thickness (microns)	All	>7.00 µm
Minimum % Voids in Mineral Aggregate (VMA)	25 mm	13.0%
	19 mm	14.0%
	12.5 mm	15.0%
	9.5 mm Type I	16.0%
	9.5 mm Type II	16.0%

G. Volumetric mix requirements for parking facilities only.

Design Parameter	Mix Type(s)	Limits
% of Max. Specific Gravity (Gmm) at design gyrations, (Ndes)	All	96%
% Gmm at the initial number of gyrations, Ni	All	91.5% Max
% voids filled with asphalt (VFA) at Ndes	4.75 mm	Min 60; Max 80
	9.5 mm Type I	Min 72; Max 80
	9.5 mm Type II, 12.5 mm	Min 72; Max 78
	19 mm	Min 71; Max 76
	25 mm	Min 71; Max 76
Design optimum air voids	4.75 mm	4.0 - 7.0
Fines to effective asphalt binder ration (F/Pbe)	9.5 mm Type I	0.6 to 1.4
	All other types	0.8 to 1.6
Minimum Film Thickness (microns)	4.75 mm	> 6.00 µm
	All others	> 7.00 µm
Minimum % Voids in Mineral Aggregate (VMA)	25 mm	13.0%
	19 mm	14.0%
	12.5 mm	15.0%
	9.5 mm Type I	16.0%
	9.5 mm Type II	16.0%

2.4 PORTLAND CEMENT

A. Type 1 or Type 2 Portland Cement per ASTM C150.

3.0 EXECUTION

3.1 INSPECTION

A. Ensure that subgrade has been finished to line, grade, and cross section shown.

B. Prepare subgrade in accordance with Division 31 "EARTHWORK". Any subgrade defects, or unsatisfactory conditions, that may adversely affect proper installation of this work shall be reported to the Design Professional and corrected prior to base course or paving course work.

3.2 AGGREGATE BASE

A. Place, compact, and maintain aggregate bases in accordance with Divison 32 "COMMON WORKS FOR EXTERIOR IMPROVEMENTS".
B. Aggregate base shall be mixed with 50 lbs/Sq. Yd. of Portland Cement and tilled to a depth of 8"-10".

3.3 PRIME COAT

A. Provide prime coats to finished, compacted, and slightly damp soil or base surfaces under the following conditions:
   1. Prime where noted on the Drawings.
   2. Prime soil or aggregate bases prior to applying bituminous surface treatments (chip seals).
   3. Prime all cement or lime stabilized bases prior to asphalt paving.
   4. Prime aggregate bases on which less than 5 inches of total thickness of hot mix asphalt will be placed. Except that prime coats are not required in parking lots and driveways bound by curbs or other features, under paved shoulders, or under non-vehicular areas.

B. Grade of cut back asphalt shall be as shown on the Drawings or as determined by the Engineer or Testing Agency. If not shown or specified, provide grade of cut back asphalt in accordance with GDOT Standard Specification 412.3.05 given base material texture {tight, average, or open} and Contractor selected curing rate.

C. Apply prime coat for optimum penetration at a rate between 0.15 and 0.30 gal/sq-yd.

3.4 TACK COAT

A. Apply tack coat of asphalt cement between all layers of successive pavement, including between the binder course and surface course pavements.

B. Apply tack coat to milled pavement surfaces prior to paving.

C. Apply tack coat to vertical surfaces of curbs, gutters, transverse and longitudinal construction joints, dig out patches prior to such surfaces being paved.

D. Limit the amount of tack coat applied to that which can be covered by paving operations that day.

E. Sweep and clean application surfaces of all loose debris, and allow to dry prior to applying tack coat.

F. Apply tack coats of asphalt cement at an application temperature of 350 - 400 °F and rates of 0.02 to 0.04 gal/sq-yd for freshly placed asphalt and at a rate of 0.04 to 0.06 gal/sq-yd on other surfaces.

G. Do not allow traffic on tack coat material. Allow the tack coat to become sufficiently tacky (break) prior to paving.

3.5 BINDER COURSE

A. Construct a hot plant mix asphaltic concrete binder course on prepared base to the line, grade, thicknesses, and tolerances indicated on the Drawings and in these specifications.

B. Uniformly spread and compact.

C. Layer Thicknesses: Conform with minimum and maximum lift thicknesses as follows (reference GDOT Section 400, Table 5):
   1. 25 mm Superpave: 3" to 5"
   2. 19 mm Superpave: 1-3/4" to 3"
   3. 12.5 mm Superpave: 1-3/8" to 2-1/2"

3.7 PLACING ASPHALTIC CONCRETE PAVING

A. Hot plant mix asphaltic concrete paving shall be placed on prepared surface, spread, and struck. Unless approved otherwise, spread mixture at minimum temperature of 225°F.

B. Place each course by pavers equipped with automatic screed control such that it can be finished to required grade, cross-section, width, thickness and is uniform in density and texture. Except that, when approved by the Testing Agency or Design Professional, small areas inaccessible to paving machines may be placed by hand. Paving machine screed extensions may be used with approval of Design Professional only. Approved Extensions shall provide for consistent lay down density through use of extended auger systems or other approved mechanisms.

C. Make longitudinal and transverse joints between old and new pavements, or between successive days work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density, and smoothness as other sections of asphaltic

concrete course. Prior to paving, clean joint contact surfaces and apply tack coat.

3.8 ROLLING

A. Commence rolling when asphaltic concrete mixture will support roller weight without excessive displacement.

B. Continue rolling until roller marks are no longer visible and asphalt has been uniformly compacted attaining required density and smoothness.

C. Compact asphaltic concrete mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.

D. Do no roll asphalt if mix temperature is less than 175° F unless a lower temperature is supported by the mix design and is otherwise approved by the Design Professional or Testing Agency.

3.9 TOLERANCES

A. Elevation tolerance for asphalt paved surfaces are:
   1. General areas +- 1/4 inch at finish grade unless field adjustments are directed or approved by the Design Professional.

B. Cross slope, thickness, and smoothness tolerances per pavement section layer are as follows:

Layer	Cross Slope	Thickness	Smoothness (1)
Base (Aggregate or treated)	+- 1.0%	-1/4 in, no max.	1/2 inch
HMA Binder Course	+- 0.75%	-1/4 in, GDOT max (2)	3/8 inch
HMA Surface Course	+- 0.5%	-3/8 in, GDOT max	2 1/4 inch

(1) In any direction within a single plane of asphalt, do not exceed the gap below a 10foot straightedge resting on high spots.
(2) Refer to Articles on HMA binder and surface courses this section for maximum layer thickness (from GDOT Standard Section 400 Table 5).

3.10 TESTING- QUALITY ACCEPTANCE

A. Inspections: Prior to commencement of portions of the work, the Testing Agency and/or Design Professional shall be notified 48 days in advance to verify the following

items:

1. Subgrade preparation, stiffness (proof rolling).
2. Subgrade profile, cross slope, and elevation.
3. Grades, elevations, compaction, surface smoothness of base aggregate.
4. Grades, elevations, surface smoothness of asphalt binder course

B. Additional testing (or retesting) after failing tests shall be paid for by the Contractor.

C. Minimal testing requirements for Owners Quality Assurance are summarized below. Contractor may elect to collect additional samples and perform additional tests, or prepare additional specimens for testing at its sole discretion in accordance with their own quality control program.

Material or Product	Characteristic /Test Method	Minimum Sample Frequency	Acceptance Criteria	Sampling Point
Aggregate base courses	Gradation; max dry density, optimum moisture by modified proctor, ASTM D1557	1 per source	Gradation within limits.	Stockpile at source
	Compaction GDT 21, 59, ASTM D6938	1 per 500 sq yards, per lift	100% of max dry density, ±2% optimum moisture *	In-place, prior to next lift
Hot asphalt concrete mixes	Compaction GDT 39, 59 ASTM D2950, ASTM D1188, ASTM D3203	1 core per 500 sq-yds per lift, not less than 1 test per paving day. Continuous nuclear gage	Percent air voids ⩽7.8%**	Completed surface after rolling

	testing during paving.		
Thickness, by coring.	Binder Courses: 1 per 1000 sq-yds. Overall Section Including Surface Course: Measured from Compaction samples.	Average of all Measurements for a given course or full section ⩾ specified thickness ***	Completed surface after rolling

* Unless shown otherwise on the Drawings.

** Additionally, asphalt mixes shall be applied with uniform density such that within a single day or paving area, the difference between highest and lowest measured air voids does not exceed 4% for new pavement and 5% for resurfacing projects.

***Additionally, at any location, the thickness of a given lift shall not be less than within ¼" of the design thickness.

D. Hot Asphalt Concrete Compaction Testing
   1. Density tests are not required when HMA is placed at 90 lbs/sq-yd or less or for courses of 4.75 mm mix.
   2. Non-conforming work: Remove completed asphalt courses that exceed maximum percentage of air voids (or do not attain minimum compaction percentages) and replace at the direction of the Design Professional or Testing Agency. Statistical testing and pay factors specified in GDOT Standard Specifications are not applicable.

E. Asphalt Cores
   1. Repair holes resulting from coring to match existing pavement elevations. Repair holes prior to paving any subsequent courses.
   2. 4" diameter cores of binder course shall be taken through base and binder course prior to placing surface course.

F. Correction of Asphalt Thickness Deficiencies
   1. In areas where there is a deficiency in the thickness of binder course(s), increase the thickness of wearing course to offset the deficiency.
   2. The average thickness of the full asphalt paving section, binder courses + surface course, shall be ⩾ the design asphalt section. If tests show a deficiency of -1/4 inch or more in the average thickness of the specimens, provide mitigation acceptable to the Design Professional, Testing Agency, or Owner's

representation. If directed, place an additional lift of wearing course at the minimum depth as specified in this Section.

3.12 MAINTENANCE OF ASPHALTIC CONCRETE PAVING

A. Protect completed asphalt surfaces from damage, siltation, and spills throughout construction.

B. Remove and replace any asphaltic concrete paving if damaged by construction activities. Do not change or alter grade during corrective work, unless approved by the Design Professional.

C. Saw cut and remove areas of damaged asphaltic concrete paving in neat and straight lines extending the width of a full lane or at least 10 feet in large areas. Corrections by surface patching will not be accepted.

END OF SECTION

SECTION 02540

EROSION & SEDIMENTATION CONTROLS

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Compliance with NPDES Phase II Construction General Permit No. GAR 100001 for land disturbing activities over 1 acre in extent.
2. Temporary erosion, sedimentation, and pollution controls (air, water, soil) from site preparation through final site stabilization that include, but are not limited to:
a. Silt dams, traps, barriers and
b. Slope stabilization,
c. Temporary grading to manage stormwater and dewatering activities.
d. Polyacrylamide (PAM) applications.

B. Related Sections:
1. 02050 "Common Works for Exterior Improvements" for soil additives and mulches
2. 02200 "Site Preparation and General Site Work" for protection of existing vegetation, waste management, and spill prevention.
3. 02211 "Grading" for dewatering requirements and additional requirements for Temporary Grading and Drainage.
4. 02920 "Turf & Grasses" for temporary vegetation and mulching and for permanent grassing.

1.2 REFERENCE SPECIFICATIONS AND DOCUMENTS

A. The Manual for Erosion and Sediment Control in Georgia, 2016 Edition, by the Georgia Soil and Water Conservation Commission, "Best Management Practices". Apply to all land disturbing activities.

B. The State of Georgia Department of Natural Resources Environmental Protection Division "National Pollution Discharge Elimination System" General Permit No. GAR 100001. This permit applies to all land disturbing activities for this project.

1.3 SUBMITTALS

A. Schedule of operations: Submit schedule of proposed operations conforming with

the "Land Disturbance Activities Sequence" as delineated on the Erosion, Sedimentation & Pollution Control Plan(s), including program for erosion control measures, logs, documentation, identified superintendent with required continuing education certification, maintenance of control facilities and vegetative practices. Show anticipated starting and completion dates for land-disturbing activities including excavation, filling and rough grading, finished grading, construction of temporary and permanent control measures, and disposition of temporary sediment control measures.

B. Product Data: For each type of the following manufactured products required provide manufactures data to the Owner for review and comment prior to bringing products onsite and incorporating into the work. Product submittals include, but are not limited to:
   1. Silt fence.
   2. Rolled erosion control blankets.
   3. Anionic polyacrylamide (PAM).

C. Samples: Submit samples of the following items or products prior to incorporating into the work.
   1. All Class A and Class B Erosion Control Blanket products proposed for the work.
   2. PAM gel bars or logs.

1.4 QUALITY ASSURANCE

A. Comply with "Manual for Erosion and Sediment Control in Georgia" and "Best Management Practices" for practices, procedures, and operations.

B. Obtain NPDES Phase II permit coverage and conform to all provisions under the State of Georgia and Federal Clean Water Act (permit no. GAR 100001). Refer to http://epd.georgia.gov/npdes-construction-storm-water-general-permits. Responsibilities of the Contractor include, but are not limited to:
   1. Filing a NOI (Notice of Intent) with State's Environmental Protection Division (EPD) 72 hours prior to land disturbance activities with both the Owner's signature and the General Contractor's signature. Coordinate with Owner and Owner's Engineer to determine if this has already been filed, if not then it is the Contractor's responsibility.
   2. Maintain a log book log book on site documenting the inspections of erosion control devices (minimum once/week and within 24 hrs of any storm event) and noting any corrections or modifications. Document all rainfall events. As necessary, coordinate and assist with required stormwater monitoring requirement and maintain monitoring reports prepared by the Testing Agency (with the log book).
   3. Filing a NOT (Notice of Termination) with the EPD when the site is fully stabilized and all stormwater discharge associated with the construction activity has

ceased.

C. Erosion, Sediment And Pollution Control Superintendent:
   1. Provide a designated representative to remain on site during land disturbance activities with the following qualifications:
      a. Minimum 5 years of experience in erosion, sediment and pollution control.
      b. Certification Level 1A (minimum) "blue card" from Georgia Soil & Water Conservation Commission.
   2. Duties include:
      a. Oversight of land disturbance operations.
      b. Ensure strict adherence to the land disturbance construction activities sequence, strict adherence to all "Best Management Practices" as defined in the "Manual for Erosion and Sediment Control in Georgia"
      c. Monitor proper grading (terracing, berming, etc..) to properly divert water, and maximize storm water travel lengths and minimize path slopes.
      d. Monitor and provide for temporary or permanent site stabilization as soon as possible and within the required time limits.

1.5 SITE CONDITIONS

A. Furnish and install erosion control measures prior to or concurrent with any land disturbance activity. Conform with the "Land Disturbance Activities Sequence" (if applicable).

B. The Contractor is solely responsible for ensuring that no silt or debris leaves the immediate construction site. Return any silted or eroded area to its natural state.

C. Install and maintain erosion and sediment control "Best Management Practices" prior to land disturbing activities, and continuously through construction until final site stabilization measures (paving, planting, etc.) are effective at controlling erosion from the site.

D. Schedule grading operations to allow permanent erosion control to take place in the same construction season. Avoid or minimize exposure of soils to winter weather. Maintain all controls until vegetative cover has been established.

E. The Contractor is responsible for all quantities of soil erosion control measures regardless if shown on the drawings. The extent of soil erosion control measures shown on the drawings is considered minimum. Install additional erosion and sedimentation control measures when deemed necessary by the Contractor, or on-site inspections from the Owner, Design Professional, Testing Agency or by authorities having jurisdiction.

1.6 PROTECTION OF ADJACENT PROPERTY AND STATE WATER BUFFERS

A. Protection existing State Water Buffers and adjacent property from sediment trespass is of the essence. Flag and fence buffers, tree save areas and property lines prior to any construction activities. Flag stream (State Water) buffers as shown on the approved "Erosion, Sedimentation, and Pollution Control Plan". Unless otherwise shown, install 11"x17" weatherproof signs along State Water buffer(s) at 40 ft intervals, that read:

"STATE WATER BUFFER – DO NOT DISTURB"

B. Protect adjacent property including, but not limited to: landscape areas, stormwater facilities, sidewalks, curbing, roadways and all utilities therein.

2.0 PRODUCTS

2.1 TEMPORARY GRASSING MATERIALS

A. Use quick growing temporary grass species suitable to the area and season.

B. Refer to 02050 "Common Works for Exterior Improvements" for soil additives and mulches, refer to 02920 "Turf Grasses" for temporary seed mixes.

2.2 HYDRAULICALLY APPLIED MULCH

A. Wood cellulose fiber containing no germination inhibiting or growth inhibiting agents with characteristics (including acceptance tolerances) as follows:
   1. Percent moisture content: 9.0% (+ 3, 0%).
   2. Percent organic matter: 99.2% (+ 0.8%).
   3. Percent ash content: 0.8% (+ 0.2%).
   4. pH: 4.8 (+ 0.5).
   5. Min. water holding capacity: 150 grams water / 100 grams fiber.

2.3 BONDED FIBER MATRIX MULCH

A. Bonded Fiber matrix (BFM) manufactured to be hydraulically applied, and upon drying, adheres to the soil in the form of a continuous, 100% coverage, biodegradable, erosion control blanket. Acceptable BFM producers include:
   1. Soil Guard as manufactured by Mat, Inc., phone (888) 477-3028
   2. Ecoaegis as manufactured by Canfor Panel & Fibre Market, LTD, phone (800) 363-8873
   3. Conwed 3000 Profile Products, phone (800) 508-8681

B. The BFM shall be comprised of a long strand, thermally produced wood fibers

passing a freeness test at a 760 cc (MLS) level or below (>88% of total volume by weight) held together by organic tackifiers (10%) and mineral bonding agents (>2%) which upon drying become insoluble and non-dispersible.

C. The matrix which forms shall be designed, tested and proven to perform in a manner equal or superior to biodegradable erosion control blankets (ECB's). Documentation of testing at an independent university laboratory shall be provided which demonstrates superior performance as measured by reduced water runoff, reduced soil loss, and faster plant germination, as compared to ECB's. The formed matrix shall meet the following requirements:
   1. Pass a free liquid quality control test (liquids separate from fibrous solids no greater than one inch in one minute's time as measured on a standard test board).
   2. Does not dissolve or disperse upon rewetting.
   3. Does not have holes > 1mm in size and no gaps between product and the soil.

2.4 SILT FENCE (TYPE C) - SENSITIVE

A. Geotextile: Silt fence fabric shall be woven geotextile for Type C fabric. Type A fabric may be either woven or non-woven. Fabric shall conform with the following properties:

Property *	Type C Fabric	Type A Fabric
Min. Tensile Strength (lbs) (ASTM D-4632)	Warp – 260 Fill – 180	Warp – 120 Fill – 100
Elongation (% Max.) (ASTM D-4632)	40	40
AOS (Apparent Opening Size) (ASTM D-4751)	No. 30	No. 30
Flow Rate (Gal./Min./Sq.Ft.) (GDT-87)	70	25
Ultraviolet Stability (ASTM D-4632 after 300 hours weathering in accordance with ASTM D-4355)	80	80
Bursting Strength (PSI Min.) (ASTM D-3786)	175	175
Minimum Fabric With (Inches)	36	36

* from GDOT Standard Specification 881.2.07

B. Wood posts:
   1. Minimum dimension: 1 ½ inch by 1 ½ inch by 4 feet.
   2. Untreated fir, redwood, cedar, or pine cut from sound timber with no loose or unsound knots.

C. Steel posts:
   1. 48-inch minimum length.
   2. Cross section shape that can resist failure from lateral loads (T-shaped, U-shaped, or L-shaped) and 0.75 pounds per foot minimum mass.

D. Silt fence reinforcement (if used):
   1. Wire mesh consisting of 14 gauge steel with mesh spacing of 6 inch x 6 inches (maximum), or prefabricated polymeric mesh of equivalent strength.

2.5 RIPRAP

A. Unless otherwise specified, riprap is well graded GDOT Type 3 (Standard Specification 805). Stone shall be made of sound, durable naturally occurring rock with nor more than 5% by weight being weathered or decomposed material or shales. Type 3 riprap gradation is as follows.

Volume	Approx. Weight	Percent Smaller Than
1.0 cu-ft	165 lbs	100%
0.1 cu-ft	15 lbs	10-65%
2” square sieve	-	Maximum 15%

2.6 FILTER STONE & SURGE STONE

A. Unless otherwise shown Filter stone, surge stone is in accordance with Appendix C of the Manual for Erosion and Sediment Control in Georgia.

2.7 SLOPE STABILIZATION BLANKET

A. Class A Blanket:
   1. Application: Unless otherwise shown on the Drawings, apply on slopes steeper than 3H:1V, up to a maximum of 1H:1V.
   2. Double net blanket.
   3. Rated for extended survivability with at least a 12 month functional longevity.
   4. Biodegradable natural fiber netting for blanket for slopes up to 2H:1V.

5. Slow degrading polypropylene or other manufacturer tested /rated netting for slopes steeper than 2H:1V.
6. Core: Straw and Coir (Coconut) blend fiber or Excelsior (shredded aspen) fiber. Certified weed free straw. Alternative core products may be submitted for approval.
7. Approved Products and Manufacturers:
   a. "Curlex ® II Blanket" by American Excelsior Company.
   b. "SK Straw/Coir Blanket" by Bon Terra. Note-Netting option shall be consistent with the slope application.
   c. "Ero-Mat Excelsior" by Verdyol.

B. Class B Blanket:
1. Application: Unless otherwise shown on the Drawings, apply on slopes of 3H:1V or flatter.
2. Single net blanket.
3. Net shall be either biodegradable (natural fiber) or photodegradable synthetic mesh.
4. Rated for short term survivability with up to a 12 month functional longevity.
5. Straw core material, if used, shall be certified weed free.
6. Approved Products and Manufacturers:
   a. "Curlex ® I Blanket" by American Excelsior Company.
   b. "S Straw Blanket" with jute/cotton threading by Bon Terra.
   c. "EroNET TM S75" by North America Green.

2.8 NON-WOVEN GEOTEXTILE FABRIC

A. Non-woven geotextile fabric shall be as indicated on Drawings. If not otherwise indicated, fabric weight shall be a minimum or 6 oz. per square yard.

2.9 POLYACRYLAMIDE

A. All polyacrylamide shall be anionic and in emulsion form and gel bars/logs.

3.0 EXECUTION

3.1 GENERAL

A. Sedimentation Control: Sediment basins, diversion berms, silt dams, traps, barriers, downlines, check dams, rock filter dams, seep berms, mulching temporary grassing and appurtenances shall be installed and shall be maintained in-place for duration of construction, as shown and detailed on erosion control plan.

B. Silt fence:
1. Construct silt fences as shown in the Drawings.

2. Where shown install multiple rows of silt fence.

C. Provide and construct erosion control check dams as shown.

D. Maintain erosion and sedimentation controls in a condition which will retain unfiltered water.

E. Construct sedimentation ponds and control devices prior to clearing and grubbing the site to insure complete silt control.

F. Provide temporary seeding for all exposed soil surfaces that are not to be fine graded or landscaped within 14 calendar days. Multiple temporary seeding applications should be expected.

G. Provide temporary or permanent grassing (season dependent) and\or mulching for all disturbed areas within 7 calendar days of reaching finished grades. Reduce areas of disturbance daily through use of temporary grassing and mulching.

3.2 GRADING OPERATIONS

A. Grading Operations: Phased grading operations so that the ground surface will be disturbed for the shortest possible time before permanent construction is installed. Maintained large areas as flat as possible to minimize soil transport through surface flow. Immediately install graded diversion channels, ditches and berms to direct storm runoff to sediment and filtering basins. Grade fill slopes in a manner which prevents surface areas from flowing over newly constructed fill slope areas through shaping and providing required temporary downlines or diversions to permanent storm structures as construction allows.
   1. Protect newly graded areas from actions of the elements. Repair settlement or washing that occurs prior to acceptance of work and maintain established grades until the date of substantial completion.
   2. Contractor is responsible for any damage occurring to adjacent property resulting from drainage or siltation from the site.
   3. Construct all fills at outmost part of fill and slope towards original ground so that all surface storm water drains back away from fill and does not run over the top of fill slope.
      Construct swales at bottom of proposed fill slopes prior to construction of any fills. Construct and maintain a swale /berm at the outermost part of top fills as fills are constructed.

B. Storm Drainage System: Install as much of the permanent storm drainage system as practical, provide the required temporary inlet sediment traps immediately and divert surface water into the system. Install temporary inlet sediment traps shall as base of structure is set and adjust up periodically as the grading operation raises the

grades around the structure.

1. Maintain temporary sediment barriers at drainage structures until final stabilization occurs.
2. Install storm drainage as grading progresses and makes additional storm drainage installation possible. Direct swales to drainage structure locations as shown on drawings.

C. Ground Cover:

1. All exposed and unworked soil shall be protected by application of temporary groundcover.
2. Ground cover may consist of any effective erosion preventative treatment such as straw or other mulches, planting, etc.
3. All grassing or planting operations shall include mulching as stabilization until ground cover by planting is effective.

3.3 STABILIZATION PRACTICES

A. Control soil erosion during all phases of construction to preserve and protect slopes, drainage structures, pavement, and other facilities, and to reduce potential sources of water pollution and damage to adjacent property.

B. Mulching: Apply dry straw or hay and/or wood chip mulch to disturbed areas at a depth of two to three inches unless otherwise shown. Apply by hand or mechanical equipment. Press Straw or hay mulch shall be pressed into the soil with a disk harrow with disk set straight or with special “Packer Disk”. The edge of the disk should be dull enough not to cut the mulch but to press it into the soil leaving much of it in an erect position. Anchor immediately after application.

C. Polyacrylamide (PAM): Utilize anionic polyacrylamide as a temporary soil binding agent to reduce soil erosion. PAM is available in emulsions, powders and gel bars or logs. Use PAM in conjunction with other “best management practices”. Use PAM in direct soil surface applications where the timely establishment of vegetation is not feasible (including building pad and parking lot areas). Apply PAM in conjunction with temporary seeding efforts or as a separate hydro spray application. The maximum application of PAM, in pure form, shall not exceed 200 pounds/acre/year. Install a PAM gel bar or log in each storm structure (secured with rope) and replace at the manufactures recommended interval. Apply PAM via hydrospreader to all disturbed areas once per 7 calendar days at the rate of 7.5 pounds per acre. Provide written record of each application.

D. Temporary Stabilization: Stabilize topsoil stockpiles and disturbed areas of the site, where construction activity has ceased for at least 14 calendar days with temporary cover or seeding.

E. Seed Bed Preparation for Temporary Vegetation: Loosen ground surface by discing,

raking or harrowing. If the area has been recently loosened or disturbed, no further roughening shall be required. Remove all large clods, boulders and debris that will interfere with the work.

F. Unless otherwise shown, plant temporary grass areas at the rates specified in 02920 Turf and Grasses.

G. Hydroseeding: Protect existing trees and shrubs during hydroseeding. Apply seed, fertilizer, lime, and fiber in one application. Maintain temporary vegetative cover until the permanent turf planting season, at which time the temporary grass or annual ryegrass shall be mowed down to the ground surface, the lawn area disc harrowed, the soil prepared for planting lawns and the permanent lawn planted or sodded as called for on the Drawings. Refer to 02920 "Turf and Grasses" for permanent turf.

H. Reseeding – Reseed and provide straw cover for bare areas 1 square foot and larger to establish and maintain vegetative cover and to prevent sheet and rill erosion. Repair erosion damage as required and reseed.

I. Matting and Mulching – Cover all seeding with matting or mulch. After seeding, cover all slopes that exceed 3H:1V with erosion control matting and/or blankets. Install mats and/or blankets per manufacturer's recommendations using the recommended fastening hardware.

J. Depending on the season at which slopes that exceed 3H:1V are established, the Contractor shall anticipate multiple applications of erosion matting. If a permanent slope is established and planted with temporary grass due to planting season, contractor shall eradicate temporary grass and install permanent grassing as called shown. Once bare soil is exposed, an additional application of matting will be required. Remaining seeded areas shall be covered with straw or hay spread at the rate of approximately 2 tons/acre or wood cellulose fiber applied at the rate of approximately 1500 lbs/acre.

K. Stabilize areas of the site that are to be paved through proper compaction of the soil and placement of a graded, stone aggregate base.

L. Rolling – Roll all seeded areas with roller weighing 60 to 90 pounds per linear foot of roller before applying mulch. On steep slopes cover seeds by dragging spiked chains or similar methods.

M. Watering – Depending on weather conditions at the time of construction, Contractor shall anticipate watering measures other than natural rainfall. Provide all watering necessary to establish a healthy vegetative cover.

N. Permanent Stabilization – Stabilize disturbed areas of the site where finished grade has been with season dependent permanent seeding within 7 calendar days of achieving grade. Refer to Drawings and 02920 "Turf and Grasses" for permanent seed mixes.
   1. Hydroseed mixtures shall contain PAM.
   2. After seeding provide erosion control mattering or blankets where shown and in accordance with manufacturers recommendations.

O. Complete all permanent erosion control features at the earliest practical time. Use temporary measures until permanent measures are completed.

3.4 STRUCTURAL PRACTICES

A. Submit any additional structural control measures in the form of shop drawings.

B. Temporary Construction Entrance – Construct a stabilized, stone aggregate construction entrance shall be constructed, as per the detail set forth in the Manual for Erosion and Sediment Control in Georgia, Latest Edition. The temporary construction entrance shall reduce vehicle tracking of sediments. Out-going trucks shall have the tires washed prior to exiting the site onto any public street or right-of-way. Any mud, dirt, or rock that is tracked onto public streets shall be swept immediately and material placed within the perimeter controls.

C. Maintain all access to the site to prevent mud from washing or being tracked onto existing pavements. Provide a temporary hose bib system or water truck with a pressure hose for wash down of trucks and equipment entering the public right-of-way as necessary.

D. Sediment Basins – Construct temporary sediment basins to contain and filter at least 67 cubic yards of sediment per disturbed acre and in accordance with the Manual for Erosion and Sediment Control in Georgia, 2016 Edition. Construct the unit complete as shown including:
   1. Principal spillways with riprap outfall protection.
   2. Anti-seep collars.
   3. Risers and Trash racks.
   4. Temporary mulching and grassing of external slopes.
   5. Skimmers.
   6. Emergency overflow areas.

E. Silt Barriers – Unless shown otherwise, install a single row of Type "C" Silt fence along the toe of all downstream slopes and a double row of Type "C" Silt Fence adjacent to all state waters buffers.

F. Temporary Diversion Berms/Dikes – Construct temporary diversion berms/dikes per

the approved Erosion, Sedimentation, and Pollution Control Plan. Raise diversions, minimum 4 feet wide, at the end of each day during grading activities. The diversions shall intercept and redirect runoff to the temporary sediment basin(s) and/or temporary storm drainage structure sediment inlet traps prior to the runoff reaching perimeter sediment controls.

3.5 MAINTENANCE

A. Inspect slope protection and erosion control elements after each rainfall. Unless otherwise shown, inspect all barriers and sediment traps after each rain event. Clear all debris and accumulated sediment from behind barriers and sediment traps when one third full. Remove accumulated sediment from traps after each rain event and spread on site.

B. Provide appropriate stabilization (mulch, grass seed) where collected sediment is redistributed onsite.

C. Control dust from disturbed areas by means of mulching, watering, calcium chloride or other method subject to the Design Professionals approval.

3.6 REMOVAL OF TEMPORARY EROSION CONTROL DEVICES

A. As soon as permanent vegetative cover is established, remove temporary devices, including sediment barriers, berms, silt traps and similar devices.

B. Remove any retrofit structure and clean out all accumulated silt and debris in detention ponds to finish grades.

C. Remove all debris resulting from temporary erosion control from project site.

END OF SECTION

SECTION 02700

WATER UTILITY DISTRIBUTION PIPING

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Water distribution system (domestic and fire protection) pipes, fittings, and appurtenances.
   2. Coordination with local authorities and utility providers.
   3. Pressure testing and sterilization.

B. Related Sections:
   1. 02211 “GRADING” for trench excavation, backfill, and compaction.

1.2 REFERENCE SPECIFICATIONS AND DOCUMENTS

A. Comply with the authority having jurisdiction Water Main Standards for domestic water line systems, meters, and backflow prevention devices.

B. Comply with the authority having jurisdiction requirements and NFPA 24, Outside Protection, latest edition, for fire line systems, fire hydrants and related fire protection system

1.3 SUBMITTALS

A. Product data: For each type of piping material, prefabricated structure, and casting. Indicate product descriptions and installation procedures.

B. As-builts: Provide the Owner with one (1) physical copy of a reproducible "as-built" plan of all underground utilities showing the location of each with dimensions shown to the building and/or curb line from each underground utility. The same information shall also be provided in electronic format (PDF).

C. Certification(s) of pressure testing.

D. Certification(s) of disinfection of all potable water piping.

1.4 QUALITY ASSURANCE

A. Underground piping which is used for fire protection shall be installed by a Contractor which holds a current Georgia Certificate of Competency for Automatic Fire Sprinkler Systems.

1.5 SITE CONDITIONS

A. Consult with the local governing authority prior to formulating bid to coordinate timing of on-site water improvements with off-site water line improvements.

B. Obtain all necessary permits for work within public right-of-way.

C. It is the Contractor's responsibility to determine all requirements of the local Water Department regarding new utility service to the site. The installation shall be in complete accordance with those requirements. Notify the local authority prior to backfilling any buried or concealed plumbing and allow inspection and observation of all Work.

D. Comply with applicable codes, ordinances, rules, regulations, and laws of local, municipal, Georgia, and federal authorities having jurisdiction.

E. Coordinate water distribution system installation with grading and paving and other site operations.

F. Install water mains when subgrade is within 6 inches of final grade, and prior to paving base installation.

1.6 WARRANTY

A. Contractor shall warranty the construction and workmanship of water distribution system(s) for a period of one (1) year from the date of project Acceptance.

2.0 PRODUCTS

2.1 DOMESTIC PIPING MATERIAL

A. Pipe material, unless otherwise provided shall conform to the following:
   1. 3” and smaller domestic water service pipe installed underground shall be Type "K" hard drawn copper tubing with wrought copper solder joint fittings conforming to ASTM B-88-72. Minimum depth of cover is 36" or as required by local authorities or utility provider.
   2. 4” and larger domestic water pipe installed underground shall be cement lined ductile iron pipe conforming to ANSI A21.51. Minimum depth of cover is 36".

3. Install warning tapes with metallic cores 12" above all underground piping. Unless otherwise provided, warning tape shall be Brady 91603(blue) for water lines, 91604(green) for sanitary sewer lines and 91600(yellow) for gas lines or approved equal by Seton or T&B Westline. Warning tape shall rise out of the ground and be accessible at the building wall or other outside location.

B. Pipe joints, unless otherwise provided shall conform to the following:
1. Joints in copper pipe shall be made with lead free solder containing tin-copper silver or 95-5 tin antimony.
2. In lieu of soldered fittings in copper pipe, the contractor may substitute Victaulic or Grinnell Gruvlok groved mechanical couplings or T-Drill mechanically formed fittings with brazed connections. Each of these systems shall be used in accordance with the manufacturer's published instructions.
3. Joints in ductile iron water and sewer pipe shall be Tyton joints except that joints at fittings in water lines shall be bolted mechanical joints.
4. Connections of copper pipe to ferrous pipe and/or equipment shall be made with dielectric unions, Watts series 3000, Victaulic or Gruvlok Clearflow or approved equal.

C. Valves, unless otherwise provided shall conform to the following:
1. Unless specifically indicated otherwise, the valves shall be designed for not less than 125 pounds working pressure. The valves shall be suitable for the service for which they are installed.
2. Gate valves for copper water lines shall be Milwaukee Fig. 115 bronze valve with non-rising stem (nut and valve key) and sweat ends or approved equal by Crane, Hammond, Mueller, Nibco, Stockham or Watts.
3. Gate valves for ductile iron water lines shall be Watts model 406-NRS-RW flanged gate valve with non-rising stem (nut and valve key) or approved equal by Crane, Hammond, Kitz, Milwaukee, Mueller, Nibco, or Stockham.
4. Double check valves shall be Watts No. 709-RW or 007-QT as indicated, epoxy coated double check valve with two gate valves and four test cocks. The valve assembly shall be U. L. listed. Approved equal valves by Ames, Febco, Hersey or Wilkins are acceptable.

2.2 FIRE PROTECTION PIPING MATERIAL

A. Valves
1. OS & Y valves, post indicator valves and check valves shall be listed by U. L. for use in fire mains. Gate valves: Iron-Body Bronze - Mounted Gate Valves, Sizes 3" - 12", inclusive: Order Specification: Double-Disc, Parallel Seats, Non-rising stem (IS), Rated at 200-psi WWP, O-ring seals, Std 2" square wrench nut, and conforming to AWWA Specifications C500 in all respects. Check with Water Department for direction of opening.

2. Post indicator valve: include a compatible supervisory control switch with tamper proof cover per manufacturer recommendations. Route all necessary conductors in approved conduit.

B. Underground Piping – Ductile Iron
   1. Underground piping shall be cement lined ductile iron pipe manufactured in accordance with ANSI 21.51.
   2. Joints in ductile iron water pipe shall be Tyton joints except that joints at fittings shall be bolted mechanical joints.

C. Fittings And Couplings (Underground Piping)
   1. Fitting for underground piping shall be ductile iron manufactured in accordance with ANSI A21-10. All ductile iron pipe fittings shall be in accordance with AWWA C151/ANSI A21.51.

D. Backflow Prevention Valves
   1. Double check detector valve assembly shall be Watts 709 DCDA double check valve with detector CFM meter, two OS & Y gate valves and four test cocks.
   2. Valves shall have epoxy coated cast iron bodies. The valve assembly shall be U. L. listed.
   3. Valves shall be as manufactured by Watts or approved equal by Ames, Febco or Hersey.

E. Fire Hydrants
   1. Fire hydrants shall be an AWWA listed type having two 2-1/2" hose outlets and a 4-1/2" pumper outlet with threads compatible with Local Fire Department equipment.

3.0 EXECUTION

3.1 GENERAL

A. Permits: Obtain the necessary permits from local governing authorities having jurisdiction and from related utility providers prior to performing any water work on site.

B. Line and Grade: Layout water systems to the required lines and grades; with fittings, valves, and hydrants at the required locations; and with joints centered and spigots home; and with all valve and hydrant stems plumb.

C. Protecting underground and surface structures: Provide temporary support, adequate protection, and maintenance of all underground and surface utility structures, drains, sewers and other obstructions encountered in the progress of the work.

D. Sub-surface exploration: Examine all available records and make explorations and excavations necessary to determine the location of existing pipes, valves, or other underground structures.

E. Detectable wire: Install tracing wire with all non-metallic piping.

3.2 LAYING PIPE

A. Install underground fire protection piping in accordance with NFPA 24-8-1 through 8-7. Anchor all tees, plugs, caps and bends with clamps, tie rods and concrete thrust blocks in accordance with NFPA 24-8-6. Underground fire protection piping shall have a minimum of 48 inches of cover above the top of the pipe.

B. General: Before lowering pipe into trenches, grade the bottom of the ditch so that will have a bearing for its entire length. Carefully examine the pipe for defects and clean the inside. After placing pipe in ditch, clean the bell gasket, and spigot of all dirt, sand and foreign material. Apply a thin film of lubricant to the gasket and spigot. Insert the plain ends of the pipe into the socket after until it makes contact with the bottom of the socket.

C. Trench water: Close the open end of pipe by approved means at all times when pipe laying is not in progress such that no trench water is permitted to enter the pipe.

D. Cutting pipe: Cut pipe in a neat and workmanlike manner for inserting valves, fittings, or closure pieces.

E. Direction of laying: Unless otherwise recommended by the manufacturer or local authorities having jurisdiction, lay pipe with bell ends facing in the direction of laying. For lines on an appreciable slope, bells shall face upgrade.

F. Permissible deflection: Wherever necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructions, to plumb stems, or where long radius curves are permitted, the degree of deflection is the lesser as recommended by the manufacturer of the pipe and the maximum allowed by local authorities having jurisdiction.

G. Unsuitable conditions: Do not lay pipe in water or when the trench conditions or weather is unsuitable for such work, except by written permission of the Design Professional.

3.3 DUCTILE IRON PIPE - PUSH ON JOINTS

A. Joints shall be made by means of a compression-type, push-on resilient gasket.

Lubricate gaskets before installation using as recommended by the pipe manufacturer. Identify the seated joint by the visible mark on the spigot of the installed pipe section. When the temperature is above 60 degrees F., force the spigot end of each cast iron pipe lead tightly on the bell of the preceding pipe. When the temperature is below 60 degrees F., maintain 1/16-inch clearance from the spigot end of pipe to face of the bell for expansion.

B. Assemble, handle and install flexible joint pipe in accordance with the printed manufacturer recommendations.

3.4 SETTING APPURTENANCES

A. Valves and fittings: Set and join gate valves and pipe fittings to new pipe in the manner previously specified for cleaning, laying and jointing pipe and as recommended by the manufacturer.

B. Valve boxes: Firmly support cast iron valve boxes, positioned centered and plumb over the wrench nut of the gate valve, with box cover flush with the surface of the finished pavement or at such other level as may be directed.

3.5 SETTING HYDRANTS

A. General locations: locate hydrants to provide complete accessibility and minimize possibility of damage from vehicles or injury to pedestrians.

B. Cleaning: Thoroughly clean hydrants of dirt or foreign matter before setting.

C. Position of nozzles: Install hydrants plumb with nozzles at an angle of 45 degrees with respect to the curb with nozzles at least 18 inches above the ground.

D. Drainage at hydrant: Wherever hydrants are set in impervious soil, excavate a drainage pit below each hydrant and filled and compacted with coarse gravel or broken stone mixed with coarse sand, under and around the bowel of the hydrant and to a level 6 inches above the waste opening.

3.6 ANCHORAGE OF BENDS, TEES, AND PLUGS

A. Limiting pipe diameter and degree of bend: Apply reaction or thrust blocking/backing on all pipelines at all tees, plugs caps and at bends deflecting eleven degrees or more. If approved, in lieu of blocking, movement may be prevented by attaching suitable metal rods or straps.

B. Reaction backing: Reaction or thrust backing shall be of concrete. Place between solid, unexcavated ground and the fitting to be anchored; the area of bearing on pipe

and on round in each instance shall be as shown on the drawings. Place the backing, unless otherwise shown, so that the pipe and fittings' joints will be accessible for repairs.

3.7 TESTING- QUALITY ACCEPTANCE

A. FLUSHING OF SYSTEM

1. Thoroughly flush underground piping in accordance with NFPA 24-8-8 prior to the connection of inside piping.

B. HYDROSTATIC TESTS

1. Pressure during test: After the pipe has been laid and partially backfilled as specified, all newly laid pipe, or any valved section of it, shall, unless otherwise specified, be subjected to hydrostatic pressure of 200 psi for at least 3 hours in accordance with NFPA 24-9.2.
2. Procedure: Test shall conform with AWWA C600. Fill each section of pipe slowly with water. Apply the specified test pressure, measured at the lowest point of elevation, by means of a pump connected to the pipe in a satisfactory manner. The pump, pipe connection gauges and all necessary apparatus shall be furnished by the Contractor. Perform the test separately to each valved section in order to check leakage through all valves. Contractor shall notify and request Fire Marshal to monitor all pressure test and leakage test procedures.
3. Expelling air before test: Before applying the specified test pressure, expel all air from the pipe. To accomplish this, tap if necessary, at points of highest elevation, and afterwards plug tightly.
4. Leakage defined: Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section of it, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and air expelled. Fire Marshal to monitor leakage test.
5. Permissible leakage: Suitable means shall be provided by the Contractor for determining the quantity of water lost by leakage under normal operating pressure. No pipe installation will be accepted until or unless this leakage is less than 10 U.S. Gal. per 24 hours per mile per inch nominal diameter. In calculating leakage, the Fire Marshal will make allowance for added joints in the pipeline above those incidental to normal unit lengths of pipe.
6. Variation from permissible leakage: Should any test of combined sections of pipe laid disclosed leakage per mile of pipe greater than that specified, or if individual sections show leakage greater than the specified limit, the Contractor shall, at his own expense, locate and repair the defective joints until the leakage is within the specified allowance.
7. Time for making test: Pipe may be subjected to hydrostatic pressure, inspected, and tested for leakage at any convenient time to Contractor, Design Professional and Fire Marshal after partial completion of backfill. Provide

water as necessary to make the tests when each section is ready.

8. Certification: Complete and submit the joint Owner-Contractor inspection and test certificates in accordance with NFPA –24-A-9-2.1 to the Fire Marshall, Owner, Design Professional, and water system authority.

C. STERILIZATION

1. Before being placed in service, chlorinate all new water main pipelines and accessories. Furnish all chlorinating equipment and materials, labor, and supplies. Prior to chlorination, remove all dirt and foreign matter by a thorough flushing through the hydrants or by other approved means. Flush each valved section of new laid pipe independently prior to the pressure test and before the trench has been backfilled. All flushing, chlorinating, and testing of water main pipelines shall be in strict compliance with the Utility Owner.
2. Sterilize in accordance with AWWA C601. Sterilize by applying clear water containing a minimum of 50 ppm of available chlorine. The chlorine bearing water shall remain in contact with the surfaces being sterilized for a period of not less than 24 hours. At the end of the contact period, the chlorine residual in all units and at extremities of pipelines shall be at least 25 ppm. The Contractor to coordinate and schedule the testing of treated water through the Owner's Representative and Water Utility.
3. Chlorinating valves and hydrants: Operate all valves or other appurtenances while the pipeline is filled with the chlorinated agent.
4. Final flushing and test: Following chlorination, thoroughly flush all treated water from the newly laid pipeline at its extremities until the replacement water throughout its length shall, upon test, be approved by the water utility owner.
5. Repetition of procedure: Should the initial treatment prove ineffective, repeat the chlorination procedure until confirmed tests shown that water sample conforms to the requirements previously stated.

END OF SECTION

SECTION 02720

STORM DRAINAGE UTILITIES

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Storm sewers, storm structures, appurtenances.

B. Related Sections:
   1. 02200 "SITE PREPARATION AND GENERAL SITE WORK" for layout and construction staking.
   2. 02211 "SITE GRADING" for trench excavation; trench safety; pipe bedding, backfill and compaction.

1.2 REFERENCE SPECIFICATIONS AND DOCUMENTS

A. Georgia Department of Transportation (GDOT)
   1. Department of Transportation, State of Georgia Standard Specifications, Construction of Roads and Bridges, 2013 Edition. Unless otherwise noted, conform with GDOT Standard Specifications for work and materials for storm drain utilities. In the event of conflict apply the more stringent requirement.

B. American Association of State Highway and Transportation Officials (ASHTO)
   1. AASHTO M36 – Standard specification for Corrugated Steel Pipe, Metallic-Coated, for Sewer and Drains.
   2. AASHTO M190 – Standard Specification for Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches.
   3. AASHTO M170 – Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.

C. American Society of Testing Materials (ASTM)
   1. ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity – Flow Applications.

1.3 SUBMITTALS

A. Product information including manufacturer instructions: pipe, fittings. Submit for approval prior to delivery of any material.

B. Shop Drawings: Structures. Submit for approval prior to delivery of any material.

C. Record Drawings: At project closeout, submit record drawings of installed site drainage piping (including lengths and slopes), layout, inverts, top elevations, and products. As-built record drawings shall be prepared by a land surveyor licensed in the State of Georgia. Revisions or necessary approved field changes shall be flagged.

1.4 SITE CONDITIONS

A. Keep a hard copy of GDOT Standard Specifications for reference at the job site at all times during construction.

B. Comply with all applicable codes and ordinances of local authorizing for City of Dacula.

C. Clean all existing drainage systems which are tied into the work.

D. Maintain in operating condition all existing surface or subsurface utilities storm drainage systems in accordance with 02400 DEMOLITION AND STRUCTURE MOVING. Repair any damage done to existing utilities during the course of the work, due to construction.

2.0 PRODUCTS

2.1 PIPE MATERIALS

A. Concrete Pipe: Unless otherwise shown, concrete pipe shall be reinforced Class IV (ASTM C76, AASHTO M170) tongue and groove with rubber gasket. All concrete pipe 12 inches and less in diameter shall be O-Ring Concrete pipe.

B. Corrugated Metal Pipe (CMP): Unless otherwise shown, CMP shall be galvanized and meets requirements of AASHTO M36, Type 1, spiral rib pipe with ½" deep corrugations UltraFlow (or approved equal). Additionally, unless otherwise shown CMP pipes shall have a protective bituminous coated & paved invert (1/2 of diameter) meeting the requirements of AASHTO M190 Type B. Bituminous coatings shall be a minimum 0.05 inches thick.

C. Contractor shall install Aluminized Type II (AST-2) corrugated metal pipe in lieu of CMP galvanized pipe with bituminous coating as illustrated on the Drawings unless otherwise specified on the Drawings, pipe gauges are as follows:

16 Gauge Pipe Diameters	14 Gauge Pipe Diameters	12 Gauge Pipe Diameters
	30″	54″
18″	36″	60″
24″	42″	72″
	48″	84″
		96″

C. Unless otherwise shown, downspout and roof rain leader pipe shall be schedule 40 polyvinylchloride pipe with matching fittings.

D. High Density Polyethylene (HDPE) corrugated pipe and fittings:
Unless otherwise shown, conform with the following:
1. For 4 to 10 inch diameters, smooth interior and annular exterior corrugated HDPE Pipe per AASHTO M252, Type S.
2. For 12 to 48 inch diameters, smooth interior and annular exterior corrugated HDPE Pipe per AASHTO M294, Type S.
3. For 54 to 60 inch diameters, smooth interior and annular exterior corrugated HDPE Pipe per AASHTO MP7-97, Type S.

E. Pipe and fittings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusions or other injurious defects. Joints shall meet or exceed the soil tight joint performance criteria of AASHTO Standard Specifications for Highway Bridges, Division II.

2.2 APPURTENANCES MATERIAL

A. Concrete shall have a minimum compressive strength of 3,000 psi.

B. Mortar for masonry work in storm sewer structures shall be 1:2 cement sand mix. Cement shall be High Early Strength American Portland cement. Sand shall be clean and sharp, free from all deleterious substances and shall contain not more than 5% by volume of material passing No. 100 sieve.

C. Brick shall be clay or shale Hard No. 1 building brick.

D. Castings: All castings shall be gray iron per Georgia DOT Specifications. Casting, grates, frames and other storm drainage appurtenances shall be on site prior to storm drainage installation. Maintain a snug fit between grates, lids, etc., and frame. All castings shall be heavy-duty, bicycle safe type.

E. Other materials required to completely install storm sewers in accordance with these specifications shall conform to all applicable articles and paragraphs of Georgia DOT specifications.

3.0 EXECUTION

3.1 PREPARATION

A. Verify lines, grades, and construction stakes before commencing any excavation for storm drainage pipes or structures.

3.2 EXCAVATION

A. Perform trench and structure excavation in accordance with 02211 “Grading” and in accordance with all OSHA Excavation Standards.

3.3 PIPE BEDDING

A. Unless otherwise shown on the Drawings, construct all bedding in accordance with 02211 “Grading”. Where incompressible soils or rock are encountered, excavate in accordance with 02211 “GRADING”.

3.4 CONCRETE PIPE INSTALL

A. Concrete pipe: lay section in a prepared trench with socket ends pointing upstream. Join sections, including rubber gaskets in accordance with manufacturer recommendations.
   1. Install concrete anti-seep collars at all pipe joints for reinforced concrete pipe within the limits of the stormwater management facility dike, if required for above ground ponds. Concrete anti-seep collars shall meet the following:
      a. Extend 12 inches, minimum, beyond the outer dimension of the pipe in each direction.
      b. Minimum 12 inches in thickness measured parallel to the concrete pipe.
      c. Reinforced with No. 3 bars at perimeter of concrete anti-seep collar. Maintain 2 inches clearance from outer dimension of anti-seep collar.

3.5 CORRUGATED METAL PIPE AND PIPE ARCH INSTALLATION.

A. CMP and pipe arches: lay sections in prepared trench, with outside laps of circumferential joints pointing upstream and longitudinal joints at the sides. Join the sections with coupling bands, fastened by 2 or more bolts. Before backfilling repair any damaged coating or exposed base metal.

3.6 HDPE AND PVC PIPE INSTALLATION

A. Install in accordance with ASTM D 2321.

3.7 APPURTENANCES

A. Headwalls and aprons shall conform with the Drawings.

B. Curb Inlets, Weir Inlet, Drop Inlets, and Manholes: Refer to Drawings for location and type.

C. Connect all downspout and rain leader lines to storm drainage system as shown.

D. Line Tracers: Wrap all non-metallic pipes with metallic tracer tape prior to backfill.

E. Line Markers: During back filling of site drainage systems, install continuous underground-type plastic line marker, located directly over buried line at 6" to 8" below finished grade.

F. All joints between pre-cast base, risers, and round-2-square adapters shall be keyed. All joints shall be grouted inside and out.

G. Stormwater Quality Control Devices (when applicable) shall be installed as recommended by the manufacturer.

H. Leave 2" diameter PVC temporary opening at subgrade in drainage structures for surface drainage. Opening shall be grouted up after finish grading and paving is completed. Contractor shall provide for temporary surface drainage removal to allow timely construction.

3.8 BACKFILLING

A. Check vertical and horizontal alignment of the pipe, culvert, or storm drain by sighting along the crown, invert, and sides of pipe. Check for sagging, faulting, and invert heaving. Repair any issues before backfilling pipe.

B. Backfill in accordance with 02211 "GRADING".

3.9 VIDEO INSPECTION

A. Contractor shall conduct Video surveillance on storm drain installations and underground detention pond concrete vault after completion of all activities that may damage the pipe and/or concrete vault but prior to the placement of the base and paving when applicable. Contractor shall provide videos on thumb drive to Owner and Civil Engineer for review. Video shall begin from existing connection points to all new work with complete identification of lines and manholes contained within the video or summarized in separate document time synced to video footage. If video surveillance indicates problems such as pipe deformation, cracking, or joint separation, or issues with underground detention pond concrete vault, the Contractor

shall be responsible for repairing/replacing pipes and vault at no cost to the Owner.

3.10 TESTING- QUALITY ACCEPTANCE

A. Perform compaction testing in accordance with 02211 "GRADING".

B. A minimum of 25% of the installed length of smooth lined corrugated polyethylene (PE), High Density Polyethylene (HDPE) or PVC pipe, selected by the Design Professional, shall be tested for deformation by the Contractor using a nine point mandrel.
   1. The mandrel shall have an effective diameter equal to 95% of the base inside diameter.
   2. Provide the Design Professional with a proving-ring to verify mandrel size.
   3. Smooth lined corrugated polyethylene or PVC profile wall drain pipe installations shall have a maximum of 5% deflection when checked after completion of all construction activities that may damage the pipe but prior to placement of the base and paving when applicable.
   4. If mandrel testing indicates that problems exist, the Design Professional may determine that up to 100% of the storm drain installation be checked for deformation.
   5. Pipe with over 5% deflection shall be removed and replaced at no cost to the Owner.

3.11 MAINTENANCE AND PROTECTION

A. Before any traffic over a culvert is allowed, provide an adequate depth and width of compacted backfill to protect the structure from damage or displacement. Any damage or displacement that may occur after installing and backfilling shall be repaired or corrected at the Contractor's expense.

B. Remove any debris or silt that constricts the flow through a pipe as often as necessary to maintain drainage throughout the life of the Contract.

3.12 CLEANUP

A. Upon completion of work, all forms, equipment, protective covering, and rubbish resulting therefrom shall be removed from the premises.

B. Fully flush and carefully clean all pipes, culverts, structures, and appurtenances of dirt, rubbish, and surplus mortar before the work is accepted. Provide video inspection after cleaning is complete.

END OF SECTION

SECTION 02730

SANITARY SEWER UTILITIES

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Sanitary pipes, joints, structures, bedding.

B. Related Sections:
   1. 02200 "SITE PREPARATION AND GENERAL SITE WORK" for layout and construction staking.
   2. 02211 "SITE GRADING" for trench excavation; trench safety; pipe bedding, backfill and compaction.

1.2 REFERENCE SPECIFICATIONS AND DOCUMENTS

A. When specified, the work for this section per the applicable portions of the following standard specifications:
   1. ANSI - American National Standard Institute.
   2. ASTM - American Society for Testing and Materials.
   3. DOT - Local Department of Transportation.
   4. NCPI - National Clay Pipe Institute.

1.3 SUBMITTALS

A. Product information including installation instructions: for all material including but not limited to pipes, joints.

B. Shop Drawings: for all fabricated structures, appurtenances.

C. Reports:
   1. Submit a complete field report of the location of all wyes, risers and building leads to the Owner's Representative at the end of each sewer section installed or on the last day of each week, whichever occurs first.
   2. The complete field report includes witnessing by the contractor of the ends of all building leads placed. Witnessing consists of recording three horizontal distances to the nearest foot from the end of the building lead to three permanent structures, with the lines of measurement at minimum angles of 45 degrees with respect to one another. Witnessing also includes recording of the depth to nearest one-half foot from the invert at the end of the lead to the finish

ground above the end of the lead. No payment will be made for un-witnessed installation or for improper witnessed installation.

3. Submit two copies of the laboratory test reports required to the Owner's Representative.

D. As-built drawings:

1. Furnish a set of record "as-built" prints of all portions of the built sanitary sewer systems. The "as-built" record drawing shall include:
   a. Horizontal location of all manholes, pipes, laterals, clean outs, etc. as built.
   b. All vertical information regarding the sanitary sewer as-built such as tops of all structures, invert elevations, location and differential vertical location at crossings with storm sewer, water, gas and all other utility lines.
2. The record as-built drawings shall be an accurate representation of the built sanitary sewer system.

E. Video Inspection:

1. All pipe, 8 inch and larger shall be video inspected. A digital video and written inspection log certified by a professional Engineer licensed in the State of Georgia shall be provided when as-builts are submitted.

1.4 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies

1. Materials, construction, and testing per the applicable requirements of State and local authorities having jurisdiction, including but not limited to: air, ex-filtration and infiltration tests.

1.5 DELIVERY STORAGE AND HANDLING

A. Storage of Materials

1. Do not stack sanitary sewer piping material higher than four feet. Suitable racks, chairs, and other supports shall be provided to protect preformed pipe mating surfaces from damage. Store bottom tiers off the ground. Alternate tiers and chock tier ends.
2. All joint and sealing materials used in the sanitary sewer system shall be protected from sunlight and stored in a cool, clean place until ready for installation.

B. Handling of Material

1. Load and unload piping using suitable hoists, skids, etc. Do not drop, or allow impact to piping. Damaged piping will be rejected by the Owner's Representative and shall be removed from the site.
2. Lifting devices shall be suited to the work and shall protect surfaces from

damage.

2.0 PRODUCTS

2.1 PIPE SYSTEMS

A. Polyvinyl Chloride (PVC) Pipe
   1. PVC pipe, 6" to 15" diameter per ASTM D3034 SDR35. Sizes 18" to 27" in diameter per ASTM F679 SDR35.
   2. Joints for PVC per ASTM D3212, push-on type. Compress an elastomeric ring gasket in the annular space between the bell end or socket and the spigot end of pipe.

B. Ductile Iron Pipe
   1. Unless otherwise shown, ductile iron pipe is 8" diameter Class 50 pipe conforming to ANSI A21.51. Pipe minimum wall thickness class for the nominal pipe inside diameter shall comply with the Utility Owner's criteria.

2.2 STRUCUTURES

A. Sanitary sewer structures per the requirements listed below:
   1. Clay brick per ASTM C32, Grade MS, recessed and/or cored as reviewed by the Design Professional.
   2. Pre-cast Concrete Units
      a. Pre-cast concrete units per ASTM C478, circular with steel reinforcement. Unless otherwise shown on the Drawings: wall thickness is 5 inches for stack depth sections up to 32 feet; Base slab is 8 inches thick for depths up to 25 feet and 12 inches for depths greater than 25 feet.
      b. Pre-cast doghouse sections shall be used for existing sewer lines 15 inches in diameter and smaller on straight-through runs for a depth up to 20 feet and on right angle runs, with a maximum of four cutouts, for depths up to 12 feet. Cast openings in pre-cast doghouse sections before curing. No breaking or chipping of sections are allowed after the pipe has cured.
      c. Pre-cast bottom sections: bottom end is flat to provide bearing of the full wall thickness. Cast the openings of sewer pipe in the manhole and the bottom section by the manufacturer.
      d. Utilize mechanically compressible flexible joints for 6-inch to 24-inch diameter connections to manholes.
      e. Grout connections for 27-inch diameter and larger connections to manholes.
      f. Riser sections of a manhole shall have modified grooved tongue joints with "O" ring gaskets.
      g. Eccentric cone sections of a manhole shall have modified tongue joints with "O" ring gaskets and be provided with four stud inserts cast in the top.

Provide a smooth finish to the top.

h. Concrete grade rings: provide smooth finished top and bottom surfaces with "O" ring gaskets.

i. Pre-cast manhole tees are allowed on straight-through runs with no angle at the manhole and where stubs or openings in the manhole are above the tee section.

j. Pre-cast concrete manhole tee units are per ASTM C76, Class IV, and are circular with circular reinforcement. The pre-cast tees must be a monolithic pour with wire cage inspection prior to concrete placement. Joints for tee are the same as the joints on the sanitary sewer.

B. Manhole steps

1. Types and sizes comply with Occupational Safety and Health Standards.
2. Cast iron manhole steps per ASTM A48, Class 30, gray iron with a minimum cross-sectional dimension of one inch in any direction.
3. Steel reinforced plastic steps shall be of a approved co-polymer polypropylene conforming to ASTM D2146, Type II, Grade 49108 with a minimum 3/8" diameter deformed reinforcing bar conforming to ASTM A615, Grade 60.

C. Manhole Frames and Covers

1. Manhole frames and covers per ASTM A48, Class 30, gray iron. Fabricate the castings free from cracks, cold sheets, holes and other defects. Grind surfaces of castings to assure proper fit and to prevent rocking. Manhole frames and covers comply with Utility Owner criteria.

3.0 EXECUTION

3.1 EXCAVATION AND BEDDING

A. Prior to the installation of any sanitary sewer piping, structures, and materials, examine all trenches and other excavations for the proper grades, lines, levels and clearances required to receive the new work. Ensure that all excavation bottoms, compacted subgrades and pipe beddings are adequate to receive the sanitary sewer materials to be installed. Correct all defects and deficiencies before proceeding with the work.

3.2 PIPE CLASS AND JOINTS

A. Prior to the installation of any sanitary sewer piping, ensure that the class of pipe, joint material and bedding are as specified herein and as indicated on the Drawings.

3.3 PREPARATION

A. Clean the outside surface of the spigot ends and the inside surface of the bell end

and ensure that they are free of any foreign material, other than sealant recommended by the manufacturer, prior to installation.

B. Carefully examine all pipe, frames, covers, accessories, and appurtenances for damage and other defects immediately before installation. Clearly mark defective or damaged material and remove from the site as soon as possible, unless otherwise approved for use by the Design Professional.

3.4 INSTALLATION- GENERAL

A. Install each section of pipe to grade and line with bearing on the trench bedding throughout its length.

B. Cut pipe with approved tools and by approved methods suitable for the pipe material. Employ pipe cutting methods that produce a smooth, square-cut end without damage to the pipe and that minimize airborne particles and in accordance with recommendations of the manufacturer for the type of pipe materials being cut and according to the best trade practices. When cutting pipe or fittings, take care to prevent damage to the lining and the exterior surface. Damage to either may be cause for rejection of that section.

C. Maintain the trench free of water and sewage during the preparation of the pipe bedding and until the trench has been satisfactorily backfilled. Provide and maintain a de-watering system.

D. Unless otherwise shown, all sanitary laterals are 6" diameter ductile iron pipe when below pavement or 6" diameter PVC outside of pavement. Minimum uniform slope of laterals is 1/8-inch per foot, unless otherwise shown.

E. Cleanouts (to grade) shall be as shown on Drawings. If not shown on Drawings, cleanouts shall be provided at all bends and at 80’ o.c. maximum spacing.

3.5 PIPE LAYING

A. Ductile Iron Pipe
   1. Install rigid pipe per ASTM C12. Lay all pipe to the line and grade called for on the Drawings. Check each pipe with grade pole or laser system to ensure that this result is obtained. When employing a laser system, the Contractor shall have an alternate and independent means of checking the line and grade. Finished work shall be straight and shall be sighted through between manholes.
   2. Typically begin construction at the outlet end and proceed upgrade with spigot ends pointing in direction of flow. Excavate bell holes so that the full length of the barrel will bear uniformly on the subgrade.

3. Join all pipe by means of a resilient gasket. Lubricate and install resilient gasket to form a watertight joint between the bell and spigot of the pipe. Center the pipe in the bell or groove. After the spigot is set into the bell and the gasket is fully compressed and brought to final shape, check the gasket for proper position around the full circumference of the joint. Complete installation by pushing the pipe tightly together to form a smooth and continuous invert.
4. Utilize mechanical means for pulling together all pipe where manual means will not result in pushing and holding the pipe together. Mechanical means may consist of a cable placed inside of the pipe with a suitable winch, jack, or come-along for pulling the pipe together and holding the pipe in position.
5. Protect installed pipe to not disturb its line and grade. Relay any pipe found off grade or out of line.
6. When adapters are required to properly connect new pipe to an existing pipe of other materials or manufacture, the nominal inside diameter of adapters shall be the same size as the nominal pipe diameter to which it is to be connected.

B. PVC / ABS Pipe
1. Install of flexible pipe per ASTM D2321.
2. Except as otherwise specified herein, install ABS and PVC piping in accordance with the published installation guide of the manufacturer.
3. Form joints for ABS pipe by first applying a coat of primer to the inside of the socket and to the outside of the spigot end of the pipe. Without delay, apply a coating of cement to the same surfaces in sufficient quantity so that when the spigot is fully inserted into the socket, a bead of excess cement will form around the complete circumference of the outside junction of the spigot and socket. Remove the excess cement and allow the assembly to cure 24 hours.
4. Joints for PVC pipe shall be made by using a lubricant immediately before joining. Apply lubricant only on the spigot, coating the entire circumference of the spigot bevel plus one inch behind the taper. Insert lubricated spigot into the bell and, using normal force, insert spigot until insertion stripe mark is flush with the bell entrance.
5. When jointing ABS or PVC pipe, rotate the pipe when inserting it approximately 1/4 to 1/2 turns.
6. Taps to ABS and PVC pipes, where fittings are not provided, are made with chemically welded saddle fittings. Cut holes for saddle by mechanical hole cutters, or by keyhole saw or saber saw. Holes for saddles shall be laid out with a template and de-burred and beveled to provide a smooth hole shaped to conform to the fitting. After the cement saddle has been fixed to the pipe surface, quickly install band clamps each side of the saddle and tighten.

3.6 PIPE BEDDING

A. Conform to the individual requirements for the pipe material being used.

B. Ductile Iron Pipe:
   1. Unless otherwise shown, use Class "C" bedding. Excavate bell holes. When excavation is carried below or beyond that required, fill the space with suitable Native Material and compact.

C. Plastic (PVC or ABS) Pipe:
   1. Unless otherwise shown, use Class "B" bedding.
      a. Class "B" Bedding: Provide minimum 4" depth of Crushed Stone Bedding all along the trench bottom and along both sides of the pipe up to the one-quarter point of the pipe diameter. Excavate the bottom of the trench flat at a minimum depth shown on the construction details below the bottom of the pipe barrel. Place and compact bedding material to proper grade. Then place bedding by hand and compact to provide full support under and up to centerline of pipe.
      b. Class "C" Bedding: Excavate the bottom of the trench flat at a minimum depth shown on the construction details below the bottom of pipe barrel. Place and compact bedding material up to one fourth of outside diameter of pipe above the invert.

D. In areas of rock excavation, and where needed in other areas, provide crushed stone bedding for all pipes. Provide this bedding over the full width of the excavation, minimum 8" depth under the pipe.

E. Whenever the sub-grade is unstable or too soft to provide a satisfactory pipe foundation for any pipe, undercut or sub excavate the trench and backfill with crushed stone. Compact and bring to proper grade the material so as to create a firm, unyielding foundation.

3.7 SANITARY SEWER MANHOLES

A. Construct sanitary sewer manhole structures to the grades, lines and levels indicated on the Drawings, or as specified. Structures shall be complete with concrete bases, reinforcing, frames, covers, and adjustment rings, as shown and as required for a complete installation. Sanitary manholes shall carry a stub opening as specified herein. Wye openings in manholes are prohibited unless indicated on Drawings.

B. Install manholes and have ready for final inspection either before 600 feet of additional sewer construction is completed or within one week after the manhole is constructed, whichever comes first. Install manholes as follows:
   1. Brick
      a. Prior to laying, thoroughly wet all brick and the surfaces allowed to dry only sufficiently to prevent slippage on the mortar.

b. Do not use broken or chipped brick on the face of the structure.
c. Lay brick in neat, even consecutive courses with full and close mortar joints. Courses shall be level throughout, except as shown or otherwise required. Stagger joints in adjoining courses by one-half a brick as nearly as practical. At least one course in every seven shall be stretcher course with intervening courses laid as headers. Length of brick closure pieces are not less than the width of one whole brick and, wherever practical, closures as headers, are made from whole brick.
d. Unless otherwise indicated, maximum joint width is 1/2-inch Construct joints of uniform thickness throughout the structure. Exposed surfaces shall be true and smooth. Rake all joints to receive plaster coat.
e. Prior to applying plaster coat, wet bricks with water and allow surface to dry sufficiently for proper bonding.

2. Construct pre-cast concrete units as detailed on the Drawings. Where pre-cast doghouse sections cannot be used, manhole shall be brick to eight inches above top of highest pipe.
3. Apply cement mortar plaster coat to the exterior surfaces of the brick sections of all manholes. Plaster coat shall be 1/2-inch thick.
4. Install all iron covers, frames, adjusting rings, and anchors to the elevations indicated on the Drawings, or as specified herein. Set castings on 1" diameter rubber "O" ring gasket, resting on adjustment rings. Anchor casting to the pre-cast concrete cone section.
5. Install steps at the plant by the manufacturer of pre-cast units. Install steps for structures of the types and in the locations indicated on the Drawings.
6. Inlet and Outlet Pipe
   a. Connect 6 inch to 24 inch diameter pipe to manholes using an approved mechanically compressible flexible joint. Properly support the pipe with compacted sand backfill from undisturbed ground so that any settlement will not disturb the connection.
7. Flow Channel
   a. Construct concrete flow channels in each manhole. For manholes with outlet pipe diameter of 24" or less, the concrete flow channel shall be constructed up to the spring line of the pipe, with a 3/4 inch to 1-1/4inch gap provided at the pipe ends to maintain joint flexibility.

C. Provide all materials and construct drop connection assembly as required. Install all piping, fittings, joints, etc. Use non-shrink grout to seal the opening and pour a 3000 psi (minimum) concrete collar 12" thick around the pipe. Drop connections to existing or new manholes shall be made as required.

3.8 TESTING- QUALITY ACCEPTANCE

A. All tests and inspections shall comply with Utility Owner requirements. All tests and

inspections shall be performed in the presence of Utility Owners Representative or Governmental Inspector.

B. First Inspection
   1. The underground portion of the sewer system shall ready for the first inspection within two weeks after the completion of each 2000-foot section of sewer installed.
   2. The first inspection shall consist of a visible and audible check of the sewers and manholes to ascertain that the manhole steps have been placed, all lift holes jointed, the channeling of the manhole bottoms completed, all visible or audible leaks stopped, all pipe has been placed straight and true to the proper grades and elevation, the required adjusting rings and frame and cover properly installed, all trenches and structures backfilled in a workmanlike manner and that the system has been thoroughly cleaned. 3. The first inspection shall be considered complete when all the repairs have been made and the system is ready for television inspection.

C. Testing
   1. Notify Owner's Representative or Governmental Inspector at least two working days in advance of all testing.
   2. The procedure for air testing of sewers shall be in accordance with the NCPI Publication titled "Low Pressure Air Test for Sanitary Sewers" and as follows:
      a. Plug and block all laterals to withstand the air pressure. Test the sewer line in increments between manholes. Clean and plug the line at each manhole. Such plugs shall be designed to hold against the test pressure and shall provide an airtight seal. One of the plugs shall have an orifice through which air can be introduced into the sewer. Connect an air supply line to the orifice and fit with suitable control valves and a pressure gauge for continually measuring the air pressure in the sewer. The pressure gauge shall have a minimum diameter of 3 1/2" and range of 0-10 PSIG. The gauge shall have minimum divisions of 0.10 PSIG and an accuracy of +/- 0.04 PSIG.
      b. Pressurize the sewer to 4.0 PSIG greater than the greatest back pressure caused by groundwater over the top of the sewer pipe. Allow at least two minutes for the air pressure to stabilize between 3.5 and 4.0 PSIG. If necessary, add air to the sewer to maintain a pressure of 3.5 PSIG or greater.
      c. After the stabilization period, close the air supply control valve so that no more air will enter the sewer. The sewer air pressure shall be noted and timing for the test begun. The test shall not begin if the air pressure is less than 3.5 PSIG, or such other pressure as is necessary to compensate for groundwater level.
      d. The time required for the air pressure to decrease 1.0 PSIG during the

test shall not be less than the time shown in the tables listed in the NCPI Publication titled "Low Pressure Air Test for Sanitary Sewers".

e. Manholes on sewers to be subjected to air tests shall be equipped with a 1/2" diameter galvanized capped pipe nipple extending through the manhole wall, three inches into the manhole and at an elevation equal to the top of the sewer pipe. Prior to the air test, the groundwater elevation shall be determined by blowing air through the pipe nipple to clear it and then connecting a clear plastic tube to the pipe nipple. The tube shall be suspended vertically in the manhole and the groundwater elevation determined by observing the water level in the tube. The air test pressure shall be adjusted to compensate for the maximum groundwater level above the top of the sewer pipe to be tested. After the test are performed and the sewer is ready for final acceptance, the pipe nipple shall be removed and the hole in the manhole wall shall be plugged with hydraulic cement.

f. If a sewer fails to pass any of the previously described tests, the Contractor shall determine the location of the leaks, repair them and retest the sewer. Repeat the test until satisfactory results are obtained.

END OF SECTION

SECTION 02920

LAWNS & GRASSES

1.0 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Preparation of Lawns/grass planting areas.
   2. Grass seed mixes.
   3. Sod application.
   4. Hydroseed application.
   5. Protection, maintenance, guarantee.

B. Related Sections:
   1. 02211 "GRADING" for basic subgrade preparation and conservation of onsite topsoil.
   2. 02540 "EROSION AND SEDIMENT CONTROL" for mulches or bonded fiber matrix mulch components to hydroseed mixes.
   3. 02050 "COMMON WORKS FOR EXTERIOR IMPROVEMENTS" for furnished / import topsoil, mulches, and soil amendments.

1.2 REFERENCE SPECIFICATIONS AND DOCUMENTS

A. Manual for Erosion and Sediment Control in Georgia, 2016 Edition, by the Georgia Soil and Water Conservation Commission, "Best Management Practices". Apply for permanent and temporary vegetation establishment where noted.

1.3 SUBMITTALS

A. Submit product data for all grassing materials, including, but not limited to:
   1. General disturbed areas hydroseed/mulch mix (state whether cool season or warm season mix).
   2. Lime, fertilizer and other soil amendments.

B. (Sub) Contractor Qualifications: Submit evidence of qualifications prior to work.

C. Manufacturer's certificates: for each Sod application (include species).

D. Testing:
   1. Copies of soil lab test results showing recommended amendments and application rates based on specific grass or grass land planting species.

1.4 QUALITY ASSURANCE (not used)

A. (Sub) Contractor Qualifications:
   1. Bonded fiber matrix mulch application Contractor shall be certified by the producer / manufacturer of the bonded fiber matrix material. Provide evidence of Certification to the Design Professional prior to work.
   2. Grassing and lawn maintenance shall be performed by a reputable lawn maintenance contractor. Secure pre-approval of lawn maintenance Contractor by the Design Professional and Owner, prior to any lawn installation commencement

1.5 SITE CONDITIONS

A. Take all necessary precautions in bringing equipment on to and off of the site and protecting curbs, walks, paving, steps, trees & shrubs, and any other existing construction site during hydroseeding and grassing work.

B. Establish grass in all areas disturbed by construction not required to be developed otherwise.

2.0 PRODUCTS

2.1 SOD

A. Unless otherwise shown on the Drawings, sod is at least 95 percent Bermuda Tifway 419 grass strongly rooted and free of pernicious weeds.

B. Acceptance criteria (sod rolls):
   1. Height of grass in sod rolls is uniform and does not to exceed 3 inches.
   2. Soil is between 1 and 1-1/2 inches thick.
   3. Harvest netting shall be removed prior to installation.

2.2 GRASS SEED

A. Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America.

Germination and hard seed minimum	70%
Purity minimum	90%
Weed seed maximum	2%

Noxious seeds maximum	1% of mix, but not to exceed the specified seeds per lb for each listed noxious weed species in GDOT Standard Spec 890.

2.3 TERMPORARY SEED MIXES

A. Conform to Table 6-4.1 Georgia Erosion and Sediment Control Manual for broadcast rate, for the Piedmont resource area within Georgia, and for the optimal planting dates for temporary grass seed. Plant the following species in accordance with the Georgia Erosion and Sediment Control Manual:
   1. Sudan grass, Sorghum Sudanese.
      a. Planting rate 60 lbs per acre.
      b. Planting dates April 15-July 31.
   2. Annual Ryegrass, Lolium temulentum.
      a. Planting rate 40 lbs per acre.
      b. Planting dates: Year long except summer season (April 15- July 31), optimal from September 1 – December 31.
   3. Annual Lespedeza, Lespedeza striata.
      a. Planting rate 40 lbs per acre.
      b. Planting dates January 1 – April 15.

2.4 PERMANENT SEED MIXES

A. Conform to Table 6-5.2 Georgia Erosion and Sediment Control Manual for broadcast rate, for the local resource area within Georgia, and for the published optimal planting dates for permanent grass seed. Do not plant shrub species or vine species published in Table 6-5.2 unless otherwise shown on the Drawings. Unless otherwise specified, plant the following species:
   1. Common Bermuda, Cynodon dactylon
      a. Planting rate 10 lbs per acre.
      b. Planting dates Jan., Feb., Oct., Nov., Dec. for unhulled seeds and when planted with 30 lbs of winter annuals or Tall Fescue.
      c. Planting dates March – June for hulled seeds.
      d. Mowing maintenance height 3 inches.

B. Steep Slope Mix:
   1. Warm season mix applied at a rate of 50 lbs / acre or cool season mix applied at rate of 100 lbs / acre as applicable.
   2. Apply on slopes 2H:1V or steeper.
   3. Mowing maintenance height 6 inches.
   4. Submitted mixes to conform with the following characteristics:

a. Permanent and temporary seed varieties, season dependent that may include: Lawns type tall fescue, unhulled Serecia Lespedeza, White Clover, and Bermuda grass.
b. Min. 5% Durana white clover.
c. Weed seed, other crop seed < 1.5%.
d. Coating: Inoculated with Germax Seed Treatment and Myco Advantage, or similar.

5. Acceptable Products and Manufacturers:
a. Slopemaster mixes from Pennington Seed Inc. Seed Production, Madison GA (seed mix).

C. Wetland / Detention Pond Mix:
1. Apply where shown at a rate of 12 lbs /acre.
2. Planting dates March 15-June 1, August 15-October 15.
3. Submitted mixes to conform with the following:
a. 25% Redtop.
b. 25% Virginia Wild Rye.
c. 15% Fox Sedge.
d. 10% Woolgrass.
e. 10% Lurid Sedge.
f. 5% Joe Pyeweed.

2.5 HYDROSEED EQUIPMENT

A. Hydroseeding equipment shall have a built in mechanical agitating system to maintain a homogenous mixture of mulch, seed, lime, and fertilizer for each 150 gallons of water.

2.6 GENERAL HYDROSEED / MULCH MIX

A. Hydroseed / mulch mix components:
1. General seed mixtures as specified or shown on the Drawings.
2. Wood cellulose mulch or wood pulp applied at a rate of 2000 lbs/acre. Substitute bonded fiber matrix mulch applied at a rate of 3,500 lbs per acre when specifically shown on the Drawings.
3. Fertilizer: Apply nutrients at the ratios and rates as recommended by soil test(s), however in no case exceed 1500 lbs/ac/yr of a 6-12-12 commercial grade.
4. Finely ground fast acting lime (95% passing No. 100 sieve) applied at a rate of 80 lbs/acre if soil pH is less than 5.5, or if no soil analysis is performed.

2.7 STEEP SLOPE HYDROSEED/ MULCH MIX

A. Hydroseed / mulch mix component for steep slope mixes:
1. Steep slope seed mixes as specified or shown.

2. 3500 lbs per acre of hydraulic mulch with Cover Factor (ASTM D7101) ⩽ 0.01 (soil loss treated surface / soil loss untreated surface).
3. Fertilizer: 19-19-19 commercial grade applied at a rate of 250 lbs / acre.
4. Lime- fast release at 80 lbs / acre if soil pH is less than 5.5 or if no soil analysis is performed.

B. Acceptable Products and Manufacturers:
1. Slopemaster mixes from Pennington Seed Inc. Seed Production, Madison GA (seed mix).
2. Flexterra Flexible Growth Medium Fiber Mulch and Neutra Lime Dry, by Profile Products, Profile Products LLC, Buffalo Grove IL (hydraulic mulch and lime products).

2.8 SEEDBED PREPARATION AMENDMENTS

A. Refer to 31 22 00 "GRADING" for conserved onsite topsoil if available. Refer to 32 05 00 "COMMON WORKS FOR EXTERIOR IMPROVEMENTS" for furnished (import) topsoil, lime, water, compost, fertilizers, mulches for grassing and erosion control.

3.0 EXECUTION

3.1 EXAMINATION

A. Examine grading, substrates and conditions where Lawns and grasses will be established.

B. Do not proceed with permanent grassing installation unless satisfactory conditions exist. Satisfactory conditions include but are not limited to:
1. Subgrades prepared in accordance with 31 22 00 "GRADING".
2. Provide allowances when establishing subgrade elevations for topsoil and soil amendment installation and settlement.
3. Slopes are stable, do not exceed 2H:1V for Steep Slope areas, and do not exceed 3H:1V for all other other areas,
4. Slopes have been graded to divert any concentrated flow away from slope faces.

3.2 TEMPORARY LAWN

A. Season: Plant temporary seed mixes at the rates and species, in accordance with the time of year, as shown in Part 2 and on the Drawings.

B. Maintain temporary Lawns until the permanent planting season, at which time the temporary grass shall be mowed down to the ground surface, the area disk harrowed (for conversion to permanent grassing), the soil prepared for the permanent surface as shown on the Drawings.

3.3 SEED BED PREPARATION & SOIL TESTING

A. For general areas with removed topsoil or insufficient topsoil and slopes 3H:1V, and flatter:
   1. Loosen subgrade as necessary to a depth no less than 4 to 6 inches achieving compaction levels no greater than 80% of standard proctor mixing any topsoil and soil additives into the loosened subgrade.
   2. Spread 2 inches of topsoil evenly over disturbed areas and mix along with other initials soil amendments into the loosened subgrade.
   3. Do not apply topsoil or compost in a frozen or muddy condition. Provide positive drainage in all cases.

B. For areas where the topsoil has not been removed:
   1. Scarified, smooth, and remove large sticks, stones (>4”) and all rubbish.

C. For general areas, steeper than 3H:1V 1. Loosen soil to a practical depth by scarifying, plowing as practical, dragging a spiked chain, walk the surface with cleated equipment or if shown by making serrated cuts. Spread 2” of topsoil starting at the top of slope only if the surface is prepared with serrated cuts.

D. Perform soil test of the upper 4 to 6 inches of mixed subgrade and topsoil to determine application rates of lime, fertilizer, and other amendments. Soil tests may be performed by County extension offices, University laboratories or other laboratories mutually agreed by the Design Professional and Contractor.

E. Apply 1 ton of lime per acre to seedbed, or as otherwise needed to increase pH to between 6.0 and 6.5.

F. Apply any additional fertilizer than shown or proposed in the hydroseed mix at the recommended rates for grassing areas as determined by a soil analysis not to exceed 1500 lbs per acre per year of 6-12-12 fertilizer.

G. Scarify or till soil to a depth of 6 inches, mixing any lime, fertilizer, and other amendments.

H. Remove sticks, stones and rubbish from surface.

I. Perform finish grading to achieve smooth contours and meet finish grades shown on the Drawings, with allowances made for settlement and sod thickness where applicable. Finish surface textures as follows:
   1. Smooth the final surface on areas 4H:1V or flatter.
   2. Provide surface grooves with a tracked vehicle on slopes exceeding 4H:1V. Surface grooves are perpendicular to the fall line of the slope.

J. ADDITIONAL PREPARATION FOR LAWNS AREAS INCLUDING:
SOD AREAS, IRRIGATED GRASSING AREAS, GRASS PLAY AREAS Spread 1 inch of nutrient grade compost and an additional 3 inches of topsoil, for 4 inches min. total depth of topsoil on loosened subgrade and prior to performing soil tests.

K. Contractor option to blend topsoil, compost, and other soil amendments prior to spreading on loosened subgrade at onsite or offsite location if approved by the Design Professional and if blending is observed by Design Professional or Testing Agency.

L. Remove all stones, sticks and rubbish over 1.0" by hand raking or by a rockhound attachment.

3.4 SODDING

A. Lay sod by butting the ends and sides up evenly and staggering the rolls of sod. Do not overlap sod.

B. As soon as the sod is laid or as it is being laid, roll over it with a light roller, ensure all of the sod is in contact with the soil. The completed sodded areas shall be true to finish grade, even and firm at all points.

C. Commence watering within 4 hours of placement.

3.5 SEEDING AND MULCHING

A. Apply seed and mulch to smoothed finish grade surface at the rates specified in Part 2. Permanent planting dates shall be approved by the Design Professional and conform to Part 2 for individual mixes.

B. Comply with manufacturer recommendations for hydroseed/ mulch mixtures, generally install in a 2 step process.
1. Step 1- apply seed, amendments, and small amount of mulch for visual metering of areas to be vegetated. Apply seed and amendments at the specified rates.
2. Step 2- Immediately mix and apply the remaining mulch and growing media and applying in opposing directions to achieve total specified mulch rate per are and with complete coverage. Remove any mulch slurry sprayed onto any hardscape surface or non-grass planting bed.

C. Any areas not specifically called out as sod shall be hydroseeded unless otherwise specified.

3.6 GENERAL MAINTENANCE, PROTECTION, GUARANTEE

A. Protect and maintain all grass areas by watering, mowing as necessary, replanting, and overseeding to establish a uniform stand. Reseed if satisfactory initial growth does not occur within 18 days of planting.

B. Maintain through acceptance by Owner and a minimum of 60 days after material completion of the project.

C. Provide frequent light irrigation if no natural rain events during the first 2 weeks of seeding to prevent the top of the soil from drying out.

D. After seed germination and when grass is about 1 inch tall, reduce irrigation frequency and increase volume as necessary to maintain growth and establish root zone.

E. Repair all seed washing and erosion.

F. Apply maintenance fertilization each subsequent growing season as required based on recommended rate from soil analysis and based on plant species needs.

G. Maintain grass height as recommended in Part 2 seed mixtures or as indicated in other Part 3 articles.

3.7 MAINTENANCE FOR LAWNS AREAS (SOD, IRRIGATED GRASS, PLAY AREAS)

A. Repair bare spots and re-fertilize and lime the soil based on soil analysis of failed areas. Replant if satisfactory initial growth does not occur within 18 days of planting. Scattered bare spots less than 1 square foot are acceptable when accounting for no more than 3% of the total area.

B. For sod, irrigated Lawns areas, play Lawns areas apply 300 lbs per acre of ammonium nitrate 30 calendar days from seeding operation. Do not apply nitrogen between October 15 and March 15.

C. For sod areas, apply 2 topdressing applications of coarse sand and peat moss (75% sand and 25% peat) at 6 mo. Intervals

3.8 MAINTENANCE FOR NATIVE OR NATIVE MEADOW MIX GRASS MIX AREAS
Reseed and water areas that do not show satisfactory growth within 45 days of planting.

A. Native mix areas shall be fully established at the end of the 2nd growing season with grass heights over 1.5 feet and scattered bare spots with no vegetation are limited to no more than 4 square feet in size account for no more than 10% of the total area.

B. Do not provide general mowing during the first 2 growing seasons. Provide only spot treatments of mowing, applications of an appropriate herbicide or mechanical removal as required to control weeds and invasive plants that would interfere with establishment of the native mix.

C. Long Term Maintenance:
   1. After native or native meadow mixes are established- mow to a height of 6-12" height, when dormant, on a 3 year rotation. Do not mow, disc, or burn more than 1/3 of an established area in any one year period.
   2. Continue spot removal or control of invasive vegetation as needed each growing season. Remove such vegetation prior to it going to seed.

D. Long Term Maintenance:
   1. After native or native meadow mixes are established mow to a height of 6-12" height each year, late fall or winter, after seed heads have dried and plants are dormant.
   2. Continue spot removal or control of invasive vegetation as needed each growing season. Remove such vegetation prior to it going to seed.

E. Contractor to provide maintenance on native or native meadow mix grass areas through the end of the 2nd growing season on no more frequently than a monthly basis.

3.9 CLEAN UP

A. Remove any soil, mulch or similar material which has been brought onto paved areas. Upon completion of the planting, remove all excess soil, stones, and debris which has not previously been cleaned up as directed by the Design Professional.

END OF SECTION