DATE: July, 2018

CONSTRUCTION SPECIFICATIONS

Oxford Road Culvert Replacement

GDOT 830	Portland Cement	1-2
GDOT 843	Concrete Pipe	1-2
GDOT 866	Precast Concrete Catch Basin, Drop Inlet and Manhole Units	1-3
GDOT 881	Fabrics for Silt Fence and Plastic Filter for Rip Rap Areas	1-4
GDOT 890	Seed and Sod	1-3
GDOT 891	Fertilizers	1-3
GDOT 893	Miscellaneous Planting Materials	1-2
GDOT 894	Silt Fencing	1-2

Note to Contractor: Any additional GDOT specifications referenced in the above GDOT specifications for this project may be found in GDOT's (complete) current specifications, online.

01005 - STATEMENT OF WORK

PART 1 – GENERAL – Oxford Road Culvert Replacement

1.01 STATEMENT OF WORK: This is a general overview of the project. Follow details shown by the specifications and drawings, interpreted in accordance with contract clauses.

A. Provide all labor, material, plant, equipment, supplies, and coordination required to replace an existing pair of 3’ by 5’ corrugated metal storm pipes and associated drainage structures with a new drainage system of HDPE and concrete pipes, and associated drainage structures, in the area of 4801 and 4790 Oxford Road in Macon, Georgia.

B. Price: Accomplish work shown for the original bid price. This includes special work times for utility outages and repair of damages. The words "at no additional cost to the Government" are implied whether stated or not.

1.02 CONTRACT SITE AND WORK RESTRICTIONS:

A. Work area is restricted to the area at the construction site. Oxford Road, just east of Guerry Drive, may be closed (either one traffic lane or two) for contractor operations for the duration of the project. The contractor shall notify the Macon-Bibb County Engineer and the Macon-Bibb County Traffic Engineer seven calendar days prior to the road closure.

1.03 HOURS OF WORK:

A. Standard work hours for this project are normal work hours of 8:00 AM to 5:00 PM local time, Monday through Friday. Work must stop on official Macon-Bibb County holidays unless specifically approved in advance.

B. Alternate Work Hours

1. If the Contractor desires to work another set of standard hours submit written request five (5) work days before the date desired to work the different standard hours.

2. To work special hours or days such as to continue paving until dark, request verbal approval from the Engineer at least four hours in advance.

3. The Government reserves the right to refuse these requests. In addition, work requiring inspector presence such as placing concrete may not be possible outside normal hours on short notice. Digging outside of normal hours will normally not be approved.

C. All references to days mean calendar days unless otherwise noted.

1.04 SUBMITTALS:

A. General: Provide the following submittals in accordance with instructions found in Section 01300, Submittals and Contractor Furnished Items.

B. Material Submittals: Omitted.

PART 2 - PRODUCTS - OMITTED

PART 3 - EXECUTION

3.01 COORDINATION: The contractor shall coordinate work between different disciplines.

A. Locations shown are approximate and may be moved if approved by the Engineer.

B. Manufacturers' recommendations and/or requirements, if more stringent than the specifications and drawings, shall be followed at no additional cost to the Government.

Section 01005 Submittals

Para #	Description	Date Required	Inspector Check Mark
1.02 A	Closure Notice	7 days prior	_____
1.03 B	Alternate Work Hours	5 days prior	_____

<<<<< END OF SECTION >>>>>

01040 – SITE REQUIREMENTS

PART 1 – GENERAL – Oxford Road Culvert Replacement

1.01 UTILITY OUTAGES: Request any necessary utility outages in writing to the appropriate utility with a copy to the Engineer, a minimum of 14 calendar days before the proposed outage. These may have to be scheduled at other than normal working hours depending on the impact to the users served by the utilities. These are at no additional cost to the Government.

1.02 SUBMITTALS:

A. General: Provide the following submittals in accordance with instructions found in Section 01300, Submittals and Contractor Furnished Items.

B. Material Submittals: None required under this section.

1.03 SAFEGUARDING COMMUNICATION FACILITIES: For work that will interfere with buried fiber optics cable, aerial cable, house cable, underground cable, or other communication facilities, notify the utility and the Engineer in writing 14 days before the scheduled construction. Do no work until receiving approval.

PART 2 - PRODUCTS - OMITTED

PART 3 - EXECUTION

3.01 DIGGING/EXCAVATION REQUIREMENTS: The Drawings where applicable show underground utilities and structures as presently shown on the best available record drawings of the site, and these may have some inaccuracies. The information is provided for general bidding purposes only. The contractor shall determine actual locations and quantities at the site by calling the Georgia Utilities Protection Center, at (800) 282-7411, prior to accomplishing any digging. .

A. Damage: The contractor is responsible for any damage to underground structures and utility lines identified on the drawings and any identified and marked in the field as a result of obtaining the utility location. If any underground utility is damaged, notify the utility and the Engineer immediately.

B. Cutting of Roads, Streets, and Paved Parking Areas:

1. Mark, barricade, and illuminate construction work on or near roads or streets which may present a traffic hazard in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). Closures of streets, parking lots, and other traffic areas will not be permitted unless approved by the Engineer, after written request 7 days before the scheduled closure.

2. Road cuts shall be backfilled immediately after completion of associated utility work. When the road is reopened, the cut shall be filled with temporary or permanent materials to a smooth condition, or metal plates or other approved methods shall be employed to prevent discomfort or damage to vehicular traffic. Road cuts shall be permanently closed within 5 working days unless approved otherwise by the Engineer. Provide advance signage warning motorists of the condition in accordance with the MUTCD. Please refer to the Construction / Detour Plan, in the bid /construction plans. Repair streets as shown on the drawings.

01040 – SITE REQUIREMENTS

3.02 STORAGE AREA: The contractor shall obtain permission for all storage on private property. Permission for materials stored on the Macon-Bibb County right of way must be obtained from the Engineer.

3.03 LOCATING AND IDENTIFYING UNDERGROUND LINES AND STRUCTURES: Through the UPC locate process. Utility information on the drawings is for bidding purposes only.

3.04 SITE MAINTENANCE, CLEAN UP, AND RESTORATION

A. Maintain the work site in a neat, orderly, and safe manner. Cut the grass regularly, in order to maintain the site to community standards.

B. Remove scrap, waste, and excess materials promptly. Provide signs, barricades, and lights as required to protect personnel. Maintain property owner access to properties within the work area.

C. Do not allow trash and debris to accumulate and become unsightly. Sweep up and collect in contractor-maintained disposal containers daily. Dispose of collected debris weekly as a minimum.

D. Store materials on site in a neat and orderly manner.

E. Restore the project site to its final condition as required by the contract as soon as possible.

F. Do not open trenches or excavations until material is on-hand or scheduled to arrive within three days. Close excavations or ditches as soon as the work has been placed, inspected, and accepted by the Engineer or his designated inspector.

Section 1040 Submittals

Para #	Description	Date Required	Inspector Checklist
1.01	Utility Outage Requests	14 days prior to outage	_____
3.01 B	Road/Parking Closure Request	7 days prior	_____

<<<<< END OF SECTION >>>>>

01300 - SUBMITTALS AND CONTRACTOR FURNISHED ITEMS

PART 1 – GENERAL – Oxford Road Culvert Replacement

1.01 GENERAL:

A. Basic: Provide items requiring drawings, diagrams, certifications, manufacturers' literature, data brochures, technical data, sample requests, forms, and other data as noted under each specification section.

B. Contractor Responsibility: Review, Corrections, or Comments made on the Submittals do not relieve the contractor from compliance with the requirements of the Drawings, Specifications, Addendums, and Contract Documents. By entering into this contract, the contractor agrees that the purpose of submittals is to demonstrate to the Engineer that the contractor understands the design concept and that he demonstrates his understanding by indicating which equipment and material he intends to furnish, install, and use. Review of shop drawing will be general only, for basic conformance with the design concept. The Government's review of such drawings, schedules, or cuts shall not relieve the contractor from the responsibility for correcting all errors of any sort contained in the submittals. The contractor is responsible for confirming and correlating all quantities and dimensions,as well as selecting proper fabrication processes, construction methods and installation techniques, and coordinating this work with that of all other trades; and performing all work in a safe, workmanlike and satisfactory manner.

1.02 OMITTED:

1.03 SUBMITTAL INSTRUCTIONS: Submittal requirements for each specification section are listed in those respective sections. The following apply to all sections.

A. Material Submittals:

1. Complete Submissions: All items requiring submittals prior to construction activities for each section should be provided at one time unless noted otherwise or logically required. In some instances the specifications may require certain items from one or more specifications sections to be submitted at one time.

2. Submittal Checklist: The contractor shall complete a copy of the checklist provided in the submittals paragraph of each specification section. This checklist shall be provided with each submittal. Submittal information shall be arranged in order to correspond with each checklist.

3. Time: The Contractor shall have approved submittals before ordering any equipment under this contract. If equipment is ordered prior to receiving approval, it will be solely at the Contractor's risk. Under no circumstances will material be installed prior to approval of submittals. There will be no time schedule for providing material submittals unless noted elsewhere in the specifications. The Contractor will be required to manage his materials/equipment lead times and obtain approval in sufficient time to complete the work on schedule. Disapproval of incomplete or unsatisfactory submittals shall not be grounds for contract extensions. Other submittals such as as-builts, test reports, etc., shall be provided as indicated. When the word "prior" is used, it shall generally mean prior to the delivery or installation of the product at the work site or prior to the time in question of the item addressed in the specification.

4. Exceptions: If any material proposed for use on this contract deviates from the specifications, the Contractor shall submit those proposed deviations for approval along with detailed

justification. All exceptions and deviations shall be described in detail with each product submittal. Cost will not be considered a justification for taking exceptions unless a credit is offered to the Government.

5. Substitutions: Products provided by manufacturers other than those specified as the "design basis" shall be considered substitutions.

a. All features of items submitted as substitutions are implied to be in full compliance with Specifications and Drawings if not specifically noted as "Exceptions."

b. Where a design basis is referenced in Specifications and Drawings, substitutions must meet or exceed the salient features of the design basis as determined by the Engineer. Exceptions to design basis characteristics must be clearly noted as "Exceptions." The contractor must demonstrate that the product substituted is clearly equal or superior to the specified product, or else the request for substitution will be denied.

c. Changes required to accommodate approved substitution shall be made at no additional cost to the Government.

B. Other Submittals: Other submittals such as samples, test results, spare parts, and etc. shall be provided as required by each specifications section. Provide 2 copies of each or an electronic copy unless directed otherwise.

1.04 RETURN AND DISAPPROVAL OF SUBMITTALS: The Engineer will return submittals to the Contractor within 14 days after receipt indicating approval or disapproval. Resubmittal of disapproved submittals shall be accomplished within 14 days after receipt of disapproval. Disapproval shall not be cause for time extension.

1.05 SUPERINTENDENT or MANAGER: When requested, provide name and qualifications for review. Provide the name and contact information of the person who will be the primary contact with the Government on this project until project completion and acceptance.

1.06 TURN-IN OF IDENTIFIED EQUIPMENT, SPARE PARTS, TOOLS, AND OTHER MATERIALS: Items indicated in the Submittals section of each specification and elsewhere, for turn-in to the Government shall be delivered as directed or in the absence of direction, before prefinal inspection. Obtain receipts from Government employees receiving the materials and deliver them to the Engineer before prefinal inspection.

1.07 AS-BUILT DRAWINGS: Not Required.

1.08 PROVIDE EQUIPMENT LIST: Omitted

1.09 FINAL INSPECTION ONLY: If the Engineer elects to have only a final inspection, turn in prefinal inspection submittals before the final inspection.

1.10 PRE-AWARD SUBMITTALS: Submit the following items before award, if directed.

A. Experience: Provide documentation on contractor experience relative to this project. After bid opening, the Government may examine contractor experience. The Contractor and/or named subcontractors shall have been

regularly engaged in the type work of this project for at least (2) years. Include for each subcontractor the name of the business and the individual responsible for this project.

B. References: Provide the names, addresses and telephone numbers of at least two customers for whom similar projects were performed in the last (two) years.

1.11 PROGRESS SCHEDULES AND REPORTS: Omitted

END OF SECTION

01560 – ENVIRONMENTAL REQUIREMENTS

PART 1 – GENERAL – Oxford Road Culvert Replacement

1.01 GENERAL:

A. General Scope: This Section provides the requirements necessary to ensure that all construction projects are in environmental compliance. Major environmental program areas which may be affected include natural resources, air quality, underground storage tanks, asbestos, lead-based paint, PCBs, cultural resources, water quality, solid and hazardous wastes, and pollution prevention.

B. Applicable Regulations and Publications: Comply with all applicable Federal, State of Georgia, any laws and regulations from other states where disposal might occur, and local Macon-Bibb County laws and regulations concerning environmental compliance and pollution prevention.

C. Ensure that all products produced or generated under contract shall meet all stated performance objectives and shall not violate in any manner the environmental requirements of any applicable local, state, or federal entity. Applicable environmental requirements shall include but are not limited to a substance's toxicity, biodegradability, and volatile organic/inorganic compound content.

D. Macon-Bibb County personnel will conduct no-notice inspections to ensure compliance with all environmental requirements.

E. Definitions:

1. Engineer-Macon-Bibb County Engineer or his or her designated representative.

2. Inspector-The individual from the Macon-Bibb County Engineering Department designated to perform daily inspection of the contractor’s work.

3. Dust - Minute solid particles caused to be suspended by natural forces or by mechanical processes such as, but not limited to, crushing, grinding, milling, drilling, demolishing, shoveling, conveying, covering, bagging, mixing, and sweeping.

4. Open Burning - Any outdoor fire from which the products of combustion are emitted directly into the open air without passing through a stack, chimney or duct.

5. Solid Waste - Defined in CFR 261.2. Examples include garbage, refuse, and other discarded solid material including non-hazardous wastes resulting from industrial, commercial, and agricultural operations.

6. GA EPD - Georgia Environmental Protection Division of the Department of Natural Resources.

1.02 OMITTED

1.03 SUBMITTALS:

A. General: Provide the submittals in accordance with instructions found in Section 01300, Submittals

and Contractor Furnished Items.

B. Material Submittals: Not required under this section.

1.04 NOTIFICATIONS:

A. Provide to the Engineer all data specified herein to ensure compliance with applicable environmental requirements.

1. Permits: Not Required

2. Other Submittals, Notifications, and Approvals: The following submittals, notifications, and approvals are required to maintain compliance:

a. Solid Waste Disposal: The Contractor shall provide a solid waste disposal plan stating how all materials leaving the site shall be disposed of.

(1) The plan shall certify that the Contractor shall dispose of all materials in compliance with all Federal, State of Georgia, and local laws. A senior official of the company shall sign this letter. The plan shall address the disposal of each item addressed in Sections 3.01 and 3.02 as applicable. Non-hazardous solid waste shall be broken down into individual types, i.e., asphalt, concrete, wood, brick, etc.

(2) The plan shall address each landfill to be used. A copy of all landfill permits shall be provided unless the Macon, Wolfe Creek (Twiggs-Wilkinson) or Houston County landfill is to be used. The plan shall designate the employee who shall be responsible for verifying that all materials removed from the site are disposed of in accordance with the above referenced laws. The employee shall be an employee of the contractor and shall have authority to act for the contractor. Provide two copies of the Disposal Plan to the Engineer prior to the Pre-construction Conference or 14 calendar days prior to the start of disposal operations if no pre-construction conference is held.

(3) Omitted.

(4) Keep on hand evidence of proper disposal of construction debris. Examples of evidence include dump tickets from a licensed sanitary landfill and copies of a current landfill permit from the State of Georgia (unless Macon, Wolfe Creek (Twiggs-Wilkinson) or Houston County landfill is used.), manifest, bill of sale, or other record for recycling.

(5) After contract work is completed and prior to final payment, the Contractor shall submit a letter of certification signed by a senior official of the company certifying that all materials removed from the site have been disposed of in accordance with all applicable Federal, State, and local laws. Attach a copy or duplicate of the disposal documents for each load transported to the Macon, Wolfe Creek (Twiggs-Wilkinson) or Houston County Landfill.

b. Hazardous Waste: Omitted.

PART 2 - PRODUCTS - OMITTED.

PART 3 - EXECUTION

3.01 DISPOSAL OF WASTE/EXCESS MATERIAL:

A. Omitted.

B. Non-hazardous Solid Waste or Excess Material, except topsoil and suitable fill material, shall be removed from the site daily unless permitted otherwise by the Engineer. Dispose of this material in a manner approved by the US Environmental Protection Agency and the Georgia Department of Natural Resources, Environmental Protection Division (EPD). Also, comply with applicable local codes and requirements. Equipment/material to be removed from the project but not turned in to the Government is the property of the contractor.

1. Disposal: Use one or more of the following methods to dispose of non-hazardous solid waste.

a. Sanitary Landfill: All solid waste may be disposed of in a sanitary landfill properly licensed by the State of Georgia. If a landfill other than the Macon, Wolfe Creek (Twiggs-Wilkinson) or Houston County sanitary landfill is used, provide a copy of the landfill license. Provide proof that any Georgia municipal solid waste disposal facility to which they propose to bring waste, except Macon, Wolfe Creek (Twiggs-Wilkinson) or Houston County is operated by someone who has obtained the certification required by the Georgia Solid Waste Management Act, O.C.G.A. 12-8-24.1.

b. Inert Waste Landfill: Materials not likely to cause production of leachate of environmental concern may be disposed of in an inert waste landfill. Only earth and earth-like products, concrete, cured asphaltic concrete, rock, bricks, yard trimmings, and land clearing debris such as stumps, limbs, and leaves are acceptable for disposal in an inert waste landfill. This definition excludes industrial and demolition waste not specifically listed above. Provide a copy of the written notice of commencement of operation by the landfill as given to the Georgia EPD. Include the weights of material disposed of in this type of landfill in the disposal and recycling report required in paragraph 3.01.c below.

c. Construction/Demolition Disposal Site: Only wood, metal, wallboard, paper, cardboard, as well as materials that can go in an inert waste landfill may be disposed of in this facility. Provide a copy of the landfill license.

d. Recycling: Recycling of materials is strongly encouraged. Materials destined for recycling must meet the definition of non-hazardous wastes under federal/state solid waste regulations. Materials defined as “recovered materials” by GA EPD regulations are excluded from regulation as solid wastes.

e. All materials to be disposed of in other than a sanitary landfill must be kept segregated at the project site from those materials, which are allowed only in a sanitary landfill.

3. Solid Waste Disposal Outside of Georgia: Dispose of no solid waste outside the state of Georgia without

prior written approval of the Engineer. If the contractor desires this, he shall provide sufficient information as determined by the Engineer to allow verification

3.02 SPECIAL WASTES OR HAZARDOUS MATERIALS: Not applicable.

3.03 PROTECTION OF LAND RESOURCES:

A. General: Do not take any action which shall adversely affect the existing Water Quality Standards classification of any streams, rivers, lakes or reservoirs within or adjacent to the project site or which would otherwise contribute to pollution of these water resources. No fuel, oils, bituminous, calcium chloride, acids, construction waste or otherwise harmful materials shall be permitted to enter these water resources. Preserve the land resources in their present condition or restore to a condition that appears natural and does not detract from the appearance of the surrounding area. If restoration is to be accomplished, the Contractor must submit his restoration plan and receive approval from Macon - Bibb County on his proposed procedures.

B. Omitted.

C. Omitted

D. Restoration of Landscape Damage:

1. Do not allow any trees, dirt or other debris to get into the storm drainage system.
2. Surface Drainage:

a. Surface drainage from cuts and fills within the construction limits, whether or not completed, and from borrow and waste disposal areas, shall, if turbidity producing materials are present, be held in suitable sedimentation ponds or shall be graded to control erosion. Temporary erosion and sediment control measures such as berms, dikes, drains, or sedimentation basins, if required to meet the above standards, shall be provided and maintained until permanent drainage and erosion control facilities are completed and operating. The area of bare soil exposed by construction operations at any time shall be held to a minimum. Stream crossings by fording with equipment shall be limited to control turbidity. Fills and waste areas shall be constructed by select placement to eliminate pollution to adjacent streams.

b. Stabilization of permanent steep slopes shall be accomplished as soon as possible, using a 2-step procedure, if necessary, to establish vegetation. Apply mulch immediately after finished grading is completed, regardless of season, and delay permanent seeding and fertilizing, if necessary, until the season most favorable for germination.

E. Spills: Prevent the spill of chemicals, fuels, oils, grease, bituminous materials, waste washings, herbicides, cement drainage or any other hazardous materials. Immediately report all spills to the Macon-Bibb County Fire Department, emergency number 911, giving name, and telephone number, location of spill, and type and amount of material spilled. Notify the Engineer of the spill immediately following initial reporting to the Fire Department. Take containment action against any hazardous spills, which threaten storm drains and other environmental areas. Ensure clean up of materials spilled as a result of contractor action, or lack thereof. The contractor is

responsible for the clean up of material(s) spilled. No spill residue shall be transported off site without specific approval from the Engineer. The contractor shall provide support, as appropriate, for containment and clean up of spills. If the spill exceeds reportable quantity limits, coordinate notification to the National Response Center with the local office of the Environmental Protection Division (EPD), through the Engineer.

3.04 AIR QUALITY:

A. Open burning operations must be approved by the Macon-Bibb County Fire Department and the Georgia Forestry Commission. Note that a burn ban is in effect from 1 May to 30 September of each year.

3.05 DUST CONTROL: Maintain all excavations, embankments, stockpiles, haul roads, permanent access roads, plant sites, waste areas, borrow areas, and all other work within or without the project boundaries free from dust which could cause a hazard or nuisance to others. Approved temporary methods of stabilization consisting of sprinkling, chemical treatment, light bituminous treatment or similar methods are permitted to control dust. To be approved, sprinkling must be repeated at such intervals as to keep all parts of the disturbed area damp at all times. If sprinkling is used, keep sufficient equipment on the job site at all times. Perform dust control as the work proceeds and whenever a dust nuisance or hazard occurs.

3.06 USING HAZARDOUS MATERIALS IN PERFORMING THE WORK:

A. Written Notification: Comply with all applicable federal, state, and local requirements concerning use of hazardous materials. Provide written notification to the Engineer when hazardous materials/chemicals are to be used or demolished. This must include the following information:

1. A list of each work activity/process required to use/demolish hazardous materials/chemicals.
2. A list of hazardous materials/chemicals used.
3. A Material Safety Data Sheet (MSDS) for each hazardous material/chemical used.
4. Written procedures for disposing of hazardous waste generated.
5. Omitted.
6. For additional hazardous material brought on site during the performance of the contract, the contractor shall provide an updated list and MSDS to the Engineer.

3.07 Omitted

3.08 Omitted

3.09 THREATENED AND ENDANGERED SPECIES:

A. The construction project is not anticipated to have any impact in this area since most plant and

animal species of concern exist in wetlands. Any project activities believed to interface with threatened and endangered species shall be coordinated through the Engineer.

3.10 WETLANDS: Comply with water and land protection paragraphs of this Section to prevent construction site sediments and runoff from entering wetlands.

3.11 UNDERGROUND STORAGE TANKS (UST's): Not applicable

Section 1560 Submittals

Para #	Description	Date Required	Inspector Check Mark
1.04 A.2.a	Solid Waste Disposal Plan	14 days prior to material disposal	_____
1.04 A.2.a	Landfill receipts	within 1 day of dumping	_____
1.04 A.2.d	Disposal Certification Letter	prior to final payment	_____
3.01 B.2.c	Landfill License	prior to dumping	_____
3.06	Use of Hazardous Chemicals	Prior to Work	_____

---- END OF NARRATIVE SECTION ----

01580 - SAFETY REQUIREMENTS

PART 1 – GENERAL – Oxford Road Culvert Replacement

1.01 CONTRACTOR OPERATIONS: This section establishes requirements to ensure the safety of Government and other personnel not directly or indirectly under the employment of the Contractor. Comply with standards maintained by Occupational Safety and Health Administration (OSHA), identified sections of Corps of Engineers Safety Manual (EM 385-1-1), and National Fire Protection Association (NFPA).

A. CONTRACTOR EMPLOYEES: Compliance with OSHA and other applicable laws and regulations for the protection of Contractor employees is the obligation of the Contractor. This contract is not intended in any way to require persons to work in surroundings or under working conditions that are unsafe or dangerous to their health.

B. Coordinate and perform work so as not to impact the safety of Government or non-Contractor personnel, or cause damage to government or private property. This requires providing appropriate safety devices to be utilized in and around the work areas to perform the job safely and protect others from hazards generated by the work.

1.02 SUBMITTALS:

A. General: Provide the following submittals in accordance with instructions found in Section 01300, Submittals and Contractor Furnished Items.

B. Material Submittals: None required under this section.

C. Other Submittals: Provide the following submittals as required by the contract or as directed by the Contracting Officer.

***** *Use below as applicable, based upon choices for paragraphs 3.02 and 3.07.* *****

Para #	Description	Date Required	Inspector Checklist
3.01.C.	Fire Reporting	If Fire	_____
3.07	Hazard Communication	Before Work	_____
3.9	Injury/Mishap Reports	By 1 hour after	_____

1.03 OSHA INSPECTIONS: Department of Labor (DOL) OSHA inspectors may arrive at Contractor work sites without formal notification in the event of an employee complaint or a no-notice inspection. The DOL has the right to stop or delay work and/or issue costly fines due to noncompliance with safety requirements. Any costs borne by such actions are the sole responsibility of the Contractor.

PART 2- PRODUCTS: Omitted

PART 3- EXECUTION

3.01 FIRE REPORTING: Report all fires as soon as discovered. The fire reporting number is 911. The caller should give his or her name and location of what is on fire. Also, give any other information that

may be requested by the Fire Department dispatcher. Stay on the telephone until the dispatcher has obtained all necessary information.

3.02 OPERATIONS INVOLVING WELDING, CUTTING, BRAZING, AND OPEN FLAME are carefully controlled on the project site due to several fires caused by such operations.

A. Start no such work until the Engineer has been notified, the site has been inspected, and the operation approved by the authorized Fire Inspector. Do not contact the Fire Department directly.

B. Observe caution and provide welding, cutting, brazing, and open flame equipment in accordance with NFPA 51B and OSHA 1926.350 through 1926.354.

C. Perform a fire watch to inspect the work area and adjacent areas for the evidence of fire for at least one-half hour after completion of the welding, cutting, brazing, or open flame.

3.03 FIRE HYDRANTS/HOSES

A. Fire hydrants shall not be used without prior approval of the Macon Water Authority. If permission is granted for use of a fire hydrant, the Contractor must furnish a gate valve to fit the 2 1/2" outlet and a proper hydrant wrench. Each time a hydrant is to be opened or used, it must be opened slowly to prevent a water surge, and it must be opened to the full "open" position. When closing the hydrant, close it slowly to prevent a water surge.

B. The Fire Department will not loan equipment; e.g., fire hoses, nozzles, or hydrant wrenches.

C. No vehicles or equipment shall be parked or stored within 15 feet of a fire hydrant.

3.04 DEBRIS

A. The accumulation of all debris shall be kept to a minimum during construction.

B. Piles of debris awaiting removal outside any facility shall not be placed in fire lanes or within 25 feet of the facility.

C. Walkways, roadways and sidewalks shall be kept clear of building material, equipment, or other obstructions caused by the Contractor operation. Protective barriers and warning signs shall be installed.

3.05 FLAMMABLE AND COMBUSTIBLE LIQUIDS

A. All flammable liquids shall be stored in suitable metal containers only.

B. Store other flammable materials properly.

C. Gasoline or any other low flash point flammable liquid shall not be used for cleaning purposes or to start fires.

D. Static bonding wires shall be properly attached before combustible or flammable liquid is transferred from one vessel to another. This includes vehicles, portable gasoline driven equipment, etc.

E. Smoking or the use of spark or flame producing equipment in areas where flammable liquids are being used or stored is strictly prohibited.

3.06 FIRE EXTINGUISHERS: The Contractor is responsible for providing an adequate number of fire extinguishers. Extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.

3.07 HAZARD COMMUNICATION: In any contract where hazardous materials are involved, the Contractor must comply with 29CFR 1910.1200, Hazard Communication. Contractors must provide the Engineer the Material Safety Data Sheets (MSDSs) for each chemical used at least 5 working days prior to start date. This includes, but is not limited to, all solvents, paints, adhesives, sealants, coatings, primers, mastics, etc. MSDSs must be the most current available.

3.8 CONFINED SPACE ENTRY: In recent years, there have been increased injuries and mishaps in confined spaces. The Contractor assumes full responsibility for performing all work in and around a confined space in a safe manner and IAW CFR 1910.146. Protect Macon-Bibb County personnel and the public by supplying barricades, warning signs, and traffic control measures as necessary.

3.9 INJURIES/MISHAP REPORTING: The Contractor shall report mishaps or incidents exceeding $1,000 (material + labor) and all injuries requiring medical treatment to any personnel, including Contractor employees, within one (1) hour by phone to the Engineer during normal day shift hours. This report shall contain all available facts. Mishaps/Incidents occurring at other times of the day shall be reported as soon as possible the next normal workday.

3.10 MOTOR VEHICLES: No vehicle shall be stopped, parked, or left standing on any road or adjacent thereto or in any area in such a manner as to endanger the vehicle, other vehicles, equipment, or personnel using or passing that road or area. Roads shall be swept if spillage occurs during hauling. For chemical spills, see the Environmental Requirements section of the specifications. Ensure safe operating condition of all Contractor-owned vehicles. Unsafe and unserviceable vehicles shall be removed from service immediately. Ensure that all Subcontractors comply with these requirements.

3.11 EXCAVATIONS: In all excavations where any personnel may be exposed to danger from moving ground, protection shall be provided by means of a shoring system, sloping of the ground, or some other equivalent means. All trenches over five feet deep in either hard and compact or soft and unstable soil shall be sloped, shored, sheeted braced or otherwise supported. Trenches less than five feet in depth shall also be effectively protected when hazardous ground movement may be expected. Additional information/requirements may be found in 29 CFR 1926 and EM 385-1-1.

3.12 PROTECTIVE BARRIERS/WARNING SIGNS: When it is necessary to barricade an area for excavation, open manholes, overhead work, or the protection of personnel from hazardous operations, moving equipment or cranes, barricades are to be provided by the Contractor. Barricades must be erected before the work begins. If the barricades are in a roadway or walkway, blinking lights must be used during the hours of darkness. Barricades and associated equipment shall be kept neat and orderly at

all times. When the work is complete and accepted, the barricades must be removed immediately from the job site.

3.13 PROTECTIVE EQUIPMENT: The Contractor is responsible for the use of appropriate personal protective equipment by his and subcontractor employees and guests. The Government recommends voluntary use of the standards in EM 385-1-1.

3.14 TOOLS AND EQUIPMENT

A. LADDERS/SCAFFOLDS: Use standard ladders that are structurally rigid, sound, equipped with approved safety shoes, and free of cracks. Metal ladders shall not be used near or for electric service. All ladders shall be tied off at the top and bottom as necessary. Special purpose job ladders may be constructed if they are properly designed and built IAW 29 CFR 1926. Scaffolds and platforms shall have handrails and toe boards. Additional information/requirements may be found in EM 385-1-1.

B. HAND TOOLS/ELECTRICAL TOOLS, PNEUMATIC TOOLS/COMPRESSED AIR: The Contractor is responsible for ensuring that all hand tools used by his or subcontractor personnel are used IAW applicable safety standards, especially 29 CFR 1910 and 1926.

C. ELECTRICAL WIRING AND EQUIPMENT: All electrical wiring and equipment shall be a type listed by UL or another recognized listing agent. All temporary electrical wiring shall be adequately installed and placed to avoid physical damage from other operations and comply with 29 CFR 1926.405. Temporary wiring shall be removed immediately upon completion of construction or the purpose for which the wiring was installed. All extension cords shall be of the three-wire type and kept in a good state of repair. Splices shall be avoided, but if they are made, they must comply with 29 CFR 1926.405. All portable electrical appliances and equipment shall be unplugged at the end of each workday.

<<<<< END OF SECTION >>>>>

4801 Oxford Road Drainage Project

Project Scope – Proposed Drainage System Replacement – Existing Pipe Route (Plan 2)

(1) Remove the damaged upstream brick headwall, wing walls and concrete splash pad, west side of the 4801 lot. Use these removed structures for upstream ditch rip-rap, after breaking them up into smaller pieces. Build a new concrete block headwall and wing walls, with a 6" concrete splash pad, with fiber mesh. Install a rip-rap 15' by 15' pad, 12" thick, just upstream from the concrete splash pad. It is intended to keep all of this work on the 4801 lot, and to not disturb the 4815 lot.

(2) Remove 172' of the existing damaged 3' by 5' double CMP's, in the 4801 lot front yard, out to the north side of the road. This work will require removal of some trees and bushes. Install 172' of 60" ADS N-12 HDPE storm pipe, in the same ditch, downstream, across the front yard of the 4801 lot, to the new 12' by 6' by 8' deep manhole, north side of the road. Remove and replace the damaged section of the concrete driveway pavement (use 6" of concrete, with fiber mesh), about 15' by 20', from pavement joint to pavement joint, after properly bedding the 60" HDPE in #57 stone, completely enclosing the new pipe, in the driveway area. This total rock enclosure around the pipe shall be done in the driveway areas of both the 4801 and 4790 addresses. The rest of the pipe bedding for the 60" HDPE work shall be, at minimum, up to "3:00" and "9:00", on the pipe. Concrete pipe laid across the street shall, at minimum, have a 6" bed of #57 stone.

(3) Remove the existing curb inlet dropping into the existing 3' by 5' CMP line, north side of the road. Install the new 12' by 6' by 8' deep manhole, with steel manhole ring and cover, and rubber coated steel steps. Install the ring and cover steps at the side wall of the manhole, so that we may, in the future, enter the manhole without a ladder. Install the ring and cover at a box side wall, away from the upstream and downstream pipes. The manhole should be installed completely within our 55' wide road right of way, although a permanent 20' wide drainage easement shall be acquired, along the 60" pipe route, on both the 4801 and 4790 lots.

(4) Remove the two 3' by 5' CMP's across the road. Replace these pipes with two 42" RCP lines, new manhole to new manhole. Remove and replace about 60' (30' on each side of the road) of concrete curb and gutter. Remove and replace asphalt and base rock area, about 30' by 40' angled across the road.

(5) Install the new manhole on the south side of the road, 20' by 8' by 8' deep, with a 24" manhole ring and cover and rubber coated steel steps. Install the manhole and steps at a side wall, for "no ladder" entry. Extend (using either thick wall PVC or double wall ADS N-12 HDPE) the existing 12" CMP from the yard inlet between the 4704 and 4790 address driveways, to tie into the new manhole, south side of the road. The pipe extension should be about 10'-12' long. A concrete connection collar is OK here.

(6) Install 72' of 60" HDPE, from the south side of the road manhole, downstream to the area of the current damaged brick headwall, wing walls and undermined concrete splash pad. Remove these damaged structures and re-use for downstream ditch rip-rap. Install a new cement brick

headwall and wing walls, with a 6” concrete splash pad, with fiber mesh. Install a 15’ by 15’ rip-rap pad area, just beyond the new concrete splash pad.

(7) On the north side of the road, on the west side turnout into the unopened roadway (Hathaway Drive), remove the existing curb inlet and approximately 32’ of existing, deteriorated 18” CMP, to the curb inlet on the east side of Hathaway Drive. Install 32’ of new concrete curb and gutter, between the removed curb inlet, item number 6 above, east (downstream) to the curb inlet on the east side of Hathaway Drive. Ensure flow to the new double inlet. Remove the approximately 20 of radius curb and gutter, both sides of the Hathaway Drive turnout, with the 10’ by 25’ area of asphalt and base rock. Install soil and grassing in the removed pavement area, behind the new curb and gutter.

(8) The existing curb inlet on the east side of Hathaway Drive, north side of Oxford Road, shall be removed and rebuilt, as a double curb inlet. Then, remove the 30’ of existing deteriorated 18” CMP, from the new double inlet, north side of the road, to the existing curb inlet on the south side of the road. Install 30’ of 18” RCP, to the south side of the road inlet. Rebuild the existing south side curb inlet, to allow 18” RCP in, and a 24” ADS N-12 HDPE out. Remove and replace the asphalt and base rock area across the road, approximately 20’ by 26’. Install 52’ of 24” ADS N-12 HDPE, from the new inlet on the south side of Oxford Road, to the new concrete block headwall, wing walls and 6” concrete (with fiber mesh) splash pad, east side of the 4790 lot.

(9) Grassed areas will have to be removed and replaced, on the 4801 and 4790 lots, as well as grassing to be installed in the removed pavement in the Hathaway Drive turnout area. Also, some grass and straw work will be needed at the two ends of the 60” HDPE pipe system, around the headwalls and rip-rap.

4801 Oxford Road Drainage Project

Project Scope – Proposed Drainage System Reroute (Plan 1)

(1) Remove the current upstream brick headwall, west side of the 4801 lot, at the drainage ditch. Seal off the ends of both of the existing 3’ by 5’ CMP’s. The demolished headwall, wing walls and the concrete splash pad, once broken into smaller pieces, may be used for ditch rip-rap.

(2) Remove and replace the collapsing concrete driveway section, joint to joint, about 12’ by 20’, over the existing double 3’ by 5’ CMP’s, 4801 address. Use 6” concrete for the replacement slab, with fiber mesh. Remove about 20’ of the two 3’ by 5’ CMP’s, under this driveway area. Seal off the remaining pipe ends. Properly compact the backfill soil, prior to replacing the concrete driveway section.

(3) Install approximately 120’ of grassed drainage ditch, from the area of the existing upstream headwall, to about the north right of way line for Oxford Road. The ditch is to be about 6’ deep by 14’ wide, and 12” thick in the 15’ by 15’ rip-rap pad, southwest corner of the 4801 lot, leading to the headwall splash pad. All of the upstream ditch work shall be on the 4801 lot. Do not install any of this ditch work on the 4815 lot.

(4) Build the new concrete brick headwall and headwalls, and concrete splash pad (6” thick, with fiber mesh), just inside the road right of way line, southwest corner of the 4801 lot. Excavation for the new headwall will expose a portion of the existing 8” clay sanitary main line. Per Algernon Wallace at the MWA, it is possible that the MWA may just remove the “flush tank” sanitary sewer manhole on the north side of Oxford Road, at the southeast corner of the 4815 lot. They would then build a new manhole on the west side of the west driveway at the 4801 address. That will take the sanitary main completely away from our upstream headwall and 60” pipe, in that area. Otherwise, coordinate with the Macon Water Authority to remove and replace about 20’ of the existing 8” clay sanitary main line, in the area of the new headwall, should the MWA not relocate their manhole. The exposed sanitary pipe section replacement shall be cast steel, per MWA requirements, and looks to be about 2.5’ to 3’ above the new splash pad surface.

(5) Remove and replace two 20’ runs of concrete curb and gutter, to install the new 60” RCP across the street, along with an asphalt and base rock area about 20’ wide by 35’ long. Install 50’ of 60” RCP, from the upstream headwall to the new 8’ by 8’ by 8’ deep manhole, south side of the road, within the road right of way, in front of the 4704 Guerry Drive (corner lot) address.

(6) Build the new 8’ by 8’ by 8’ deep concrete block wall/concrete floor (8” thick on all manhole concrete floors, with fiber mesh) manhole, south side of the road. Include a

24” standard manhole ring and cover, with rubber coated steel steps, aligned at the side wall of the manhole, for a “no ladder needed” access.

(7) Install 168’ of 60” ADS N-12 HDPE storm pipe, along the south side of the road, parallel to the road and within the road right of way. This pipe will run from the manhole in item 6 above, east to a second similar new manhole, northeast corner of the 4790 lot. Note that our proposed 60” HDPE pipe route, on the south side of Oxford Road, will cross three driveways, at the 4704 (Guerry Drive address, on a corner lot) and 4790 addresses, two of them on the 4790 lot. At each driveway crossing, replace the driveway concrete with 6” thick concrete, with fiber mesh. Pipe backfill rock shall totally enclose the pipe, to 5’ beyond each driveway edge, all driveways. All HDPE pipe runs, at a minimum, shall include #57 bedding stone under the pipe, minimum 6” thick, up to “3:00 and 9:00” on the pipe. Also, at each driveway slab, on the south side of Oxford Road (three driveway repairs, total), make sure that the new 6”driveway concrete slab overlaps the sides of the pipe trench by at least 12”. The 168’ of 60” HDPE pipe excavation will probably require replacement of the 2’ wide rollover curb and gutter along the pipe route, as the 60” pipe will be right at the back of curb. We need to protect the edge of the asphalt and base rock pavement.

(8) Install the 8’ by 8’ by 8’ deep concrete block manhole, with 24” standard manhole ring and cover, northeast corner of the 4790 lot. Include rubber coated steel steps, with the steps and manhole access aligned at the manhole side wall, for a no ladder access.

(9) There is an existing shallow grate inlet with a 12” CMP, in the northwest corner of the 4790 lot, between the two driveways. Extend the existing 12” CMP approximately 10’, to tie into the new 60” ADS N-12 HDPE main storm pipe. A secure concrete collar connection is ok here.

(10) Install 53’ of 60” ADS N-12 HDPE, from the manhole in item 8 above, downstream to the new downstream concrete block headwall and wing walls, with a 6” concrete splash pad, with fiber mesh, northwest corner of the 4784 lot. The design intent is to make sure that the new 60” HDPE line will extend the headwall to the northwest corner of the 4784 lot, and that none of the new ditch will be on the 4790 lot. Remove the existing 24” CMP, about 52’ long from the existing curb inlet, south side of the road, to the existing downstream brick headwall. Note that our 60” HDPE pipe installation, and the new manhole at the northeast corner of the 4790 lot, will require that the existing 6” water main be deflected under the 60” HDPE pipe.

(11) Remove the existing downstream brick headwall and wing walls. Remove both 3’ by 5’ CMP’s, from the old brick downstream headwall upstream, to the north edge of Oxford Road. The demolished downstream brick headwall and wing walls, and the old concrete splash pad, may be used for ditch rip-rap, once this material has been broken into smaller pieces.

(12) Install the downstream 12” thick rip-rap pad, 15’ wide by 15’ long, extending from the new downstream headwall downstream. The rip-rap pad and short run of grassed ditch will lie upon the northwest corner of the 4784 lot. Grass to repair all disturbed areas.

(13) Remove the curb inlet over the existing 3’ by 5’ CMP, north side of the road, by the 4801 lot east driveway. Remove approximately 70’ of the two existing 3’ by 5’ CMP’s, crossing the road. Remove the two pipes, on the south side of the road, to the downstream pipe ends and the old brick headwall, to allow room to install the new 60” HDPE pipe. Seal the two existing 3’ by 5’ CMP ends, north side of the road.

(14) Remove and replace about 60’ of concrete curb and gutter (about 30’ on each side of the road) and asphalt and base rock (30’ by 40’), after removing the 3’ by 5’ CMP sections in the roadway, and sealing the pipe ends on the north side of the road.

(15) Remove the existing curb inlet, west side of the unopened roadway turnout, north side of the road, at the southeast corner of the 4801 lot. Remove approximately 35’ of the existing 18” CMP, from this curb inlet east to the second curb inlet, east side of the roadway turnout (formerly Hathaway Drive). Remove approximately 20’ (two 10’ long radius runs) of the turnout concrete curb and gutter, and the 10’ by 25’ area of pavement. Install 35’ of road edge curb and gutter, between the two curb inlets, to ensure flow to the rebuilt inlet. The area of the removed pavement will get soil and grassing.

(16) Rebuild the existing curb inlet, on the east side of the roadway turnout, item 15 above, to create a double inlet. From that rebuilt double inlet, install 26’ of 24” RCP, double curb inlet to the new 8’ by 8’ by 8’ deep manhole, south side of the road. Remove the existing 24” CMP running across the road. Remove and replace about 20’ of curb and gutter, south side of the road, after installing the new 24” RCP, along with asphalt and base rock, in an area about 30’ wide by 25’, across Oxford Road.

(17) Rebuild the existing curb inlet, south side of the road, northeast corner of the 4790 lot. Install about 8’ of 18” ADS N-12 HDPE pipe, rebuilt curb inlet to the new 8’ by 8’ by 8’ deep manhole, northeast corner of the 4790 lot.

(18) Grassed areas will have to be removed and replaced in various project areas. The main area will be on the south side of the road, from large manhole to large manhole, about 15’ by 210’. The intent is to position the new 60” HDPE pipe run to save as many trees as possible. We will also need to grass the 10’ by 25’ area, on the north side of the road, where the unopened roadway (Hathaway Drive) turnout pavement will be removed, at the southeast corner of the 4801 lot. The rip-rap and headwall areas to be installed will require grass and straw, in the disturbed areas.

Section 163—Miscellaneous Erosion Control Items

163.1 General Description

This work includes constructing and removing:

- Silt control gates
- Temporary erosion control slope drains shown on the Plans or as directed
- Baled straw erosion checks
- Other temporary erosion control structures shown on the Plans or directed by the Engineer

This work also includes applying temporary mulch and temporary grass.

163.1.01 Definitions

Retrofit Device—A temporary sediment filter placed in front of an existing or proposed detention pond being used as a temporary sediment basin during the construction of the Project

163.1.02 Related References

A. Standard Specifications

Section 171—Temporary Silt Fence

Section 603—Rip Rap

Section 700—Grassing

Section 890—Seed and Sod

B. Referenced Documents

AASHTO M252

AASHTO M294

163.1.03 Submittals

Note: All references to “Engineer”, in this specification and all other Lee Road specifications, imply the Macon Bibb County Engineer.

163.2 Materials

Provide materials shown on the Plans, such as pipe, spillways, wood baffles, and other accessories including an anti-seep collar, when necessary. The materials shall remain the Contractor’s property after removal, unless otherwise shown on the Plans.

Materials may be new or used; however, the Engineer shall approve previously used materials before use.

Materials shall meet the requirements of the following Specifications:

Material	Section
Temporary Silt Fence	171
Concrete Aprons and Footings shall be Class A	163.3 (Below)
Rip Rap	603
Temporary Grass	700
Lumber and Timber	860.2.01

Additional requirements:

- Use 40d nails.
- Use rectangular, standard size baled straw in mechanically produced bales.

163.3 Concrete Requirements

Concrete for flumes and footings shall be Class A, 3,000 PSI strength at 28 days.

163.4 Construction

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A. Baled Straw Erosion Checks

Construct baled straw erosion checks according to the Plan details. Substitute temporary silt fence Type B as specified in Section 171 for baled straw erosion checks at the Engineer's direction or the Contractor's option.

B. Other Temporary Structures

When special conditions occur during the design stage, the Plans may show other temporary structures for erosion control with required materials and construction methods.

C. Temporary Grass - Omitted

D. Temporary Ditch Checks

Temporary ditch checks shall be constructed and placed according to Plan details. Temporary ditch checks may be constructed of stone plain rip rap according to Section 603 or of sand bags as in Section 603 without Portland cement.

Place plastic filter fabric on ditch section before placing rip rap.

Temporary ditch checks shall be cleaned of sediment when 1/2 the height of the temporary ditch check has been reached. They remain in place until the permanent ditch protection is in place or being installed and the removal is approved by the Engineer.

These ditch checks may remain in place to aid in establishing permanent grass in vegetated waterways, if approved by the Engineer..

Section 171—Silt Fence

171.1 General Description

This work includes furnishing, installing, and removing a water permeable filter fabric fence to remove suspended particles from drainage water.

171.1.01 Definitions - Omitted

171.1.02 Related References

A. Standard Specifications

Section 163—Miscellaneous Erosion Control Items

Section 700—Grassing

Section 862—Wood Posts and Bracing

Section 881—Fabrics

Section 894—Fencing

B. Referenced Documents

ASTM D 3786

ASTM D 4355

ASTM D 4632

ASTM D 4751

GDT 87

QPL 36

171.1.03 Submittals - Omitted

171.2 Materials

Materials shall meet the requirements of the following Specifications:

Material	Section
Filter Fabrics	881
Fencing	894
Wood Posts and Bracing	862

Conditions during Project construction will affect the quantity of the silt fence to be installed.

The Macon -Bibb County Engineer may increase, decrease, or eliminate the quantity at his or her direction. Variations in quantity are not changes in details of construction or in the character of the work. Please note that all references to the "Engineer" imply the Macon -Bibb County Engineer.

For Type A, B, and C fences, use fabric as specified in Subsection 881.2.07, "Silt Fence Filter Fabric."

171.2.01 Delivery, Storage, and Handling

During shipment and storage, wrap the fabric in a heavy-duty covering that will protect the cloth from sunlight, mud, dust, dirt, and debris. Do not expose the fabric to temperatures greater than 140 °F (60 °C).

When installed, the Engineer will reject the fabric if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.

171.3 Construction Requirements

171.3.01 Personnel – Omitted

171.3.02 Equipment - Omitted

171.3.03 Preparation - Omitted

171.3.04 Fabrication - Omitted

171.3.05 Construction

Install the silt fence according to this Specification, as shown on the Plans, or as directed by the Engineer.

A. Install Silt Fence

1. Install silt fence by either of the following methods:
   a. Excavated Trench Method

      Excavate a trench 4 to 6 in (100 to 150 mm) deep using equipment such as a trenching machine or motor grader. If equipment cannot be operated on the site, excavate the trench by hand.

   b. Soil Slicing Method

      Create a mechanical slice in the soil 8 to 12 in (200 to 300 mm) deep to receive the silt fence. Ensure that the width of the slice is not more than 3 in (75 mm). Mechanically insert the silt fence fabric into the slice in a simultaneous operation with the slicing that ensures consistent depth and placement.
2. Install the first post at the center of the low point (if applicable). Space the remaining posts a maximum of 6 ft (1.8 m) apart for Types A and B fence and 4 ft (1.2 m) apart for Type C fence.
3. Bury the posts at least 18 in (450 mm) into the ground. If this depth cannot be attained, secure the posts enough to prevent the fence from overturning from sediment loading.
4. Attach the filter fabric to the post using wire, cord, staples, nails, pockets, or other acceptable means.
   a. **Staples and Nails (Wood Posts):** Evenly space staples or nails with at least five per post for Type A fence and four per post for Type B fence.
   b. **Pockets:** If using pockets and they are not closed at the top, attach the fabric to a wood post using at least one additional staple or nail, or to a steel post using wire.

      Ensure that the additional attachment is within the top 6 in (150 mm) of the fabric.
   c. Install the filter fabric so that 6 to 8 in (150 to 200 mm) of fabric is left at the bottom to be buried. Provide a minimum overlap of 18 in (450 mm) at all splice joints.
   d. For Type C fences, attach the filter fabric to the top of a woven wire support fence at the midpoint between posts.
5. Install the fabric in the trench so that 4 to 6 in (100 to 150 mm) of fabric is against the side of the trench with 2 to 4 in (50 to 100 mm) of fabric across the bottom in the upstream direction.

6. Backfill and compact the trench to ensure that flow cannot pass under the barrier. When the slice method is used, compact the soil disturbed by the slice on the upstream side of the silt fence first, and then compact the downstream side.

B. Remove the Silt Fence

1. Keep the silt fence in place unless the Engineer directs. A removed silt fence may be used at other locations if the Engineer approves of its condition.
2. After removing the silt fence, return the area to a pleasing appearance. Seed and mulch the area according to Section 700.

171.3.06 Quality Acceptance

Approved silt fence is listed in QPL 36. Approved fabrics must consistently exceed the minimum requirements of this Specification as verified by the Engineer. The Engineer will disallow fabric that fails to meet the minimum requirements of this specification from the QPL until the products' acceptability has been reestablished to the Engineer's satisfaction.

At the time of installation, the Engineer will reject the fabric if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.

171.3.07 Contractor Warranty and Maintenance

Maintain the silt fence until the Project is accepted or until the fence is removed. Also, remove and dispose of the silt accumulations at the silt fence.

Remove and replace any deteriorated filter fabric that reduces the effectiveness of the silt fence.

Repair or replace any undermined silt fence at no additional cost to Macon – Bibb County.

Section 205—Roadway Excavation

205.1 General Description

Roadway excavation shall conform to the lines, grades, and cross-sections shown on the Plans or established by the Macon Bibb County Engineer. Note: All references in this specification, and all other Oxford Road project specifications, imply the Macon - Bibb County Engineer.

If artifacts of historical or archaeological significance are encountered, temporarily stop excavation operations until directed by the Engineer.

Roadway excavation includes the following:

- Excavating, hauling, and placing or disposing of materials (not removed under another Contract Item) from within the limits of areas designated in the Contract.
- Excavating ditches (except channel excavation) and filling and/or plugging abandoned wells (both dug and drilled) located within the Right-of-Way and construction easements according to Georgia Standard 9031H.
- Removing paving aggregates and ballast not incorporated into the new work as a result of alignment shifts, grade changes, or reasons that may or may not be shown on the Plans.
- Salvaging aggregates, paving, (only if designated on the Plans) and removed railroad ballast.
- Macon Bibb County claims salvaged materials unless the Engineer directs that materials be wasted. Dispose of materials not salvaged. Stockpile salvaged materials on the Project unless other sites for stockpiling are shown on the Plans.

205.1.01 Definitions - Omitted

205.1.02 Related References

A. Related Specifications

Section 209—Subgrade Construction

B. Related Documents - Omitted

205.1.03 Submittals - Omitted

205.2 Materials

Define excavated material, regardless of its nature or composition, as “unclassified excavation” unless otherwise specified in the Plans.

The Engineer will designate materials that are unsuitable.

205.2.01 Delivery, Storage, and Handling

A. Disposal of Surplus Material

Unless directed by the Engineer, do not waste excavated material until satisfying embankment and backfill requirements, unless material is designated on the Plans as “Unsuitable for embankment or backfill construction.”

Dispose of wasted materials offsite in an approved disposal facility.

B. Waste Disposal Areas

When unable to dispose of unsuitable or surplus excavation material on the Right-of-Way, dispose of it in the following areas:

1. Disposal Areas Shown on Plans - Omitted
2. Disposal Areas Not Shown on Plans

   When waste disposal areas are not shown on the Plans, obtain suitable disposal areas at no expense to Macon - Bibb County.

   Obtain approval from the private property owner to dispose of the surplus material in these cases 107.22 and

205.3 Construction Requirements

205.3.01 Personnel - Omitted

205.3.02 Equipment – Omitted

205.3.03 Preparation - Omitted

205.3.04 Fabrication - Omitted

205.3.05 Construction

Perform roadway excavation according to the Plans, and all of the requirements of this Subsection.

1. Provide adequate openings in spoil banks to allow the adjacent land surface to drain.
2. To carry water from the side hill, cut surface ditches at the top of cut slopes that extend to each end of the cuts.
3. Turn side ditches or gutters that empty from cuts to embankments outward to avoid embankment erosion.
4. Discharge water from surface ditches at terraces or in tail ditches cut along contour lines (wherever possible).
5. Provide outlets or flumes for roadway ditches where necessary according to the Plans.

   Surface ditches, outlets, and other such ditches will be paid for as “unclassified excavation.”
6. Uniformly round the intersection of cut slopes with natural ground surfaces, including the beginning and end of cut slopes.
7. Bring cut slopes to the grade and cross-section shown on the Plans or established by the Engineer.
8. Finish to reasonably uniform surfaces acceptable for seeding and mulching operations.
9. Dispose of material from slides and overbreaks that occur before Final Acceptance as directed by the Engineer.

A. Constructing Serrated Slopes

Construct serrated slopes as follows:

1. Grade the back slope according to the Construction Detail.

   The pay line is the template line or the final staked cross- section slope line. Macon Bibb County will not make additional measurement or payment for constructing serrated slopes.
2. Start the first serration (step) as designated on the Construction Detail. Ensure that it is level instead of parallel to the roadway grade.
3. Use the tilt-control blade bulldozer to cut steps in alternate directions.

B. Constructing Non-serrated Slopes

Construct non-serrated slopes by leaving the front and back slopes in a roughened condition to provide a seed bed for temporary or permanent grassing operations.

C. Erosion and Siltation Control

Take the measures necessary throughout the Project to control erosion and to prevent silting of rivers, streams, and impoundments. Construct drainage facilities and perform all other construction work that contributes to erosion and siltation control in conjunction with earthwork operations as required by Section 163.

D. Rock Excavation - Omitted

E. Unsuitable Material Excavation

The Engineer may require unsuitable material be removed from its location.

1. Remove material and backfill with properly compacted approved material.
2. Undercut material to the depth shown on the Plans or established by the Engineer in cut areas where the material is not suitable for subgrades or shoulders. Backfill the area with suitable material.
3. Excavate unsuitable material in roadway cuts and dispose of the material as directed by the Engineer.

Macon Bibb County will not designate the unsuitable material excavation as a separate Pay Item unless specifically designated on the Plans, but will pay for it as “Roadway Excavation—Unclassified.”

F. Obliteration of Old Roads - Omitted

G. Surcharge Removal - Omitted

H. Use of Select Materials

Conserve and use excavated materials suitable for subgrade, shoulder construction, plant topsoil, blanket for fill slopes, or other purposes as directed by the Engineer.

1. Reserve suitable material by either leaving it in its original position or stockpiling it as directed by the Engineer.
2. Haul select materials directly from the excavation area to the final placement area whenever possible. Do not stockpile materials unless specifically directed.

I. Final Finishing of Roadway

After excavation has been completed use the following procedure to finish the roadway:

1. Shape the surface of the roadbed and slopes to reasonably true grade alignment and cross-section shown on the Plans or established by the Engineer. Finish according to Section 209.
2. Open all ditches, drains, and culverts constructed to effectively drain the roadway.

   Macon - Bibb County will make no separate payment for finishing done under this Section. Include the work in the cost of the roadway excavation, in the overall base bid.
3. Maintain the excavated areas until final acceptance of the Project.

205.3.06 Quality Acceptance - Omitted

205.3.07 Contractor Warranty and Maintenance - Omitted

Section 207—Excavation and Backfill for Minor Structures

207.1 General Description

This work includes excavating, backfilling, or disposing of materials required to install a bridge culvert, box culvert, pipe, arch culvert, headwall and retaining wall according to the Specifications, the Plans, and the Macon - Bibb County Engineer. Note: All references to the "Engineer" in this specification, and all other Oxford Road project specifications, imply the Macon - Bibb County Engineer.

207.1.01 Definitions - Omitted

207.1.02 Related References

A. Standard Specifications

Section 205—Roadway Excavation

Section 206—Borrow Excavation

Section 208—Embankments

Section 810—Roadway Materials

Section 812—Backfill Materials

B. Referenced Documents

GDT 7

207.1.03 Submittals - Omitted

207.2 Materials

Ensure that materials meet the requirements of the following Specifications:

Material	Section
Foundation Backfill Material—Type I	Subsection 812.2.01
Foundation Backfill Material—Type II	Subsection 812.2.02
Imperfect Trench Backfill Material—Type III	Subsection 812.2.03

207.2.01 Delivery, Storage, and Handling - Omitted

207.3 Construction Requirements

207.3.01 Personnel – Omitted

207.3.02 Equipment - Omitted

207.3.03 Preparation - Omitted

207.3.04 Fabrication - Omitted

207.3.05 Construction

A. Locations and Elevations

The Engineer will determine final locations and elevations of the structure. The locations and elevations shown on the Plans are approximate.

B. Excavation

The Engineer will determine the minimum requirements for length and depth of excavation for each structure. Assume the responsibility for the cost of installing necessary sheeting and bracing.

When excavating, follow these requirements:

- Excavate through rock or boulder formations to at least 1 ft (300 mm) below the bottom of the structure, except for where the entire concrete or masonry structure rests on solid rock.
- Backfill with Type I or Type II material to the proper subgrade elevation.
- As the embankment is constructed, excavate and place pipe on the new embankment. Pipe may be placed incrementally on steep gradients.
- Cut surfaces at structure trenches to prevent damage to the adjacent pavement when existing paved areas will be retained.
- Saw pavements deep enough to cause the edges to break in straight lines.
- Ensure that the width, depth, and vertical walls of an excavated imperfect trench conform to Plan details and dimensions within 2 in (50 mm).

• Dispose of surplus and unsuitable materials as directed by the Engineer.

C. Backfill

Obtain backfill materials that meet the Specifications from sources approved by the Engineer.

1. Foundation Backfill Materials, Types I and II

   Use the following materials as shown on the Plans or as directed by the Engineer:

   a. Use Type I material in dry structure trenches and Type II material in wet trenches.
   b. Use Type I material as a finishing course for Type II material when permitted by the Engineer.
   c. Backfill excavations beyond the specified limits with the same type of material required for the adjacent area.
   d. Place Type I and Type II backfill material in layers of no more than 6 in (150 mm) loose.
   e. Compact each layer as follows:
      1) Type I Backfill Material: Compact to 95 percent of the theoretical dry density determined by GDT 7.
      2) Type II Backfill Material: Compact to a satisfactory uniform density as directed by the Engineer.

2. Imperfect Trench Backfill Material, Type III

   Place this material as loose uncompacted backfill over pipe structures as shown on the Plans where imperfect trench backfill is specified.

3. Normal Backfill

Ensure that normal backfill material meets the requirements of Subsection 810.2.01, Class I or II. Place and compact according to Section 208 except as follows:

a. Do not place rock more than 4 inches (100 mm) in diameter within 2 ft (600 mm) of any drainage structure.

D. Pavement Replaced

Replace pavement removed at structure trenches in kind where adjacent pavements will be retained. An equal or better material may be used when approved by the Engineer.

Backfill and maintain a smooth riding surface until repaving is complete.

207.3.06 Quality Acceptance – Omitted

207.3.07 Contractor Warranty and Maintenance – Omitted

Section 209—Subgrade Construction

209.1 General Description

This work includes placing, mixing, compacting, and shaping the top 6 in (150 mm) or the Plan-indicated thickness of the roadbed in both excavation and embankment areas.

This work also includes subgrade stabilization, select material subgrade, and shoulder stabilization.

209.1.01 Definitions – Omitted

209.1.02 Related References

A. Standard Specifications

Section 412—Bituminous Prime

Section 810—Roadway Materials

Section 815—Graded Aggregate

B. Referenced Documents

GDT 7

GDT 20

GDT 21

GDT 24a

GDT 24b

GDT 59

GDT 67

209.1.03 Submittals - Omitted

209.2 Materials

A. Subgrade Materials

If the Plans do not show the source of material for subgrade, the Macon - Bibb County Engineer will direct the Contractor according to the Specifications, to ensure a satisfactory subgrade. Note: All references to “Engineer” in this specification, and all other Oxford Road project specifications, imply the Macon - Bibb County Engineer.

If the existing roadway excavation or borrow materials are not suitable or available for stabilizing the subgrade, use the quantity of stabilizer materials defined below in Subsection 209.2.B.

B. Subgrade Stabilizer Materials

Material	Section

Material	Section
Class IIB3 or Better Soil	810.2.01.A.1

C. Select Material Subgrade

Material	Section
Class IIB3 or Better Soil	810.2.01.A.1
Graded Aggregate	815

D. Shoulder Stabilization

Material	Section

209.2.01 Delivery, Storage, and Handling - Omitted

209.3 Construction Requirements

209.3.01 Personnel – Omitted

209.3.02 Equipment – Omitted

209.3.03 Preparation - Omitted

209.3.04 Fabrication - Omitted

209.3.05 Construction

A. Subgrade Construction

Construct subgrade as follows:

1. Plow, harrow, and mix the entire surface of the in-place subgrade to a depth of at least 6 in (150 mm).
2. After thoroughly mixing the material, bring the subgrade to Plan line and grade and compact it to 100 percent of the maximum laboratory dry density.
3. If the subgrade needs to be stabilized, or if a subsequent contract provides for base construction, do not apply density requirement at this stage.

   If a subsequent Contract provides for base construction, eliminate mixing and compact the in-place subgrade to 95 percent of the laboratory maximum dry density.
4. Ensure that the subgrade can firmly support construction equipment before placing subsequent layers of base and paving materials. The subgrade must support construction equipment without excessive movement regardless of compaction.

5. Rework unstable areas of subgrade to a moisture content that will provide stability and compaction. The Engineer may direct the Contractor to proof roll the subgrade with a loaded dump truck.
6. Compact the subgrade using a sheepsfoot roller.

   Where the subgrade soils are predominantly sands, the Engineer may permit the use of vibratory rollers.

B. Subgrade Stabilization

Construct a stabilized subgrade according to Plans or as directed:

1. Undercut and dispose of the amount of subgrade material that will be displaced with the aggregate or selected material according to the Engineer's direction.
2. Leave material off the subgrade in fill sections requiring stabilization.
3. Place the amount of material specified in Subsection 209.2.B. on the subgrade as specified on the Plans or established by the Engineer.
4. Thoroughly incorporate the material into the existing subgrade to a depth of 6 in (150 mm), or as indicated on the Plans. Plow, disk, harrow, blade, and then mix with rotary tillers until the mixture is uniform and homogeneous throughout the depth to be stabilized.
5. Finish the stabilized subgrade to the Plan line, grade, and cross-section. Compact it to 100 percent of the maximum laboratory dry density as defined in Subsection 209.3.06.

   Plant mixing is permitted as an alternative to the mixed-in-place method.
6. Eliminate the mixing and scarifying method before compaction in undercut areas where Type III Stabilizer Aggregates are specified, unless otherwise specified by the Engineer.

C. Select Materials Subgrade

Place select materials as follows:

1. Place a uniform blanket of select material consisting of Class I or II soil or graded aggregate on the prepared subgrade (according to Plan dimensions or as directed by the Engineer).
2. Use the select material reserved from the grading or borrow operations. If material is not available through this source, obtain it from other sources.
3. Finish and compact the material according to Subsection 209.3.05.A.

D. Shoulder Stabilization

Stabilize the shoulder as follows:

1. Spread the stabilizer aggregate at the rate and to the dimensions indicated on the Plans.
2. Mix the aggregate with the in-place shoulder material thoroughly to the Plan depth.
3. Compact the area thoroughly and finish it to Plan dimensions.

E. Finishing Subgrade

When finishing subgrade use the following procedure:

1. Leave the underlying subgrade in cuts and fills low enough to accommodate the additional material when the work requires either subgrade stabilization, select material subgrade, or stabilization for shoulders.
2. Test short sections in curb and gutter areas as might be necessary to obtain the proper elevation.
3. Blade the surface of the completed subgrade to a smooth and uniform texture.

209.3.06 Quality Acceptance

The contractor shall have tested by, means of an approved commercial testing laboratory, the in- place density of the subgrade, using GDT 7, GDT 24a, or GDT 67 as applicable.

The contractor's approved commercial testing laboratory shall determine in-place density of the compacted subgrade according to GDT 20, GDT 21, or GDT 59 , or an equivalent commercial standard.

Ensure that the centerline profile conforms to the established elevations with an acceptable tolerance of ±0.5 in (±13 mm). The acceptable tolerance under a template conforming to the designated cross section shall be ±0.25 in (±6 mm).

209.3.07 Contractor Warranty and Maintenance – Omitted

Section 209 Submittals

Paragraph Number	Description	Date Required	Inspection Check Mark
209.3.06	Test Results	7 Days After	

Section 600—Controlled Low Strength Flowable Fill

600.1 General Description

This work consists of furnishing and placing Flowable Fill as an alternate to compacted soil as approved by the Macon Bibb County Engineer. Applications for this material include beddings, encasements, and closures for tanks and pipe, and general backfill for trenches and abutments. Note: All references to “Engineer”, in this specification and all other Oxford Road specifications, imply the Macon Bibb County Engineer.

600.1.01 Definitions – Omitted

600.1.02 Related References

A. Standard Specifications

Section 801—Fine Aggregate

Section 830—Portland Cement

B. Referenced Documents

SOP 10

600.1.03 Submittals

Mix designs for flowable fill, and other documentation listed in Subsection 500.1.03.

600.2 Materials

All materials shall meet the requirements of the following Specifications:

Material	Section
*Fine Aggregate	Subsection 801.2.02
Portland Cement	Subsection 830.2.01

*Note—Gradation requirement is waived.

600.2.01 Delivery, Storage, and Handling - Omitted

600.3 Construction Requirements

600.3.01 Personnel - Omitted

600.3.02 Equipment - Omitted

600.3.03 Preparation

A. Mix Design

Flowable fill is a mixture of Portland cement, fly ash, fine aggregate, air entraining admixture, and water. Flowable fill contains a low cement content for reduced strength development.

1. Submit mix designs for flowable fill to the Engineer for approval . The following table lists mix design proportion ranges for excavatable and non-excavatable flowable fill:

Table 1—Mix Designs for Flowable Fill		
	Excavatable	**Non-Excavatable**
Cement Type I	75-100 lbs/yd^3 (45-60 kg/m^3)	75-150 lbs/yd^3 (45-90 kg/m^3)
Fly Ash	–	150-600 lbs/yd^3 (90-355 kg/m^3)
Water	*	*
**Air	15 to 35%	5-15%
**28-Day Compressive Strength	Maximum 100 psi (690kPa)	Minimum 125 psi (860 kPa)
**Unit Weight (Wet)	90-100 lbs/ft^3 (1440-1600 kg/m^3)	100-125 lbs/ft^3 (1600-2000 kg/m^3)

*Mix designs shall produce a consistency that will result in a flowable self-leveling product at time of placement.

**The requirements for percent air, compressive strength, and unit weight are for laboratory designs only and are not intended for jobsite acceptance requirements.

600.3.04 Fabrication

Ensure flowable fill is manufactured at plants that qualify as approved sources according to the Standard Operating Procedure for Quality Assurance for Ready-Mix Concrete Plants in Georgia (SOP 10). Mix and deliver according to Subsection 500.2.01 of the Specifications or other methods approved by the Engineer. Revolution counter requirements are waived.

600.3.05 Construction

When using as backfill for pipe, where flotation or misalignment may occur, assure correct alignment of the pipe by using straps, soil anchors, or other approved means of restraint.

Protect flowable fill from freezing for 36 hours after placement.

600.3.06 Quality Acceptance

A. Jobsite Acceptance

Acceptance of flowable fill is based on documentation as outlined in Subsection 500.1.03 of the Specifications and a minimum temperature of flowable fill at the point of delivery of 50 °F (10 °C).

600.3.07 Contractor Warranty and Maintenance – Omitted

Section 603—Rip Rap

603.1 General Description

This work includes placing protective coverings of sand-cement bag rip rap or stone rip rap.

When required, this work includes placing crushed stone filter material or plastic filter fabric beneath stone rip rap on:

- Fill slopes
- Cut slopes
- End rolls
- Shoulders
- Ditches
- Stream banks
- Channel banks
- Other locations

603.1.01 Definitions – Omitted

603.1.02 Related References

A. Standard Specifications

Section 800—Coarse Aggregate

Section 801—Fine Aggregate

Section 805—Rip Rap and Curbing Stone

Section 815—Graded Aggregate

Section 830—Portland Cement

Section 881—Fabrics

B. Referenced Documents

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603.1.03 Submittals – Omitted

603.2 Materials

Ensure that the materials meet the requirements of the following Specifications:

Material	Specification
Portland cement	830.2.01
Rip Rap (Stone)	805.2.01

Material	Specification
Woven Plastic Filter Fabric	881.2.05

A. Bags for Sand-Cement Bag Rip Rap - Omitted

B.

B. Stone Dumped Rip Rap

Stone dumped rip rap is designated on the Plans as Type 3 as defined in Subsection 805.2.01. See the note on the plans.

603.2.01 Delivery, Storage, and Handling – Omitted

603.3 Construction Requirements

603.3.01 Personnel - Omitted

603.3.02 Equipment - Omitted

603.3.03 Preparation - Omitted

603.3.04 Fabrication – Omitted

603.3.05 Construction

Construct this Work according to the following requirements:

A. Preparing the Foundations

Prepare the ground surface where the rip rap will be placed to conform with the correct lines and grades before beginning the placement.

1. When filling depressions, compact the new material with hand or mechanical tampers.

   Dispose of excess material by spreading it neatly within the right-of-way as an incidental part of the work.

2. Unless otherwise shown or provided below, begin placing the rip rap in a toe ditch constructed in original ground around the toe of the fill or the cut slope.

Ensure that the toe ditch is 2 ft (600 mm) deep in original ground and the side next to the fill or cut has the same slope.

3. After placing the rip rap, backfill the toe ditch and spread the excess dirt neatly within the right-of-way as an incidental part of the work.
4. When beginning rip rap in water or below normal water level, substitute an apron of rip rap for the toe ditch.

   Ensure that the width and thickness of this apron is as shown on the Plans or determined by the Macon Bibb County Engineer. Note: All references in this specification, and all other Oxford Road project specifications, imply the Macon Bibb County Engineer.

B. Placing Stone Rip Rap

Place rip rap to the limits shown on the Plans or as directed by the Engineer. Place and classify rip rap as follows:

1. Stone Plain Rip Rap

   Dump and handle stone plain rip rap into place to form a compact layer to the design thickness.

   Ensure that the thickness tolerance for the course is plus 12 in (300 mm) with no under-tolerance. If the Plans do not show a thickness, place stone rip rap to at least 12 in (300 mm) thick, but no greater than 2 ft (600 mm) thick.
2. Stone Dumped Rip Rap

   Dump stone dumped rip rap into place to form a uniform surface as thick as specified in the Plans.

   a. Ensure that the thickness tolerance for the course is minus 6 in (150 mm) and plus 12 in (300 mm). If the Plans or Proposal do not specify a thickness, place the course to at least 2 ft (600 mm) thick.

   b. Recycled concrete that meets the requirements of Subsection 805.2.01 may be used instead of stone when shown on the Plans or approved by the Engineer.

      Use recycled concrete only when materials do not contain steel after processing.

C. Placing Filter

Place woven plastic filter fabric under all rip rap. Follow these requirements for placing the filter fabric:

1. Prepare the surface to receive the fabric until it is smooth and free from obstructions, depressions, and debris.
2. Place the fabric with the long dimension running up the slope. Minimize the number of overlaps.
3. Place the strips to provide a width of at least 1 ft (300 mm) of overlap for each joint.
4. Anchor the filter fabric in place with securing pins of the type recommended by the fabric manufacturer. Place the pins on or within 3 in (75 mm) of the centerline of the overlap.
5. Place the fabric so that the upstream strip will overlap the downstream strip.
6. Loosely place the fabric to prevent stretching and tearing during stone placement.

   Do not drop the stones more than 3 ft (1 m) during construction.
7. Always protect the fabric during construction from clogging due to clay, silts, chemicals, or other contaminants.
8. Remove contaminated fabric or fabric damaged during installation or rip rap placement. Replace with uncontaminated or undamaged fabric at no expense to the Department.

D. Placing Sand-Cement Bag Rip Rap - Omitted

603.3.06 Quality Acceptance - Omitted

603.3.07 Contractor Warranty and Maintenance – Omitted

Section 700—Grassing

700.1 General Description

This work includes preparing the ground, furnishing, planting, seeding, fertilizing, sodding, and mulching disturbed areas within the Right-of-Way limits and easement areas adjacent to the right-of-way as shown on the Plans except as designated by the Macon Bibb County Engineer. Note: All references to “Engineer” in this specification, and all other Oxford Road project specifications, imply the Macon Bibb County Engineer. Also, all grassing on this project shall be sod, not mulching, or seed and straw or hydro seeding. Sod species shall be determined by the Engineer and the property owners, in order to match the existing yard species.

700.1.01 Definitions – Omitted

700.1.02 Related References

A. Standard Specifications

Section 163—Miscellaneous Erosion Control Items

Section 890—Seed and Sod

Section 891—Fertilizers

B. Referenced Documents

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700.1.03 Submittals - Omitted

700.2 Materials

Use materials that meet the requirements of the following Specifications:

Material	Section
Seed	890.2.01
Sod	890.2.02
Fertilizer	891.2.01
Plant Topsoil	893.2.01

B. Water

Obtain the water for grassing from an approved source. Use water free of harmful chemicals, acids, alkalis, and other substances that may harm plant growth or emit odors. Do not use salt or brackish water.

C. Asphalt - Omitted

D. Fertilizer Mixed Grade - Omitted

E. Mulch - Omitted

700.2.01 Delivery, Storage, and Handling – Omitted

700.3 Construction Requirements

700.3.01 Personnel – Omitted

700.3.02 Equipment - Omitted

A. Rollers

Use at least 12 in (300 mm) diameter rollers with corrugated or notched surfaces. Do not use smooth surface rollers.

700.3.03 Preparation – Omitted

700.3.04 Fabrication - Omitted

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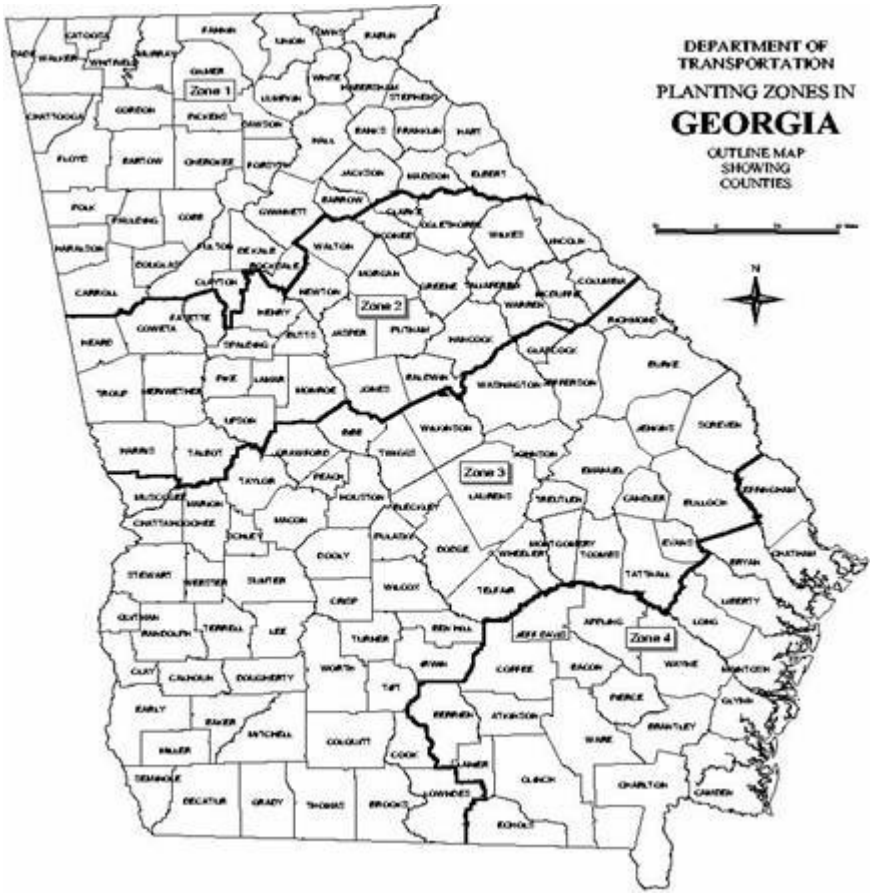

700.3.05 Construction

Follow the planting zones, planting dates, types of seed, seed mixtures, and application rates described throughout this Section.

In general:

- Obtain the Engineer's approval before changing the ground cover type.
- Do not use annual rye grass seeds with permanent grassing.
- Follow the planting zones indicated on the Georgia State Planting Zone Map, below.
- Sod may be installed throughout the year, weather permitting.
- For permanent grassing, apply the combined amounts of all seeds for each time period within each planting zone and roadway location listed in the Seeding Table, below. Do not exceed the amounts of specified seed.

Planting Zone Map

SEEDING TABLE

Planting Zones	Planting Dates	Pounds (kg) Of Seed Per Acre (hectare)									REQUIRED PERMANENT PLANTING
		Rye Grass, Millet, Cereal Grass (Oats)	Common Bermuda Grass (Hulled	Common Bermuda Grass (Unhulled)	Tall Fescue	Weeping Love Grass	White Or Crimson Clover	Crown Vetch	Scarified Interstate Lespedeza	Unscarified Interstate Lespedeza	
1	March 1 – May 15		10 (11)	10 (11)	50 (56)						Common Bermuda Grass
1	May 1 – July 31		10 (11)	10 (11)							
1	August 1 – February 28	15 (17)									
1	November 15 – January 31						6 (7)				
2,3,4	February 15 – August 31		10 (11)	10 (11)							
2,3,4	September 1 – February 14	15 (17)									Common Bermuda Grass
2,3,4	November 15 – January 31						6 (7)				

Plant these combinations on back slopes, fill slopes and areas which will not be subject to frequent mowing											
1,2	March 1 – July 31					4 (5)			50 (56)		Interstate Lespedeza Of Crown Vetch
1,2	August 1 – February 28				30 (34)			15 (17)		75 (84)	
3,4	February 15 – August 31					4 (5)			50 (56)		Interstate Lespedeza
3,4	September 1 – February 14	50 (56)								75 (84)	

A. Ground Preparation

Prepare the ground by plowing under any temporary grass areas and preparing the soil as follows:

1. Slopes 3:1 or Flatter

   On slopes 3:1 or flatter, plow shoulders and embankment slopes to between 4 in and 6 in (100 mm and 150 mm) deep.

   Plow front and back slopes in cuts to no less than 6 in (150 mm) deep. After plowing, thoroughly disk the area until pulverized to the plowed depth.

2. Slopes Steeper Than 3:1

   Serrate slopes steeper than 3:1 according to Plan details when required.

   On embankment slopes and cut slopes not requiring serration (sufficient as determined by the Engineer), prepare the ground to develop an adequate seed bed using any of the following methods as directed by the Engineer:

   - Plow to a depth whatever depth is practicable.
   - Use a spiked chain.
   - Walk with a cleated track dozer.
   - Scarify.

   Disking cut slopes and fill slopes is not required.

3. All Slopes

a. Obstructions

Remove boulders, stumps, large roots, large clods, and other objects that interfere with grassing or may slide into the ditch.

b. Topsoil

Spread topsoil stockpiled during grading evenly over cut and fill slopes after preparing the ground.

Push topsoil from the top over serrated slopes. Do not operate equipment on the face of completed serrated cuts.

B. Grassing Adjacent to Existing Lawns

When grassing areas adjacent to residential or commercial lawns, the Engineer shall change the plant material to match the type of grass growing on the adjacent lawn.

C. Seeding

Following is a list of both common names and botanical names for approved seed types. Whenever seeds are specified by the common names, the strains indicated by their botanical name apply.

Common Name	Botanical Name
Annual Ryegrass	Lolium multiflorum
*Bermuda Grass, Common Hulled and Unhulled	Cynodon dactylon
**Crimson Clover	Trifolium incranatum Var. Reseeding
**Lespedeza Virgata	Lespedeza Ambro Virgata
**Lespedeza Sericea	Lespedeza cuneta, Var. Sericea

7. Mulch the entire hydroseeded area according to Subsection 700.3.05.F.1, above, and Subsection 700.3.05.G, below.

Common Name	Botanical Name
**Lespedeza Serala	Lespedeza cuneta, Var. Serala
**Lespedeza Interstate	Lespedeza cuneta, Var. Interstate
**Lespedeza Korean	Lespedeza stipulacea Maxim
Pensacola Bahiagrass	Paspalum notatum, var. Pensacola
Tall Fescue	Festuca arundinacea
Weeping Love Grass	Eragrostis curvula
**White Dutch Clover	Trifolium repens
**Crown Vetch	Coronilla Varia
*Do not use Giant Bermuda Seed (Cynodon species) including NK-37. **Requires inoculation.	

Prepare seed and sow as follows:

1. Inoculation of Seed

   Inoculate each kind of leguminous seed separately with the appropriate commercial culture according to the manufacturer's instructions for the culture.

   When hydroseeding, double the inoculation rate.

   Protect inoculated seed from the sun and plant it the same day it is inoculated.

2. Sowing

   Weather permitting, sow seed within 24 hours after preparing the seed bed and applying the fertilizer and lime, or sow seed within 24 hours after applying mixed-in-place mulch.

   Sow seed uniformly at the rates specified in the Seeding Table. Use approved mechanical seed drills, rotary hand seeders, hydraulic equipment, or other equipment to uniformly apply the seed. Do not distribute by hand.

   To distribute the seeds evenly sow seed types separately, except for similarly sized and weighted seeds. They may be mixed and sown together.

3. Rolling

   Roll seeded areas before applying mulch, except on steep slopes where rollers cannot operate satisfactorily. On slopes inaccessible to compaction equipment, cover the seeds by dragging spiked chains over them or by using other methods.

   Do not sow during windy weather, when the prepared surface is crusted, or when the ground is frozen, wet, or otherwise nontillable.

4. Overseeding

   Temporary grass areas that were prepared in accordance with Subsection 700.3.05.A, shall be overseeded using the no-till method. The no-till method is defined by planting permanent grass seeds using a drill-type seeder over existing temporary grass without plowing or tilling soil and in accordance with Subsection 700.3.05.C. This method shall be shown on the Plans or directed by the Engineer before being implemented.

D. Sod

Furnish and install sod in all areas shown on the Plans or designated by the Engineer. Note: Per the plans, all grassing for the Lee Road project shall be sod.

1. Kinds of Sod – Where possible, match existing grass species. Where this is not possible, use:

   Common Bermudagrass (Cyndon dactylon) or one of the following Bermudagrass varieties:

   Tifway 419
   Tifway II
   Tift 94
   Tifton 10
   Midlawn
   Midiron
   GN-1
   Vamont

No dwarf Bermuda types shall be used. Sod shall be nursery-grown and be accompanied with a Georgia Department Of Agriculture Live Plant License Certificate or Stamp. Sod shall consist of live, dense, well-rooted material free of weeds and insects as described by the Georgia Live Plant Act.

2. Type And Size Of Sod:

   Furnish either big roll or block sod. Ensure that big roll sod is a minimum of 21 inches wide by 52 feet long. Minimum dimensions for block sod are 12 inches wide by 22 inches long. Ensure all sod consists of a uniform soil thickness of not less than 1 inch.

3. Ground Preparation

   Excavate the ground deep enough and prepare it according to Subsection 700.3.05.A to allow placing of sod. Spread soil, meeting the requirements of Subsection 893.2.01, on prepared area to a depth of 4 inches.

4. Application Of Lime And Fertilizer

   Apply lime and fertilizer according to Subsection 700.3.05.D within 24 hours prior to installing sod.

5 Weather Limitation

   Do not place sod on frozen ground or where snow may hinder establishment.

6. Install Sod

   Install Sod as follows:

   - Place sod by hand or by mechanical means so that joints are tightly abutted with no overlaps or gaps. Use soil to fill cracks between sod pieces, but do not smother the grass.
   - Stake sod placed in ditches or slopes steeper than 2:1 or any other areas where sod slipping can occur.
   - Use wood stakes that are at least 8 in (200 mm) in length and not more than 1 in (25 mm) wide.
   - Drive the stakes flush with the top of the sod. Use a minimum of 8 stakes per square yard (meter) to hold sod in place.
   - Once sod is placed and staked as necessary, tamp or roll it using adequate equipment to provide good contact with soil.
   - Use caution to prevent tearing or displacement of sod during this process. Leave the finished surface of sodded areas smooth and uniform.

7. Watering Sod

   After the sod has been placed and rolled or tamped, water it to promote satisfactory growth. Additional watering will be needed in the absence of rainfall and during the hot dry summer months. Water may be applied by Hydro Seeder, Water Truck or by other means approved by the Engineer.

8. Dormant Sod

   Dormant Bermuda grass sod can be installed. However, assume responsibility for all sod through establishment and until final acceptance.

9. Establishment

   Sod will be inspected by the Engineer at the end of the first spring after installation and at the time of Final Inspection. Replace any sod that is not live and growing. Any cost for replacing any unacceptable sod will be at the Contractor's expense.

700.3.06 Quality Acceptance

The Engineer may require replanting of an area that shows unsatisfactory growth for any reason at any time.

Except as otherwise specified or permitted by the Engineer, prepare replanting areas according to the Specifications as if they were the initial planting areas. Use a soil test or the Engineer's guidance to determine the fertilizer type and application rate, then furnish and apply the fertilizer.

700.3.07 Contractor Warranty and Maintenance

A. Plant Establishment

Before Final Acceptance, provide plant establishment of the specified vegetation as follows:

1. Plant Establishment

   Preserve, protect, water, reseed or replant, and perform other work as necessary to keep the grassed areas in satisfactory condition.

2. Watering

   Water the areas during this period as necessary to promote maximum growth.

3. Mowing

   Mow seeded areas of medians, shoulders, and front slopes at least every 6 months. Avoid damaging desirable vegetation.

   In addition, mow as necessary to prevent tall grass from obstructing signs, delineation, traffic movements, sight distance, or otherwise becoming a hazard to motorists.

B. Growth and Coverage

Provide satisfactory growth and coverage, ensuring that vegetation growth is satisfactory with no bare spots larger than1 ft^2 (0.1 m^2). Bare spots shall comprise no more than 1 percent of any given area. An exception is given for seed not expected to have germinated and shown growth at that time.

C. Permissible Modifications

When all Items of the work are ready for Final Acceptance except for newly planted repaired areas or other areas with insufficient grass, the Contractor may fill the eroded areas or treat bare areas with sod obtained, placed, and handled according to Subsection 700.3.05.H.

Carefully maintain the line and grade established for shoulders, front slopes, medians, and other critical areas.

Section 700 Submittals

Paragraph Number	Description	Date Required	Inspection Check Mark
700.3.05.D (above)	Sod	Prior to Sodding	

Section 800—Coarse Aggregate

800.1 General Description

This section includes requirements for coarse aggregate. All aggregate shall be the specified type, class, and grade, and shall meet the requirements for the intended use.

800.1.01 Related References

A. Standard Specifications

Section 424—Bituminous Surface Treatment

B. Referenced Documents

AASHTO	ASTM
T 11 T 27 T 96 T 104 T 303	C 295 E 30 G 23

GDT 104

GDT 129

GDT 133

QPL 2

SOP 1

800.2 Materials

800.2.01 Coarse Aggregate

A. Requirements

The Contractor shall use the type, group, class, and grade of coarse aggregate specified. For coarse aggregate sources, see QPL 2.

1. Coarse Aggregate Types

Type	Characteristics

Type	Characteristics
Crushed stone	Sound, durable rock particles.
Gravel	Sound, durable rock without damaging coatings.
Air-cooled blast furnace slag	Sound, durable particles with uniform density and quality, or other slags that have a good service record. Dry slag shall weigh at least 70 lb/ft³ (1120 kg/m³) compacted and shall contain less than 30% glassy particles by weight. Do not use slag as aggregate for Portland cement concrete.
Synthetic aggregate	Sound, durable, expanded clay, shale, or other manufactured product.

2. Coarse Aggregate Groups
   a. Group I: Limestone, dolomite, marble, or any combination thereof. Ensure Group I aggregates meet the abrasion requirement for Class A stone when used in Portland cement concrete of any type or class.
   b. Group II: Slag, gravel, granitic and gneissic rocks, quartzite, synthetic aggregate, or any combination thereof.
3. Classes

   Aggregates are classified by physical properties that determine how they are used.
   a. Do not blend aggregates that meet abrasion requirements with aggregates that do not meet requirements.
   b. "Class A" and "Class B" aggregate used in Portland cement concrete, asphaltic concrete, and bituminous surface treatment shall meet these limits:

Percent Wear AASHTO T 96 ("B" Grading)		
	Class A	**Class B**
Group I Aggregates	0-40	41-55
Group II Aggregates	0-50	51-60

   c. "Class B" aggregates used in all applications other than Portland cement concrete, asphaltic concrete, or bituminous surface treatment shall meet these limits:

Percent Wear AASHTO T 96 ("B" Grading)	
	Class B
Group I Aggregates	41-55
Group II Aggregates	51-65

4. Soundness

   Test coarse aggregate used in Portland cement concrete, bituminous surfaces, bituminous bases, aggregate bases, or surface treatment with five alternations of the magnesium sulfate soundness test.
   a. Use aggregate with a weight loss of less than 15 percent.
   b. The 15 percent soundness loss for a Class "CS" concrete is waived if it has a 5-year service record.
   c. If the material meets all the requirements except for the 15 percent soundness requirement, the material may be used in Zones 3 and 4 (see Subsection 424.3.05, "Construction Requirements") under the following conditions:
      1) The aggregate in bituminous courses and in all types and classes of Portland cement concrete construction, except as stated in Group I, has a satisfactory five-year service record under similar service and exposure.
      2) The Engineer's investigation shows that it equals or exceeds the quality of approved aggregate (in cases where the material's uniformity changes at the source, or does not have a five-year service record).
5. Grades

   Use coarse aggregate that is well graded within the limits and sizes specified in Table 800.1.

6. Detrimental Substances
   a. Detrimental substances include shale, weathered or decomposed rock, friable particles, or any substance that may be detrimental for the use intended.
   b. Do not use any aggregate that can cause a deleterious reaction.
   c. Do not use aggregates that contain Chrysotile (defined as fibrous serpentinite) as a temporary or permanent unbound surfacing for roads, nor as stabilizer for soil used as subgrade, base, or surface course.
   d. Detrimental substances shall not exceed the following limits:
      1) For Portland Cement Concrete:

Substance	Max % Allowed
Mica schist—Materials defined in ASTM C 294 as phyllite or schist. Use GDT 104 to analyze these materials.	5
Materials that pass the No. 200 (75 µm) sieve.	1.5
Flat and elongated pieces (with lengths more than five times the average thickness).	10
Sulphur content computed as sulfide sulphur (for bridge-type structures)—If the sulphur content exceeds 0.01%, do not use the aggregate unless it passes a petrographic analysis and a weathering test equivalent to 6 months or more of exposure.	0.01
Other local detrimental substances. (Any Combination)	2.0
NOTE: Do not use aggregate in Portland Cement concrete that is capable of producing a deleterious reaction when combined with Portland Cement.	

      2) For Asphaltic Concrete:

Substance	Max. % Allowed
Mica schist—Materials defined in ASTM C 294 as phyllite or schist. Use GDT 104 to analyze these materials. (Use this requirement for Interstate Construction, SMA mixes, OGFC mixes and all surface mixes on roadways ≥ 25,000 ADT).	10
Flat or elongated particles (with lengths more than five times the average thickness).	10
Glassy particles (slag).	30
Other local detrimental substances. (Any combination)	2.0

      3) For Bituminous Surface Treatment:

Substance	Max. % Allowed
Mica schist—Materials defined in ASTM C 294 as phyllite or schist. Use GDT 104 to analyze these materials.	10
Material finer than No. 200 (75 µm) sieve. #5 Stone #6 Stone #7 Stone #89 Stone	 0.5 0.7 0.7 1.0
Flat and elongated particles (with lengths more than five times the average thickness).	10
Glassy particles (slag).	30
Other local detrimental substances. (Any combination)	2

7. Ensure that gravel used in Asphaltic Concrete and Bituminous Surface Treatment meets the following additional requirements:
   - Consists of siliceous particles.

- A minimum of 85%, by count, of the material retained on the No. 4 (4.75 mm) sieve has one or more fractured faces.
- The fracture is for the approximate average diameter or thickness of the particle.

8. Ensure that No. 7 stone used in Bituminous Surface Treatment meets the following gradation:

¾" (19 mm)	½" (12.5 mm)	3/8" (9.5 mm)	No. 4 (4.75 mm)	No. 8 (2.36 mm)
100	85-100	40-70	0-15	0-5

B. Fabrication - Omitted

C. Acceptance

Test as follows:

Test	Method
Material that passes the No. 200 (75 µm) sieve	AASHTO T 11
Sulphur content	ASTM E 30, Leco method
Weathering	ASTM G 23
Petrographic analysis	ASTM C 295
Soundness (magnesium sulfate)	AASHTO T 104
Percent wear	AASHTO T 96
Aggregate gradation	AASHTO T 27
Reactivity	AASHTO T 303
Schist or phyllite	GDT 104
Flat and elongated particles	GDT 129
Friable Particles	GDT 133

D. Materials Warranty - Omitted

TABLE 800.1 - SIZES OF COARSE AGGREGATES

SIZE NO	NOMINAL SIZE SQUARE OPENINGS		AMOUNTS FINER THAN EACH LABORATORY SIEVE (SQUARE OPENINGS). %, BY WEIGHT										
	(1)	mm	2 ½"	2"	1 ½"	1"	¾"	½"	3/8"	No. 4	No. 8	No-16	No. 50
			63 mm	50 mm	37.5mm	25 mm	19 mm	12.5 mm	9.5 mm	4.75 mm	2.36mm	1.18 mm	300 µm
3	2-1	50 - 25	100	90-100	35-70	00-15	-----	00-5	----	-----	-----	-----	-----
357	2-No. 4	50 - 4.75	100	95-100	-----	35-70	-----	10-30	----	00-5	-----	-----	-----
4	1 ½ - 3/4	37.5 - 19	-----	100	90-100	20-55	00-15	-----	00-5	-----	-----	-----	-----
467	1 ½-No. 4	37.5 - 4.75	-----	100	95-100	-----	35-70	-----	10-30	00-5	-----	-----	-----
5	1-1/2	25 – 12.5	-----	-----	100	90-100	20-55	00-10	00-5	-----	-----	-----	-----
56	1-3/8	25 – 9.5	-----	-----	100	90-100	40-75	15-35	00-15	00-5	-----	-----	-----
57	1-No. 4	25 – 4.75	-----	-----	100	95-100	-----	25-60	-----	00-10	00-5	-----	-----
6	¾-3/8	19 – 9.5	-----	-----	-----	100	90-100	20-55	00-15	00-5	-----	-----	-----
67	¾-No. 4	19 – 4.75	-----	-----	-----	100	90-100	-----	20-55	00-10	00-5	-----	-----
68	¾-No. 8	19 – 2.36	-----	-----	-----	100	90-100	-----	30-65	05-25	00-10	0-5	-----
7	½-No. 4	12.5 – 4.75	-----	-----	-----	-----	100	90-100	40-70	00-15	00-5	-----	-----
78	½-No. 8	12.5 – 2.36	-----	-----	-----	-----	100	90-100	40-75	05-25	00-10	0-5	-----
8	3/8-No. 8	9.5 – 2.36	-----	-----	-----	-----	-----	100	85-100	10-40	0-10	0-5	-----
89	3/8-No. 16	9.5 – 1.18	-----	-----	-----	-----	-----	100	90-100	20-55	0-15	0-10	0-5
9	No. 4-No. 16	4.75 – 1.18	-----	-----	-----	-----	-----	-----	100	85-100	10-40	0-10	0-5

(1) In inches, except where otherwise indicated. Numbered sieves are those of the United States Standard Sieve Series.

Section 801—Fine Aggregate

801.1 General Description

This section includes the requirements for fine aggregate. All aggregate shall be the specified type, class, and grade.

801.1.01 Related References

A. Standard Specifications

Section 800—Coarse Aggregate

B. Referenced Documents

AASHTO	ASTM
T 11 T 21 T 27 T 112 T 303	C 295

GDT 4

GDT 5

GDT 63

GDT 75

GDT 132

QPL 1

SOP 1

801.2 Materials

801.2.01 Fine Aggregate for Cushion

A. Requirements

Use the type, class, and grade of fine aggregate specified.

1. Types

Use fine aggregate for cushion under granite curb or brick that is natural or manufactured sand with hard, strong, durable particles. Make manufactured sand from crushed gravel or stone meeting the requirements of Section 800. For a list of fine aggregate sources, see QPL 1.

2. Grades

Use fine aggregate for cushion with less than 10 percent total silt and clay. Grade as follows:

Size	Percent by Weight
Passing No. 4 (4.75 mm) sieve	100
Passing No. 16 (1.18 mm) sieve	25-75
Passing No. 100 (150 µm) sieve	0-25

B. Fabrication - Omitted

C. Acceptance

Test as follows:

- Sieve analysis—AASHTO T 27

D. Materials Warranty - Omitted

801.2.02 Fine Aggregate for Portland Cement Concrete of All Types and for Mortar

A. Requirements

1. Concrete and Mortar

Use fine aggregate for concrete and mortar that consists of natural sand, manufactured sand, or blends of natural and manufactured sands, having hard, clean, strong, durable, uncoated particles, meeting the requirements of the Specifications.

2. Manufactured Sand

Use manufactured sand made exclusively from crushed stone or gravel that meets Section 800 requirements.

Manufactured sand used in concrete for construction of Portland cement concrete pavement, approach slabs, and bridge decks, shall be made from Group II aggregates as specified in Subsection 800.2.01.A.2.

3. Miscellaneous Concrete

Sand manufactured from synthetic aggregate meeting the requirements of Section 800 may be blended with natural sands or manufactured sands made from crushed stone or gravel for use in miscellaneous concrete as described in Section 441.

Blend at least 50 percent natural sand or manufactured sand made from crushed stone or gravel.

4. Concrete Sand

Concrete sand that passes the No. 10 (2 mm) sieve shall have these characteristics:

Characteristic	Requirement
Durability index	70 or greater
Sand equivalent	70 or greater

5. Detrimental Substances

Keep detrimental substances within these limits:

Substance	Maximum Percent by Weight

Clay lumps	0.5 maximum in total sample
Coal and lignite	0.5 maximum in total sample
All detrimental substances (any combination)	2.0 maximum in total sample
NOTE: Do not use fine aggregate in Portland cement concrete that is capable of producing a deleterious reaction with Portland cement	

Provided the material passing the No. 16 (1.18 mm) sieve is petrographically determined to be essentially free of detrimental substances, test results for coal and lignite and other detrimental substances listed will be based upon a petrographic analysis of material retained on the No. 16 (1.18 mm) sieve.

Calculations will be based upon the weighted average for the total sample.

Other detrimental substances include constituents such as shale, weathered or decomposed rock, soft or friable particles, coated grains, or other substances that might be considered detrimental for the use intended.

6. Organic Impurities (natural sands only)

   Ensure all fine aggregate is free from detrimental amounts of organic impurities.

   Do not use materials that have colorimetric test (AASHTO T 21) results darker than the Reference Standard color plate.

7. Grades

   Grade fine aggregates for Portland cement concrete and mortar as follows:

Size No.	Description	Total Percent by Weight Passing Each Sieve					
		3/ 8 in (9.5 mm)	No. 4 (4.75 mm)	No. 16 (1.18 mm)	No. 50 (300 µm)	No. 100 (150 µm)	No. 200 (75 µm)
10 NS	Natural concrete sand	100	95-100	45-95	8-30	1-10	0-3
20 NS	Natural mortar sand	100	100	90-100	15-50	0-15	0-5
10 SM	Standard manufactured concrete sand	100	95-100	45-95	8-30	1-10	0-4
10 FM	Fine manufactured concrete sand	100	95-100	45-95	15-42	6-22	0-9

B. Fabrication - Omitted

C. Acceptance

Test as follows:

Test	Method
Petrographic analysis	ASTM C 295
Material that passes a No. 200 (75 µm) sieve	AASHTO T 11
Organic impurities	AASHTO T 21
Sieve analysis	AASHTO T 27
Sand equivalent	GDT 63
Reactivity	AASHTO T 303
Durability index	GDT 75

Clay lumps	AASHTO T 112
Friable Particles	GDT 132
NOTE: The percent passing the No. 200 sieve (75 µm) for size 10FM will be based upon the total percent determined by AASHTO T-11 and AASHTO T-27. The percent passing the No. 200 sieve (75 µm) for sizes 10NS, 20NS and 10SM will be as determined by AASHTO T-11 only.	

D. Materials Warranty - Omitted

Section 805—Rip Rap

805.1 General Description

This section includes the requirements for rip rap.

805.1.01 Related References

A. Standard Specifications - Omitted

B. Referenced Documents

AASHTO T 96

AASHTO T 104

ASTM C 295

GDT 64

805.2 Materials

805.2.01 Rip Rap

A. Requirements

1. Aggregate Quality

   All rip rap stone shall be made of sound, durable rock pieces that meet these requirements:

Aggregate Quality	Maximum Percent
Abrasion loss “B” grading	65
Soundness loss	15
Flat and slabby pieces (length five times more than the average thickness)	5
Weathered and/or decomposed pieces and shale	5

2. Gradation for Stone-Dumped rip rap Type 1 and Type 3:

Severe Drainage Conditions or Moderate Wave Action (Type 1)*		
Size By Volume	**Approx. Weight**	**Percent Smaller Than**
4.2 ft³ (0.12 m³)	700 lbs (320 kg)	100%
1.8 ft³ (0.05 m³)	300 lbs (135 kg)	50% - 90%
0.8 ft³ (0.02 m³)	125 lbs (55 kg)	20% - 65%
*Between 0% and 15% of the Type 1 rip rap shall pass a 4 in (100 mm) square opening sieve.		

General Use Normal Drainage Conditions (Type 3)*		
Size By Volume	**Approx. Weight**	**Percent Smaller Than**
1.0 ft³ (0.03 m³)	165 lbs (75 kg)	100%
0.1 ft³ (0.003 m³)	15 lbs (7 kg)	10% - 65%
*Between 0% and 15% of the Type 3 rip rap shall pass a 2 in (50 mm) square opening sieve.		

3. Stone for Plain Rip Rap

   The stones shall be clean and free of rock dust and fines.

   a. Process the stone so that the largest pieces have a volume of 2 ft³ (0.06 m³) or less.

b. Ten percent or less of the total rip rap weight can consist of spalls that pass a 5 in (125 mm) sieve.

B. Fabrication - Omitted

C. Acceptance

Test as follows:

Test	Method
Percent wear	AASHTO T 96
Petrographic analysis	ASTM C 295
Soundness (magnesium sulfate)	AASHTO T 104

D. Materials Warranty - Omitted

Section 810—Roadway Materials

810.1 General Description

This section includes the requirements for the materials used in roadway construction.

810.1.01 Related References

A. Standard Specifications - Omitted

B. Referenced Documents

GDT 4

GDT 6

GDT 7

GDT 67

810.2 Materials

810.2.01 Roadway Materials

A. Requirements

Do not use materials containing logs, stumps, sod, weeds, or other perishable matter.

1. Classes

   The materials are divided into six major classes. Classes I, II, and III are further subdivided and identified by description and physical property requirements specified in the table below and in Table 1. Classes IV, V, and VI are identified by descriptive requirements.

Class I	
IA1 and IA2	Medium- to well-graded sand or clayey sand.
IA3	Fine-grained, silty, or clayey sand; usually less dense than IA1 or IA2. These soils have an excellent bearing capacity.
Class II	
IIB1, IIB2, and IIB3	Medium- to well-graded sandy clays, sandy silts, and clays with some mica. These soils generally have low volume change properties and good densities that serve well as subgrade material.
IIB4	Similar to IIB1, IIB2, and IIB3, but generally contain more mica and are more sensitive to moisture. The bearing value of these soils is less predictable. The soils may or may not be satisfactory for subgrade material. Analyze file data or run laboratory and/or field tests for Class IIB4 when considering it for a subgrade material.
Class III	
IIIC1, IIIC2, IIIC3 and IIIC4	Medium- to fine-graded micaceous sandy silts, micaceous clayey silts, chert clays, and shaly clays. Undesirable characteristics are high volume change properties and/or low densities. The bearing values are unpredictable. The Department recommends testing these materials in a laboratory, where possible, before use. One exception is District 6, where chert clay soils are prevalent.

	Chert clay soils (IIIC4) with less than 55% passing the No. 10 (2 mm) sieve may be considered suitable for subgrade materials. These soils are found generally in the northwest corner of the state in Dade, Walker, Catoosa, Whitfield, Murray, Chattooga, Gordon, and Floyd counties.
Class IV	Highly organic soils or peat, muck, and other unsatisfactory soils generally found in marshy or swampy areas.
Class V	Shaly materials that are not only finely laminated but have detrimental weathering properties and tend to disintegrate.
Class VI	Rock or boulders that cannot be readily incorporated into the embankment by layer construction, and that contain insufficient material to fill the interstices when they are placed.

Table 1: Physical Properties (Material Passing No. 10 (2.00 mm) Sieve)

Sub-Class	No. 60 (250 µm) Sieve % Passing	No. 200 (75 µm) Sieve % Passing	Clay, %	Volume Change, %	Maximum Dry Density lbs/ft^3 (kg/m^3)
Class I					
A1	15-65	0-25	0-12	0-10	115+ (1840+)
A2	15-85	0-35	0-16	0-12	110+ (1760+)
A3	15-100	0-25	0-12	0-18	98+ (1570+)
Class II					
B1		0-30	0-20	0-10	120+ (1920+)
B2		0-45	0-30	0-15	110+ (1760+)
B3		0-60	0-50	0-20	105+ (1680+)
B4		0-75		0-25	90+ (1440+)
Class III					
C1		0-75		0-30	90+ (1440+)
C2				0-35	80+ (1280+)
C3				0-60	80+ (1280+)
C4*					80- (1280-)
*Chert clay soils in District 6 having less than 55% passing the No. 10 (2.00 mm) sieve may be considered suitable for subgrade material.					

B. Fabrication - Omitted

C. Acceptance

Test as follows:

Test	Method

Soil gradation	GOT 4
Volume change	GOT 6
Maximum density	GOT 7 or GOT 67

D. Materials Warranty - Omitted

Section 812—Backfill Materials

812.1 General Description

This section includes the requirements for four types of material used as backfill: foundation backfill, Types I and II, imperfect trench backfill, Type III, and mechanically stabilized wall backfill.

812.1.01 Related References

A. Standard Specifications

Section 810—Roadway Materials

B. Referenced Documents

AASHTO T 27

GDT 4

GDT 6

GDT 7

GDT 67

812.2 Materials

812.2.01 Foundation Backfill, Type I

A. Requirements

1. Use natural or artificial mixtures of materials consisting of hard, durable particles of sand or stone, mixed with silt, clay and/or humus material for Type I backfill.
2. Have the final blend of material meet the requirements of Class I or II soils in Subsection 810.2.01.

B. Fabrication - Omitted

C. Acceptance

Test as follows:

Test	Method
Soil gradation	GDT 4
Volume change	GDT 6
Maximum density	GDT 7 or GDT 67

D. Materials Warranty - Omitted

812.2.02 Foundation Backfill, Type II

A. Requirements

1. Type

   Use material that meets the requirements of Section 800, Class A or B aggregate. Crushed concrete may be used provided it meets the requirements of Section 800 that are applicable to Group 2 Aggregates.

Do not use backfill aggregate containing soil or decomposed rock.

2. Gradation

Use material that meets the following gradation requirements:

Sieve Size	% Passing by Weight
1-1/2 in (37.5 mm)	100
1 in (25 mm)	80-100
No. 8 (2.36 mm)	0-5

B. Fabrication - Omitted

C. Acceptance

Test as follows:

Test	Method
Sieve analysis	AASHTO T 27

D. Materials Warranty - Omitted

812.2.03 Imperfect Trench Backfill, Type III

A. Requirements

1. Type

Use material made from either of the following for Type III backfill:

- A natural soil with a density of less than 95 lb/ft³ (1520 kg/m³) when tested with GDT 7
- An artificial mixture of soil and organic material, such as hay, leaves, or straw

B. Fabrication - Omitted

C. Acceptance

Test the soil density with GDT 7, or an approved commercial equivalent.

1. Review the mixture and the percentages of each material, and approve a mixture suitable for the Project.

D. Materials Warranty - Omitted

812.2.04 Mechanically Stabilized Embankment Backfill

A. Requirements

Use material comprised of crushed stone, natural sand, or a blend of crushed stone and natural sand free of soils, organic or any other deleterious substances that meet the following additional requirements:

1 Crushed Stone

Use a material manufactured from Class A or B stone free of soil overburden and having a soundness loss of not more than 15 percent.

2. Natural Sand

Use material that consists of strong, hard, durable particles, is non-plastic, and has a durability index of at least 70.

3. Gradation

Sieve Size	% Passing by Weight
4 in (100 mm)	100
2 in (50 mm)	80 -100
No. 10 (2 mm)	20 - 90*
No 200 (75 μm)	0 - 12
* Natural Sand may be 20 - 100	

4. Chemical

Ensure the material meets the following chemical requirements:

Test Method	Requirement
pH	6.0 – 9.5
Resistivity	>3000 ohms/cm
Chlorides	<100 ppm
Sulfates	<200 ppm
Note: These chemical requirements are not applicable to MSE walls stabilized with an approved extensible reinforcement.	

5. Maximum Dry Density

Use backfill material with a maximum dry density equal to or greater than the design unit weight shown on the plans. If no maximum dry density of the backfill material is shown, use a weight of 125 lb/ft^3 (2000 kg/m^3) .

B. Fabrication - Omitted

C. Acceptance

Test the material as follows:

Test Method	Requirement
Percent Wear	AASHTO T96 (“A” Grading)
Sieve Analysis	AASHTO T 27

Material Passing No. 200 (75 μm) Sieve	AASHTO T 11
Durability Index	GDT 75
Maximum Dry Density	GDT 7 or GDT 24a, GDT 24b
Soundness (Magnesium Sulfate)	AASHTO T 104

D. Materials Warranty - Omitted

Section 815—Graded Aggregate

815.1 General Description

This section includes the requirements for material to be used for base, subbase, or shoulder course material, and includes graded aggregate, unconsolidated limerock base, and crushed concrete base.

815.1.01 Related References

A. Standard Specifications

Section 800—Coarse Aggregate

B. Referenced Documents

AASHTO T 27

ASTM C 295

ASTM D 3042

FL DOT Method FM5-515

SOP–1

GDT 63

815.2 Materials

815.2.01 Graded Aggregate

A. Requirements

1. Type

   Use graded aggregate base, subbase, or shoulder course material of uniform quality.

   a. Obtain the graded aggregate from an approved source or deposit that will yield a satisfactory mixture meeting all requirements of this Specification.

   b. Use material that is crushed or processed as a part of the mining operations, or, mix two grades of material so that when combined in the central mix plant, the mixture meets the specifications.

2. Retained on the No. 10 (2 mm) sieve

   Ensure that the material retained on the No. 10 (2 mm) sieve is Class A or B aggregate that meets the requirements of Section 800.

3. Passing the No. 10 (2 mm) sieve

   Ensure that any material passing the No. 10 (2 mm) sieve is relatively free of detrimental substances, such as soil overburden, decomposed rock, and/or swelling silts.

4. Stabilized Mixtures

   Ensure that mixtures to be stabilized react satisfactorily when mixed with Portland cement. The Engineer will specify the percentage of Portland cement to use.

5. Gradation

   Grade the graded aggregate base, subbase, or shoulder material as follows:

Sieve Size	Percent Passing By Weight
Group I Aggregates	
2 in (50 mm)	100
1-1/2 in (37.5 mm)	97-100
3/4 in (19.0 mm)	60-95
No. 10 (2 mm)	25-50 (Note 1, 2 and 3)
No. 60 (250 µm)	10-35

Sieve Size	Percent Passing By Weight
No. 200 (75 µm)	7-15
Group II Aggregates	
2 in (50 mm)	100
1-1/2 in (37.5 mm)	97-100
3/4 in (19 mm)	60-90
No. 10 (2 mm)	25-45 (Note 2 and 4)
No. 60 (250 µm)	5-30
No. 200 (75 µm)	4-11
NOTE 1: Group I aggregates having less than 37% passing the No. 10 (2 mm) sieve, shall have at least 9 percent passing the No. 200 (75 µm) sieve.	
NOTE 2: For graded aggregate stabilized with Portland Cement, 30-50 percent by weight shall pass the No. 10 (2 mm) sieve. All other requirements remain the same.	
NOTE 3: Material passing the No. 10 (2 mm) sieve shall have a sand equivalent of at least 20 for Group I aggregates.	
NOTE 4: Material passing the No. 10 (2 mm) sieve shall have a sand equivalent of at least 28 for Group II aggregates. Sand Equivalent values as low as 20 will be acceptable provided they are attributed exclusively to rock flour and the percent passing the No. 10 (2 mm) sieve does not exceed 40.	

B. Fabrication - Omitted

C. Acceptance

Test as follows:

Test	Method
Gradation	AASHTO T 27
Sand Equivalent	GDT 63

D. Materials Warranty - Omitted

Section 830—Portland Cement

830.1 General Description

This section includes the requirements for Portland cement, including Portland blast-furnace slag cement and Portland-Pozzolan cement.

830.1.01 Related References

A. Standard Specifications

Section 831–Admixtures

B. Referenced Documents

AASHTO M 85

AASHTO M 240

QPL 3

830.2 Materials

830.2.01 Portland Cement

A. Requirements

Use only Portland cements that are listed in QPL 3.

1. Types

   Use Portland cement that meets the requirements in AASHTO M 85. Portland cement types include:

Use	High Early Strength Concrete	Remaining Portland Cement Concrete
Portland cement	Types I or III	Types I or II

2. Ensure that the Portland cement concrete meets the low alkali and the false set requirements of AASHTO M 85.
3. Do not use cement that is damaged, partially set, lumpy, or caked.
4. Mixing and Storing

   Do not mix or store different brands or types of cement in the same bin. Do not mix or store the same brand of cement from different mills in the same bin.

B. Fabrication - Omitted

C. Acceptance

See the requirements in AASHTO M 85.

D. Materials Warranty - Omitted

830.2.02 Portland Blast-Furnace Slag Cement

A. Requirements

Use Portland blast-furnace slag cement in cement stabilization that meets the requirements of AASHTO M 240, Type IS.

B. Fabrication - Omitted

C. Acceptance

See requirements of AASHTO M 240, Type IS.

D. Materials Warranty - Omitted

830.2.03 Portland-Pozzolan Cement

A. Requirements

Use Portland-Pozzolan cement that meets the requirements of AASHTO M 240, Type IP, with the following modifications:

1. Limit the fly ash content to a maximum of 25 percent by weight.
2. Limit the Pozzolan to fly ash that meets the requirements of Subsection 831.2.03.
3. If grinding fly ash with Portland cement clinker to produce Portland-Pozzolan cement, do the following:

   Exclude the fineness and the loss-on-ignition requirements of Subsection 831.2.03.

   Ensure that the final blend of Portland-Pozzolan cement meets AASHTO M 240, Type IP requirements.
4. Wherever the Standard Specifications allow or specify Portland cement that meets the requirements of Subsection 830.2.01, you may substitute Portland-Pozzolan cement that meets the requirements of this Subsection.
5. If the substitute cement results in a higher cement factor than required for Type I cement, the cost of the additional cement will be borne by the Contractor.

B. Fabrication - Omitted

C. Acceptance

See the requirements of AASHTO M 240, Type IP.

D. Materials Warranty - Omitted

Section 843—Concrete Pipe

843.1 General Description

This section includes the requirements for reinforced concrete pipe.

843.1.01 Related References

A. Standard Specifications

Section 800—Coarse Aggregate

Section 801—Fine Aggregate

Section 831—Admixtures

Section 880—Water

B. Referenced Documents

AASHTO M 86(M 86M), Class II

AASHTO M 170 (M 170M)

AASHTO M 175 (M 175M) or AASHTO M 176 (M 176M)

QPL 4

GDT 16

843.2 Materials

843.2.01 Reinforced Concrete Pipe

A. Requirements

1. Type

   Use reinforced concrete pipe that meets the requirements of AASHTO M 170 (M 170M), with the changes described in the following table. For a list of sources, see QPL 4.

Material	Requirements	Other Modifications
Coarse aggregate	Subsection 800.2.01	Gradation requirements do not apply
Fine aggregate	Subsection 801.2.02	Gradation requirements do not apply
Fly ash	Subsection 831.2.03.A	None
Water	Subsection 880.2.01	None

NOTE: Before manufacture, you may request approval of modified designs that differ from the Specifications.

2. Certification

   File a certificate with the Macon - Bibb County Engineer stating that the concrete pipe manufactured for use on this project meets the requirements specified in this Section. Note: All references to “Engineer” imply the Macon Bibb County Engineer.

B. Fabrication - Omitted

C. Acceptance

Macon - Bibb County will test and inspect using GDT 16, if deemed necessary by the Engineer.

D. Materials Warranty

See the Certification requirements under Subsection 843.2.01.A.2.

843.2.02 Nonreinforced Concrete Pipe – Omitted

Section 843 Submittals

Paragraph Number	Description	Date Required	Inspection Check Mark
843.2.01. A.2	Certificate of Compliance	14 days prior to need	

Section 845-Smooth lined Corrugated Polyethylene (PE) Culvert Pipe

845.1 General Description

This section includes the requirements for smooth-lined, corrugated polyethylene culvert pipe.

845.1.01 Related References

A. Standard Specifications

General Provisions 101 through 150.

B. Referenced Documents

AASHTO M294

AASHTO Standard Specifications for Highway Bridges, Division II

QPL51

SOP-28

845.2 Materials

845.2.01 Smooth-lined, Corrugated Polyethylene (PE) Culvert Pipe

A. Requirements

1. Use pipe meeting the requirements of AASHTO M 294, Type S.
2. Use pipe evaluated by the National Transportation Product Evaluation Program (NTPEP) test facility or other approved test facility.
3. Ensure pipe is produced from an approved source listed on QPL21_.

4. Use fittings and couplings as recommended by the manufacturer and approved by the Office of Materials and Research. The fittings and couplings shall comply with the joint performance criteria of AASHTO Standard Specifications for Highway Bridges, Division II. Ensure that the joints are "soil tight" per the AASHTO bridge specifications.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

The Department will test and inspect using SOP-28.

D. Materials Warranty

General Provisions 101 through 150.

Section 866—Precast Concrete Catch Basin, Drop Inlet, and Manhole Units

866.1 General Description

This section includes the requirements for manufacturing the following to the dimensions shown on the Plans:

- Precast reinforced concrete catch basins
- Drop inlets
- Manhole units

866.1.01 Related References

A. Standard Specifications

Section 500– Concrete Structures

Section 853– Reinforcement and Tensioning Steel

B. Referenced Documents

AASHTO T 22

AASHTO T 24

QPL 4

GDT 16

866.2 Materials

The materials to be used shall meet the following requirements:

Material	Section
Reinforcement for Concrete	
Steel Bars	853.2.01
Steel Wire	853.2.06
Welded Steel Fabric	853.2.07
*Ensure that the concrete compressive strength is at least 4,000 psi (28 MPa). Do not use the gradation requirements.	

For a list of sources, see QPL 4.

866.2.01 Precast Concrete Catch Basin, Drop Inlet, and Manhole Units

A. Requirements

1. Reinforcement

   Follow the Plans, except as follows:

   a. Do not let reinforcement vary by more than 1/4 in (5 mm) from the position shown in the design, except at pipe connections.

   b. Ensure the cover on the reinforcement is not less than that shown on the Plans.

2. Ensure all precast concrete units are true to shape with smooth, dense, and uniform surfaces.

3. All concrete shall be Class AA1, 4,500 PSI, at 28 days.

B. Fabrication

1. Casting
   a. Place the concrete in each unit without interruption.
   b. Consolidate the concrete with an approved vibrator and hand-tamping as necessary. Force the concrete into the corners of the forms to prevent stone pockets or cleavage planes.
2. Holes for Pipes

   Make each hole about 4 in (100 mm) larger than the outside diameter of the appropriate pipe.
3. Curing:

   Cure the units with one of the following methods until the minimum compressive strength has been achieved, or for 24 hours, whichever comes first.
   a. Method 1
      1) Place the units in a curing chamber, free from outside drafts, and cure them in a moist atmosphere not exceeding 160 °F (70 °C).
      2) Use steam injection for the time and temperature needed to obtain proper curing.
      3) Construct the curing chamber and place the units so that steam may fully circulate around the entire unit.
   b. Method 2
      1) Keep the units wet by covering the concrete not in contact with the forms with wet burlap or other suitable material.
      2) Protect the units from freezing between when you place the concrete until curing is complete.
4. Removing the Forms

   Leave the forms in place until you can remove them without damaging the unit.
5. Quality of Work
   a. Correct minor surface cavities or irregularities that do not impair the service value of the unit, that can be corrected with marring the surface by pointing with an approved mortar. Apply the mortar immediately after removing the forms.
   b. Minor defects will not be cause for rejection.

C. Acceptance

1. Testing Facilities

   Ensure that the manufacturer to furnish facilities and assistance as required to let the Inspector sample and test quickly and efficiently.

NOTE: Check OPL 4 for pre-approved manufacturers that supply material compliant with this Specification.

2. Macon - Bibb County will accept the units based on a certificate of compliance with this section from the manufacturer. The certificate shall include the compressive strength of the concrete. The certificate, and site inspections, will determine the unit's conformance with the design and quality of work prescribed in these Specifications and on the Plans.
3. Macon - Bibb County will accept any unit that meets the test requirements, regardless of age.
4. Rejection

   The Inspector will reject units if they fail to meet any requirements in this Specification, and for any of the following defects:

   - Imperfect mixing and molding
   - Honeycombed or open texture
   - Exposure of the reinforcement that indicates the reinforcement is misplaced

5. Marking

   Ensure that each approved unit is marked with the name or trademark of the manufacturer and the date it was cast. The mark will be stenciled or otherwise placed so it is clearly legible at time of delivery.

   a. When approved by the Inspector, each unit will be stamped with the official mark of the Department or Certified Pipe Technician number (CPT) – (Not Applicable).

   b. Accepted units or finished units will be rejected at any time if found to be defective.

Section 866 Submittals

Paragraph	Description	Date Required	Inspection Check Mark
866.2.01.C.2	Certificate From Manufacturer	14 days prior to need	

Section 881—Fabrics

881.1 General Description

This section includes the requirements for the following fabrics:

- Plastic filter fabric
- Silt fence filter fabric

881.1.01 Related References

A. Standard Specifications - Omitted

B. Referenced Documents

Federal Specification CCC-C 419 Type III

ASTM D 36

ASTM D 146

ASTM D 412

ASTM D 1777

ASTM D 3786

ASTM D 4355

ASTM D 4632, GRAB

ASTM D 4751

ASTM D 4833

GDT 87

GDT 88

GDT 95

QPL 28

QPL 36

QPL 40

QPL 47

881.2 Materials

881.2.01 Plain Cotton Duck – Omitted

881.2.02 Plastic Filter Fabric

A. Requirements

1. Use pervious sheets of plastic yarn made from a long-chain synthetic polymer. Use polymer composes of at least 85 percent by weight of propylene, ethylene, amide, ester, or vinylidene chloride.

   Use a sheet of plastic yarn that contains stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultra-violet and/or heat exposure.
2. Ensure that the fabric is finished so that the filaments will retain their relative position with respect to each other.
3. Use fabric without defects, rips, holes, or flaws.

4. Use fabric that meets the following physical requirements for woven and non-woven fabric:

Woven Fabrics	
Tensile strength (any direction)	200 lbs (890 N) minimum
Bursting strength	500 psi (3.5 MPa) minimum
Elongation before breaking	10% to 35%
Percent open area	4.0% to 6.5%
Non-woven Fabrics	
Puncture resistance	30 lbs (135 N) minimum
Grab tensile strength	65 lbs (290 N) minimum
Grab elongation	40% minimum
Flow rate [H from 3 to 1 in (75 to 25 mm)]	50 gal/min/ ft² (34 liters/second/m²) (minimum) to 350 gal/ min/ft² (240 liters/second/m²) (maximum)

5. Seams
   a. Get approval on the seams from the Engineer before use on a Project.
   b. Use fabric that is sewn with thread of the same chemical requirements as the fabric, or use fabric bound with cement or heat. Either have the fabric bound or sewn at the point of manufacture or at a location approved by the Engineer.
   c. Seam Uses: You may use one seam in edge drain and underdrain applications.

You may bond or sew fabric together to form sections at least 6 ft (1.8 m) wide for use under rip rap or behind retaining walls.

6. Fabric Use
   a. Use woven fabrics beneath rip rap when dropping stone from 3 ft (1 m) or less.
   b. You may use woven fabrics that meet the flow rate for edge drains.
   c. Use non-woven fabrics to line edge drains, underdrains, or behind retaining walls, where specified.
   d. Do not use non-woven fabrics for filter beneath rip rap.

B. Fabrication - Omitted

C. Acceptance

Test according to the following:

Test	Method
Puncture resistance	ASTM D 4833
Tensile strength, elongation, grab strength	ASTM D 4632
Bursting strength	ASTM D 3786
Percent open area	GDT 88
Flow rate	GDT 87

1. See QPL 28 for acceptable woven and non-woven fabrics that meet the requirements of this Specification. See QPL 47 for acceptable Geocomposite wall drains.
2. The Department will reject any fabrics that meet this Specification but fail to perform in actual use.

D. Materials Care and Warranty

Wrap fabric in burlap or similar heavy duty protection during shipment and storage to protect it from mud, dirt, dust, and debris.

881.2.03 Silt Fence Filter Fabric

A. Requirements

1. Use approved silt fence from QPL 36.
   a. Type “A” and “B” Fences: Use either woven or nonwoven filter fabric for Type “A” and “B” fences. If using woven fabric, the fabric may have slit tape yarns in one direction (warp or fill) only.
   b. Type “C” Fences: Use non-calendered woven fabric constructed with monofilament yarns only.

NOTE: Approved fabrics must consistently exceed the minimum requirements of this Specification as verified by the GDOT Office of Materials and Research. If a fabric is removed from the Qualified Products List, do not use it in the work until the Department has reestablished the product’s acceptability.

2. Ensure that silt fence filter fabrics have the following characteristics:
   - Has strong rot-proof synthetic fibers formed into either a woven or non-woven fabric
   - Has no treatment or coating that might significantly alter its physical properties after installation
   - Contains stabilizers and/or inhibitors to make the filaments resistant to deterioration resulting from exposure to sunlight or heat
   - Makes a pervious sheet of synthetic fibers oriented into a stable network so that the fibers retain their relative position with respect to each other under normal handling, installation, and service conditions
   - Has finished fabric edges to prevent the outer yarn from pulling away from the fabric

- Has no defects or flaws that would significantly affect its physical and/or filtering properties
- Meets the following physical or dimensional requirements:

Type Fence	A	B	C
Minimum tensile strength, pounds (newtons) (1)	Warp – 120 (530) Fill – 100 (445)	Warp – 120 (530) Fill – 100 (445)	Warp– 260 (1155) Fill – 180 (800)
Elongation (% Max.)	40	40	40
Apparent opening size (max. sieve size)	No. 30 (600 um)	No. 30 (600 um)	No. 30 (600 um)
Flow rate, gal/ min./ft² (L/min./m²)	25 (1015)	25 (1015)	70 (2850)
Ultraviolet stability (2)	80	80	80
Bursting strength, psi (kPa)	175 (1200)	175 (1200)	175 (1200)
Minimum fabric width	36 in (900 mm)	22 in (550 mm)	36 in (900 mm)
1. Minimum roll average of five specimens. 2. Percent of required initial minimum tensile strength.			

B. Fabrication

The fabric may be manufactured with pockets for posts, hems with cord, or with posts pre-attached using staples or button head nails.

Ensure that the fabric has the manufacturer's mark, either with an approved color mark yarn in the fabric or the manufacturer's name and product trade name labeled on the fabric at a minimum of 100 ft (30 m) intervals.

C. Acceptance

Test according to the following:

Test	Method
Tensile strength	ASTM D 4632
Elongation	ASTM D 4632
Apparent opening size	ASTM D 4751
Flow Rate	GDT 87
Ultraviolet stability	ASTM D 4632 (after 300 hours weathering according to ASTM D 4355)
Bursting strength	ASTM D 3786, Diaphragm Bursting Strength Tester

D. Materials Care and Warranty

Wrap fabric in a heavy-duty protective covering during shipment and storage to protect it from mud, dirt, dust and debris.

Do not expose fabric to temperatures greater than 140 °F (60 °C).

Section 890—Seed and Sod

890.1 General Description

This section includes the requirements for seed and sod.

890.1.01 Related References

A. Standard Specifications - Omitted

B. Referenced Documents - Omitted

890.2 Materials

890.2.01 Seed

A. Requirements

1. Use seed that meets the requirements of the Georgia Seed Laws and Rules and Regulations.
2. The germination, purity, and maximum weeds specified in the Georgia Seed Laws for all seeds used by DOT are:

Germination and hard seed minimum	70%
Purity minimum	90%
Weed seeds maximum	2%
Noxious seeds maximum	300 seeds per lb (660 seeds per kg), subject to the limitations in Table 1

3. Seed Mixture

   When seed mixtures are specified, each variety of seed shall be furnished separately and mixed after approval by the Macon Bibb County Engineer. All references to “Engineer” in this specification, all other specifications for this project, imply the Macon Bibb County Engineer. Note: This item is (Seed Mixture) Not Applicable – All site grassing for this project shall be sod, with the species to be specified by the Engineer and property owners.

Table 1—Noxious Weed List

Name		Limitations
1.	Field Bindweed (Convolvulus arvensis)	Prohibited
2.	Cocklebur	Prohibited
3.	Hedge Bindweed (Convolvulus sepium)	Prohibited
4.	Nutgrass (Cyperus Rotundus)	Prohibited
5.	Blessed Thistle (Cnicus benedictus)	9 per pound (20 per kg)
6.	Wild Onion and/or Wild Garlic ((Allium spp.)	27 per pound (60 per kg)
7.	Sandbur (Cenchrus pauciflorus)	27 per pound (60 per kg)
8.	Johnson Grass (Sorghum halepense)	100 per pound (220 per kg)
9.	Wild Mustard and Turnips (Brassica spp.)	27 per pound (60 per kg)
10.	Blue Weed (Helianthus ciliaris)	200 per pound (440 per kg)
11.	Wild Radish (Raphanus raphanistrum)	27 per pound (60 per kg)

12. Dodders (Cuscuta spp.)	100 per pound (220 per kg)
13. Canada Thistle (Cirsium arvense)	100 per pound (220 per kg)
14. Quack Grass (Agrophron repens)	100 per pound (220 per kg)
15. Russian Knapweed (Centaurea Picris)	100 per pound (220 per kg)
16. Bermuda Grass (Cynodon dactylon)	300 per pound (660 per kg)
17. Cheat or Ches (Bromus secalinus and/or Bromus commutatus)	300 per pound (660 per kg)
18. Darnel (Lolium temulentum)	200 per pound (440 per kg)
19. Cornockle (Agrostemma githago)	100 per pound (220 per kg)
20. Horsenettle (Solanum carolinense)	200 per pound (440 per kg)
21. Purple Nightshade (Solanum elaeagnifolium)	200 per pound (440 per kg)
22. Buckhorn Plantain (Plantago lanceolata)	200 per pound (440 per kg)
23. Docks (Rumex spp.)	100 per pound (220 per kg)
24. Gian Foxtail	100 per pound (220 per kg)
25. Sheep sorrel (Rumex acetosells)	200 per pound (440 per kg)
26. Red Rice (oryza sativa variety)	300 per pound (660 per kg)
27. Sorghum almum	100 per pound (220 per kg)
Sum Total Noxious Weeds	300 per pound (660 per kg)

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

1. Get approval from the Engineer before sowing seed.
2. Ensure each bag of seed is tagged with an analysis tag showing the results of a test made within 9 months of planting.
   a. Collect and check the tags to ensure that they show a lot number, a test date within 9 months, and that the seed quality meets the requirements in Table 1 .
   b. The Georgia Department of Agriculture and the laboratory will randomly sample seed.
3. Even though the Engineer approves the seed, you are still responsible to furnish and sow seed that meets these Specifications at the time of sowing.
4. If the Engineer requires, provide seed samples to the Engineer early enough before seeding to allow further testing before seeding.
5. You may increase the rate of seeding to obtain the minimum pure live seed content specified if a low percentage of germination causes the quality of the seed to fall below the minimum.

NOTE: You may increase the seeding rates if the noxious weed seed per square yard (meter) does not exceed the allowable quantity at the regular rate of seeding.

6. The Engineer will reject wet, moldy, or otherwise damaged seed.

D. Materials Warranty - Omitted

890.2.02 Sod

A. Requirements

1. Use living, growing sod of the designated species for block or big roll sod. This includes sod that is dormant during the cold or dry season and capable of renewing growth after the dormant period.
2. Obtain all sod from approved nurseries that have a Georgia Live Plant License.
3. Ensure that at least 75 percent of the plants in the sod are of the designated variety of grass.

B. Fabrication

1. Mow grass and weeds to a maximum height of 3 in (75 mm). Rake and remove the grass before cutting the sod.
2. Cut the sod into the following sizes:
   - Block sod—12 in (300 mm) by 22 in (550 mm)
   - Big roll sod—21 in (525 mm) by 52 ft (15.8 m)

   Ensure that the sod has at least 1/2 in (15 mm) of soil adhering firmly to the roots.
3. Always exercise care to retain the soil on the roots of the sod during cutting, transporting, and planting. Do not dump the sod from vehicles.

C. Acceptance

The Engineer will accept the material based on the following:

1. Notify the Engineer to inspect the sod sources before it is harvested.
2. The Engineer will inspect the sod while it is being planted.
3. The Engineer will reject sod with weeds or other growth or foreign material that may be detrimental to the planting. Sod that is excessively dried out, exposed to heat or not viable will also be rejected.

Do not assume that an approval of a source means that the material is accepted.

D. Materials Warranty

1. Transplant the sod within 72 hours from the time it is harvested.
2. Sod that is not transplanted within 24 hours shall be kept moist and protected from exposure to heat, direct sunlight, and freezing until it is transplanted. Do not exceed the 72-hour time limit for transplanting all of the harvested sod.
3. Cut and install sod only when the soil moisture conditions are favorable.

Section 891—Fertilizers

891.1 General Description

This section includes the requirements for fertilizers.

891.1.01 Related References

A. Standard Specifications - Omitted

B. Referenced Documents

Georgia Plant Food Act

891.2 Materials

891.2.01 Fertilizer

A. Requirements

1. Use fertilizer of the grades specified that meet the requirements of the Georgia Plant Food Act in effect at the date of Advertisement for Bids.
2. Any fertilizer that becomes caked or otherwise damaged, making it unsuitable for use, shall be replaced at the Contractor's expense.

B. Fabrication - Omitted

C. Acceptance

The Macon - Bibb County Engineer will accept fertilizer that meets the above requirements.

D. Materials Warranty - Omitted

Section 893—Miscellaneous Planting Materials

893.1 General Description

This section includes the requirements for miscellaneous planting materials, such as the

following: Plant topsoil

893.1.01 Related References

A. Specifications

Section 814—Soil Base Materials

B. Referenced Documents

"USA Standard for Nursery Stock" of the American Association of Nurserymen, Inc.

"Standardized Plant Names"

"Method of Test for Moisture Content of Hay or Straw" United States Department of Agriculture and the United States Composting Council, "Test Methods for the Examination of Composting and Compost" (TMECC).

GDT 41

893.1.02 Submittals - Omitted

893.2 Materials

893.2.01 Plant Topsoil

A. Requirements

1. Use plant topsoil with the following characteristics:
   - Obtained from well-drained, arable land, but not from fields where tobacco grew in the last three years, or where Johnson grass or kudzu is present.
   - Friable, loamy soil with between 2 and 30 percent organic matter. Determine the percentage by measuring the loss on ignition of oven-dried samples ignited at 1,200 °F (650 °C).
   - Reasonably free from subsoil, heavy or stiff clay, coarse sand, and other deleterious
   - substances. Has no toxic amount of acid or alkaline elements.Can sustain healthy plant life.
   - Meets the grade requirements of Subsection 814.2.01.A.8.
   -
2. The Department reserves the right to inspect all plant topsoil during the planting period. The Department will reject any material that does not meet the Specifications.
3. Do not use frozen, muddy, or nonfriable topsoil.
4. Before delivering any topsoil to the job site, clear stones larger than 2 in (50 mm) size and roots, sticks, brush, coarse litter, and other substances that would interfere with mixing, planting, and maintenance.

Section 894—Fencing

894.1 General Description

This section includes the requirements for the following types of fence and fencing accessories:

- Silt fabric fencing

894.1.01 Related References

A. Standard Specifications

Section 862—Wood Posts and Bracing

Section 881—Fabrics

B. Referenced Documents

ASTM			AASHTO
A 116	A 392	A 817	M 181
A 121	A 491	A 824	
A 123/ A 123 M	A 584	F 626	
A 153/ A 153M	A 585	F 1043	
A 239	A 702	F 1083	

894.2 Materials

894.2.01 Silt Fabric Fencing – Please note that silt fencing is the only type of "fencing" specified for this project.

A. Requirements

1. Fabric
   a. See Sub section 881.2.07, "Silt Fence Filter Fabric," for the types of fabric available.
   b. Use a woven wire support fence with Type "C" fence.
      1) Ensure that the wire fence fabric is at least 32 in (810 mm) high with at least 6 horizontal wires.
      2) Ensure that the vertical wires have a maximum spacing of 12 in (155 mm).
      3) Ensure that the top and bottom wires are at least 10 gauge (2.49 mm) and all other wires are at least 12-1/2 gauge (2.03 mm).
      4) You may use other designs subject to approval by the Macon Bibb County Engineer.
2. Posts

   Use post sizes and types as determined by the type of fence being installed. Generally hardwood posts will be limited to ash, hickory, or oak. Other hardwoods may be acceptable if approved by the Macon Bibb County Engineer.

   a. Type "A" Fence: Use either wood or steel posts that are at least 4 ft (1.2 m) long.
      1) If using soft wood, use posts that are at least 3 in (75 mm) in diameter or nominal 2 x 4 in (33 x 89 mm) and straight enough to provide a fence without noticeable misalignment.
      2) If using hardwood, use posts that are 1-1/2 x 1-1/2 in (38 x 38 mm) with a minus tolerance of 1/4 in (6 mm) providing the cross sectional area is at least 2.25 in^2 (1440 mm^2).

3) If using steel, use posts that are “U,” “T,” or “C” shaped with a minimum weight of 1.15 lb/ft (1.7 kg/m), and have projections for fastening the fence to the posts.

b. Type “B” Fence: Use either wood or steel posts that are at least 3 ft (900 mm) long.

1) If using soft wood, use posts that are at least 2 in (50 mm) in diameter or nominal 2 x 2 in (33 x 33 mm).

2) If using hardwood, use posts that are 1 x 1 in (25 x 25 mm) with a minus tolerance of 1/ 4 in (6 mm) providing the cross sectional area is a minimum of 1 in^2 (625 mm^2).

3) If using steel posts, use types “U,” “T,” or “C” shapes with a minimum weight of 0.75 lb/ft (1.1 kg/m).

c. Type “C” Fence: Use only steel posts that are at least 5 ft (1.5 m). Use “U,” “T,” or “C” shaped posts with a minimum weight of 1.15 lb/ft (1.7 kg/m). Use posts that have projections for fastening the woven wire and filter fabric.

NOTE: You must use woven wire to provide extra support for Type “C” fence installations.

3. Fasteners for Wooden Posts

a. Wire Staples: Use staples that are at least 17 gauge (1.37 mm), legs at least 1/2 in (13 mm) long, and a crown at least 3/4 in (19 mm) wide.

b. Nails: Use nails that are at least 14 gauge (2.03 mm), 1 in (25 mm) long, with button heads of at least 3/4 in (19 mm).

D. Materials Warranty - Omitted