

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

**ATLANTA BELTLINE
NORTHEAST TRAIL SEGMENT 2, PHASE 2**

Section 999 Stormwater Detention Ponds and Bioretention Areas

999.1 General Description

This work includes materials and equipment, subgrade preparation, pipe installation, bed preparation, pipe placement, concrete pipe, backfilling, riser/outlet structure installation, embankment construction, impoundment area construction, outlet protection, vegetative stabilization, and miscellaneous items for the construction and installation of Stormwater Detention Ponds and Bioretention Areas. All references to Bioretention Areas are inclusive of swales.

999.1.01 Definitions

Detention Pond - Storm water best management practice (BMP) that provides general flood protection and can also control extreme floods such as a 1 in 100-year storm event. The pond will manage the excess runoff generated by the newly constructed impervious trail surfaces.

Bioretention Pond - A bioretention system that provides efficient treatment of stormwater through fine filtration, extended detention and some biological uptake.

Bioswale - Landscape elements designed to remove silt and pollution from surface runoff water. They consist of a swaled drainage course with gently sloped sides (less than six percent) and filled with vegetation, compost and/or riprap. The water's flow path, along with the wide and shallow ditch, is designed to maximize the time water spends in the swale, which aids the trapping of pollutants and silt.

Each of the components of the bioretention area is designed to perform a specific function. The grass buffer strip reduces incoming runoff velocity and filters particulates from the runoff. The sand bed also reduces the velocity, filters particulates, and spreads flow over the length of the bioretention area. Aeration and drainage of the planting soil are provided by the 0.5 m (20 in) deep sand bed. The ponding area provides a temporary storage location for runoff prior to its evaporation or infiltration. Some particulates not filtered out by the grass filter strip or the sand bed settles within the ponding area.

A basin or pond functions by allowing large flows of water to enter but limits the outflow by having a small opening at the lowest point of the structure. The size of this opening is determined by the capacity of underground and downstream culverts and washes to handle the release of the contained water.

Bioretention Soils – Permeable soils for the infiltration of storm water runoff at a minimum rate meeting the requirements of the Georgia Stormwater Management Manual, and soils having sufficient moisture retention to support healthy vegetation.

Bioretention Swale (biofiltration trench) - Bioretention system located within the base of a swale. The purpose of such a structure is to provide conveyance of storm water in addition to the filtration of fine and coarse sediments.

Bioretention - The process in which contaminants and sedimentation are removed from stormwater runoff. Stormwater is collected into the treatment area, which consists of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants.

999.1.02 Related References

A. Georgia Department of Transportation Specifications

- Section 101 – Definitions and Terms
- Section 105 – Control of Work
- Section 106 – Control of Materials
- Section 161 – Control of Soil Erosion and Sedimentation
- Section 170 – Silt Retention Barrier
- Section 171 – Silt Fence
- Section 202 – Random Clearing and Grubbing
- Section 204 – Channel Excavation
- Section 207 – Excavation and Backfill for Minor Structures
- Section 208 – Embankments
- Section 210 – Grading Complete
- Section 550 – Storm Drain Pipe, Pipe-Arch Culverts, and Side Drain Pipe
- Section 573 – Underdrains
- Section 643 – Fence
- Section 668 – Miscellaneous Drainage Structures
- Section 700 – Grassing
- Section 703 – Tree Wells, Tree Walls, and Root Protection
- Section 706 – Turf Establishment
- Section 708 – Plant Topsoil
- Section 711 – Turf Reinforcement Matting
- Section 716 – Erosion Control Mats
- Section 725 – Weed Control
- Section 805 – Rip Rap and Curbing Stone
- Section 812 – Backfill Materials
- Section 813 – Pond Sand
- Section 843 – Concrete Pipe
- Section 846 – Polyvinyl Chloride (PVC) Drain Pipe
- Section 866 – Precast Concrete Catch Basin, Drop Inlet, and Manhole Units
- Section 997 – Mowing

B. Referenced Documents

- American Association of Nurserymen (AAN)
- American Association of State Highway and Transportation Officials (AASHTO)
- American Concrete Institute (ACI)
- American National Standards Institute (ANSI)
- American Society of Civil Engineers (ASCE)
- American Society of Testing and Materials (ASTM)
- Atlanta Regional Commission (ARC)
- Georgia Department of Transportation (DOT)

- Georgia Stormwater Management Manual, 2010
- Natural Resources Conservation Service (NRCS)
- American Society of Agricultural Engineers (ASAE)
- Testing Methods for the Examination of Compost and Composting (TMECC)
- Seal of Testing Assurance (STA)

Obtain approval by the Engineer for all materials, equipment, accessories and components that are not in accordance with the specific standards and requirements. Ensure conflicts between referenced industry specifications and this specification are addressed by the Engineer.

Use the latest version of referenced industry specifications, standards, and practices in force and in existence as of this project's advertisement date unless otherwise noted.

Acquire and use all applicable manuals, guidelines, standards and practices applying to the design, construction, and testing activities required to complete this project.

999.1.03 Submittals

This chart is to be used as a guide and does not relieve the Contractor from submitting additional information to form a complete submittal package.

Section 999 Submittal Requirements									
Material	Specification Reference	Catalog Cuts	Mfg. Spec.	Materials Cert.	Lab Test	Installation Procedure	Test Plan	Training Plan Maint Procedure	Submittal Due Date (Cal. Days after NTP)
Earth Fill	999.2.01			X					30 Days
Bioretention Soils (Refer to 999.1.04)	999.2.02			X			X		30 Days
Structural Backfill	999.2.03			X			X		30 Days
Reinforced Concrete Pipe (RCP)	999.2.04	X	X	X		X			30 Days
Concrete	999.2.05			X	X		X		30 Days
Rock Rip Rap	999.2.06			X					30 Days
Filter Fabric	999.2.07	X	X			X			30 Days
Filter Sand	999.2.08	X	X			X			30 Days
Outlet Control Structures (OCS)	999.2.09			X					30 Days
Polyvinyl Chloride (PVC) Drain Pipe	999.2.10	X	X	X					30 Days

Temporary Grassing	999.2.11			X					30 Days
Permanent Grassing (Under Separate Contract)	999.2.12	X	X	X		X			30 Days

999.1.04 Submittals - Bioretention Soils

The following added requirements must be submitted to the Engineer for approval at least 30-days prior to the anticipated construction date:

- a. A 100-pound minimum sample of the mixed Bioretention Soil.
- b. A 10-pound minimum sample of the mineral aggregate.
- c. A 10-pound minimum sample of compost.
- d. Grain size analysis results of the fine sand component performed in accordance with ASTM D 422, Standard Test Method for Particle size Analysis of Soils.
- e. Quality analysis results for compost performed in accordance with Seal of Testing Assurance (STA) standards as specified in this document.
- f. Organic content test results of mixed Bioretention Soil. Organic content test shall be performed in accordance with Testing Methods for the Examination of compost and Composting (TMECC) 05.07A, “Loss-On-Ignition Organic Matter Method”.
- g. Modified Proctor compaction testing of mixed Bioretention Soil, performed in accordance with ASTM D 1557, Test Method for Laboratory compaction Characteristics of Soil Using Modified Effort.
- h. A description of the equipment and methods proposed to mix the mineral aggregate and compost to produce Bioretention Soil.
- i. Permeability or hydraulic conductivity testing of the Bioretention Soil, performed in accordance with ASTM D 2434, Standard Test Method for Permeability of Granular Soils. For the Landscape Bioretention Soil assume a relative compaction of 85 percent of Modified maximum dry density (ASTM D 1557).
- j. Provide the following information about the testing laboratory(ies):
 - 1. Name of laboratory(ies), including contact person(s),
 - 2. Address(es),
 - 3. Phone contact(s),
 - 4. E-mail address(es), and
 - 5. Laboratory qualifications.

Provide six (6) copies of complete and thorough submittal data for all components required for this item. Furnish the submittal data to the Engineer.

Include in the submittal data complete technical and performance specifications on all hardware, materials and training to be performed under this contract. Provide technical schematics clearly showing how the proposed equipment works and is connected and configured.

Organize each package of submittal data and separate by hardware item. Include an index of all submittal data documents contained within the package. Provide neat, legible, and orderly submittal data. Organize each package of submittal data and separate by hardware item.

Use the “Materials Certification Package Index and Transmittal Form”, contained in Section 105.02 of the Special Provisions, to document and list all material and components included in the submittal package.

Any submittal data submitted without the Index/Transmittal form or is incomplete or not clear will be rejected.

999.2 Materials

999.2.01 Earth Fill

The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6-inches, frozen or other objectionable materials. Fill material for the center of the embankment shall conform to Unified soil classification GC, SC, CH, or CL and must have at least 30% passing the No. 200 sieve. Consideration may be given to the use of other materials in the embankments designed by a geotechnical engineer. Materials used in the outer shell of the embankment must have the capacity to support vegetation of the quality required to prevent erosion of the embankment.

999.2.02 Bioretention Soils

Bioretention soils shall be in accordance with this project Special Provision.

999.2.03 Structural Backfill

Structural backfill shall be in accordance with the applicable GDOT Specifications

999.2.04 Reinforced Concrete Pipe

Reinforced concrete pipe (RCP) shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C 361.

999.2.05 Concrete

Concrete shall be in accordance with the applicable GDOT Specifications.

999.2.06 Rock Rip Rap

Rip Rap shall be in accordance with the applicable GDOT Specifications.

999.2.07 Filter Fabric

Filter fabric placed beneath the rip rap shall meet federal department of transportation requirements for a Class "C" filter fabric.

999.2.08 Filter Sand

Filter sand shall be in accordance with the applicable GDOT Specification.

999.2.09 Outlet Control Structures

Outlet Control Structures shall be in accordance with the applicable GDOT Specifications.

999.2.10 Polyvinyl Chloride (PVC) Drain Pipe

Polyvinyl Chloride (PVC) shall be in accordance with the applicable GDOT Specification.

999.2.11 Temporary Grassing

Grassing shall be in accordance with the applicable GDOT Specifications.

999.2.12 Permanent Grassing

Permanent grassing is covered under a separate contract.

999.3 Construction Requirements

Ensure that all construction for the equipment, materials, components and assemblies of the Stormwater Detention Ponds and Bioretention Areas conform to the manufacturer's requirements and recommendations.

Install Stormwater Detention Ponds and Bioretention Areas at the locations indicated on the Plans. Coordinate Contractor installation activities with other utilities along the project corridor and the Engineer.

999.3.01 Personnel

General Provisions 101 through 150

999.3.02 Equipment

General Provisions 101 through 150

999.3.03 Preparation

General Provisions 101 through 150

999.3.04 Fabrication

General Provisions 101 through 150

999.3.05 Construction

999.3.05.01 Site Preparation

Site preparation shall be in accordance with the applicable GDOT Specifications and the following provisions:

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots, and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15-feet of the toe of the embankment, and within 25-feet of the principal spillway outlet.

Areas to be covered by the impoundment, ponds, and swales will be cleared of all trees, brush, logs, fences, rubbish and other objectionable materials unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface, with the exception of areas designated for bioretention. For bioretention areas; trees, brush, and stumps shall be removed, including roots.

All cleared and grubbed material shall be disposed of outside and below the limits of the pond as directed by the Engineer. A sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated area.

999.3.05.02 Earth Fill

Earth fill shall be in accordance with the applicable GDOT Specifications and the following provisions:

Material – The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6-inches, frozen or other objectionable materials. Fill material for the center of the embankment shall conform to Unified soil classification GC, SC, CH, or CL and must have at least 30% passing the No. 200 sieve. Consideration may be given to the use of other materials in the embankments designed by a geotechnical engineer. Materials used in the outer shell of the embankment must have the capacity to support vegetation of the quality required to prevent erosion of the embankment.

Placement – Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8-inch thick (prior to compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment.

Compaction – The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used.

The minimum required density shall not be less than 95% of maximum dry density with a moisture content within 2% of the optimum. Each layer of fill shall be compacted as necessary to obtain the density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

Embankment Core – The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of 4-feet. The height shall extend up to at least the 100-year water elevation or as shown on the plans. The side slopes shall be 1:1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment.

999.3.05.03 Bioretention Soils

Bioretention soils shall be in accordance with the applicable Special Provision and the GDOT Specifications and the following provisions:

Material – The bioretention soil material shall meet the material requirements within the applicable Special Provision.

Placement and Compaction – Mixing or placing bioretention soil will not be allowed if the area receiving bioretention soil is wet or saturated or has been subjected to more than ½-inch of precipitation within 48-hours prior to mixing or placement. Engineer shall have final authority to determine if wet or saturated conditions exist.

Place Landscape Bioretention Soil loosely. Final grade shall be measured only after the soil has been water compacted, which requires filling the cell with water, without creating any scour or erosion, to at least 1-inch of ponding. If water compaction is not an option, final grade shall be measured at „X“ inches above the grade specified on the plans to allow for settling after the first storm. „X“ shall be calculated by depth of soil times 0.85 and rounded up to the nearest whole number.

Place Turf Bioretention Soil in loose lifts not exceeding 8-inches. Compact Turf Bioretention Soil to a relative compaction of 58-percent of Modified maximum dry density (ASTM D 1557), where slopes allow, as determined by the Engineer. Where Turf Bioretention Soil is placed within the trail shoulder, compact to a relative compaction of 90-percent of Modified maximum dry density (ASTM D 1557).

Contractor shall not start bioretention construction until the site draining to the bioretention area has been stabilized and the Engineer gives a authorization.

At the locations shown on the drawings, excavate, grade, and shape to the contours indicated to accommodate placing of bioretention soil to the thickness required. Dispose of excavated soils or reuse elsewhere, as the Contractor or Engineer will allow. Scarify the subgrade soil a minimum of 2-inches deep where slopes allow, as determined by the Engineer prior to placing bioretention soil.

Mixing or placing bioretention soil will not be allowed if the area receiving bioretention soil is wet or saturated or has been subjected to more than ½-inch of precipitation within 48-hours prior to mixing or placement. Engineer shall have final authority to determine if wet or saturated conditions exist.

Place Landscape Bioretention Soil loosely. Final grade shall be measured only after the soil has been water compacted, which requires filling the cell with water, without creating any scour or erosion, to at least 1 -inch of ponding. If water compaction is not an option, final grade shall be measured at „X“ inches above the grade specified on the plans to allow for settling after the first storm. „X“ shall be calculated by depth of soil times 0.85 and rounded up to the nearest whole number.

Place Turf Bioretention Soil in loose lifts not exceeding 8-inches. Compact Turf Bioretention Soil to a relative compaction of 58-percent of Modified maximum dry density (ASTM D 1557), where slopes allow, as determined by the Engineer. Where Turf Bioretention Soil is placed within the trail shoulder, compact to a relative compaction of 90-percent of Modified maximum dry density (ASTM D 1557).

Mineral Aggregate for Bioretention Soil- Mineral aggregate shall be free of wood, waste, coating, or any other deleterious material. All aggregate passing the #200 sieve size shall be non-plastic.

Mineral Aggregate for Turf and Landscape Bioretention Soil- Mineral aggregate for Turf and Landscape Bioretention soils shall be analyzed by an accredited lab using #200, #100, #60, #40, #20, #10, #4, 3/8-inch, and 1-inch sieves, and meet the following gradation:

Sieve Size	Percent Passing
3/8-inch	100
No. 4	95 – 100
No. 10	75 – 90
No. 40	25 – 40
No. 100	4 – 10
No. 200	2 – 5

Efforts should be made to have the mineral aggregate for Turf and Landscape Bioretention soils meet the following gradation coefficients: Coefficient of Uniformity ($C_u = D_{60}/D_{10}$) equal to or greater than 6; and Coefficient of Curve ($C_c = \frac{D_{40}^2}{D_{10}D_{60}}$) greater than or equal to 1 and less than or equal to 3.

Bioretention Soil - Bioretention Soil shall be a well-blended mixture of mineral aggregate and compost measured on a volume basis.

Landscape Bioretention Soil - Landscape Bioretention soil shall consist of 2 parts compost, 35 to 40 percent, by volume meeting the requirements of Section 999.4.04 and 2 parts mineral aggregate, 60 to 65 percent, by volume meeting the requirements of Section 999.3.02. The mixture shall be well blended to produce a homogeneous mix. Efforts should be made to attain organic matter content as close to 5 to 6 percent as possible, with the final mix to be determined by the Engineer based on samples and test results submitted.

Turf Bioretention Soil - Turf Bioretention soil shall consist of 2 parts - compost, 30 to 35 percent, by volume meeting the requirements of Section 999.4.04 and 2 parts mineral aggregate, 65 to 70 percent, by volume meeting the requirements of Section 999.3.02. The mixture shall be well blended to produce a homogeneous mix. Efforts

should be made to attain organic matter content as close to 5 to 6 percent as possible, with the final mix to be determined by the Engineer based on samples and test results submitted.

Composted Material- Compost products shall be the result of the biological degradation and transformation under controlled conditions designed to promote aerobic decomposition. Compost shall be stable with regard to oxygen consumption and carbon dioxide generation. Compost shall be mature with regard to its suitability for serving as a soil amendment and an erosion control BMP as defined below. The compost shall have a moisture content that has no visible free water or dust produced when handling the material.

Compost production and quality shall meet the following criteria:

1. Compost material shall be tested in accordance with Testing Methods for the Examination of Compost and Composting (TMECC) Test Method 02.02-B, "Sample Sieving for Aggregate Size Classification".

Compost shall meet the following:

Percent passing 1-inch: greater than or equal to 99%, and less than or equal to 100%
Percent passing 5/8-inch: greater than or equal to 90%, and less than or equal to 100%
Percent passing 1/4-inch: greater than or equal to 40%, and less than or equal to 90%

2. The pH shall be between 5.5 and 8.0 when tested in accordance with TMECC 04.11-A, "1:5 Slurry pH".
3. Manufactured inert material (plastic, concrete, ceramic, metal, etc.) shall be less than 1.0 percent by weight as determined by TMECC 03.08-A: Percent Dry Weight Basis".
4. Organic matter content should be between 45 and 65 percent dry weight as determined by TMECC 05.07A, "Loss-On-Ignition Organic Matter Method".
5. Soluble salt shall be less than 6.0 mmhos/cm tested in accordance with TMECC 04.10-A, "1:5 Slurry Method, Mass Basis".
6. Maturity shall be greater than 80% in accordance with TMECC 05.05-A, "Germination and Vigor".
7. Stability shall be 7 or below in accordance with TMECC 05.08-B, "Carbon Dioxide Rate".
8. The compost must have a minimum of 65 percent recycled material, by volume. A maximum of 35 percent by volume of organic wastes, including post-consumer food waste, but not including biosolids.
9. Carbon to nitrogen ratio shall be less than 25:1 as determined using TMECC 04.01 "Total Carbon" and TMECC 04.02D "Total Kjeldhal Nitrogen".
10. The Engineer may also evaluate compost for maturity using the Solvita Compost Maturity Test at time of delivery. Compost shall score a number 6 or above on the solvita Compost Maturity Test.

The compost supplier shall test all compost products within 90 calendar days prior to application. Samples will be taken using the Seal of Testing Assurance (STA) sample collection protocol. (The sample collection protocol can be obtained from the U. S. Composting Council, 4250 Veterans Memorial highway, Suite 275, Holbrook, NY 11741 Phone: 631-737-4931, www.compostingcouncil.org). The sample shall be sent to an independent STA Program approved laboratory. The compost supplier shall pay for the tests. A copy of the approved STA Program laboratory test report shall be submitted to the Engineer prior to the initial application of the compost.

Compost not conforming to the above requirements or taken from a source other than those tested and accepted shall be immediately removed for the project and replaced with acceptable material at no cost to the owner

999.3.05.04 Structure Backfill

Structural Stormwater Detention Pond and Bioretention Area backfill shall be in accordance with the applicable GDOT Specifications and the following provisions:

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed 4-inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than 4-feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of the concrete structure or pipe, unless there is a compacted fill of 24-inches or greater over the structure or pipe.

999.3.05.05 Reinforced Concrete Pipe (RCP)

Reinforced Concrete Pipe (RCP) shall be in accordance with the applicable GDOT Specifications and the following provisions:

Materials– Reinforced concrete pipe (RCP) shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C 361.

Bedding – Reinforced concrete pipe conduits shall be laid in a concrete bedding / cradle for their entire length. This bedding / cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 50% of its outside diameter with a minimum thickness of 6-inches. Gravel bedding is not permitted.

Laying pipe – Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care should be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4-feet from the riser.

Backfilling – Backfilling shall conform with Structural Backfill.

999.3.05.06 Concrete

Concrete shall be in accordance with the applicable GDOT Specifications.

999.3.05.07 Rip Rap

Rip Rap shall be in accordance with the applicable GDOT Specifications.

999.3.05.08 Filter Fabric

Filter Fabric shall be in accordance with the applicable GDOT Specifications and the following provisions:

Filter fabric placed beneath the rip rap shall meet federal department of transportation requirements for a Class “C” filter fabric. Some acceptable filter fabrics that meet the Class “C” criteria include:

- Mirafi 180-N
- Amoco 4552
- Webtec N07
- Geolon N70
- Carthage FX-70S
- “or approved equal”

999.3.05.09 Outlet Control Structures (OCS)

Outlet Control Structures (OCS) shall be in accordance with the applicable GDOT Specifications and the following provisions:

Refer to applicable drawings for structure details.

999.3.05.10 Temporary Grassing

Grassing shall be in accordance with the applicable GDOT Specifications. Permanent Grassing is included within a separate contract.

999.3.05.11 Sand Filter

Filter sand shall be in accordance with the applicable GDOT Specifications and placed per the project drawings.

999.3.06 Quality Acceptance

Perform acceptance testing for all work provided under this Contract at each Stormwater Detention Pond and Bioretention Area installation.

Obtain Engineer's approval for all test procedures prior to beginning acceptance testing.

Notify the Engineer of a desired acceptance test schedule no less than fourteen Calendar days prior to beginning testing.

Complete all work prior to the beginning of any acceptance testing at a given Stormwater Detention Pond site.

Perform all testing in the presence of the Engineer.

Have a complete copy of all materials and equipment submissions and all documentary items on hand at all acceptance testing sessions.

999.3.07 Contractor Warranty and Maintenance

Provide a manufacturer's support (usual and customary warranties) period for all equipment and materials furnished and installed as part of the Stormwater Detention Ponds.

999.4 Measurement

Work measured as Per Each for all Stormwater Detention Ponds and Bioretention Areas within project scope.

Item No. 999	Stormwater Detention Ponds	Per Each
Item No. 999	Bioretention Area	Per Each

999.4.01 Limits

General Provisions 101 through 150

999.5 Payment

A. Stormwater Detention Ponds

Storm water Detention Ponds and Bioretention Areas are paid for per each for all ponds and areas shown on plans. Payment is full compensation for furnishing and installing all Storm water Detention Ponds and Bioretention Areas including the work within this specification section.

Payment for Stormwater Detention Ponds is made under:

Item No. 999	Stormwater Detention Ponds	Per Each
Item No. 999	Bioretention Area	Per Each

999.5.01 Adjustments

General Provisions 101 through 150.