

**EXHIBIT L
TO CONTRACT AGREEMENT
SPECIAL PROVISIONS**

01) DEFINITIONS

GDOT Standard Specifications shall include applicable referenced sections in the Georgia Department of Transportation, State of Georgia, Standard Specifications, Construction of Transportation Systems, 2001 Edition, as updated or replaced in the 2008 Edition Supplemental Specifications for Construction of Roads and Bridges or in any GDOT Special Provisions (Shelf, Reference, or Unpublished 2008 Edition) available at the GDOT "The Source" online reference at time of notice to proceed. Specification sections not specifically listed below, referenced in sections below, or on the drawings shall not apply.

Whenever the word "Department" appears within the referenced GDOT Standard Specifications, it shall be understood to mean "City of Sandy Springs".

Whenever the words "Chief Engineer," "Engineer," "Inspector," "Superintendent," or "Treasurer" appear within the referenced GDOT Standard Specifications, it shall be understood to mean an "authorized representative of the City of Sandy Springs".

The Contractor shall be responsible for all "Quality Control" testing while the City shall be responsible for all "Quality Assurance" testing required in the specifications.

02) REFERENCES

The following GDOT Standard Specifications sections are referenced in the plans. All commands and references in, or in connection with, these Specifications (including all text, related documents, electronic media, graphics, or photographs) are written to imply Contractor responsibility for action unless otherwise specified.

All measurement and payment sections shall not apply to this project since this project is lump sum. Additional modifications to any GDOT specifications are included herein as Special Provisions.

NOTE: Disregard any references to the International System of Units (SI or "metric" units).

03) MAINTENANCE OF TRAFFIC

Contractor is required to maintain a minimum of a single lane of traffic throughout the construction project. Temporary closures within a single work day and/or flagging will be allowed only with prior approval of the City of Sandy Springs. A minimum 48 hour notice is required for a request for closure. A minimum of a single lane of traffic adequate for emergency services is required to be maintained at all times when Contractor is not actively working on site. All traffic control shall conform to GDOT Standard Specification 150 as updated in the Shelf Special Provisions dated July 24, 2012 and the MUTCD.

04) PROTECTION OF PARK PROPERTY

Contractor will not be allowed to use Overlook Park property for any construction use, including, but not limited to parking, lay-down space, and truck turn-around. A minimum 48 hour notice is required for any entry into park property for purposes of construction. Contractor will be held strictly liable for any disturbance or damage to park property, including but not limited to curbing,

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pavement, landscaping, parking lot, or structures. Contractor will be solely responsible to repair, replace in kind, or reimburse any damage to park property or facilities. Election of remedy will be at the City of Sandy Springs's sole discretion. If park property or facilities are damaged, the City of Sandy Springs will suspend progress or final payments on the project until remedy is completed and approved by the City of Sandy Springs.

GDOT STANDARD SPECIFICATIONS

SPECIFICATION SECTIONS SPECIFICALLY LISTED BELOW OR ON THE DRAWINGS SHALL APPLY FOR ALL CONSTRUCTION AND STRUCTURAL ITEMS, EXCEPT AS REPLACED OR AMMENDED BY NON-GDOT SPECIFICATIONS INCLUDED IN THIS DOCUMENT:

Legal Regulations and Responsibility to the Public

GDOT Standard Specifications Section 107

Traffic Control

GDOT Standard Specifications Section 150

Mobilization

GDOT Standard Specifications Section 151

Control of Soil Erosion and Sedimentation

GDOT Standard Specifications Section 161

Erosion Control Check Dams

GDOT Standard Specifications Section 162

Miscellaneous Erosion Control Items

GDOT Standard Specifications Section 163

Maintenance of Temporary Erosion And Sedimentation Control Devices

GDOT Standard Specifications Section 165

Water Quality Monitoring

GDOT Standard Specifications Section 167

Temporary Silt Fence

GDOT Standard Specifications Section 171

Clearing and Grubbing Right of Way

GDOT Standard Specifications Section 201

Excavation and Backfill for Minor Structures

GDOT Standard Specifications Section 207

Subgrade Construction

GDOT Standard Specifications Section 209

Grading Complete

GDOT Standard Specifications Section 210

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Blanket for Fill Slopes

GDOT Standard Specifications Section 218

Crushed Aggregate Subbase

GDOT Standard Specifications Section 219

Special Subgrade Compaction and Test Rolling

GDOT Standard Specifications Section 221

Concrete Structures

GDOT Standard Specifications Section 500

Steel Structures

GDOT Standard Specifications Section 501

Reinforcing Steel

GDOT Standard Specifications Section 511

Handrail-Ferrous Metal and Pipe

GDOT Standard Specifications Section 515

Shoring

GDOT Standard Specifications Section 522

Waterproofing Fabrics

GDOT Standard Specifications Section 530

Storm Drain Pipe, Pipe-Arch Culverts, and Side Drain Pipe

GDOT Standard Specifications Section 550

Underdrains

GDOT Standard Specifications Section 573

Rip Rap

GDOT Standard Specifications Section 603

Permanent Anchored Walls

GDOT Standard Specifications Section 617

Concrete Barrier

GDOT Standard Specifications Section 621

Precast Concrete Barrier

GDOT Standard Specifications Section 622

Guard Rail

GDOT Standard Specifications Section 641

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Repair of Galvanized Coatings

GDOT Standard Specifications Section 645

Painting Traffic Stripe

GDOT Standard Specifications Section 652

Thermoplastic Traffic Stripe

GDOT Standard Specifications Section 653

Miscellaneous Drainage Structures

GDOT Standard Specifications Section 668

Water Distribution System

GDOT Standard Specifications Section 670

Grassing

GDOT Standard Specifications Section 700

Coarse Aggregate

GDOT Standard Specifications Section 800

Fine Aggregate

GDOT Standard Specifications Section 801

Aggregate for Drainage

GDOT Standard Specifications Section 806

Backfill Materials

GDOT Standard Specifications Section 812

Portland Cement

GDOT Standard Specifications Section 830

Admixtures

GDOT Standard Specifications Section 831

Curing Agents

GDOT Standard Specifications Section 832

Special Surface Coating for Concrete

GDOT Standard Specifications Section 836

Graffiti-Proof Coating for Concrete

GDOT Standard Specifications Section 838

Concrete Pipe

GDOT Standard Specifications Section 843

Structural Steel

GDOT Standard Specifications Section 851

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Miscellaneous Steel Materials

GDOT Standard Specifications Section 852

Reinforcement and Tensioning Steel

GDOT Standard Specifications Section 853

Steel Pile

GDOT Standard Specifications Section 855

Guard Rail

GDOT Standard Specifications Section 859

Precast Concrete Catch Basin, Drop Inlet, and Manhole Units

GDOT Standard Specifications Section 866

Water

GDOT Standard Specifications Section 880

Fabrics

GDOT Standard Specifications Section 881

Epoxy Resin Adhesives

GDOT Standard Specifications Section 886

Seed and Sod

GDOT Standard Specifications Section 890

Fertilizers

GDOT Standard Specifications Section 891

Sign Fabrication

GDOT Standard Specifications Section 910

Sign Posts

GDOT Standard Specifications Section 911

Guard Sign Blanks and Panels

GDOT Standard Specifications Section 912

Reflectorizing Materials

GDOT Standard Specifications Section 913

Sign Paint

GDOT Standard Specifications Section 914

Any other GDOT standard specifications that are referenced in the aforementioned specifications are to be included and complied with.

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END OF SECTION

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GDOT SPECIAL PROVISIONS**

Section 107—Legal Regulations and Responsibility to the Public

Delete Subsection 107.12 and substitute the following:

107.12 Use of Explosives

When the use of explosives is necessary for the prosecution of The Work, the Contractor shall exercise the utmost care not to endanger life or property, and shall obey all State, Federal and other Governmental regulations applying to transportation, storage, use, and control of such explosives. The Contractor shall be completely responsible for any and all damage resulting from the transportation, storage, use, and control of explosives in the prosecution of The Work by the Contractor, the Contractor's agents, or employees; and shall hold the Department harmless from all claims of damages resulting in any manner there from. The Contractor shall notify each public utility owner having structures or other installations, above or below ground, near the site of The Work of his intention to use explosives. Such notice shall be given sufficiently in advance to enable the utility owners to take such steps as they may deem necessary to protect their property from injury. Such notice shall not relieve the Contractor of responsibility for all damages resulting from his blasting operations. All explosives shall be stored securely in compliance with all laws and ordinances, and all such storage places shall be clearly marked DANGEROUS EXPLOSIVES. Explosives and detonators shall be stored in separate storage facilities in separate areas. Where no laws or ordinances apply, locked storage shall be provided satisfactory to the Engineer, never closer than 1,000 ft (300 m) from any travel-road, building, or camping area. In all cases where the transport, storage, or use of explosives is undertaken, such activities shall be controlled and directed by fully qualified representatives of the Contractor. Whenever electric detonators are used, all radio transmitters shall be turned off within a radius of 500 ft (150 m). No blasting supplies shall be transported in vehicles with two-way radio unless the transmitter is turned off, or extra shielding precautions are taken. Appropriate signs shall be placed so as to give ample warning to anyone driving a vehicle equipped with two-way radio. Electrical detonators will not be used within 500 ft (150 m) of a railroad.

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Submit a blasting plan to the Engineer a minimum of five working days prior to the use of explosives, that provides details of the proposed blasting plan, including, but not limited to, the type and amount of explosives, the shot sequence, the description of and distance to the closest inhabitable structure, and other information as requested by the Engineer. Do not begin blasting until the blasting plan has been reviewed and approved in writing by the Engineer. Such approval does not relieve the contractor of the responsibility for the adequate and safe performance of the blasting.

Delete Subsection Standard Specifications 107.23 and substitute the following:

107.23 Environmental Considerations

A. Construction

Erosion control measures shall be installed, to the greatest practical extent, prior to clearing and grubbing. Particular care shall be exercised along stream buffers, wetlands, open waters and other sensitive areas to ensure that these areas are not adversely affected.

Construction equipment shall not cross streams, rivers, or other waterways except at temporary stream crossing structures approved by the Engineer.

All sediment control devices (except sediment basins) installed on a project shall, as a minimum, be cleaned of sediment when one half the capacity, by height, depth or volume, has been reached.

Sediment basins shall be cleaned of sediment when one-third the capacity by volume has been reached.

B. Bridge Construction Over Waterways

Construction waste or debris, from bridge construction or demolition, shall be prevented from being allowed to fall or be placed into wetlands, streams, rivers or lakes.

Excavation, dewatering, and cleaning of cofferdams shall be performed in such a manner as to prevent siltation. Pumping from cofferdams to a settling basin or a containment unit will be required if deemed necessary by the Engineer.

Operations required within rivers or streams, i.e. jetting or spudding, shall be performed within silt containment areas, cofferdams, silt fence, sediment barriers or other devices to minimize migration of silt off the project.

C. Borrow and Excess Material Pits

Specific written environmental clearance from the Engineer will be required for any sites not included in the plans as excess material or borrow areas. No work other than testing shall be started at any potential excess material or borrow site not shown on the plans prior to receiving said environmental clearance from the Engineer.

The Engineer will require a written notice from the Contractor requesting environmental clearance studies and written permission from the property owner at least six weeks prior to intended use of the site. The Department will not begin studies on such sites before a Notice to Proceed is issued.

The Engineer will inform the Contractor in writing as to the granting or denial of environmental clearance. If denied, the Contractor may, at no expense to the Department, seek to obtain permits or pursue other remedies that might otherwise render the site(s) acceptable.

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Sites included in the Plans have environmental clearance and shall be used only for the purpose(s) specified in the Plans or other contract documents. Should the Contractor wish to expand or utilize said sites for any purpose other than that provided for in the Plans or other contract documents, specific written environmental clearance as noted above shall be obtained.

D. Control of Pollutants

Pollutants or potentially hazardous materials, such as fuels, lubricants, lead paint, chemicals or batteries, shall be transported, stored, and used in a manner to prevent leakage or spillage into the environment. The Contractor shall also be responsible for proper and legal disposal of all such materials.

Equipment, especially concrete or asphalt trucks, shall not be washed or cleaned-out on the Project except in areas where unused product contaminants can be prevented from entering waterways.

E. Environmentally Sensitive Areas

Some archaeological sites, historic sites, wetlands, streams, stream and pond buffers, open waters and protected animal and plant species habitat within the existing/required Right-of-Way and easement areas may be designated as ENVIRONMENTALLY SENSITIVE AREAs (ESAs). These areas are shown on the applicable Plan sheets and labeled "ESA" (e.g. ESA – Historical Boundary, ESA – Wetland Boundary). The Department may require that some ESAs or portions thereof be delineated with orange barrier fence. The Contractor shall install, maintain, and replace as necessary orange barrier fence at ESAs as delineated in the Plan sheets.

The Contractor shall not enter, disturb, or perform any construction related activities, other than those shown on the approved plan sheets within areas designated as ESAs including ESAs or portions thereof not delineated with orange barrier fence. This includes but is not limited to the following construction activities: clearing and grubbing; borrowing; wasting; grading; filling; staging/stockpiling; vehicular use and parking; sediment basin placement; trailer placement; and equipment cleaning and storage. Also, all archaeological sites, historic sites, wetlands, streams, stream and pond buffers, open waters, and protected animal and plant species habitat that extend beyond the limits of existing/required Right-of-Way and easement areas shall be considered ESAs and the Contractor shall not perform any construction related activities (such as those listed above) within these areas or make agreements with property owners to occupy these areas for construction related activities (such as those listed above). The Contractor shall make all construction employees aware of the location(s) of each ESA and the requirement to not enter or otherwise disturb these areas.

If the Contractor is found to have entered an ESA, either within or outside the project area, for any purpose not specifically shown on the approved plan sheets, the Department may, at its discretion, issue a stop work order for all activities on the project except erosion control and traffic control until such time as all equipment and other items are removed and the ESA is restored to its original condition.

However, should damage to an ESA occur as a result of the Contractor's action in violation of this section, and notwithstanding any subsequent correction by the Contractor, the Contractor shall be liable for any cost arising from such action, including but not limited to, the cost of repair, remediation of any fines, or mitigation fees assessed against the Department by another government entity.

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Section 207—Excavation and Backfill for Minor Structures

Delete Subsection Standard Specifications 207.3.05.C and substitute the following:

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; however, the Department will not measure excess backfill material for payment.
 - 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. Class IIIC1 material may be used in Districts 6 and 7. 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.
- b. For backfill behind retaining walls, use a pervious material that meets the requirements of Case I or Case II as follows:
 - 1) Case I. Case I refers to backfills for retaining walls that support roadbeds and parking areas.

Ensure that the backfill conforms to [Section 208](#). Do not place rock more than 4 in (100 mm) in diameter within 2 ft (600 mm) of the retaining wall or finished surface.

- 2) Case II. Case II refers to backfills for retaining walls that do not support roadbeds or parking areas. Ensure that the backfill conforms to the requirements of Case I above, except compact the backfill to the density of the adjacent soil.

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Section 636—Highway Signs

Delete Section Standard Specifications 636 and substitute the following:

636.1 General Description

This work includes fabricating and installing highway signs according to the details on the Plans and the Manual on Uniform Traffic Control Devices.

636.1.01 Definitions

General Provisions 101 through 150.

636.1.02 Related References

A. Standard Specifications

[Section 500—Concrete Structures](#)

[Section 830—Portland Cement](#)

[Section 855—Steel Pile](#)

[Section 870—Paint](#)

[Section 910—Sign Fabrication](#)

[Section 911—Sign Posts](#)

[Section 912—Sign Blanks and Panels](#)

[Section 913—Reflectorizing Materials](#)

[Section 914—Sign Paint](#)

[Section 915—Mast Arm Assemblies](#)

[Section 916—Delineators](#)

[Section 917—Reflective and Nonreflective Characters](#)

B. Referenced Documents

Manual on Uniform Traffic Control Devices

636.1.03 Submittals

Before fabricating overhead panel type signs, submit to the Engineer the Shop Drawings to approve the sign bracing and method of attaching to sign supports.

Before driving piles, furnish a list of proposed pile lengths to the Engineer.

636.2 Materials

Ensure that materials meet the requirements of the following Specifications

Section 636—Highway Signs

Material	Section
Sign Fabrication and Accessories	910
Steel Sign Posts and Bolts (Drive Type)	911.2.01
Galvanized Steel Structural Shape Posts	911.2.02

Delineator Posts

Galvanized Steel	911.2.04.A.4
Aluminum "U" Flange	911.2.04.A.5
Wood	911.2.04.A.6
Flexible	911.2.04.A.7
Aluminum Sign Blanks	912.2.01
Extruded Aluminum Sign Panels	912.2.02
Reflective Sheeting	913.2.01
Silk Screen Lettering Paint	914.2.01
Steel Posts and Arms for Mast Arm Assembly	915.2.01
Guy Wires for Mast Arm Assembly	915.2.02

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Center Mount Reflector	916.2.01
Demountable Characters with Reflective Sheeting	917.2.01
Fittings, bolts, nuts, washers, clips, molding, etc., for panel signs shall conform to the requirements shown on the Plans.	
Class A Concrete Footings for Signs	500
Piling	855.2.03
Portland Cement	830.2.01
Sign Paint, Enamel	870.2.03

636.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

636.3 Construction Requirements

636.3.01 Personnel

General Provisions 101 through 150.

636.3.02 Equipment

General Provisions 101 through 150.

636.3.03 Preparation

General Provisions 101 through 150.

636.3.04 Fabrication

General Provisions 101 through 150.

636.3.05 Construction

A. Finished Signs

Ensure that the finished signs are clear cut and that the lines of letters and details are true, regular, and free of waviness, unevenness, furry edges or lines, scaling, cracking, blistering, pitting, dents, or blemishes.

Only one type of demountable characters (letters, numerals, symbols, and borders) is permitted on special roadside signs

on each Project.

B. Erecting the Signs

1. Drive Type Posts

Drive type posts may be driven in place or placed in prepared holes.

- a. Use driven posts only in firm and stable soil. If the soil is sandy or unstable, place each drive type post in a prepared dry hole of at least a 4 in (100 mm) diameter.
- b. When placing posts in prepared holes:
 - 1) Backfill the holes with a mixture of damp, clean friable soil and 8 percent by volume Portland cement.
 - 2) Thoroughly tamp the mixture in place around the posts.
- c. Erect posts vertically as deep and at an angle to the roadway as shown on the Plans or as directed.
- d. Do not penetrate posts in the coastal plain region less than 4 ft (1.2 m) or 3 ft (1 m) for posts in the Piedmont and the Valley and Ridge Regions when no guard rail is present.

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When erecting signs behind a guard rail, penetrate at least 3 ft (1 m) for posts 14 ft (4.2 m) or less long, or 4 ft (1.2 m) for posts over 14 ft (4.2 m) long.

2. Single-Plate Signs
Erect single-plate signs 9 ft² (0.84 m²) or less on one drive-type post unless otherwise specified on the Plans. Erect single-plate signs greater than 9 ft² (0.84 m²) on two drive-type posts. Leave enough distance between the two posts to fit the mounting holes in the sign plate.
3. Steel Posts for Mast Arm Assemblies
 - a. Erect steel posts for mast arm assemblies in a concrete foundation according to the Plans. Erect at the place, height, and angle to the roadway specified.
 - b. After curing the concrete foundation for at least 24 hours, securely fasten the specified signs into place on the mast arm.
4. Ground-Mounted Panel-Type Signs
 - a. Erect the supporting members of ground-mounted panel-type signs where shown on the Plans or as directed by the Engineer at the specified angle to the roadway.
 - b. Securely fasten the panels into place.
5. Milepost Signs
Erect milepost signs including posts as specified on the Plans.
6. Delineator Posts
Use delineator posts made of galvanized steel, aluminum, or an alloy that conforms to the requirements of [Subsection 911.2.04.A.4](#) or [911.2.04.A.5](#).
 - a. Erect the posts where shown on the Plans.
 - b. Mount reflectors for galvanized steel or aluminum posts on the flange side of the post.
 - c. When signs are attached to supports, torque the bolts to at least 20 ft-lbs (27 N•m).
7. Overhead Panel-Type Signs
Erect overhead panel type signs on sign supports where shown on the Plans or as directed by the Engineer.
 - a. Ensure that the bottom of the sign is 18 in (450 mm) above the top of the lighting fixture.
 - b. Ensure that the sign has ample bracing for mounting the sign support so that each sign can withstand 1 in (25 mm) of ice accumulated on the entire sign and wind pressures shown on the Plans.
 - c. Ensure that the top of each sign is three degrees off perpendicular from the bottom of the sign. Use the three-degree slant to lean the sign toward the approaching traffic.

C. Foundations (for Special Roadside Signs)

Do not disturb the natural ground adjacent to a foundation more than necessary to construct the footing.

1. Excavate for the footings to the lines and elevations shown on the Plans or established by the Engineer. Do not disturb or loosen the foundation below these elevations.
2. Use forms of the necessary shape and dimensions to construct the footings to the lines and elevations shown on the Plans.
3. Cure the concrete foundations, constructed in conformance with [Section 500](#) and the Plan details, at least 7 days before erecting the sign.
4. Ensure that the minimum lengths of steel H piling used in the foundations of ground-mounting signs are accepted and meet the Plan penetration requirements.

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- a. The Plan quantity of steel H piling is shown for estimating purposes only; determine and provide the necessary lengths of piles.
5. Before driving the piles, furnish a list of proposed pile lengths to the Engineer.
 - a. Use full-length piles or built-up piles with a maximum of two splices that are made in the presence of the Engineer.
 - b. Furnish satisfactory identification for all piles or portions thereof.
6. When rock prevents the penetration required on the Plans, construct according to the notes and details shown on the Plans.
7. The minimum energy ratings required by [Section 520](#) for pile hammers will be waived for constructing ground-mounted sign supports. Jetting is not permitted.
8. Place required backfilling in layers no greater than 6 in (150 mm) thick and thoroughly compact it to the approximate density of the undisturbed soil in the area.

D. Sign Panels

Use extruded, panel-type aluminum. Ensure that the sign type used meets the requirements of [Subsection 912.2.02](#).

E. Legends and Borders

Place legends and borders according to [Sub section 917.2.01, "Demountable Characters"](#), with Type IX reflective sheeting.

636.3.06 Quality Acceptance

General Provisions 101 through 150.

636.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

636.4 Measurement

A. Type-1 or Type-2 Highway Signs

Type 1 or Type 2 highway signs with reflective sheeting of Type III, IV, or IX as specified on the Plans to be paid for are measured for payment by the actual number of square feet (meters) and fraction thereof of sign type and sheeting specified. The measurement includes providing the message and furnishing and placing signs complete and accepted. The Plan quantity will be the pay quantity.

B. Extruded Aluminum Panels

Extruded aluminum panels to be paid for are the number of square feet (meters) or portion of square feet (meters) furnished, including legend components, border material, fittings, nuts, washers, clamps, molding, etc., furnished, erected, completed, and accepted.

C. Galvanized Steel Posts

Galvanized steel posts, types 1, 2, 3, 4, 5, 6, 7, or 8 to be paid for are the actual number of linear feet (meters) and fraction thereof of the type specified, furnished, erected, completed, and accepted. Galvanized steel to be paid for is the number of pounds (kilograms) furnished, erected, and accepted. Weights are computed from theoretical weights listed in the Plans for each post size. Base plates, connections, anchors, stub post, etc., are not measured for payment but are considered incidental to the Item.

D. Delineators

Delineators (reflectorized guide markers) to be paid for are the number of the type specified, including posts, rivets, and spacers, that are furnished, placed, and completed and accepted.

E. Mast Arm Assemblies

Mast arm assemblies to be paid for are the actual number furnished and erected, including concrete footing, sign, and post, completed and accepted.

F. Special Roadside Signs

Class A concrete for special roadside signs to be paid for are measured by the cubic yard (meter), neat measurement according to [Section 500.5 "Payment."](#) No deductions are made for the volume of concrete displaced by steel piling, anchor bolts, or posts.

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G. Portland Cement

Portland cement stabilized material used for backfilling holes is not measured for payment.

H. Steel H—Piling

Steel H—piling is measured for payment by the linear foot (meter) of accepted piling in place (signs), remaining in the completed work.

636.4.01 Limits

General Provisions 101 through 150.

636.5 Payment

Highway signs, galvanized steel posts, I-beam posts, delineators, mast arm assemblies, Class A concrete, and piling for signs are paid for at the Contract Unit Price for the various items. Payment is full compensation for furnishing and erecting the Item complete in place according to this Specification.

Separate payment will not be made for piling splices, the cost of cutting, or the cutoff portions. Pile cutoffs remain the Contractor's property.

Piles eliminated due to authorized revisions will be paid for according to [Subsection 109.06, "Eliminated Items."](#) These piles become Departmental property. Except for the above provision, no payment will be made for piles delivered to the Project that are not used in the work.

Payment will be made under:	Highway signs, type 1 material, reflective sheeting type____,	Per square foot (meter)
Item No. 636		
Item No. 636	Highway signs, type 2 material, reflective sheeting type____,	Per square foot (meter)
Item No. 636	Galvanized steel posts, type ____	Per linear foot (meter)
Item No. 636	Galvanized steel structural shape posts	Per pound (kilogram)
Item No. 636	Highway signs, aluminum extruded panels, reflective sheeting type ____	Per square foot (meter)
Item No. 636	Plastic Flexible Delineator, type ____	Per each
Item No. 636	Delineator, Type____	Per each
Item No. 636	Piling in place, signs, steel H, HP 12x53 (HP 310x79)	Per linear foot (meter)

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NON-GDOT SPECIFICATIONS

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PERMANENT SOIL NAILED WALLS

628.1 General Description

This work includes furnishing materials, labor, tools, equipment, and other incidental items to design, detail, and construct a soil nailed wall. This Specification also applies to any Contractor-proposed alternate design of Department-furnished plans.

628.1.01 Definitions

Soil Nail -Synonymous with nail or soil reinforcing

The term Soil Nailed Wall includes the following items:

- Soil nails
- Nails
- Shotcrete (pneumatically applied concrete)
- Temporary Steel Plate facing
- Permanent block facing
- Drainage

628.1.02 Related References

A. GDOT Standard Specifications

Section 500 -Concrete Structures

Section 511 -Reinforcement Steel

Section 853 -Reinforcement and Tensioning Steel

B. Referenced Documents

General Provisions 101 through 150.

628.1.03 Submittals

A. Proof of Ability

Submit the following proof of ability (or ability of the subcontractor) when requested by the Department to design or construct soil nailed walls:

- Evidence of successfully completing at least 5 projects similar in concept and scope to the proposed wall.
- Resumes of foremen, nail testing personnel, and drilling operators to be employed on this project. Show the type, length, and number of soil nails each has installed or tested within the past 5 years.
- Evidence of experience in nail testing. Persons performing nail testing shall prove experience by performing sample tests supervised by the Engineer.
- The soil nail contractor shall be a qualified with GDOT as a 'registered subcontractor' or a 'registered GDOT Contractor' prior to the bid date.

The City of Sandy Springs is the sole judge of the qualifications of the foreman, drilling operator, and testing personnel. Do not begin wall construction until the City of Sandy Springs has approved proof of ability.

B. Design Drawings and Construction Documents

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Materials Submittals: The Contractor shall submit manufacturers' certifications two weeks prior to start of work stating that the retaining wall system components meet the requirements of this specification.

Design Submittal: The Contractor shall submit two sets of detailed design calculations and final retaining wall plans for approval at least four weeks prior to the beginning of wall construction. All calculations and drawings shall be prepared and sealed by a professional Civil Engineer (P.E.) – (Wall Design Engineer) experienced in soil nail wall design and licensed in the State of Georgia. Obtaining the services of the Wall Design Engineer shall be the responsibility of the Contractor. Permitting through Public Works & Community Development is the responsibility of the Contractor/Wall Design Engineer. A certification shall be provided to City of Sandy Springs Community Development following wall completion.

C. Final Wall Plans and Calculations

Submit final wall plans and calculations to the City of Sandy Springs for review and approval before beginning construction on the wall. The City has 14 days for plan and calculation review per item after receiving the structure calculations and drawings.

New submittals from the Contractor showing corrections from the City's review or changes to ease construction or to correct field errors have a 14 day review. The City is the sole judge of information adequacy.

The City's review and acceptance of the final plans and construction methods do not relieve the Contractor from successfully completing the work. Time extensions are not granted for Contractor delays from untimely submissions or insufficient information.

D. Admixture Literature

Before using an admixture, submit the manufacturer's literature to the Engineer. Indicate the admixture type and the manufacturer's recommendations for mixing the admixtures with grout.

628.2 Materials

A. Concrete

Use concrete conforming to Section 500.

B. Reinforcing Steel

Use reinforcing steel conforming to Section 511. Reinforcing steel used as soil nails shall be full length where possible. The threaded bar utilized for the actual soil nail may be coupled with the appropriately sized coupler, with the Design Engineer's express approval.

C. Structural Steel

Use structural steel shapes or plates conforming to Section 501. Use ASTM A 709 Grade 36 (Grade 250) structural steel unless otherwise specified on the plans.

D. Cement Grout

Produce cement grout using Portland cement conforming to AASHTO M-85, Type I, II, or III, and potable water. Use cement that is fresh and free of lumps and hydration.

Follow these restrictions if using admixtures:

1. Do not use admixtures with chemicals that may harm the soil nail, reinforcing steel, or cement.
2. Do not use admixtures that cause air bubbles in the grout.

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3. If approved by the Engineer, use admixtures imparting low water content, flowability, and minimum bleeding in the cement grout.

E. Plastic

Use Polyethylene conforming to AASHTO M-252 with a minimum wall thickness of 30 mils (0.76 mm) for corrosion protection, where required by the soil nail design engineer.

F. Corrosion Inhibitor

Corrosion inhibitor (grease) where required by the soil nail design engineer shall conform to the following:

1. Drop point 300 degrees F (149 degrees C) minimum by ASTM D-566.
2. Flash point 300 degrees F (149 degrees C) minimum by ASTM D-92.
3. Water content 0.1% maximum by ASTM D-95.
4. Rust test – Rust Grade 7 or better after 720 hours, aggressive conditions: Rust Grade 7 or better after 1000 hours by ASTM B-117 and ASTM D-610.
5. Water soluble ions. Chlorides 10 ppm maximum by ASTM D-512 Nitrates 10 ppm maximum by ASTM D-3867 Sulfates 10 ppm maximum by APHA 427D (15th ED)
6. Oil separation – 0.5% by weight maximum at 160 degrees F (71 degrees C) by FIMS 719B, Method 321.2.
7. Soak test – 5% Salt Fog at 100 degrees F (38 degrees C), 5 mils (0.13 mm) (Q Panel Type S), immerse panels in 50% salt solution and expose to 5% Salt Fog – no emulsification after 720 hours by ASTM B117 Modified.

628.2.01 Delivery, Storage, and Handling

A. Protection Systems

Protect soil nails against corrosion by properly storing, fabricating, and handling the nail components before inserting them into the borehole. Avoid prolonged exposure of the nail components to the elements, and avoid mechanical or physical damage that reduces or impairs the component's ability to resist adverse conditions during service. Nail components will be rejected for heavy corrosion or pitting, but not for a light coating of rust.

Use the protection systems as follows:

1. Soil Nail

Protect the entire length of the soil nail from the anchor plate to the end of the nail from corrosion with an acceptable coating (such as galvanized steel) or encasement for a design life of 50 years.

- a. When using grout encasement, encase the nail in a corrugated plastic tube.
- b. Use cement grout to fill the voids between the tube and the nail and the tube and the soil. Place cement grout between the soil and the tube to at least $\frac{3}{4}$ in (20 mm) thick and extend the entire length of the nail. Cement grout between the tube and the nail shall be a minimum of $\frac{1}{2}$ in (12 mm) thick
- c. Provide centralizers spaced at a maximum of 5 feet (1.5 m) center-to-center throughout the nail length. Do not use wood or material harmful to the soil nail or the corrugated plastic tubing as centralizers.
- d. Provide a smooth piece of plastic sheath to encapsulate the entire free length. Do not splice the sheath. Ensure that the sheath is at least 0.05 in (1.27 mm) thick. Provide a void space between the sheath and the steel as shown on the plans and maintain that space with centralizers. Fill visible void space with grease and seal the bottom to prevent grout intrusion.

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2. Area Underneath Anchorage

Protect the area immediately behind the stressing anchorage.

- a. Weld a pipe sleeve to the bearing plate and seal the pipe sleeve to the anchor sheath at the other end of the sleeve.
- b. Clean the pipe sleeve to remove dirt, rust, or other harmful material before inserting the soil nail into the pipe sleeve.
- c. If a seal is not provided at the lower end of the pipe sleeve, during installation and grouting, fill the lower end of the pipe sleeve with grout. Keep the pipe sleeve free of harmful material until the upper portion of the pipe sleeve and anchor head are filled with grout.
- d. Fill the void inside the sleeve and anchor head with anti-bleed expansion grout after the nails have been stressed.

3. Anchorage

Uncoated soil nails shall encase the anchorage system head into a corrosion protective system before proceeding to the next lift. Install the protective system for each lift within 30 days after installing the nails for that lift. Ensure that the anchorage system has a cover of at least 3 in (75 mm) once the wall face is placed.

628.3 Construction Requirements

628.3.01 Personnel

A. Contractor Qualifications

The Contractor and Subcontractor shall be experienced in constructing permanent soil nailed walls. Provide at least one Registered Professional Engineer licensed to perform work in the State of Georgia and a supervising Engineer for the Project with at least 5 years of experience in constructing permanent soil nailed walls.

Furnish verification of these qualifications to the Engineer before beginning operations.

B. Design Engineer

The Design Engineer shall:

- Be registered as a Professional Engineer in the State of Georgia
- Have considerable knowledge and experience designing and constructing soil nailed walls and modular block facing
- Be available at any time during the Contract to discuss the design of the walls with the Department. An employee of the design engineer must be available to visit the site within 2 hours notice.

C. Registered Professional Engineer

The Project Engineer or Owner may retain the services of a second Professional Engineer licensed to perform work in the State of Georgia. The Engineer shall operate independently from the Professional Engineer of Subsection 628.3.01.B, "Design Engineer."

This Engineer will independently check the design calculations and Plan details for the permanent soil nailed wall before submitting them to the Department

628.3.02 Equipment

Use anchorage and hardware suitable for the type of soil nails used. Ensure that the anchorage and hardware are capable of the following:

- Developing 75 percent of the yield capacity of the nails when tested in the unbonded state and

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- without failure of the nail
- Holding the soil nail at a load producing a stress of not less than 75 percent of the yield capacity of the nail without exceeding the anticipated set and without causing anchorage or soil nail failure
- Test nails shall be capable of lifting-off, detensioning, or retensioning a nail before secondary grouting to fill voids at the top of the pipe sleeve.

628.3.03 Preparation

Before beginning the work, survey the condition of the adjoining properties. Keep records and photograph settlement or cracking of adjacent structures that may become the subject of possible damage claims. Deliver the report to the Department before beginning work at the site.

628.3.04 Fabrication

A. Soil Nails

Fabricate the soil nails according to the approved details.

1. Keep the nails free of dirt, rust, and other harmful substances.
2. Use a plastic sheath when using encasement that is a single piece without splices.
3. Before installation, handle and store the nails so as to avoid corrosion and physical damage. Nails will be rejected for damage such as abrasions, cuts, nicks, welds, weld splatters, or heavy corrosion and pitting. Replace the nails at the Contractor's expense for material replacements or time delays.

628.3.05 Construction

A. Design Criteria

The design criteria for a proposed design or design include:

1. Design soil nails according to this Specification.
2. Design and install permanent drainage systems behind the wall. Connect the drainage systems to the nearest drop inlet using pipe or free drainage through traffic barriers or other obstructions. Ensure that holes through traffic barriers and/or facing are no higher than 3 in (75 mm) above the gutterline or ground line.
3. Ensure that the wall is compatible with the horizontal and vertical criteria indicated in the Department Plans.
4. Provide a wall design that is adequate to resist sliding, overturning and bearing forces. Safety factors shall be as follows:
 - Sliding 1.50
 - Overturning 2.00
 - Bearing 1.00
 - Global Stability 1.50

Design the wall for a 50 year design life.

B. Ground Movements and Load Transfer Instruments

During construction of the wall, the Department may install devices to monitor ground movements and load transfers during or after construction. The Department will schedule installation to minimize interference with the Contractor's operations. Cooperate with the instrumentation installers. Anticipate delays of two to four hours per instrumented nail.

Although the Instrumentation Specialist maintains the instruments, assume responsibility for damage to the instruments, connections or readouts from operations. Replace and install damaged equipment at the Department's approval and at the Contractor's expense.

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C. Soil Nail Installation

Install the soil nails as follows:

1. Before installation, visit the site to observe existing conditions that may affect the work or design, if applicable, and to review the geotechnical data available for the Project.
2. Drive or drill the holes for the soil nails by core drilling, rotary drilling, auger drilling, or percussion drilling. If using water in the drilling operation, dispose of the water to minimize wall erosion. Repair water erosion damage to the site at no cost to the Department.
3. If the hole will not stand open, install casing to maintain a clean and open hole. Ensure that the hole diameter is at least 3 in (75 mm) if no pressure grouting is used. Pressure grouting is grouting with a pressure greater than 60 psi (415 kPa).
4. Ensure that the drill bit diameter is not more than 1/8 in (3 mm) smaller than the specified hole diameter.
5. Start soil nail holes within an angle tolerance of 3 degrees from the inclination specified on the approved design Plans. Do not allow the holes to deviate from a straight line by more than 2 in (50 mm) in 10 ft. (3 m). Do not allow the holes to extend outside the Right-of-Way limits. Thoroughly clean the holes of all dust, grease, or other deleterious material before inserting the nail.
6. Install the nail in the casing or the hole drilled for the nail. Ensure that the nail's corrosion protection is not damaged during handling or installation.
7. Install the nail in the bond length to achieve at least 1½ in (38 mm) of grout cover.
8. Do not use nails to ground electric equipment and do not subject the nails to sharp bends.
9. Provide centralizers spaced a maximum of 5 ft (1.5 m) center to center throughout the nail length. Do not use spacers of wood or other material harmful to the nail or corrosion protection.
10. Inject grout at the lowest point of the nail and place over the entire length of the nail.
 - a. Ensure that the grouting equipment can continuously mix and produce lump-free grout. Equip the grout pump nozzle with a grout pressure gauge capable of measuring pressure of at least 150 psi (1 MPa) or twice the actual pressure used.
 - b. Base the material proportions used in the grout on grout tests made before beginning grouting; or select the proportions based on prior documented experience with similar materials and equipment under comparable field conditions.
 - c. Use the minimum water content necessary for proper placement and do not exceed a water-cement ratio of 0.45. Do not leave the grout in the mixer longer than 45 minutes.
11. After grouting, do not disturb the nail until the grout has reached a cube strength of 3500 psi (25 MPa). Keep the mouth of the hole clean after grouting. Record the following data in a Project field book during the grouting operation:
 - Type of mixer
 - Water-cement ratio
 - Type of additives
 - Grout pressure
 - Type of cement
 - Test sample strengths (before stressing)
 - Volume placed in bond and free lengths
12. If using pressure grouting, choose whether to perform a water-tightness test. However, if injecting grout with a pressure of 60 psi (415 kPa) or less, always perform a water-tightness test. Perform the test as follows:
 - a. Fill the entire hole in the rock with water and subject it to a pressure of 5 psi (35 kPa) in excess of the hydrostatic head as measured at the top of the hole.
 - b. If after 10 minutes the leakage rate from the hole exceeds 0.001 gal per inch diameter per foot of depth per minute (0.5 ml per mm diameter per meter of depth per minute), consolidate grout, redrill, and retest the hole. If the second water-tightness test fails, repeat the entire

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process.

- c. During the tests, observe holes adjacent to the hole being tested for water-tightness to detect and seal inter-hole connections.
- d. If artesian or flowing water is encountered in the drilled hole, maintain the pressure on the consolidation grout until the grout has initially set.

D. Permanent Stone Veneer Facing

Provide permanent stone veneer facing, as shown in the plans and in accordance with the following:

1. The permanent stone veneer facing shall be interlocked directly to the soil nail. No geogrid face wrap around a pipe for connection of concrete block to the soil nail is allowed.
2. Utilize the soil nails for support of the stone veneer facing. A mechanical connection linking the veneer block with the soil nail must be provided by the Design Engineer.
3. Facing shall be granite stone veneer, similar in color, finish, and size of the granite rubble used to construct the granite rubble gravity retaining walls used in this project. Submit details of facing to the city for approval prior to ordering of materials.

628.3.06 Quality Acceptance

A. Nail Testing and Acceptance

Perform testing according to this subsection. Perform ultimate strength testing on 100% of all soil nails or on at least 5% of the nails in each row to verify the soil-to-grout bond stress used in the design. When testing only 5% of the soil nails, the following shall apply:

Provide separate nails specifically for the purpose of testing. Test nail locations shall be approved by the Engineer. Test nails will not be considered part of the permanent support system. Install the test nails in accordance with Figure 2. Grout only the bonded length of the nail prior to testing. Provide and use the following testing equipment:

- A dial gauge that can measure elongation to the nearest 0.001 in (0.025 mm)
- A hydraulic jack and pump with a pressure gauge graduated in increments of 100 psi (690 kPa) or less.

Test by incrementally loading the nail according to the following schedule:

AL
0.25P
0.50P
0.75P
1.00P
1.25P
1.50P

where:

AL = minimum load required to support the jacking system tightly against the bearing surface = 2 kips (8.9 kN).

P = design load

Measure the nail movement with the dial gauge fixed to an independent reference point. Apply the load with a hydraulic jack and measure it with a hydraulic pressure gauge. Increase the load from one increment to the next immediately after the nail movement is recorded.

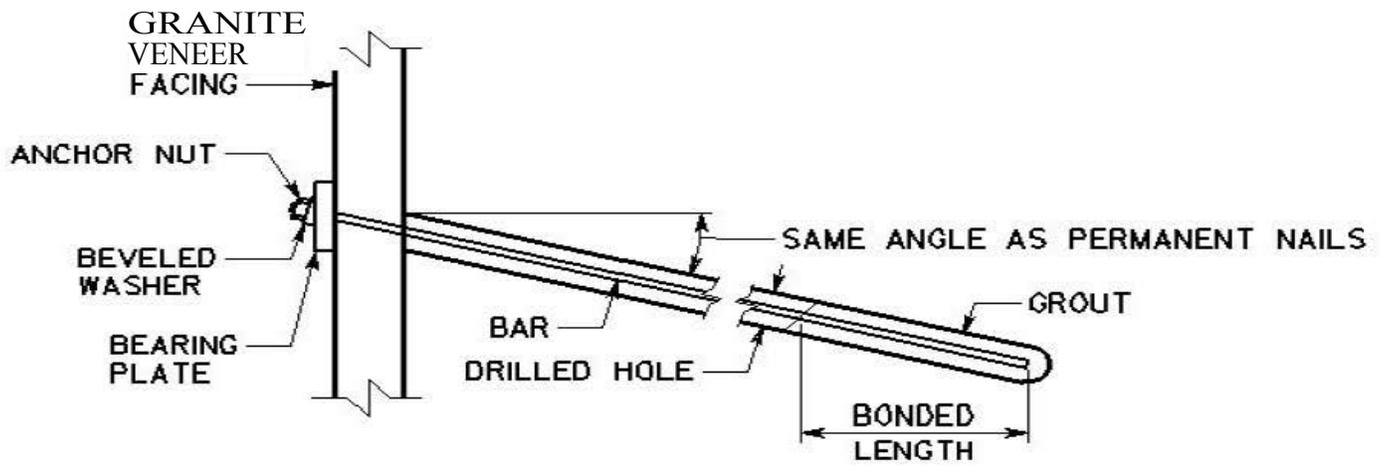
Hold the maximum test load for ten (10) minutes. Start the load hold period as soon as the maximum test load is applied, and measure the nail movements at one (1), two (2), three (3), four (4), five (5), six (6), and ten (10) minutes. The nail test is acceptable if the nail carries the maximum test load with less than 0.08 in (2 mm) of movement between one (1) and ten (10) minutes. If the nail fails the test, determine the cause. If the failure indicates that the nails will not achieve the design

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soil-to-grout bond stress, then modify the design and/or construction procedures. These modifications may include, but are not limited to, installing replacement nails, reducing the design bond stress by increasing the number of soil nails or by lengthening the nails, or modifying the installation methods. After modifications, test the nails for acceptance of the new design. Make the modifications of the design and/or construction procedures at no cost to the Department unless the modifications are due to changed conditions. After completion of testing and determination of acceptance, detention all test nails and all nails shall be tensioned to 200 ft-lb (270 N-m) of torque.

628.4 Measurement

Permanent Soil Nailed Walls are not measured separately for payment.



TEST NAIL DETAIL

NO SCALE

FIGURE 2

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STORMCEPTOR WATER QUALITY UNITS

800-1.1 **DESCRIPTION:** The work covered by this section consists of the construction of a structural underground stormwater oil and sediment separator to meet the State and Local Water Quality requirements for 80% TSS removal. The Contractor shall furnish all equipment, tools, labor, materials, and incidentals necessary to complete the work in accordance with the plans and specifications for the details as shown and as provided below or for an equivalent device approved by the Owner's Engineer.

800-1.2 **SHOP DRAWINGS:** Shop drawings consisting of catalog cuts of fabricator drawings showing the structure and frames, grates, or covers shall be submitted by the Contractor to the Engineer for approval. Where an external bypass is required, the manufacturer must provide calculations and designs for all structures, piping and other required material applicable to the proper functioning of the system, stamped by a Professional Engineer.

800-1.3 **HANDLING AND STORAGE:** Care shall be taken in loading, transporting, and unloading to prevent damage to materials during storage and handling.

MATERIALS

800-2.1 **GENERAL:** Unless otherwise approved by the Engineer as an approved equal, the separator shall be circular and constructed from pre-cast concrete circular riser and slab components. An internal fiberglass insert shall be bolted and sealed watertight inside the reinforced concrete component. Where required by the Engineer and shown on the plans, the separator shall be capable to be used as a bend or junction structure within the stormwater drainage system.

800-2.2 **PRECAST CONCRETE SECTIONS:** All precast concrete components shall be designed and manufactured to a minimum live load of AASHTO HS-20 truck loading or greater based on local regulatory specifications.

800-2.3 **JOINTS:** The concrete joints shall be water-tight and meet the design criteria according to ASTM C-443. Mastic sealants or butyl tape are not an acceptable alternative.

800-2.4 **FRAME AND COVER:** The frame and cover shall include an indented top design with lettering of the unit's name cast into the cover to allow for easy identification in the field.

800-2.5 **CONCRETE:** All reinforced concrete components shall be manufactured according to GDOT and local specifications and shall meet the requirements of ASTM C 478.

800-2.6 **FIBERGLASS:** The fiberglass portion of the water treatment device shall be constructed in accordance with the following standard: ASTM D-4097: Contact Molded Glass Fiber Reinforced Chemical Resistant Tanks.

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800-2.7 **INSPECTION:** All precast concrete sections shall be inspected to ensure that dimensions, appearance and quality of the product meet GDOT and local specifications and ASTM C 478

CONSTRUCTION METHODS

800-3.1 **INSTALLATION:** The installation of the pre-cast concrete stormwater quality treatment device should conform to GDOT specifications for the construction of manholes. General specifications that are applicable are summarized below.

800-3.2 **EXCAVATION:** Excavation for the installation of the stormwater quality treatment device should conform to GDOT and local specifications.

The stormwater quality treatment device should not be installed on frozen or saturated ground. Excavation should allow for adequate compaction around the structure in accordance with the Project compaction requirements. Additional excavation and/or off-site material may be required around the structure to achieve these compaction requirements and this additional excavation and off-site material shall not be measured for payment, but shall be incidental to the installation of the Water Quality Device.

Dewatering shall be provided during installation to ensure the area is free from water during installation. All costs associated with dewatering, including pumping, labor, materials, and all other incidentals shall not be measured for payment but shall be incidental to the installation of the Water Quality Device.

800-3.3 **BACKFILLING:** Backfill material should conform to Project specifications for suitable structural fill. Backfill material should be placed in uniform layers not exceeding 12 inches (300 mm) in depth and compacted to Project specifications for backfill and construction of embankments. If off-site backfill material or stone is required to meet Project specifications, this material and/or stone shall not be measured separately for payment, but shall be considered incidental to the installation of the Water Quality Device.

800-3.4 **WATER QUALITY DEVICE CONSTRUCTION SEQUENCE:** The concrete water quality device is installed in sections in the following sequence:

- aggregate base
- base slab
- treatment chamber section(s)
- transition slab (if required)
- bypass section
- connect inlet and outlet pipes
- riser section and/or transition slab (if required)
- maintenance riser section(s) (if required)
- frame and access cover

The precast base should be placed level at the specified grade. The entire base

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should be in contact with the underlying compacted granular material. Subsequent sections, complete with gasketed joint seals, should be installed in accordance with the precast concrete manufacturer's recommendations.

Adjustment of the stormwater quality treatment device can be performed by lifting the upper sections free of the excavated area, re-leveling the base, and re-installing the sections. Damaged sections and gaskets should be repaired or replaced as necessary at no additional cost to the Owner. Once the stormwater quality treatment device has been constructed, any lift holes must be plugged with mortar or other lift hole plugs as approved by the Engineer.

800-3.5 **DROP PIPE AND RISER PIPE:** Once the upper chamber has been attached to the lower chamber, the inlet drop tee, and riser pipe must be attached. Pipe installation instructions and required materials shall be provided with the insert.

800-3.6 **INLET AND OUTLET PIPES:** Inlet and outlet pipes should be securely set into the upper chamber using non-shrink grout or approved pipe seals (flexible boot connections, where applicable) so that the structure is watertight. These connections shall be approved by the Engineer prior to construction.

800-3.7 **FRAME AND COVER OR FRAME AND GRATE INSTALLATION:** The grade adjustment units should be laid in a full bed of mortar with successive units being joined using sealant recommended by the manufacturer. Frames for the cover should be set in a full bed of mortar at the elevation specified.

800-3.8 **MAINTENANCE:** The Contractor is responsible for maintaining the devices until substantial completion. Throughout the duration of the project, until substantial completion, the contractor shall remove sediment and oil from the water quality devices when accumulations reach 50% of the capacity of the device or as directed by the Engineer. Upon substantial completion, the contractor shall clean out all sediment and oil accumulations to the satisfaction of the Engineer prior to turning over the water quality devices to the Owner. Cleanout shall be done using methods approved by the Engineer and Manufacturer. Any resulting oil or sediment accumulation in stormwater system shall be cleaned by the Contractor at no additional cost to the Owner. The cost of this maintenance shall not be measured for payment and shall be included in the cost of the water quality devices.

PERFORMANCE

800-4.1 **GENERAL:** The stormwater quality treatment device shall remove oil and sediment from stormwater so that the resulting removal is 80% TSS removal in accordance with State and Local requirements.

800-4.2 **TOTAL SUSPENDED SOLIDS:** The treatment device shall be capable of removing 80 percent of the average annual total suspended solids (TSS) load without scouring previously captured pollutants.

Design methodologies shall provide calculations substantiating removal efficiencies and correlation to field monitoring results using both particle size and TSS removal

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efficiency.

All manufactures shall provide performance data that the stormwater quality treatment system does not scour previously captured pollutants based on the particle size distribution specified in section 4.5. Performance data should be laboratory testing with an initial sediment load of 50 percent of the unit's sediment capacity at an operating rate of 125% or greater. Particle size distribution (PSD) for the initial sediment load shall conform to table 4.5.

800-4.3 **FREE OIL:** The separator must be capable of removing 95 percent of the floatable free oil. The first 16 inches (405 mm) of hydrocarbon storage shall be lined with fiberglass to provide a double wall containment of the hydrocarbon materials.

800-4.3 **PARTICLE SIZE:** The separator must be capable of trapping fine sand, silt, clay and organic particles in addition to larger sand, gravel particles and small floatables.

The stormwater quality treatment device shall be sized to a specific particle size distribution (PSD) that is clearly identified in both diameter and specific gravity. Below is the PSD that shall be used in design of the water quality devices for this Project to ensure proper design for capturing smaller particles and the high load of associated pollutants. If an alternate PSD is needed for the design of an approved equal water quality device, Contractor shall provide data supporting the alternate PSD and shall provide City of Sandy Springs approval of the PSD and approved equal water quality device.

Table 4.5 – Particle Size Distribution

Amount	Diameter	Specific Gravity
0%	1 micron	2.65
3%	53 micron	2.65
15%	75 micron	2.65
25%	88 micron	2.65
40.8%	106 micron	2.65
15%	125 micron	2.65
1%	150 micron	2.65

METHOD OF MEASUREMENT

800-5.1 The accepted quantities of water quality devices shall be measured per each, with each unit having a unique sizing and identification label per the construction drawings.

800-5.2 The cost of maintaining the devices throughout the duration of the Project and upon substantial completion shall not be measured for payment and shall be included in the cost of the water quality devices.

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BASIS OF PAYMENT

800-6.1 For "Water Quality Device", payment shall be made at the contract price per each device, complete and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, maintenance, dewatering, including pumping, backfilling, removal of unsuitable materials, hauling unsuitable materials off-site, and placing and compaction of suitable backfill materials; furnishing and installation of such special connections to pipes and other structures as may be required to complete the item as shown on the plans; and for all labor equipment, tools and incidentals necessary to complete the installation complete and in place of the water quality device. No measurement or allowances will be made for steps, steel, forms, false work, cofferdams, pumping, bracing, joints, or finishing work.

Payment will be made under:

Item 000-0001	STC900	2,400 Gallon Water Quality Device -- per Each.
Item 000-0002	STC2400	900 Gallon Water Quality Device -- per Each.

TESTING AND MATERIAL REQUIREMENTS

ASTM D-4097 Contact Molded Glass Fiber Reinforced Chemical Resistant Tanks

ASTM C 478 Standard Specification for Precast Reinforced Concrete Manhole Sections

ASTM C 443 Standard Specification for Precast Reinforced Concrete Manhole Sections

END OF SECTION

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NYLOPLAST DRAINAGE STRUCTURES

Section 2722

Engineered Surface Drainage Products

GENERAL

PVC surface drainage inlets shall be of the inline drain type as indicated on the contract drawing and referenced within the contract specifications. The ductile iron grates for each of these fittings are to be considered an integral part of the surface drainage inlet and shall be furnished by the same manufacturer. The surface drainage inlets shall be as manufactured by Nyloplast a division of Advanced Drainage Systems, Inc., or prior approved equal.

MATERIALS

The inline drain required for this contract shall be manufactured from PVC pipe stock, utilizing a thermo-molding process to reform the pipe stock to the furnished configuration. The drainage pipe connection stubs shall be manufactured from PVC pipe stock and formed to provide a watertight connection with the specified pipe system. This joint tightness shall conform to ASTM D3212 for joints for drain and sewer plastic pipe using flexible elastomeric seals. The flexible elastomeric seals shall conform to ASTM F477. The pipe bell spigot shall be joined to the inline drain body by use of a **swage mechanical joint**. The raw material used to manufacture the pipe stock that is used to manufacture the inline drain body and pipe stubs of the surface drainage inlets shall conform to ASTM D1784 cell class 12454.

The grates furnished for all surface drainage inlets shall be ductile iron grates for sizes 8", 10", 12", 15", 18", 24" and 30" shall be made specifically for each fitting so as to provide a round bottom flange that closely matches the diameter of the surface drainage inlet. Grates for inline drains shall be capable of supporting H-20 wheel loading for traffic areas or H-10 loading for pedestrian areas. 12" and 15" square grates will be hinged to the frame using pins. Metal used in the manufacture of the castings shall conform to ASTM A536 grade 70-50-05 for ductile iron. Grates shall be provided painted black.

INSTALLATION

The specified PVC surface drainage inlet shall be installed using conventional flexible pipe backfill materials and procedures. The backfill material shall be crushed stone or other granular material meeting the requirements of class 2 material as defined in ASTM D2321. Bedding and backfill for surface drainage inlets shall be placed and compacted uniformly in accordance with ASTM D2321. The drain basin body will be cut at the time of the final grade. No brick, stone or concrete block will be required to set the grate to the final grade height. For H-20 load rated installations, a concrete ring will be poured under and around the grate and frame. The concrete slab must be designed taking into consideration local soil conditions, traffic loading, and other applicable design factors. For other installation considerations such as migration of fines, ground water, and soft foundations refer to ASTM D2321 guidelines.

END OF SECTION

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SECTION 323113 - CHAIN LINK FENCES AND GATES

PART 2 - GENERAL

2.1 SUMMARY

- A. Section includes chain-link fences and swing gates.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design chain-link fences and gates, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Chain-link fence and gate framework shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7:
 - 1. Minimum Post Size: Determine according to ASTM F 1043 for framework up to 12 feet (3.66 m) high, and post spacing not to exceed 6 feet.
 - 2. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified and on the following:
 - a. Fence Height: 5 feet.

2.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each polymer-coated product and for each color and texture specified, in 6-inch (150-mm) lengths for components and on full-sized units for accessories.
- D. Delegated-Design Submittal: For chain-link fences and gate framework indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

2.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of chain-link fence and gate, from manufacturer.
- B. Product Test Reports: For framing strength according to ASTM F 1043.
- C. Sample of special warranty.

**EXHIBIT L
TO CONTRACT AGREEMENT
SPECIAL PROVISIONS**

2.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

2.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, deterioration of metals, metal finishes, and other materials beyond normal weathering.
 2. Warranty Period: Five years from date of Substantial Completion.

PART 3 - PRODUCTS

3.1 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:
1. Fabric Height: As indicated on Drawings.
 2. Steel Wire Fabric: 9 gauge, prior to any coatings
 - a. Polymer-Coated (Vinyl) Fabric: ASTM F 668, Class 1 over zinc -coated steel wire.
 - 1) Color: Black complying with ASTM F 934.
 3. Selvage: Knuckled at both selvages (top and bottom).

3.2 FENCE FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 for framing, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:
1. Fence Height: As indicated on Drawings
 2. Heavy Industrial Strength: Material Group IA, round steel pipe, Schedule 40 Retain first subparagraph below if size is critical. According to ASTM F 1043, first four options are for both types of round pipe, fifth option is for Schedule 40 pipe only, and the last three options are for roll-formed steel C-section shapes.
 - a. Line Post: See GDOT detail on drawings for dimensions
 - b. End, Corner and Pull Post: See GDOT detail on drawings for dimensions
 3. Horizontal Framework Members: top and bottom rails complying with ASTM F 1043.

**EXHIBIT L
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4. Brace Rails: Comply with ASTM F 1043.
5. Metallic Coating for Steel Framing:
6. Polymer coating over metallic coating.
 - a. Color: Black, complying with ASTM F 934.

3.3 TENSION WIRE

- A. Metallic-Coated Steel Wire: 0.177-inch- (4.5-mm-) diameter, marcelled tension wire complying with ASTM A 817 and ASTM A 824, with the following metallic coating:
- B. Polymer-Coated (Vinyl) Steel Wire: 0.177-inch- (4.5-mm-) diameter, tension wire complying with ASTM F 1664, Class 1 over zinc-coated steel wire.
 1. Color: Black, complying with ASTM F 934.

3.4 FITTINGS

- A. General: Comply with ASTM F 626.

3.5 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

PART 4 - EXECUTION

4.1 INSTALLATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
 1. Do not begin installation before final grading is completed unless otherwise permitted by Engineer or Program Manager.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

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- C. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet (152.5 m) or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.
- D. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated.
- E. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- F. Post Setting: Set posts in concrete at corner posts, end posts and pull posts and elsewhere by mechanically driving into soil at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
 - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Exposed Concrete: Extend 2 inches (50 mm) above grade; shape and smooth to shed water.
 - b. Concealed Concrete: Top 2 inches (50 mm) below grade to allow covering with surface material.
 - c. Posts Set into Concrete in Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.
 - d. Posts Set into Voids in Concrete: Form or core drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.
 - 3. Mechanically Driven Posts: Drive into soil to a minimum depth of 30 inches (762 mm). Protect post top to prevent distortion.
- G. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more
- H. Line Posts: Space line posts uniformly per GDOT detail on drawings
- I. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Provide horizontal tension wire at the following locations:
 - 1. Extended along top and bottom of fence fabric.
- J. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2 inches (50 mm) between finish grade or surface and bottom selvage unless otherwise indicated.

END OF SECTION 323113

**EXHIBIT L
TO CONTRACT AGREEMENT
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**EXHIBIT L
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**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

SPECIAL PROVISION

Section 163—Miscellaneous Erosion Control Items

Delete Subsection 163.2 and substitute the following:

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
Mulch	893.2.02
Temporary Silt Fence	171
Concrete Aprons and Footings shall be Class A	500
Riprap	603
Temporary Grass	700
Triangular Silt Barrier	715
Lumber and Timber	860.2.01
Preservative Treatment of Timber Products	863.1
Corrugated Polyethylene Temporary Slope Drain Pipe	AASHTO M252 or M294

163.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

Delete Subsection 163.4.M. and substitute the following:

M. Stone Filter Berms

Stone filter berms are measured for payment per linear foot (meter) required. This includes the entire structure at each location and all the work necessary for construction.

Delete Subsection 163.5.M. and substitute the following:

M. Stone Filter Berms

Stone filter berms are paid for per linear foot (meter). Payment is full compensation for all materials, construction, and removal for each. Clean stone Type 3 riprap and #3 stone are paid for on the same basis as new items. Plastic woven filter fabric is required under rock filter berms and is included in the price bid for linear foot (meter).

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

SPECIAL PROVISION

**Section 165—Maintenance of Temporary Erosion and Sedimentation
Control Devices**

Add the following:

165.1 General Description

This work consists of providing maintenance on temporary erosion and sediment control devices, including but not limited to the following:

- Silt fence
- Sediment basins
- Silt control gates
- Check dams
- Silt retention barriers

It also consists of removing sediment that has accumulated at the temporary erosion and sediment control devices.

165.1.01 Definitions

General Provisions 101 through 150.

165.1.02 Related References

A. Standard Specifications

General Provisions 101 through 150.

B. Referenced Documents

General Provisions 101 through 150.

165.1.03 Submittals

General Provisions 101 through 150

165.2 Materials

General Provisions 101 through 150.

165.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

165.3 Construction Requirements

165.3.01 Personnel

General Provisions 101 through 150.

165.3.02 Equipment

General Provisions 101 through 150.

165.3.03 Preparation

General Provisions 101 through 150.

165.3.04 Fabrication

General Provisions 101 through 150.

165.3.05 Construction

A. General

As a minimum, clean the sediment from all temporary erosion control devices (except sediment basins) installed on the project when one half the capacity, by height, depth or volume has been reached. Clean the sediment from all temporary sediment basins installed on a project when one third the capacity of the storage volume has been filled.

Handle sediment excavated from any erosion or sediment control device in one of the following ways:

- Remove sediment from the immediate area and immediately stabilize it to prevent the material from refilling any erosion or sediment control device.
- Place and mix it in the roadway embankment, or waste it in an area approved by the Engineer.
- Repair or replace at no cost to the Department, any erosion or sediment control devices that are not functioning properly or are damaged due to negligence or abuse.

B. Temporary Silt Fence

Maintenance of Temporary Silt Fence consists of furnishing all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0 % filled). Also included is the removal of sediment accumulations ("filtercake") on the fabric by tapping the fabric on the downstream side.

C. Silt Control Gates

Maintenance of Temporary Silt Control Gates consists of all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled). When applicable, this item will include the removal of sediment accumulations on the fabric by tapping the fabric on the downstream side.

D. Check Dams (all types)

Maintenance of Temporary Erosion Control Check Dams shall consist of all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled). This item also includes the removal of any material deposited in sump holes. When applicable, this item will include the removal of sediment accumulations on the fabric by tapping the fabric on the downstream side, or from the baled straw by similar means.

E. Silt Retention Barrier

Maintenance of Temporary Silt Retention Barrier consists of all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled).

F. Temporary Sediment Basins

Maintenance of Temporary Sediment Basins consists of all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original bottom of the basin. This also includes removing accumulated sediment from the rock filter and restoring the rock filter to its original specified condition and any work necessary to restore all other components to the pre-maintenance conditions.

G. Sediment Barrier (baled straw)

Maintenance of sediment barrier (baled straw) consists of furnishing all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0 % filled). Also included is the removal of sediment accumulations on the bales by tapping.

H. Triangular Silt Barrier

Maintenance of Triangular Silt Barrier consists of all labor, tools, materials, equipment and necessary incidentals to remove and dispose of accumulated sediment down to the original ground line (0% filled).

I. Retrofit:

Maintenance of the retrofit device consists of all labor, tools, materials, equipment and necessary incidentals to remove and properly dispose of accumulated sediment in the permanent detention pond being utilized as a temporary sediment basin. This item also includes any maintenance that is required to ensure the retrofit device is maintained per Plan details and any maintenance of the stone filter to maintain its filtering ability, including cleaning and replacement.

J. Construction Exit:

Maintenance of the construction exit consists of all labor, tools, materials, equipment and incidentals, including additional stone and geotextile fabric as required to prevent the tracking or flow of soil onto public roadways. This includes, scarifying existing stone, cleaning existing stone, or placement of additional stone.

Cleaning of the construction exit by scraping and/or brooming only will not be measured for payment.

K. Inlet Sediment Trap

Maintenance of inlet sediment traps consists of all labor, tools, materials, equipment and necessary incidentals to remove and properly dispose of accumulated sediment in the trap and/or the excavated area adjacent to the trap. It also includes any maintenance that is required to remove sediment accumulations ("filtercake") from the material selected to construct the inlet sediment trap.

165.3.06 Quality Acceptance

General Provisions 101 through 150.

165.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

165.4 Measurement

A. Temporary Silt Fence:

Maintenance of temporary silt fence, Type A, B, or C, is the actual linear feet (meter) of silt fence, measured in place, where sediment is removed.

B. Silt Control Gates:

Maintenance of temporary silt control gates, type I, II, III or IV, as specified on the Plans, is measured as a single unit.

C. Check Dams (All Types):

Maintenance of temporary erosion control check dams as specified on the Plans is the actual linear feet (meter) of baled straw, type c silt fence or rip rap, measured in place, where sediment is removed.

D. Silt Retention Barrier:

Maintenance of temporary silt retention barrier as specified on the Plans, is measured by the linear foot (meter) where sediment is removed.

E. Temporary Sediment Basins:

Maintenance of temporary sediment basins as specified on the Plans, is measured as a single unit.

F. Sediment Barrier (baled straw)

Maintenance of sediment barrier (baled straw), is the actual linear feet (meter) of baled straw measured in place, where sediment is removed.

G. Triangular Silt Barrier:

Maintenance of triangular silt barrier as specified on the plans, is measured by the linear foot (meter) where sediment is removed.

H. Retrofit:

Maintenance of retrofit device at the location specified on the Plans is measured per each.

I. Construction Exit:

Maintenance of construction exit at the location specified on the Plans, or as directed by the Engineer is measured per each.

J. Inlet Sediment Trap

Maintenance of inlet sediment trap at the location specified on the Plans, or as added by the Engineer is measured per each.

165.4.01 Limits

General Provisions 101 through 150.

165.5 Payment

A. Temporary Silt Fence:

Maintenance of temporary silt fence, Type A, B, or C, is paid for at the contract unit price bid per linear foot (meter).

B. Silt Control Gates:

Maintenance of temporary silt control gates, Type I, II, III, or IV as specified on the Plans is paid for at the contract unit price bid per each.

C. Check Dams (All Types):

Maintenance of Check Dams as specified on the Plans is paid for at the contract unit price bid per linear foot (meter).

D. Silt Retention Barrier:

Maintenance of temporary silt retention barrier as specified on the Plans is paid for at the contract unit price bid per linear foot (meter).

E. Temporary Sediment Basins:

Maintenance of temporary sediment basins as specified on the Plans is paid for at the contract unit price bid per each.

F. Sediment Barrier (baled straw):

Maintenance of sediment barrier (baled straw) as specified on the Plans is paid for at the contract unit price bid per linear foot (meter).

G. Triangular Silt Barrier:

Maintenance of triangular silt barrier as specified on the Plans is paid for at the contract unit price bid per linear foot (meter).

H. Retrofit:

Maintenance of the retrofit device at the location specified on the Plans is paid for at the contract unit price bid per each.

I. Construction Exit:

Maintenance of the construction exit at the location specified on the Plans or as added by the Engineer is paid for at the contract unit price per each.

J. Inlet Sediment Trap

Maintenance of the inlet sediment trap at the location specified on the Plans or at the location specified by the Engineer is paid for at the contract unit price per each.

Payment will be made under:

Item No. 165	Maintenance of temporary silt fence Type ____	per linear foot (meter)
Item No. 165	Maintenance of silt control gate Type ____	per each
Item No. 165	Maintenance of check dams (all types)	per linear foot (meter)
Item No. 165	Maintenance of silt retention barrier	per foot (meter)
Item No. 165	Maintenance of temporary sediment basin, Sta. No. ____	per each
Item No. 165	Maintenance of sediment barrier (baled straw)	per linear foot (meter)
Item No. 165	Maintenance of triangular silt barrier	per linear foot (meter)
Item No. 165	Maintenance of retrofit, Sta. No. ____	per each
Item No. 165	Maintenance of construction exit	per each
Item No. 165	Maintenance of inlet sediment trap	per each

165.5.01 Adjustments

General Provisions 101 through 150.