COLUMBIA COUNTY
BOARD OF COMMISSIONERS

COLUMBIA COUNTY

ENGINEERING DIVISION

CONSTRUCTION STANDARD

SPECIFICATIONS

AND DETAILS

Columbia County
Engineering Services Division
Road Construction Department
(706) 447-7600

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PREFACE

COLUMBIA COUNTY ENGINEERING DIVISION
CONSTRUCTION STANDARDS AND SPECIFICATIONS:

ALL DESIGN AND CONSTRUCTION WITHIN RIGHTS-OF-WAY AND/OR EASEMENTS OWNED BY COLUMBIA COUNTY, OR TO BE DEDICATED TO COLUMBIA COUNTY AT ANY POINT IN THE FUTURE, SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS AND SPECIFICATIONS, UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.

ROADWAY INFRASTRUCTURE CONSTRUCTION:

- Subdivision Roads – Construction standards and specifications shall be in accordance with ***Columbia County Engineering Division Construction Standard Specifications and Details***. Construction standards and specifications not addressed herein shall be in accordance with respective GDOT/AASHTO/MUTCD guidelines.
- Non-Subdivision Roads – Construction standards and specifications shall be in accordance with respective GDOT/AASHTO/MUTCD guidelines.

WATER UTILITY INFRASTRUCTURE CONSTRUCTION:

- Construction standards and specifications shall be in accordance with the ***Columbia County Water Utility Construction Standards and Specifications***.

SUPPLEMENTAL DESIGN AND CONSTRUCTION RESOURCES:

- **Columbia County Board of Commissioners (CCBOC)**
  - *CCBOC Code of Ordinances*
  - *CCBOC Design Supplement A Pavement System Design Requirements*
  - *CCBOC Driveway Encroachment Policy Manual*
  - *CCBOC Projects Access Improvements Manual*
  - *CCBOC Stormwater Supplement*
  - *CCBOC Utility Accommodation Standards, Policies and Procedures Manual*
  - *CCBOC Work Zone Traffic Control Procedure*
- **Georgia Department of Transportation (GDOT)**
  - *GDOT Construction Standards and Details*
  - *GDOT Regulations for Driveway and Encroachment Control*
  - *GDOT Standard Specifications Construction of Transportation Systems*
- **American Association of State Highway and Transportation Officials (AASHTO)**
  - *AASHTO A Policy on Geometric Design of Highways and Streets*
  - *AASHTO Roadside Design Guide*
  - *AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities*
- **American Society for Testing and Materials (ASTM)**
- **Institute of Transportation Engineers (ITE)**
- **Manual on Uniform Traffic Control Devices (MUTCD)**

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SPECIFICATIONS

COLUMBIA COUNTY
GEORGIA

1.0 GENERAL

1.1 Applicability

1.1.1 Construction of Public Works by Private Parties under Contract with Columbia County

It is the intention of these specifications that all work done by the contractor under contract with Columbia County, as owner, be done in strict accordance with the Project Documents.

1.1.2 Construction of Public Works by Private Parties to be Dedicated to Columbia County

It is the intention of these specifications that all work done by the contractor for private parties, which is intended to be dedicated to Columbia County, either immediately or at any time in the future, shall be done in strict accordance with the Project Documents.

1.2 Responsibility

1.2.1 General

The presence or absence of the County Engineer on the site does not relieve the Contractor from performing all work in strict accordance with the Project Documents.

1.2.2 Permits, Fees, and Legal Requirements

The Contractor is responsible for obtaining all permits, paying all fees, and complying with all local, state, and federal regulations.

1.3 Control of Work

The term "County Engineer" as used in these specifications refers to the County Engineer of Columbia County, Georgia. County Staff Project Engineers/Inspectors assigned to the work by the County Engineer are authorized to perform such duties as deemed necessary in representing the County Engineer.

All work on the project shall be performed in an orderly and logical sequence to produce the highest quality product. If, in the opinion of the County Engineer, the work is performed in an unsatisfactory sequence that may cause long term detrimental consequences to the project, the County Engineer has the authority to direct the work sequence be performed in the most satisfactory way.

The County Engineer has the authority to suspend the work, in whole or in part, and to revoke the Land Disturbance Permit for the project for failure to carry out the provisions of the Project Documents, for failure to perform work in reasonably close conformance with the Project Documents, for failure to correct unsafe conditions for

workers or the general public, and for any reason or condition that is in the best interest of the County.

1.4 Project Documents Precedence

All Project Documents including the Special Provisions, Plans, Supplemental Specifications, Standard Drawings, Standard Specifications, and any supplemental documents that are part of the Contract shall be followed in strict accordance. If any discrepancy should arise, the order of precedence is as follows:

1) Special Provisions
2) Plans
3) Supplemental Specifications
4) Standard Drawings
5) Standard Specifications

1.5 Ambiguities

In the case of ambiguous Project Documents or typographical errors, the County Engineer shall provide the interpretations or application of the specification in question.

1.6 Waivers

The County Engineer may waiver in writing whatever sections of the Project Documents as are appropriate to meet existing field conditions.

1.7 References

Mention of any referenced Project Document or other publication refers to the current edition of that document or its replacement.

1.8 Damages

Any existing materials, property, structure or other item damaged by the Contractor shall be repaired to the satisfaction of the County Engineer and in accordance with the applicable section of the Project Documents. The cost for all such repairs shall be paid for by the Contractor.

1.9 Material Testing

Unless specified otherwise, the Contractor shall perform Quality Control (QC) material testing. QC material testing shall be performed at the Contractor's expense. Any work that fails to meet the requirements of the Project Documents shall be retested at the Contractor's expense. All QC test reports shall be submitted to the County Engineer on a weekly basis for approval; in no case shall the time frame between submission of reports exceed 7 calendar days.

Columbia County reserves the right to perform Quality Assurance (QA) material testing at its own expense when deemed necessary by the County Engineer.

1.10 Notification

For all phases of work requiring approval, the Contractor must notify the County Engineer at least two working days before the inspection is necessary.

2.0 CLEARING AND GRUBBING

2.1 General

2.1.1 Description

The work covered by this section of the specifications consists of furnishing all labor, equipment, materials, and appurtenances in performing the removal and disposal of all trees, brush, stumps, logs, grass, weeds, roots, decayed vegetable matter, rock debris, posts, fences, stubs, rubbish, and all other objectionable matter resting on or protruding through the original ground surface and occurring within the construction limits, easement or right of way. The work shall be performed in strict accordance with Project Documents.

2.1.2 Preservation

This work shall also include the preservation from injury or defacement of all vegetation and objects outside the limits of clearing as shown on the plans or designated to remain.

2.1.3 Erosion Control

The Erosion and Sedimentation Control plan shall be approved and implemented prior to clearing and grubbing operations.

2.1.4 Permits

The Contractor shall obtain all necessary permits, licenses and other authorization from the appropriate authorities before any construction may begin.

2.2 Construction

2.2.1 Clearing

2.2.1.1 Clearing shall consist of the felling, cutting or trimming of trees, vegetation and other objectionable material and the satisfactory disposal of cleared material from the site as indicated on the drawings or as directed by the County Engineer together with the down timber, snags, brush, and rubbish occurring within the areas to be cleared.

2.2.1.2 Clearing also includes the removal and proper disposal of all obstructions not to be retained, such as fences, bridges, buildings, and other incidental material aforementioned.

2.2.1.3 Clearing operations shall be conducted so as to prevent damage to trees left standing, to existing structures and installations, and to any items designated to remain in place.

2.2.2 Grubbing

2.2.2.1 Grubbing shall consist of the removal from the construction limits, easement or right-of-way and proper disposal of all objectionable material which is embedded in the underlying soil.

2.2.2.2 Within the grading limits, stumps, roots, logs, or other timber, matted roots and other objectionable material shall be removed to a minimum depth of 18 inches or as directed by the County Engineer.

2.2.2.3 All depressions excavated below the original ground surface for or by the removal of stumps and roots, shall be refilled with suitable clean material as indicated on the plans or as directed by the County Engineer and compacted to make the surface conform to the surrounding ground surface.

2.3 Disposal of Materials

2.3.1 Compliance

The Contractor shall dispose of all waste materials at his expense and in accordance with all local, state, and federal regulations.

2.3.2 Salvageable Material

Saw logs, pulpwood, cord wood, or other merchantable timber removed in the above operations shall become the property of the Contractor and may be sold by him provided such disposal is otherwise in accordance with these specifications and is not noted otherwise in the Project Documents.

2.3.3 Non-Salvageable Material

All non-salvageable material shall be removed and disposed of at a location approved by the County Engineer.

3.0 ROADWAY EXCAVATION AND EMBANKMENT

3.1 General

3.1.1 Description

Roadway excavation and embankment shall consist of the excavation, hauling and satisfactory placement or disposal of all materials from within the limits of construction, easement or right-of-way including designated borrow areas, in strict accordance with the Project Documents.

3.1.2 Conformity

All work shall be in conformity with the Project Documents or as directed by the County Engineer.

3.2 Excavation

3.2.1 Unclassified Excavation

3.2.1.1 The term excavation used hereinafter is defined as "unclassified excavation." Excavation of every description regardless of material encountered within the grading limits of the project, shall be performed in strict accordance with the Project Documents.

3.2.1.2 Rock is considered unclassified excavation and shall be excavated to a depth of 18-inch minimum below the subgrade.

3.2.2 Unsuitable Material

All unsuitable material encountered within the limits of the work shall be excavated below the grade shown and backfilled with suitable material, properly compacted in accordance with Section 3.3.1.2. Such suitable material shall conform to Georgia Department of Transportation Specification 812. Backfill materials, Type I or Type II, shall be devoid of weeds, underbrush, roots, wood, trash of all description, and other foreign materials.

3.3 Embankment

3.3.1 Compaction

3.3.1.1 Embankment shall be placed in uniform, horizontal layers no greater than 8 inches loose, and shall be compacted by mechanical means.

3.3.1.2 Each layer of embankment shall be uniformly compacted to at least 95% of maximum dry density to within 12 inches of the top of the embankment. The top 12 inches shall be compacted to 100% maximum dry density. Compaction shall be based upon the standard proctor method per ASTM D698, or as directed by the County Engineer.

3.4 Cement Stabilized Sub-Grade

3.4.1 Description

This work consists of construction of one or more courses of a mixture of soil, cement, and water as indicated in the Project Documents, and in conformity with the lines, grades, thickness, and typical cross sections shown on the plans for the purpose of stabilizing existing soil properties.

3.4.2 Materials

3.4.2.1 Cement shall be Type I or Type I/II meeting the requirements of ASTM C 150. The source of the cement shall recognized by GDOT QPL and approved in advance of stabilization operations in order that Standard Proctor tests can be completed. The source of cement shall be submitted to the County Engineer for approval, prior to use. Cement shall be stored and handled in closed weatherproof containers until immediately before distribution. Cement exposed to moisture prior to mixing with soils shall be discarded.

3.4.2.2 Water used for mixing or curing shall be reasonably clean and free of oil, salt acid, alkali, sugar, vegetable, or other substances injurious to the finished product.

3.4.2.3 Soil for this work consists of materials on the site or selected materials from other sources and shall be uniform in quality and gradation, and shall be approved by the County Engineer. The soil shall be free of roots, sod, weeds, and stones larger than 1 ½ inches.

3.4.3 Composition

The amount of cement to use, and the application procedure depends on the soil classification and should be established to achieve a 300 psi unconfined compressive strength in a sample test. The amount and procedure should not produce an unconfined compressive strength of greater than 450 psi to avoid the sub-base behaving as a rigid pavement, as this may negatively affect the performance of the asphalt pavement layers. The percent of cement and application procedure should be determined through appropriate laboratory testing and shall be based on a minimum mixing depth of 8 inches.

3.4.4 Roadway Pavement Design Method Submittal

The Mix Design shall be submitted to the County Engineer for approval, prior to use, as outlined in Columbia County Design Supplement A.

3.4.5 Tolerances

At final compaction, the cement and water content for each course of subgrade treatment shall conform to the following tolerances
Material Tolerance
Cement +0.5%, -0%
Water +2.0%, -0%

3.4.6 Construction

3.4.6.1 The cement treated subgrade shall not be mixed while the atmospheric temperature is below 35°F or when conditions indicate that temperatures may fall below 35°F within 24 hours, when it is foggy, rainy, or when soil or subgrade is frozen.

3.4.6.2 The equipment required shall include all equipment necessary to complete this item such as: grading and scarifying equipment, a spreader for the cement, mixing or pulverizing equipment, sheepsfoot, and pneumatic rollers, water delivery equipment, and trucks.

3.4.6.3 It is the primary requirement of this specification to secure a completed stabilized subgrade containing a uniform cement mixture, free from loose or segregated areas, of uniform density and moisture content, well bound for its full depth, and with a smooth surface suitable for placing subsequent courses. The Contractor shall regulate the sequence of work, to apply specified rates of cement, maintain the work, and rework the courses as necessary to meet the above requirements.

3.4.6.4 The area to be incorporated with cement shall be graded from at grade to 0.10 feet below final grading lines before incorporation will be allowed. The Contractor shall provide the County Engineer facilities with which to check proper grading in anticipation of cement incorporation. Pre-application grading shall be based upon the proposed rate and the intent to provide the final 8 inch layer of cement-treated subgrade in conformity with the lines and grades specified in the plans.

3.4.7 Cement Application

3.4.7.1 Cement shall be spread only on areas where the mixing and compaction operations can be completed within 2 hours. The amount of cement spread shall be the amount required to obtain the cement content as determined from the mix design.

3.4.7.2 The cement shall be spread uniformly over the top of the subgrade by an approved screw-type spreader box or other approved spreading equipment. The cement shall be distributed in such a manner that scattering by wind will be minimal. Cement shall not be applied when wind or other weather conditions, in the opinion of the County Engineer, are detrimental to a proper application.

3.4.7.3 The full depth of the treated subgrade shall be mixed with the pulverizing mixer. Cement shall not be left exposed for more than 30 minutes after application. The pulverizing mixer shall make a minimum of two passes to incorporate the cement into the soil. Water shall be added through use of a pulverizing mixer equipped with a spray bar in the mixing drum capable of applying sufficient quantities of water to achieve the required moisture content of the soil-cement mixture. The system shall be capable of being regulated to the degree as to maintain moisture contents within the specified range.

3.4.7.4 Specified moisture contents shall be established by the Design Engineer based on Standard Proctor tests with the site soils and the specific cement to be used for the treatment. Final moisture content of the mix, immediately prior to compaction, shall not be below nor more than 2% above the optimum moisture content for maximum density of the mix. If moisture contents exceed the specified limits, additional cement may be added to lower the moisture content to the required limits. Lowering moisture contents by aeration following addition of the cement will not be permitted.

3.4.8 Testing

3.4.8.1 All camera inspections and subsequent repairs shall be complete prior to installation of cement stabilized subgrade and curb on all projects.

3.4.8.2 All testing specified below shall be performed by the Contractor, unless otherwise noted. Submission of all test reports to the County Engineer shall be in accordance with Section 1.9 of these Specifications.

3.4.8.3 Spread rates shall be checked a minimum of once daily or more often as determined by County Engineer.

3.4.8.4 Compaction of the soil-cement mixture shall begin immediately after mixing of the cement and be completed within 2 hours following incorporation of the cement. The field density of the compacted mixture shall

be at least 100% of the maximum density (Standard Proctor) of laboratory specimens prepared from samples taken from the material in place

3.4.8.5 The Contractor shall perform QC compaction testing of the embankment at the following minimum frequency: 1 test every 500 linear feet. Additional QC testing may be performed as needed to ensure compaction requirements are being met. The County Engineer may perform QA testing of the material as needed.

3.4.8.6 Irregularities, depressions, or weak spots, which develop, shall be corrected immediately by scarifying the area affected, adding or removing material as required, and reshaping and re-compacting. The surface of the course shall be maintained in a smooth condition, free from undulations, and ruts, until other work is placed thereon or the work is accepted.

3.4.8.7 Compaction tests shall be performed after each section is completed. If the material fails to meet the density requirements, it shall be reworked to meet these requirements. Throughout this operation, the shape of the course shall be maintained by blading, and the surface upon completion shall be smooth and shall conform with the typical section shown on the plans and to the established lines and grades. Should the material lose the required stability, density, and finish before the next course is placed or the work is accepted; it shall be re-compacted and refinished.

3.4.8.8 The thickness of the cement treated subgrade shall be determined by depth checks or cores taken at intervals so that each test will represent no more than 500 linear feet or as approved by the County Engineer. When the base thickness is deficient by more than ½ inch, the Contractor shall correct such areas in a manner satisfactory to the County Engineer. The Contractor shall replace the base material where borings are taken for test purposes. The County Engineer may perform additional testing as needed.

3.4.9 Finishing and Curing

3.4.9.1 After the final layer or course of the cement treated subgrade has been compacted, it shall be brought to the required lines and grades in accordance with the typical sections. The finished surfaces shall not vary more than 1/2 inch when tested with a 10 foot straightedge applied parallel with and at right angles to the subgrade centerline. Any variations in excess of this tolerance shall be corrected by the Contractor in a manner satisfactory to the County Engineer.

3.4.9.2 After the cement treated course has been finished as specified herein, the surface shall be protected against rapid drying and maintained in a thorough and continuously moist condition until the pavement section is placed.

3.4.10 Maintenance

The Contractor shall maintain the cement treated subgrade in good condition from the start of work until all the work has been completed, cured, and accepted by the County Engineer. Traffic permitted on uncovered stabilized subgrade shall be limited to equipment to satisfy the work. Excessive traffic shall be avoided until full curing of the subgrade has occurred.

3.5 QC/QA Testing

The Contractor shall perform QC testing of the embankment at the following minimum frequency: 1 test per lift of embankment per every 500'. Additional QC testing may be performed as needed to ensure compaction requirements are being met. All QC testing shall be submitted in accordance with Section 1.9 of these Specifications.

The County Engineer may perform QA testing of the embankment as needed.

3.6 Final Finishing of Roadbed

3.6.1 Roadway Surface

After completion of roadway excavation and embankment, the entire surface of the roadbed and slopes shall be shaped to true grade, alignment, and cross-section as shown in the Project Documents

3.6.2 Drainage

During construction, all excavation, embankment, ditches, drains, and culverts within the construction limits, easements, or right of way shall be constructed in a manner and sequence as to provide suitable drainage at all times.

4.0 CONSTRUCTION OF SUB-BASE

4.1 General

4.1.1 Description

This work shall consist of placing, mixing, compacting, and shaping the top 8 inches of the roadbed in both excavation and embankment areas.

4.2 Construction

4.2.1 Sub-Base Construction

The entire surface of the in place sub-base shall be thoroughly mixed to a depth of 8 inches. After the material has been thoroughly mixed, the sub-base shall be brought to line and grade and compacted to 100% of the maximum dry density. Compaction shall be based upon the standard proctor method per ASTM D698, or as directed by the County Engineer.

The limits of the sub-base shall underlay the proposed base course plus three (3) feet on each side.

4.2.2 Finishing Sub-Base

4.2.2.1 The surface of the completed sub-base shall be bladed to a smooth and uniform texture. The design centerline profile and template cross-section shall conform to the established elevations within an acceptable tolerance of ± ½ inch.

4.2.2.2 The area between the top of curb and right-of-way shall be finish graded to a uniformly smooth surface free from any abrupt irregularities and in close conformance with Plans.

4.2.2.3 Prior to the placement of base material, the Contractor shall provide all test results for the sub-base, as noted in the Project Documents, to the County Engineer for approval. All testing of the sub-base will be performed at the Contractor's expense.

4.2.2.4 The sub-base shall conform to current Georgia Department of Transportation Specification, Section 810 for Class IA material; however, at no time shall any sub-base clay content exceed 16%. Should the material not meet Georgia Department of Transportation Specification, Section 810 for Class IA material, the Design Engineer shall submit his/her method of stabilizing to the County Engineer for approval.

4.2.3 Roadway-Pavement Design Method Submittal

The Design Engineer shall submit a roadway design in conformance with Design Supplement A, Pavement System Design Requirements for Columbia County to the County Engineer for approval.

4.3 Proof Rolling

4.3.1 Extent

Proof rolling shall be done on all portions of the sub-base or sub-grade underlying the base, which includes three (3) feet of width on each side of the base. The surface shall be in a finished condition ready for the placement of base material.

4.3.2 Means

4.3.2.1 All sub-base and sub-grade shall be compacted and shaped to a firm and non-yielding surface prior to placement of another layer or course.

4.3.2.2 Proof roll shall be performed with a tandem axle dump truck loaded to a minimum gross load of 56,000 pounds provided by the Contractor with no exceptions.

4.3.2.3 The pattern for the proof roll shall be up, back and then the test roll.

4.3.2.4 All proof rolling shall be done in the presence of the County Engineer

4.3.3 Repairs to Sub-Base and Sub-Grade

4.3.3.1 All deficient areas shall be satisfactorily repaired and retested.

4.3.3.2 In the event of a rain event exceeding 0.25 inches, after a passing proof roll, the area shall be subject to retesting.

4.4 Protection of Existing Service Lines and Utilities

The Contractor shall be responsible for the location and protection of all services and utilities of any description and for notifying and coordinating with the appropriate utility companies of work to be performed within the limits of the right-of-way, easements, or construction limits. This shall include all lines and/or structures.

4.5 Restoration of Property

The Contractor shall carefully restore all property defaced or damaged by operations or acts of any of his agents, employees, or subcontractors. Such restoration shall include seeding, sodding, and transplanting of lawns, hedges, ornamental plantings and repair

or replacement of driveways, walks, fences, steps or other facilities and shall be in like quality to the original undisturbed work.

4.6 Reconstruction or Adjustment to Grade of Miscellaneous Structures

The Contractor shall reconstruct or adjust to grade all manholes, water valve boxes, catch basins, traps, or the like within the right-of-way, easements, or construction limits.

4.7 QC/QA Testing

The Contractor shall perform QC testing of the sub-base at the following minimum frequency: 1 test every 500'. Additional QC testing may be performed as needed to ensure compaction requirements are being met. All QC testing shall be submitted in accordance with Section 1.9 of these Specifications.

The County Engineer may perform QA testing of the sub-base as needed.

5.0 CONSTRUCTION OF BASE COURSE

5.1 Definition

This work shall consist of, but not be limited to, the premixing, hauling, placing, compaction, and shaping of the base course.

5.2 Material

5.2.1 Graded Aggregate Base

Before any graded aggregate base material is brought on site, the Design Engineer shall submit a roadway design in conformance with Design Supplement A, Pavement System Design Requirements for Columbia County to the County Engineer for approval.

5.2.2 Additional Graded Aggregate Base

At the discretion of the County Engineer additional thickness of graded aggregate base material may be required.

5.3 Construction

5.3.1 Preparation of Sub-Base

The construction of the graded aggregate base course shall not commence until the sub-base has been construction in accordance with Section 4.2 and to the satisfaction of the County Engineer.

5.3.2 Placement

Graded aggregate base shall be placed in a manner as to prevent segregation and in accordance with Section 310.3.05.A.2 of the Georgia Department of Transportation Specifications.

5.3.3 Compaction

After the graded aggregate base material has been placed and brought to line, grade, and cross-section, it shall be compacted to 100% maximum dry density. Compaction shall be based upon standard proctor method per AASHTO T 310.

5.3.4 QC/QA Testing

The Contractor shall perform QC testing of the base at the following minimum frequency: 1 test every 500 feet. Additional QC testing may be performed as needed to ensure compaction requirements are being met. All QC testing shall be submitted in accordance with Section 1.9 of these Specifications.

The County Engineer may perform QA testing of the base as needed.

5.4 Finish Grading

5.4.1 Roadway Surface

5.4.1.1 The Contractor shall finish off the surface to a smooth and uniform surface, free from abrupt changes and sloping to the edges at a rate of ¼ inch per foot. The surface may vary from profile and cross section at any given point by no more than ¼ inch.

5.4.1.2 The final surface shall be constructed in strict accordance with the Plans.

5.4.2 Finished Shoulders

The Contractor shall ensure the areas from the edge of the road or back of curb to the right-of-way and utility easements are finished to a uniformly smooth surface, free from abrupt surface changes.

5.5 Proof Rolling

5.5.1 Extent

Proof rolling shall be done on all portions of the graded aggregate base. The surface shall be in a finished condition ready for the placement of asphaltic material.

5.5.2 Means

5.5.2.1 The graded aggregate base shall be compacted and shaped to a firm and non-yielding surface prior to placement of another layer or course.

5.5.2.2 Proof roll shall be performed with a tandem axle dump truck loaded to a minimum gross load of 56,000 pounds provided by the Contractor with no exceptions.

5.5.2.3 The pattern for the proof roll shall be up, back and then the test roll.

5.5.2.4 All proof rolling shall be done in the presence of the County Engineer

5.5.3 Repairs to Graded Aggregate Base

5.5.3.1 All deficient areas shall be satisfactorily repaired and retested.

5.5.3.2 In the event of a rain event exceeding 0.25 inches, after a passing proof roll, the area shall be subject to retesting.

5.6 Protection of Surface.

5.6.1 Graded Areas

5.6.1.1 The Contractor shall be responsible for the protection of all graded areas including the roadway, shoulders, ditches, swales, etc. within the right-of-way, easement, or limits of construction.

5.6.1.2 The graded areas shall be protected from traffic and erosion or damage in any form or manner. Any settlement, washing, silting, sanding, or damage that may occur from any cause shall be repaired and grades re-established according to the required grades or elevations.

5.6.2 Roadway

Unless otherwise specifically noted, the Contractor shall maintain the roadway until application of the surface course and during the warranty period.

5.7 Protection of Existing Service Lines and Utilities

Protection of existing service lines and utilities shall be performed in accordance with Section 4.4 of these Specifications.

5.8 Restoration of Property

Restoration of property shall be performed in accordance with Section 4.5 of these Specifications.

5.9 Reconstruction or Adjustment to Grade of Miscellaneous Structures

Reconstruction or adjustment to grade of miscellaneous structures shall be performed in accordance with Section 4.6 of these Specifications.

6.0 BITUMINOUS PRIME COAT AND/OR TACK COAT

6.1 Prime Coat Description

This work shall consist of preparing and treating a prepared base course or an existing surface with bituminous material and blotter material, if required, in accordance with these specifications. All base courses shall be primed with the exception of sand asphalt or asphaltic concrete base material. Prime shall not be applied until all conditions of Section 5.0 have been met and the base course approved by the County Engineer.

6.2 Tack Coat Description

This work shall consist of preparing and treating an existing surface with bituminous material in accordance with these specifications.

6.3 Material for Prime Coat and/or Tack Coat

Unless otherwise specified, all materials used shall meet the requirements of Georgia Department of Transportation Quality Products List (QPL) for prime coat and/or tack coat.

6.4 Prime Coat Construction

6.4.1 Weather

6.4.1.1 Prime coat shall not be applied on a wet surface nor when the ambient air temperature is below 40 degrees F in the shade. Prime coat shall not be applied when weather conditions would prevent proper bonding and curing of the prime coat.

6.4.2 Condition of Surface

6.4.2.1 The surface to which the prime coat is to be applied shall have been finished to the line, grade, and cross section specified.

6.4.2.2 The surface shall be uniformly compacted and bonded. All irregularities occurring in the surface shall be corrected in accordance with the Project Documents for the particular construction being primed.

6.4.2.3 All loose material, dust, caked clay, and all other material likely to prevent penetration or bonding of the prime with the surface shall be removed from the road.

6.4.3 Heating and Applying Prime Coat

The prime coat shall be applied to the full width of paving plus six inches in areas without curb and gutter and in accordance with Section 412 of the Georgia Department of Transportation Specifications. Caution shall be exercised to avoid the placement of prime coat on concrete curb and gutters.

6.5 Tack Coat Construction

6.5.1 Weather

The tack coat shall not be applied on a wet surface nor when the ambient air temperature is below 40 degrees Fahrenheit in the shade. The tack coat shall not be applied when weather conditions would prevent proper bonding and curing of the tack coat.

6.5.2 Condition of Surface

The surface to which the tack coat is to be applied shall be clean and free from any material which would prevent the proper bonding and curing of the tack coat.

6.5.3 Applying Tack Coat

A tack coat of 0.02 gallons per square yard to 0.04 gallons per square yard shall be applied to new surfaces. A tack coat of 0.04 gallons per square yard to 0.08 gallons per square yard shall be applied to existing surfaces. These tack rates may be adjusted at the discretion of the County Engineer. The temperature of the tack coat shall be in accordance with Section 413 of the Georgia Department of Transportation Specifications.

The tack coat shall be applied to the full width of paving in areas without curb and gutter. For areas with curb and gutter or other structures, the contact face shall be coated with a thin uniform coat just prior to placement of asphalt courses. Caution shall be exercised to avoid the placement of tack coat on concrete curb and gutter.

6.6 Protection, Curing, and Maintenance

6.6.1 Closing to Traffic

The primed surface shall be closed to all traffic and left undisturbed for so long as necessary for the prime to cure and until it does not pick up under traffic.

6.6.2 Sanding (Blotting)

6.6.2.1 If necessary, or as directed by the County Engineer, clean, dry, sharp sand shall be spread by hand or mechanically, over the surface, to prevent the prime coat from being picked up.

6.6.2.2 Sand shall only be spread on places that are tacky and shall be the least amount needed to prevent it from being picked up.

6.6.3 Maintenance

The Contractor shall maintain the prime coat and the surface of the course primed until it is covered by other construction.

7.0 ASPHALT COURSES

7.1 General

7.1.1 Description

7.1.1.1 This specification covers the general requirements that are applicable to all types of bituminous plant mixtures irrespective of gradation of aggregate, kind, and amount of bituminous material or pavement use.

7.1.1.2 This work shall consist of the placement of bituminous plant mix on the prepared foundation surface in the required compacted thicknesses and in strict conformance with the Project Documents

7.1.2 Conformity

Except where otherwise indicated herein below, all work and materials shall conform to the requirements of Section 400 of the Georgia Department of Transportation Specifications.

7.2 Material

7.2.1 Type of Material

The asphalt concrete mixture shall conform to Section 400 of the Georgia Department of Transportation Specifications for mix designs as specified in Design Supplement A, Pavement System Design Requirements for Columbia County.

7.3 Construction

7.3.1 Weather

The mixing and placing of asphalt concrete mixtures shall not be performed when the existing surface is wet or frozen. The minimum temperature at which the asphalt concrete mixtures can be placed shall be in accordance with Section 400 of the Georgia Department of Transportation Specifications.

7.3.2 Preparation of Existing Surface

7.3.2.1 If the surface has been rained on, the surface shall be proof rolled again in the presence of the County Engineer prior to any paving operations commencing to ascertain any damage to the primed surface or base course. Repairs will be made as specified by the County Engineer.

7.3.2.2 Before beginning paving operations, the existing surface shall be cleaned. The cleaning operations shall include the removal of dust, foreign matter such as pine straw, leaves, sand, or any other objectionable material.

7.3.2.3 Before beginning paving operations, all damaged or deficient areas which require patching or repair as directed by the County Engineer shall be corrected prior to any mix being placed. Areas to be patched shall be cut out and all loose material removed. At the discretion of the County Engineer, defects, which are not excessive in depth, width or length, may be removed ahead of the paving operation, filled from the paving operation and overlaid. If the extent of the defect is excessive, the defect shall be removed, filled with acceptable material, and compacted before overlaying.

7.3.2.4 The surface of existing abutting roadways shall be thoroughly cleaned of all objectionable material and the tack coat shall be applied at the appropriate rate on the adjacent area being overlaid.

7.3.3 Transportation and Delivery

7.3.3.1 All asphalt concrete mixtures shall be transported and delivered in accordance with Section 400 of the Georgia Department of Transportation Specifications.

7.3.3.2 The County Engineer shall be notified at least 48 hours prior to the placement of any asphalt concrete mixtures.

7.3.3.3 The County Engineer may reject any load of asphalt concrete mixture that does not meet these Specifications. Reasons for rejection may include but are not limited to: mix temperature out of tolerance, equipment failure, uncoated aggregate, segregation, deleterious material in mix, etc.

7.3.4 Placement Sequence

The asphalt mixture shall be placed in a manner so as to minimize the amount of construction traffic that will travel on the pavement (i.e, complete asphalt paving operations on side roads first, beginning at the end of each side road; complete asphalt paving operations on the main roads last, beginning at the end of the main roads), or as approved by the County Engineer.

7.3.5 Bituminous Pavers and Spreading

All requirements for bituminous pavers and spreading shall be in accordance with Section 400 of the Georgia Department of Transportation Specifications.

7.3.6 Rolling and Compaction Operations

7.3.6.1 All requirements for rolling and compaction operations shall be in accordance with Section 400 of the Georgia Department of Transportation Specifications.

7.3.6.2 The types of roller equipment shall include, at a minimum, a breakdown roller, pneumatic-tired roller, and a finish roller.

7.4 Access

7.4.1 Access

In all cases, the Contractor shall ensure free access to the driveway without scraping, bumping, or rubbing of a vehicle entering or leaving the driveway during all phases of construction and upon acceptance of the work.

7.5 Adjoining Roads

7.5.1 Damaged Roadway

The adjoining pavement to new construction shall have all deficient and damaged pavement removed by the Contractor as directed by the County Engineer. The surface shall be cleaned and tacked as specified in Section 7.3.2.4.

7.6 Protection of Paving

All sections of new pavement shall be protected from traffic until the traffic will not mar the surface or alter the surface texture.

7.7 Testing

7.7.1 QA/QC Testing

The asphalt concrete mixture shall be tested in accordance with Section 400 of the Georgia Department of Transportation Standard Specifications. Copies of all of the Contractor's QC test results, along with the Asphaltic Concrete Lot Worksheet, shall be submitted in a timely manner to the County Engineer for approval.

The County Engineer may elect to check the thickness of the asphalt concrete mixture by obtaining three (3) inch asphalt core samples for each street. An asphalt core sample would be taken for each six hundred and fifty (650) lane feet per travel lane or one per travel lane if the street length is less than six hundred fifty (650) feet.

The County Engineer reserves the right to perform any additional testing of the asphalt concrete mixture as needed.

7.7.2 Tolerances

If the County Engineer elects to check the thickness of the asphalt concrete mixture by obtaining asphalt core samples, the following shall apply:

If the overall thickness of the asphalt core sample is deficient more than one eighth (1/8) of an inch from plan thickness, additional asphalt core samples shall be obtained at fifty (50) feet intervals on each side of the original asphalt core sample until an asphalt core sample is obtained that is within

tolerance. Once the deficient areas are determined, the Developer/ Design Engineer shall submit a Corrective Action Plan to the County Engineer for approval. Once corrective actions have been completed, additional asphalt sample cores shall be obtained to verify that the asphalt thickness in these areas is within tolerance.

Once all corrective actions have been completed, all asphalt core sample thicknesses shall be averaged to obtain an overall average pavement thickness for each street. If the overall average pavement thickness is deficient more than one eight (1/8) of an inch from plan thickness, the Developer/Design Engineer shall submit a Corrective Action Plan to the County Engineer for approval.

The County Engineer shall appoint an independent AASHTO accredited testing laboratory to obtain and analyze the asphalt core sample and to determine the final pavement thickness.

7.7.3 Penalty

All asphalt concrete mixtures shall be accepted, accepted with conditions, or rejected based on the Indicated Pay Factors as reported on the Asphaltic Concrete Lot Worksheet, as shown below.

Sieve Analysis
PF = 0.90 - 1.00 : Accepted without exceptions
PF = 0.80 - 0.85 : Accepted with an additional 1 year warranty
PF = Less than 0.80 : Remove and Replace

Asphalt Cement & Percent Air Voids
PF = 0.90 - 1.00 : Accepted without exceptions
PF = 0.50 - 0.80 : Accepted with an additional 1 year warranty
PF = Less than 0.50 : Remove and Replace

All additional warranties shall be in addition to the warranty stated in the Project Documents and shall apply only to the lot of asphalt mixture in question.

7.8 Smoothness

The finish surface shall not vary more than 1/4 inch in 10 feet from the true profile and cross-section.

7.9 Shoulders and Right-of-Way

7.9.1 Grading

In areas disturbed by the Contractor's operations, these areas shall be finish graded in accordance with Section 4.2.2.2.

7.9.2 Finishing

All trash, debris, construction material and equipment, excess dirt or asphalt, and all objectionable or unsightly material shall be removed by the Contractor from the right-of-way, easement, or limits of construction.

7.10 Restoration of Property

Restoration of property shall be performed in accordance with Section 4.5 of these Specifications.

8.0 CONCRETE CONSTRUCTION

8.1 General

This section covers concrete construction including reinforcing steel.

All concrete shall be sourced from a Georgia Department of Transportation approved concrete plant. All concrete mix designs shall be Georgia Department of Transportation approved and submitted to the County Engineer for approval.

All concrete with a 28 day minimum compressive strength of 4000 psi and greater shall be considered structural concrete. All concrete with a 28 day minimum compressive strength of 3000 psi and less shall be considered miscellaneous concrete.

8.2 Forms

8.2.1 Design

8.2.1.1 Forms, including their bracing and supports, shall be of sufficient strength to support the wet concrete and other loads and forces incidental to construction operations, without bulging between supports or bracing and without other deviation from the lines and contours shown on the plans.

8.2.1.2 When form work is, or appears to be, inadequately supported, tied or braced, whether before or during concrete placement operations, the County Engineer may require that the operation be stopped until the apparent defects have been corrected.

8.2.2 Material

8.2.2.1 Except as specifically noted otherwise, forms shall be of lumber, plywood, metal, plastic or a combination of the above, which shall produce the required surface finish. All material shall be free of defects, which materially affect form strength or impair the accuracy or appearance of the concrete surface. Prior to placing concrete, forms shall be coated with acceptable material to prevent bonding of concrete to the form.

8.2.2.2 Forms placed for successive pours for continuous surfaces shall be fitted to accurate alignment to assure smooth, completed surface free from irregularities and shall be sufficiently tight to prevent loss of mortar. No forms shall be left permanently in place without prior approval of the County Engineer. Holes resulting from removal of form ties shall be filled solid within 12 hours after removal of forms with cement grout, using the same cement and sand as used in the concrete.

8.3 Materials

8.3.1 General

The Contractor shall be responsible of obtaining concrete mix designs, obtaining and testing of concrete components, and field testing of concrete. Field testing of concrete includes tests for slump, air content, temperature, casting test cylinders, and obtaining test results. The testing laboratory used shall be AASHTO accredited and approved by the County Engineer. All test results shall be submitted to the County Engineer in a timely manner for approval.

8.3.2 Cement

8.3.2.1 Only one type of cement shall be used for exposed concrete in any individual structure.

8.3.2.2 Type I Portland cement to be used in all concrete unless otherwise directed.

8.3.2.3 Type II Portland cement shall be used where concrete will be in contact with the sanitary sewer.

8.3.3 Fine Aggregate

Fine aggregate shall consist of clean, hard natural sand manufactured sand or a combination thereof, conforming to ASTM C-33, concrete aggregates, and shall be graded from 3/8 inch to No. 100 sieve.

8.3.4 Coarse Aggregate

Coarse aggregate shall consist crushed stone, gravel or a combination thereof, conforming to ASTM C-33, concrete aggregates, and shall be graded to meet the requirements of size No. 467 and 67 as appropriate.

8.3.5 Water

Water shall be clean, free from oils, acids, salt, or other injurious substances.

8.3.6 Admixtures

Admixtures not listed in the approved concrete mix designs shall be used only with prior written approval.

8.3.7 Curing

Curing compound shall conform to Georgia Department of Transportation, Qualified Products List (QPL), for clear or white pigmented curing compound.

8.3.8 Reinforcing Steel

Reinforcing steel for concrete shall conform to ASTM A-615 Grade 60. Mesh reinforcement shall conform to ASTM A-185. All splices shall be lapped 30 diameters unless otherwise specified.

8.3.9 Preformed Expansion Joint Filler Strips

Preformed Expansion Joint Filler Strips shall conform to ASTM D-1751.

8.3.10 Vapor Barriers

Vapor barriers of 6-mil polyethylene shall be provided under all building floor slabs.

8.4 Concrete Quality

8.4.1 Strength

All concrete quality shall be classified by strength. The strength classification shall be 28-day minimum compressive strength.

8.4.2 Slump and Air Content

The slump and air content shall conform to the specified limits noted in the approved concrete mix designs.

8.4.3 Water - Cement Ratio

The water cement shall conform to the specified limits noted in the approved concrete mix designs.

8.4.4 Ready Mix

Ready mix concrete shall conform to Section 500 of the Georgia Department of Transportation Standard Specifications.

8.4.5 Strength

8.4.5.1 Sidewalks, manhole slabs, curbs, gutters, and ditch paving shall be 3000 psi.

8.4.5.2 Flowable fill shall have a minimum compressive strength of 100 psi.

8.5 Construction

8.5.1 Placing

8.5.1.1 All weather and temperature restrictions on placing the concrete shall be in conformance with Section 500 of the Georgia Department of Transportation Standard Specifications for structural concrete or Section 441 of the Georgia Department of Transportation Standard Specifications for miscellaneous concrete.

8.5.1.2 The maximum time that the concrete may be held in the truck shall conform to Section 500 of the Georgia Department of Transportation Standard Specifications.

8.5.1.3 Concrete shall be placed in the forms and mechanically vibrated to produce concrete without segregation or honeycomb. Slabs inclusive with beams shall be placed in one operation. Concrete shall be placed continuously between construction joints. Each batch shall be placed into the edge of previously placed concrete to avoid stone pockets and segregation. If there is a delay in casting, the concrete placed after the delay shall be thoroughly spaded and consolidated by mechanical vibration. During the casting of wall sections, not less than two mechanical vibrators shall be operated continuously for each casting section. The concrete shall not be freely dropped more than six feet, nor be moved horizontally after being deposited, more than five feet. Care must be taken to avoid excessive vibration. Do not allow the vibrators to come into contact with the reinforcing material.

8.5.2 Floating

The concrete shall be brought to correct level with a straight edge and struck off. Bull floats shall be used to smooth the surface of the slabs. Power floating of the slabs shall begin when the water sheen has disappeared and/or the mix has set sufficiently to support the weight of equipment.

8.5.3 Reinforcing Steel

Reinforcing steel shall be free from scale, oil, and structural defects. The retaining system shall insure that all reinforcing steel in the top surface will be of adequate support to prevent displacement. All reinforcing steel within the limits of a day's pour shall be in place and adequately tied before concrete placement begins. Pulling up reinforcement to the proper elevation during the placement of concrete shall not be allowed.

8.5.4 Construction Joints

Construction joints shall be formed at the locations shown on the plans. Joints, which must be formed in other locations, shall be water-stopped where appropriate, and be adequately keyed and doweled to form a horizontal or vertical line.

8.5.5 Curing and Protection

8.5.5.1 All freshly placed concrete shall be protected from the detrimental effects of the elements – freezing, rapid temperature loss, loss of moisture, and from future construction operations. The concrete shall be cured in accordance with Section 500 of the Georgia Department of Transportation Standard Specifications for structural concrete or Section 441 of the Georgia

Department of Transportation Standard Specifications for miscellaneous concrete.

8.5.5.2 Alternatively, all surfaces not protected by forms nor covered with water for the entire curing period shall be covered with curing compound meeting requirements of Section 8.3.6 of these Specifications. If a floor is left uncovered during the curing period, a film of water shall be clearly visible at all times on the entire surface of the slab. Other curing methods may be acceptable, but shall be approved by the County Engineer.

8.5.6 Removal of Forms

The forms shall not be removed until the concrete has attained sufficient strength to prevent cracking or other damage. When forms are removed, the Contractor shall take appropriate measures to prevent damage to the concrete by construction loads. It is the Contractor's responsibility to protect the concrete.

8.5.7 Backfilling

8.5.7.1 The County Engineer shall be notified 48 hours before backfilling in order that the work may be inspected before it is covered.

8.5.7.2 Backfilling shall not begin until all forms have been removed and trash and debris have been removed from the excavation.

8.5.7.3 Symmetrical backfill loading shall be maintained. Special care will be taken to prevent any wedging action or eccentric loading upon or against the structure.

8.5.7.4 Compaction shall be in accordance with Section 3.3 of these Specifications.

8.6 Concrete Finishes

8.6.1 Rough Finish

8.6.1.1 All concrete wall surfaces which are not exposed to view may be given this finish. This finish has as a prerequisite, a thoroughly vibrated concrete which will give a surface smooth, free from air pockets, water pockets, sand streaks, or honeycombs.

8.6.1.2 After the removal of forms, all fins shall be cut off; all holes, depressions, and rough spots shall be carefully pointed up with grout having the same proportions of cement and sand as used in the concrete being treated. The surface film of all pointed surfaces shall be carefully removed before

setting occurs, otherwise, surfaces shall be left with the texture imparted by the forms.

8.6.2 Rubbed Finish

8.6.2.1 Wall, beam, sill and under slab surfaces which are exposed to view shall have a rubbed finish. As soon as the rough surface finish has set sufficiently, the entire surface shall be wet with a brush and rubbed with a No. 16 carborundum stone, to bring the surface to a paste. The rubbing shall continue until all form marks and projections are removed, and to produce a smooth dense surface without pits or irregularities. The material, which is ground to a paste in the above process, will be carefully spread or brushed uniformly over the entire surface and allowed to "reset".

8.6.2.2 The final finish shall be obtained by a thorough rubbing with No. 30 carborundum stone. This rubbing shall continue until the entire surface is of a smooth texture and uniform in color. The surfaces shall be stripped evenly with a brush so as to remove excess paste, and the surface left smooth with only enough paste remaining to obtain a uniform color.

8.6.3 Float Finish

The surface of all concrete slabs shall, unless otherwise hereinafter specified, be given a float finish. The structural slab shall be brought to the established grade by screeding. Irregularities shall be eliminated and the entire surface finished with a hand float or finishing machine to within ±1/16 inch.

8.6.4 Broom Finish

Surfaces of exterior walkways or platforms shall be given a broom finish. A smooth, true, and uniform surface is required for this finish. When the progress of the set provides the proper consistency, the surface shall be raked with a broom to give parallel transverse lines in the surface, and to give a uniform texture.

8.6.5 Trowel Finish

All interior finish shall be machine troweled and hand troweled. Machine trowelling shall begin as soon as little or no cement past slings to the blade. Trowelling shall be continued until the surface is dense, smooth, and free of all minor blemishes, such as trowel marks. Hand trowelling shall be required to remove slight imperfections left by the trowelling machine and to bring the surface to a dense smooth finish.

Sprinkling of dry cement and mixture or dry cement on the surface of the fresh concrete shall not be permitted.

8.6.6 Polished Finish

Prior to polishing or hard trowel finishing, the surface must be finished in accordance with Section 8.6.5. The additional hand trowelling required for

this finish shall bring the surface to a smooth polished finish. Final hand trowelling shall continue until a clear ringing sound is heard as the trowel passes over the surface.

8.7 Samples and Testing

8.7.1 Description

The Contractor shall be responsible for the concrete mix designs, test cylinders for proving the mix designs, tests for the aggregate gradation and quality, for molding test cylinders during the progress of the job, delivering the cylinders for testing to a laboratory, approved by the County Engineer, testing for slump and air content, and for conducting load tests, if required.

8.7.2 Test Cylinders

One set of three concrete test cylinders shall be cast per each 50 cubic yards of concrete placed, for each class of concrete used. Cylinders shall be cured in accordance with ASTM C-31. The cylinders shall be tested for 28 day minimum compressive strength. All test reports shall be submitted to the County Engineer in a timely manner for approval.

In the event that concrete test cylinders do not meet the 28 day minimum compressive strength requirement, the Design Engineer shall submit a Corrective Action Plan to the County Engineer for approval.

The County Engineer reserves the right to cast additional concrete test cylinders as needed.

8.7.3 Slump

Slump test shall be performed whenever concrete test cylinders are cast. The County Engineer reserves the right to request additional slump tests, based on visual inspection of the mix.

Any failing test shall result in rejection of the load.

8.7.4 Air Content

Air content test shall be performed whenever concrete test cylinders are cast. The County Engineer reserves the right to request additional air content tests, at his discretion.

Any failing test shall result in rejection of the load.

8.7.5 Temperature

Temperature test shall be performed whenever concrete test cylinders are cast. The County Engineer reserves the right to request additional temperature tests, based on environmental conditions.

Any failing test shall result in rejection of the load.

8.8 Concrete Repairs

The Contractor is responsible for correction of concrete work which does not conform to specifications, including, but no limited to, strength, honeycomb, spalls, cracks, chips, holes, fins, tolerances, and finished. The County Engineer shall determine the acceptability of the proposed method of repair.

9.0 CONSTRUCTION OF CONCRETE CURB AND GUTTER

9.1 Description

This section covers the construction of Portland cement concrete curb and gutter section, including furnishing all labor, equipment, materials, and appliances whatsoever required to complete the work in accordance with these Specifications.

9.2 Utilities

All utilities shall be in place and in final configuration prior to the placement of concrete curb and gutter.

9.3 Portland Cement Concrete Curb and Gutter

9.3.1 Dimensions

Size and dimensions of curb and gutter shall conform with Standard Drawing 9-1.

9.3.2 Concrete

9.3.2.1 Concrete shall have a minimum compressive strength of 3000 psi at 28 days.

9.3.2.2 All concrete equipment, workmanship, and materials shall conform to the applicable requirements of Section 8 of these Specifications, except as hereinafter specified.

9.3.2.3 Concrete shall conform with Section 8.4 of these Specifications.

9.3.3 Base Preparation

9.3.3.1 The base shall be constructed true to line, grade, and cross section. The base shall be of materials meeting applicable specifications of Section 4 of these Specifications in regard to material quality, compaction, testing, etc. The base for curb and gutter shall extend in all cases at least six inches behind the back of curb.

9.3.3.2 The base shall be maintained in a smooth, compacted condition, in conformity with the required section and established grade.

9.3.4 Forms

9.3.4.1 The forms shall straight and true, without any defects, which adversely affects the appearance or strength of the curb, and of sufficient strength to resist springing during depositing and consolidating the concrete.

9.3.4.2 Flexible or curved forms shall be used in curves and radii, as necessary, to allow for a smooth curve and to prevent a chord effect in the alignment.

9.3.4.3 Prior to use, all forms shall be thoroughly cleaned and coated with acceptable material to prevent bonding of the concrete to the form.

9.3.5 Powered Curb Formers

9.3.5.1 Powered curb formers shall be in good working and able to produce curb that is smooth and uniform.

9.3.6 Joints

9.3.6.1 Expansion joints and contraction joints shall be constructed at right angles to the line of curb and gutter.

9.3.6.2 Contraction joints shall be placed so that monolithic sections of curb and gutter shall not be less than 5 feet nor more than 10 feet in length and shall be uniformly placed.

9.3.6.3 The depth of the contraction joint shall be a minimum of ¼ inch in depth and shall be placed as soon as practical without causing damage to the concrete. Separators shall be removed as soon as practicable after the concrete has set sufficiently to preserve the width and shape of the joint.

9.3.6.4 Expansion joints shall be formed by means of preformed expansion joint filler material cut and shaped to the cross section of the curb and gutter.

9.3.6.5 Expansion joint filler, unless otherwise specified, shall conform to Georgia Department of Transportation, QPL.

9.3.6.6 Expansion joints shall be provided in curb and gutter at the ends of all returns, at catch basins, cold joints, and at intervals not to exceed 50 feet.

9.3.7 Construction

9.3.7.1 All weather and temperature restrictions for the concrete shall be adhered to in accordance with Section 441 of the Georgia Department of Transportation Standard Specifications.

9.3.7.2 All new construction of concrete curb and gutter, which adjoins existing curb and gutter, shall begin at the joint of the first section of existing curb and gutter in good condition, or as determined by the County Engineer. The Contractor shall bear all costs occurring from the removal of existing unsuitable curb and gutter.

9.3.7.3 Concrete shall be placed to the required depth and thoroughly consolidated so that there are no rock or air pockets at forms and mortar entirely covers the surfaces. Concrete may be compacted by means of mechanical vibrators. Concrete shall not be free dropped from a height so as to cause segregation.

9.3.7.4 The curb and gutter shall conform to meet Standard Drawing 9-1 with and edging tool to radii on exposed edges, and the surfaces floated and finished with a smooth float until true to grade and section and uniform in texture. The floated surfaces shall then be brushed with a fine hair brush with longitudinal strokes.

9.3.7.5 Visible surfaces and edges of the finished curb and gutter shall be free of blemishes, form and tool marks, and shall be uniform in color, shape, and appearance.

9.3.7.6 All camera inspections and subsequent repairs shall be complete prior to installation of cement stabilized subgrade and curb on all projects.

9.4 Testing

9.4.1 Sampling and Testing

Sampling and testing shall be done in accordance with Section 8.7 of these Specifications, or as directed by the County Engineer.

9.4.2 Notification

The Contractor shall notify the County Engineer at least 48 hours prior to concrete placement. No concrete shall be placed prior to inspection of the base by the County Engineer.

9.4.3 Tolerances

The finished surfaces, except plan grade changes or curves, shall not vary from plan line and grade by more than 1/4 inch per ten feet in the curb and gutter.

9.5 Finishing and Protection

9.5.1 Backfill

After the concrete has set sufficiently, the area to be backfilled shall be cleaned of debris and the backfill shall be placed in accordance with Section 8.5.7 of these Specifications.

9.5.2 Protection

The Contractor shall protect the completed curb and gutter from all damage until accepted. Curb and gutter, which has settled due to base settlement or erosion under cut or has been cracked or broken, shall be removed and replaced in accordance with the above specifications.

9.5.3 Repair

All minor repairs or defects shall be filled with mortar composed of one part Portland cement and two parts sand, or as directed by the County Engineer. Plastering shall not be allowed.

9.5.4 Damage

Any damaged curb and gutter that is deemed unacceptable by the County Engineer, shall be removed, and replaced for the entire length between contraction and expansion joints.

9.6 Protection of Exiting Service Lines and Utilities

Protection of existing service lines shall be performed in accordance with Section 4.4 of these Specifications.

9.7 Restoration of Property

Restoration of property shall be performed in accordance with Section 4.5 of these Specifications.

10.0 CONCRETE SIDEWALKS AND DRIVEWAYS

10.1 General

This specification covers the general requirements for the construction and reconstruction of concrete sidewalks and driveways.

10.2 Utilities

All utilities shall be in place and in final configuration prior to the placement of concrete sidewalk and driveways.

10.3 Concrete sidewalks

10.3.1 Size and Dimensions

10.3.1.1 Concrete sidewalks size shall conform to Standard Drawing 10-1.

10.3.1.2 Concrete sidewalks shall be a minimum of 5 feet wide and 4 inches thick, except at driveways where it shall be 6 inches thick, tapered 1 inch on each side of the driveway.

10.3.2 Material

Concrete shall have a minimum compressive strength of 3000 psi at 28 days and shall meet all applicable specifications of Section 9.3.2.

10.3.3 Preparation of Base

10.3.3.1 Base shall be prepared in accordance with all applicable specifications of Section 3.3 inclusive, with the following changes.

10.3.3.2 Base shall be compacted to 95% maximum dry density, standard proctor.

10.3.4 Forms

10.3.4.1 Forms shall be straight and true, without any defects, which adversely affect the appearance or strength to resist springing during depositing and consolidating the concrete.

10.3.4.2 Forms shall have a height equal to the full depth of the sidewalk.

10.3.4.3 Forms shall be held rigidly in place.

10.3.4.4 Flexible or curved forms shall be used in curves and radii, as necessary, to allow for a smooth curve and to prevent a chord effect in the alignment.

10.3.4.5 Forms shall not be removed in any case while the concrete is sufficiently plastic to slump in any direction.

10.3.4.6 Prior to use, all forms shall be thoroughly cleaned and coated with acceptable material to prevent bonding of the concrete to the form.

10.3.5 Joints

10.3.5.1 Expansion joint filler, unless otherwise specified, shall conform to Georgia Department of Transportation, QPL.

10.3.5.2 Expansion joints shall be formed by means of preformed expansion joint filler material cut and shaped to the cross section of the sidewalk and shall not extend more than ½ the thickness of the sidewalk below the level surface of the sidewalk.

10.3.5.3 Expansion joints shall be provided in the sidewalk at the ends of all returns, at catch basins, cold joints and at intervals not to exceed 50 feet.

10.3.5.4 Contraction joints shall be placed not less than 5 feet in length or as directed by the County Engineer.

10.3.5.5 The depth of the contraction joint shall be a minimum of ¼ inch in depth and shall be placed as soon as practical without causing damage to the concrete.

10.3.6 Construction

Construction shall be in accordance with Section 9.3.7, as it applies to concrete sidewalks and driveways.

10.3.7 Finish and Protection

10.3.7.1 Sidewalks shall be finished with floats and final finished with transverse strokes of a stiff bristle broom.

10.3.7.2 The Contractor shall ensure and be responsible for protection of the sidewalk from pedestrian traffic, vandalism, and weather in addition to other damage during the curing period.

10.3.7.3 After the concrete has cured sufficiently, the area to be backfilled shall be cleaned of debris and fill shall be placed as required.

10.3.7.4 The Contractor shall be responsible for the protection of the complete sidewalk from any and all damages whatsoever until it has been accepted by the County Engineer. Sidewalk which has cracked, settled, or been displaced will not be accepted by the County Engineer.

10.3.7.5 Sidewalks that are damaged, shall be removed and reconstructed for the entire length between contraction and expansion joints.

10.4 Driveways

10.4.1 Sidewalk

10.4.1.1 Sidewalk shall match grade to existing concrete and asphalt driveways so as not to present a hazard or unsightly appearance.

10.4.1.2 Sidewalk shall be placed across unimproved driveways at the plan grade.

10.4.2 Access

Access shall be in accordance with Section 7.4 of these Specifications.

10.5 Testing

10.5.1 Specifications

Testing shall be done in accordance with Section 8.7 of these Specifications, or as directed by the County Engineer.

10.5.2 Inspection

The Contractor shall notify the County Engineer at least 48 hours prior to placing concrete. No concrete shall be placed without inspection of the base by the County Engineer.

10.5.3 Tolerances

The finished surfaces, except at plan grade or line changes, shall vary no more than ¼ inch in 10 feet for the top and face of sidewalk from plan grade and line.

10.6 Protection of Existing Service Lines and Utilities

Protection of existing service lines shall be performed in accordance with Section 4.4 of these Specifications.

10.7 Restoration of Property

Restoration of property shall be performed in accordance with Section 4.5 of these Specifications.

10.8 Reconstruction or Adjustment to Grade of Miscellaneous Structures

Reconstruction or adjustment to grade of miscellaneous structures shall performed be in accordance with Section 4.6 of these Specifications.

10.9 Drainage

10.9.1 General

The Contractor shall be responsible for retaining all drainage characteristics of the project, unimpeded at all times, and through acceptance of the work.

10.9.2 Ditches

The Contractor shall be responsible for the relocation and/or construction of all drainage ditches or swales as shown on the plans or as required by the County Engineer.

10.9.3 Driveway Pipes (Side Drains)

The Contractor shall be responsible for the relocation of all driveway pipes or side drains as shown on the plans or as directed by the County Engineer.

11.0 CONSTRUCTION OF STORM DRAIN PIPE SYSTEM

11.1 Description

The work covered by this section of the specifications consists of furnishing and in performing all operations, necessary and incidental to the construction and installation of storm drain pipe. This shall include, but not be limited to all excavation, trenching, removal, and replacement of unsuitable materials, grading, all pipe, and fittings, as shown on the Project Documents.

11.2 Plans, Permits and Codes

11.2.1 Permits and codes

It is the intent of this section of the specifications that the Contractor's bid on this work be based upon the Project Documents and with all applicable codes, permits and regulations.

11.2.2 Plans

11.2.2.1 The Project Documents indicate the extent and specific arrangement of the work.

11.2.2.2 If any departure from the indicated line, grade or location as shown by the plans are deemed necessary by the Contractor, details of such departures and the reasons therefore shall be submitted by the Design Engineer to the County Engineer as soon as practicable for approval.

11.2.2.3 No work on such departures or deviations shall begin without written approval from the County Engineer. No work shall be accepted by the County Engineer with any unapproved departures or deviations from the Project Documents.

11.3 Materials

11.3.1 General

11.3.1.1 All materials furnished by the Contractor shall meet the requirements of these Specifications.

11.3.1.2 All materials shall be new, first quality and free from any and all defects and blemishes such as cracking, splitting, spalling, damages to coatings, bending, dents, and deformations of any type. Material shall be protected from damage at all times.

11.3.1.3 The materials may be inspected at any time and all material deemed unsuitable or damaged, shall either be satisfactorily repaired or removed from the project, easement, or limits of construction. All repairs shall be approved by the County Engineer.

11.3.1.4 Extreme care shall be exercised in handling the material during unloading, storing and at all times during construction. All unloading or placing of pipe in the trench shall be done carefully by hand or machine. At no time will materials be allowed to free fall or be dropped from any height.

11.3.2 Pipe Specifications

Except as otherwise approved, pipe for storm drains shall be reinforced concrete pipe (RCP) or polypropylene pipe (PP) (in limited applications per GDOT QPL for all applications within the right of way and drainage easements). Smooth-lined corrugated polyethylene (PE) culvert pipe or double walled high density polyethylene pipe (HDPE) may be used for private applications and will not be accepted by County as public infrastructure.

A. Reinforced Concrete Pipe (RCP):
   a. Pipe shall meet or exceed the requirements of ASTM C- 76.
   b. Minimum pipe size shall be 18 inches.
   c. Gasketed pipe shall be used for all roadway crossings.
   d. Pipe class and minimum cover shall be determined by Design Engineer and approved by the County Engineer.

B. Polypropylene (PP) Pipe:
   a. Pipe shall meet or exceed the requirements of ASTM F2881 and AASHTO M330.
   b. Minimum pipe size shall be 18 inches.
   c. Pipe shall have smooth interior walls and annular exterior corrugations.
   d. Minimum pipe cover shall be determined by Design Engineer and approved by the County Engineer.

C. Smooth-Lined Corrugated Polyethylene (PE) Pipe:
   a. For private use only. Not allowable within County-owned right-of-way.
   b. Type “S” pipe diameter sizes 18” to 26” shall meet or exceed the requirements of AASHTO M294.
   c. Type “S” pipe diameter sizes 42” and 48” shall meet or exceed the requirements of AASHTO MP6-95.
   d. Minimum pipe cover shall be determined by Design Engineer and approved by the County Engineer.

D. High-Density Polyethylene (HDPE) Pipe:
   a. For private use only. Not allowable within County-owned right-of-way.
   b. Type “S” or Type “D” smooth interior walls shall meet or exceed the requirements of AASHTO M-252, M-294, and MP6-95.
   c. Installation shall be in conformance with ASTM D 2321.
   d. Minimum pipe cover shall be determined by Design Engineer and approved by the County Engineer.

11.3.3 Fittings and Bands

All fittings and bands shall be factory produced first quality and shall be designed for installation on the pipe to be used and be of the same quality and material as the pipe to be used. The fittings and couplings shall comply with the joint performance criteria of AASHTO Standard Specifications for Highway Bridges, Division II.

11.3.4 Weep Holes

Weep hole pipe shall be minimum schedule 40 PVC meeting ASTM D1785 Standard Specification for Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120, or D2665 Standard Specification for Poly Vinyl Chloride (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.

11.3.5 Affidavit of Compliance

The Contractor shall furnish an affidavit from the manufacturer that all material conforms to the above referenced ASTM or AASHTO Specifications to the County Engineer.

11.4 Excavation, Trenching and Backfill for Pipelines

11.4.1 General

The work covered by this specification consists of furnishing all labor, equipment, and materials in performing all operations in connection with the excavation, trenching, and backfilling for pipelines in strict accordance with the Project Documents.

11.4.2 Classification of Excavation

The term “excavation” used hereinafter is defined as “unclassified excavation”. Excavation of every type and description regardless of material encountered shall be constructed to the lines and grades as indicated on the plans or as directed by the County Engineer.

11.4.3 Excavation for Storm Water Structures

Excavation for walls and footings shall extend a sufficient distance to allow for the placing and removal of forms, installation of services and for inspection, except where the wall or footing may be authorized to be placed directly against excavated surfaces.

11.4.4 Trench Excavation for Storm Water Pipe

11.4.4.1 General

Trenches shall be excavated true to line and grade regardless of substances or material encountered and after the right-of-way, easement, or limits of

construction have been cleared, grubbed and graded to sub-base or plan line and grade.

11.4.4.2 Trench Width

Trenches shall be excavated to a sufficient width for proper placement of pipe and to ensure proper compaction of the backfill material in accordance with the Project Documents and all OSHA Regulations.

11.4.5 Trench Foundation

11.4.5.1 Preparation

Trenches shall be excavated accurately to plan grade to provide a uniform and stable foundation. Any undercut shall be replaced with approved material which is suitable from the undercut or select fill placed and compacted to 95% of maximum dry density, as per Section 3.3.1 of these Specifications.

All fill material shall be free of trash, lumber, debris, objectionable material, rock greater than 1 ½ inches in diameter, frozen or wet material, roots or other organic, perishable or detrimental matter.

11.4.6 Bell Holes

Bell holes shall be dug at each bell or coupling so that load is supported entirely by the pipe barrel, uniformly throughout its entire length, on the prepared bottom of the trench. Bell holes shall be excavated only to an extent sufficient to permit accurate work in the making of the joints.

11.4.7 Rejection

Any and all pipe which is not uniformly supported throughout its entire length shall be removed and the trench bottom reshaped and compacted to plan line and grade so as to support the pipe uniformly. There shall be no voids visible anywhere below the pipe.

11.4.8 Unsuitable Foundation

11.4.8.1 Where the natural trench bottom is incapable of satisfactorily supporting the pipe, such unsuitable soil shall be removed to a minimum depth of 6” and shall be filled with material suitably compacted and reshaped to plan line and grade so as to support the pipe uniformly throughout its length, as approved by the County Engineer.

11.4.8.2 Where rock excavation is required, the rock shall be excavated a minimum of 1 foot below the plan grade of the pipe. Select fill shall then be placed and compacted in accordance with Section 11.4.9.2.

11.4.9 Backfilling and Compaction

11.4.9.1 The backfilling shall not begin until necessary inspections and tests have been performed and inspected by the County Engineer.

11.4.9.2 All pipe backfill shall be placed in uniform, horizontal, 8 inch loose layers and compacted to 95% maximum dry density.

11.4.9.3 After pipe is laid in the prepared trench bottom, suitable material shall be placed in symmetrical and uniform layers and compacted under the pipe haunches to the spring line and carefully compacted in conformance with the Project Documents. Only enough material to backfill to the spring line shall be placed in the trench and compacted until compaction of the haunches has been attained. Extreme care will be exercised by the Contractor to attain the desired compaction without displacing the pipe. Typical trench section shall conform to Standard Drawings 1-7 and 1-8.

11.4.9.4 When compaction has been attained at the pipe haunches, the Contractor shall begin the initial backfill to the top of the pipe, placing material symmetrically and uniformly so as to prevent displacement of the pipe.

11.4.9.5 The remainder of the trench zone shall be carefully placed and compacted by mechanical tampers. Proper compaction shall be obtained without causing any damage to the pipe.

11.4.10 Dewatering and Drainage

11.4.10.1 Grading

All grading in the vicinity of the trench excavations shall be controlled to prevent surface ground water from flowing into the trenches.

During excavation, material suitable for backfilling shall be stored in an orderly manner and safe distance from the excavation as to prevent slides or cave-ins, in accordance with OSHA Regulations.

11.4.10.2 Dewatering

Where water is encountered, it shall be prevented from accumulating in excavated areas by pumping, well pointing, or other acceptable means. Water so removed shall be discharged in a manner and location so as not to cause injury or damage to public or private property, work in progress, or completed work and in accordance with all environmental guidelines

Under no circumstances will pipe be laid in accumulated water. Where ground water table is such that it makes well pointing impractical, the Contractor shall bed the pipe in stone to the extent necessary to provide a dry trench bottom.

11.4.11 Shoring and Sheeting

11.4.11.1 Description

All shoring, sheeting, and bracing required to perform and protect the excavation and to safeguard employees and the public shall be performed. The Contractor shall comply with all OSHA Regulations for all trenching, shoring, and sheeting operations during construction.

11.4.11.2 Responsibility

The Contractor shall be responsible for the placing of such protection as necessary and shall be responsible for any damages resulting from its omission.

11.4.11.3 Removal

Whenever sheeting is driven to a depth below the elevation of the top of the pipe, that portion of the sheeting below the elevation of the top of the pipe shall not be disturbed or removed. Sheeting left in place shall be cut off not less than one foot below finish grade. No sheeting shall be removed until the excavation is substantially backfilled. Excluded from this requirement are specially constructed reusable shoring devices.

11.4.12 Blasting

11.4.12.1 Requirements

All explosives used within the right of way, easement, or limits of construction shall be done in strict accordance with all state and federal regulations.

11.4.12.2 Responsibility

It is the Contractor's responsibility to ensure the compliance with Section 11.4.12.1 of these specifications and is solely responsible for any kind and all damage resulting from blasting operations.

11.4.12.3 Notification

The County Engineer and Columbia County Public Relations Manager shall be notified 48 hours prior to any blasting.

11.4.13 Testing

11.4.13.1 Testing

The pipe backfill shall be tested for compaction. The length of pipe between two catch basins shall be considered a section requiring testing. In each section, compaction testing shall be performed on every other lift of backfill up to within 1 foot of subgrade elevation.

All test reports shall be submitted in accordance Section 1.9 of these Specifications.

The County Engineer reserves the right to perform additional testing, as needed.

11.4.14 Protection of Existing Services Lines

The Contractor shall be responsible for the protection of existing service line and utilities in accordance with Section 4.4 of these Specifications.

11.4.15 Restoration of Property

The Contractor shall be responsible for the restoration of property in accordance with Section 4.5 of these Specifications.

11.4.16 Removal and Replacement of Existing Pipes and Equipment

Where shown on the plans or drawings or where required to properly construct the work under the contract, the Contractor shall remove and replace such pipelines and equipment or structures as directed by the County Engineer.

11.4.17 Pavement Removal and Replacement

11.4.17.1 Open Cuts

No open cuts of pavement on county roads shall be made without prior written approval of the County Engineer.

Certain roads will require a permit from Georgia Department of Transportation. No work shall begin until receipt of the Georgia DOT permit.

11.4.17.2 Repair

The Contractor shall be responsible for the repair of pavement in streets and driveways in accordance with Standard Drawings 1-9 and 1-10.

Concrete driveways and sidewalks shall be saw cut either side of the limit of excavation or the concrete shall be removed to the nearest joint. The trench shall be backfilled and compacted in accordance with the above Specifications and concrete of 3000 psi compressive strength shall be placed monolithically 9 inches on either side of the trench. The thickness of the concrete over the trench shall not be less than 6 inches for driveways or not less than 4 inches for sidewalks. The concrete shall be placed to align with the grade of the existing driveway and sidewalk in the areas of the repair.

11.4.18 Finish Grade

11.4.18.1 Drainage

The Contractor shall be responsible for maintaining all ditches, drains, and culverts on the right of way, easement, or limits of construction and for ensuring the effective functioning of all existing drainage characteristic.

11.4.18.2 Responsibility

The Contractor shall be responsible for all damage to property, public, or private, resulting from the above.

11.5 Construction

11.5.1 Pipe Laying

11.5.1.1 Only such pipe as has been previously inspected and approved, is free of dents, spalls, cracks and is free from any damage which may, be detrimental to the proper functioning of the storm drain system, shall be laid in the trench.

11.5.1.2 The Contractor shall remove from the site all damaged material.

11.5.1.3 Pipe shall be carefully lowered into the trench; no pipe shall be free dropped into the trench.

11.5.1.4 The pipe laying shall proceed upgrade with the spigot end of bell and spigot pipe pointing in the direction of the flow.

11.5.1.5 Each pipe shall be laid true to line and grade in such manner as to form a close concentric joint with the adjacent pipe and to prevent offsets in the flow line.

11.5.1.6 The pipe shall be kept clean and free of debris at all times.

11.5.2 Jointing

11.5.2.1 Reinforced concrete pipe sections may be joined by mortar joints, bituminous plastic cement joints, rubber type gasket joints, O-Ringed gasket joints or preformed plastic gasket joints. In mortar and bituminous plastic cement joints the annular space shall be filled with the joint material and the inside of the joint wiped smooth. Mortar joints shall be made in the same manner except that the annular space shall be thoroughly wetted before filling with joint material. After the initial wet, the mortar on the outside shall be protected from the air and sun with thoroughly wet over**.**

11.5.2.2 HDPE shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable,

protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly. Joints shall have an exterior bell wrap installed as recommended by the manufacturer.

11.5.2.3 PP shall be joined with a gasket, integral bell, and spigot joint, meeting the requirements of ASTM F2881. Joints shall be watertight according to the requirements of ASTM D3212. Spigots shall have gaskets meeting the requirements of ASTM F477. Gasket shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during joint assembly. Joints shall have an exterior bell wrap installed as recommended by the manufacturer.

11.6 Tie-in to Existing Storm Drains

11.6.1 Authorization

11.6.1.1 At no time shall the Contractor make any unauthorized tie-ins of storm drains of any type under construction to existing storm drains of any type.

11.6.1.2 The Contractor shall not make any authorized tie-ins (e.g. called for on the Project Documents or previously approved changes) unless the County Engineer is present.

11.6.2 Construction

11.6.2.1 The Contractor shall make any such tie-ins in strict accordance with the Project Documents.

11.6.2.2 The Contractor shall take whatever measures are necessary to prevent the introduction of mud, silt, debris, or excess surface water runoff into the existing storm drain system.

11.6.2.3 Expediting Work- The Contractor shall excavate, lay the pipe, and backfill as closely together as possible. Unjointed pipe shall not be left in the trench overnight. The Contractor shall backfill and compact the trench as soon as possible after laying and jointing is completed. The exposed end of the installed pipe shall be covered with plywood or filter fabric each day at the close of work and at all other times when work is not in progress. If necessary to backfill over the end of an uncompleted pipe, the end shall be closed with a mechanical joint plug, however, backfilling shall commence only after inspection.

11.6.3 Field Tests

11.6.3.1 Pipe and Fittings

Each piece of pipe and fitting shall be visually inspected immediately before being placed in the trench and all pieces which are damaged and cannot be repaired after installation shall be rejected.

11.6.3.2 Joints Alignment and Grade

After the pipe has been installed in the trench and prior to backfill, the joints alignment and grade shall be carefully checked for conformance with the plans. Any protruding joint material shall be removed and the joint remade.

11.6.3.3 Visual Inspection

All storm drains shall be visually checked for alignment between structures and any deviations from the plan line and grade or offsets of any type shall cause that portion of the storm drain system to be rejected if said defects will adversely affect the designed performance of the system and shall be relayed correctly by the Contractor at the Contractor's expense.

11.6.3.4 All camera inspections and subsequent repairs shall be complete prior to installation of cement stabilized subgrade and curb on all projects.

11.7 Protection of Service Lines and Utilities

Protection of service lines and utilities shall be performed in accordance with Section 4.4 of these Specifications.

11.8 Restoration of Property

Restoration of property shall be performed in accordance with Section 4.5 of these Specifications.

11.9 Removal and Replacement of Existing Pipes and Equipment

Removal and replacement of existing pipes and equipment shall be in strict accordance with the Project Documents, or as directed by the County Engineer.

11.10 Pavement Removal and Replacement

Pavement removal and replacement shall be in strict accordance with the Project Documents, or as directed by the County Engineer.

11.11 Clean Up and Finishing

All pipe shall be clean and free from silt, mud, debris or anything which may block the free flow of water prior to acceptance.

12.0 CONSTRUCTION OF STORMWATER DRAINAGE STRUCTURES AND STORMWATER MANAGEMENT FACILITIES

12.1 General

The work covered by this section of the specifications consists of furnishing all labor, equipment, materials, and appliances and in performing all operations necessary and incidental to the construction of stormwater structures. This will include but not be limited to all excavation, trenching, removal, and replacement of unsuitable materials and grading as shown on the Project Documents.

12.2 Plans, Permits and Codes

12.2.1 Changes in Plan

12.2.1.1 The Project Documents indicate the extent and specific arrangement of the work.

12.2.1.2 The Contractor, in consultation with the County Engineer, may have reasonable leeway to make minor adjustments to grades and stormwater drainage system, excluding stormwater management facilities, in order to maintain project uniformity as long as the designed intent of the systems are not changed and positive drainage is maintained. Substantial changes shall be submitted by the Design Engineer for the approval by the County Engineer before implementation.

12.3 Excavation and Backfill

12.3.1 Excavation for Structures

All excavation shall be in strict accordance with Sections 3 and 8 of these Specifications.

12.3.2 Excavation for Stormwater Management Facilities

All stormwater management facilities shall be constructed in strict accordance with the Project Documents. Any deviations shall be approved by the County Engineer, prior to implementation.

12.3.3 Backfill for Structures

Backfill shall be constructed in strict accordance with Sections 3 and 8 of these Specifications.

12.3.4 Earth Fill for Stormwater Management Facilities

Earth fill shall be constructed in strict accordance with Sections 3 and 8 of these Specifications.

12.3.5 Structural Fill for Stormwater Management Facilities

Structural fill shall be constructed in strict accordance with the Project Documents.

12.3.6 Drainpipe through Stormwater Management Facilities

Drainpipe through stormwater management facilities shall be constructed in strict accordance with the Project Documents.

12.4 Construction of Stormwater Structures

12.4.1 Applicability

12.4.1.1 All stormwater structures shall be constructed in strict accordance with the appropriate Georgia Department of Transportation Standard Drawing, the appropriate Columbia County Standard Drawing, and the Project Documents.

12.4.2 Inspections

12.4.2.1 All stormwater structures shall be inspected by the County Engineer prior to acceptance for conformity with the specifications.

12.4.3 Drainage through Structures

12.4.3.1 All catch basins shall have weep holes installed per the Columbia County Standard Details.

12.5 Protection and Repairs

All stormwater structures shall be protected from damage until accepted. Any damage that may occur shall be repaired to the satisfaction of the County Engineer.

12.6 Clean up and Finishing

All stormwater structures shall be clean and free from silt, mud, debris or anything which may block the free flow of water prior to acceptance.

12.7 Protection of Service Lines and Utilities

Protection of service lines and utilities shall be performed in accordance with Section 4.4 of these Specifications.

12.8 Restoration of Property

Restoration of property shall be performed in accordance with Section 4.5 of these Specifications.

12.9 Reconstruction or Adjustment to Grade of Miscellaneous Structures

The Reconstruction or adjustment to grade of miscellaneous structures shall be performed in accordance with Section 4.6 of these Specifications.

13.0 EROSION AND SEDIMENT CONTROL

13.1 Applicability

13.1.1 Construction Standards and Specifications

Construction standards and specifications for Best Management Practices (BMPs) shall be in accordance with Georgia Soil and Water Conservation Commission's Manual for Erosion and Sediment Control in Georgia (Green Book), latest edition.

13.1.2 Authorization to Discharge Storm Water

Authorization to discharge storm water associated with construction activities to the waters of the State of Georgia shall be in accordance with Georgia Department of Natural Resources / Environmental Protection Division's National Pollutant Discharge Elimination System (NPDES).

13.1.3 Permitting, Inspection, Enforcement and Penalties

Permitting, inspection, enforcement, and penalties shall be in accordance with Columbia County's Code of Ordinances, Chapter 34, Article 3 – Soil Erosion, Sedimentation, and Pollution Control.

14.0 FENCING

14.1 Description

The work covered by this section of the specification consists of furnishing all labor, equipment, and materials, and in performing all operations in connection with the construction of the chain link fence, complete with all appurtenances, in strict accordance with this section of the specifications, the applicable drawings, and subject to the terms and conditions of the contract.

14.2 Materials

14.2.1 General

The fence shall have an overall height of 6 feet excluding the 3 strands of barbed wire on the top, arms inside. The fence shall be the standard product of Cyclone Fence Corp., or American Chain & Cable, Anchor Post Products, or equal.

14.2.2 Fabric

Fabric shall be No. 9 gauge, 2 inch mesh, Class I, galvanized in conformance with ASTM requirements.

14.2.3 Posts

Line posts, 2 inch O.D. shall be spaced not more than 10 feet. Corner and gate posts shall be 3 inch O.D. Posts shall be anchored in concrete footings, crowned to shed water.

14.2.4 Toprail

A 1 5/8 inch O.D. toprail shall be provided for the entire fence.

14.2.5 Fabric Reinforcing Wire

Fabric reinforcing wire shall be provided along the bottom edge. It shall be not less than No. 7 gauge coiled spring wire. Galvanized ties or clips shall be provided for attaching reinforcing wires to fabric at intervals of not more than 2 inches.

14.2.6 Post Braced

Nominal 1 5/8 inch O.D. galvanized tubular post braces extending to each adjacent line post at mid-height of the fabric shall be provided for each gate, corner, pull and end post. A 3/8 inch diameter truss rod shall also be provided from the line post back to the gate, corner, pull, or end post, with a turnbuckle or other equivalent provision for adjustment.

14.2.7 Stretcher Bars

Stretcher Bars 3/16 X 3/4 inch in size, with length 1 inch less than fabric height, shall be provided for stretching and securing the fabric at each gate,

end, corner and pull post, one for each gate and end post and two for each corner and pull post.

14.2.8 Post Tops

All posts shall be provided with post tops which will fit over the outside of posts to exclude moisture and shall be combination tops with barbed wire supporting arms. Post tops shall be provided with a hole suitable for the through passage of the top rail.

14.2.9 Barbed Wire Supporting Arms

Barbed wire supporting arms shall be at an angle of 45 degrees and shall be fitted with clips or other means for securing three lines of barbed wire, the top line approximately 12 inches horizontally from the fence line and 12 inches above the top of the fabric and the other lines spaced uniformly between the top line and the top of the fabric.

14.2.10 Barbed Wire

Barbed wire shall consist of 3 strands of 12 gauge wire with 14 gauge, 4 point barbs spaced approximately 5 inches apart. The wire shall be electrogalvanized. The barbs may be aluminum.

14.2.11 Ties or Clips

Ties and clips of adequate strength shall be provided in sufficient number for attaching the fabric to all line posts and to top rail at intervals not exceeding 15 inches

14.2.12 Bands and Clips

Bands and clips of adequate strength shall be provided in sufficient number for attaching the fabric and stretcher bars to all terminal posts at intervals not exceeding 15 inches.

14.2.13 Gates

Gates shall be swing-type complete with latches, stops, keepers, and hinges, with 3 strands of barbed wire mounted on vertical arms above the fabric. One double leaf gate for a minimum 14 feet opening is required.

14.2.13.1 Gate frames shall be constructed of galvanized tubular members, 3 inch O.D. at 2.72 lbs. for the double leaf 14 feet gate, and trussed and braced in such a manner as to provide a rigid frame and ample strength to insure a gate free from sag and twist, the end members of each frame shall be extended approximately 12 inches above the top member and arranged for attaching 3 uniformly spaced lines of barbed wire.

14.2.13.2 Stretcher bars shall be provided for each gate to facilitate tight installation of the fabric in each gate frame.

14.2.13.3 Ties, bands, and clips of adequate strength shall be provided in sufficient number for attaching the fabric to the frame and stretcher bars and the stretcher bars to the gate frame.

14.2.13.4 Hinges shall be of heavy pattern, of adequate strength for the gate, and with large bearing surfaces for clamping in position. The hinges shall not twist or turn under the action of the gate. The gates shall be capable of being open and closed easily by one person.

14.2.13.5 Latches, stops, and keeper shall be provided for all gates; the latches shall have the plunger bar arranged to engage the stops when closed and the keepers when open. Latches shall be arranged for locking by padlock. Center stops shall consist of a device arranged to be set in concrete and to engage the plunger of the latch bar of double gate. Keepers shall consist of a mechanical device for securing the free end of the gate when in fully open position, one being required for each gate leaf.

14.2.13.6 All metallic units or items shall be hot-dip galvanized finish except barbed wire which shall be electrogalvanized. Ties, clips and bands and barbed wire may be aluminum.

14.3 Installation

14.3.1 Post Setting

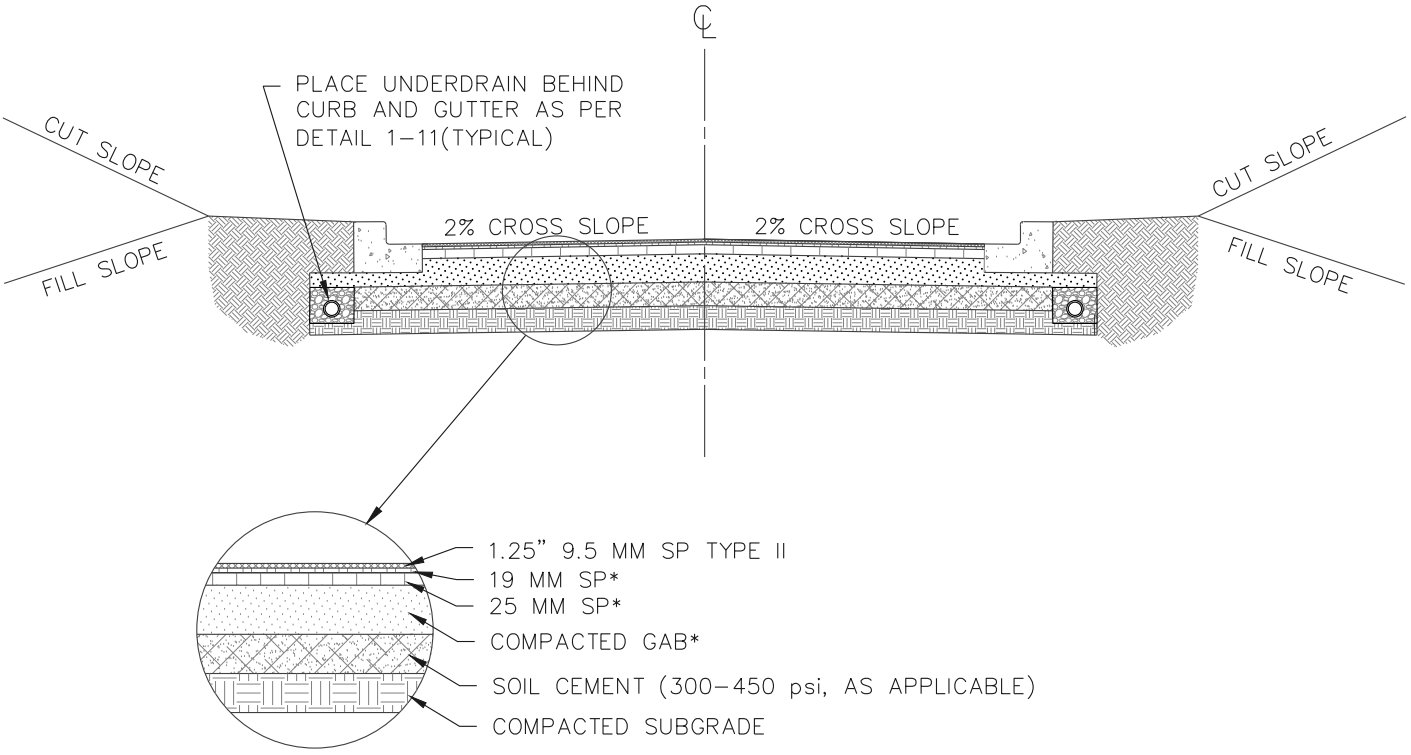
All posts shall be securely anchored in concrete footings, neatly crowned to shed water. Footings shall be poured in cored holes unless the soil will not permit coring, in which case alternate methods will be permitted subject to prior approval by the County Engineer. Footings for line posts shall be 9 inch diameter by 2 feet 9 inch deep and gate posts shall be 12 inch diameter by 3 feet 3 inch deep. In all cases, the posts shall extend to within 3 inches of the bottom of the footing. Posts shall be aligned and set to permit fabric and top rail installation at a uniform grade approximately the general slope of the ground. Where necessary, to prevent short length sags of dips in the top of the fence, post heights shall be adjusted as directed by the County Engineer.

14.3.2 Post Spacing

Each run of fence shall be set up so that a uniform spacing of posts will result. The spacing shall be approximately, but not more than 10 feet. In all runs in excess of 200 feet, and in shorter runs when desired by the contractor, pull posts shall be installed to facilitate proper stretching of the fabric during its installation.

DETAILS

COLUMBIA COUNTY
GEORGIA



*THICKNESSES VARY AND SHALL BE IN ACCORDANCE WITH FINAL APPROVED PAVEMENT DESIGN SUPPLEMENT A FOR RESIDENTIAL SUBDIVISION ROADS. THICKNESSES FOR MAJOR COLLECTOR AND ARTERIAL ROADS SHALL BE BASED ON AASHTO/GDOT DESIGN METHODS, BUT IN NO CASE SHALL BE LESS THAN STD 1–2.1.

ROAD TYPE	R/W WIDTH	MINIMUM PAVEMENT WIDTH
COMMERCIAL	VARIES	VARIES
INDUSTRIAL	80'	VARIES
PRIMARY ARTERIAL	150'	48'
SECONDARY ARTERIAL	120'	48'
URBAN COLLECTOR	80'	32' B/C to B/C
MINOR RURAL ROAD	60'	22' WITH DITCHES
URBAN RESIDENTIAL	50'	32' B/C to B/C
URBAN RESIDENTIAL	50'	28' B/C to B/C

NOTES:

1. MINIMUM R/W AND PAVEMENT WIDTHS SHOWN ABOVE UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
2. WIDER R/W AND PAVEMENT WIDTHS MAY BE REQUIRED, AS DIRECTED BY THE COUNTY ENGINEER.
3. BOTH FILL AND CUT SLOPES SHALL BE 6:1 MAXIMUM, RESIDENTIAL; 3:1 MAXIMUM, OTHER.

PAVEMENT CROSS SECTION

NOT TO SCALE

Approved By: _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____

COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

1–1

ISSUE DATE: 3/3/2022

Approved By: _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____

COLUMBIA COUNTY GEORGIA

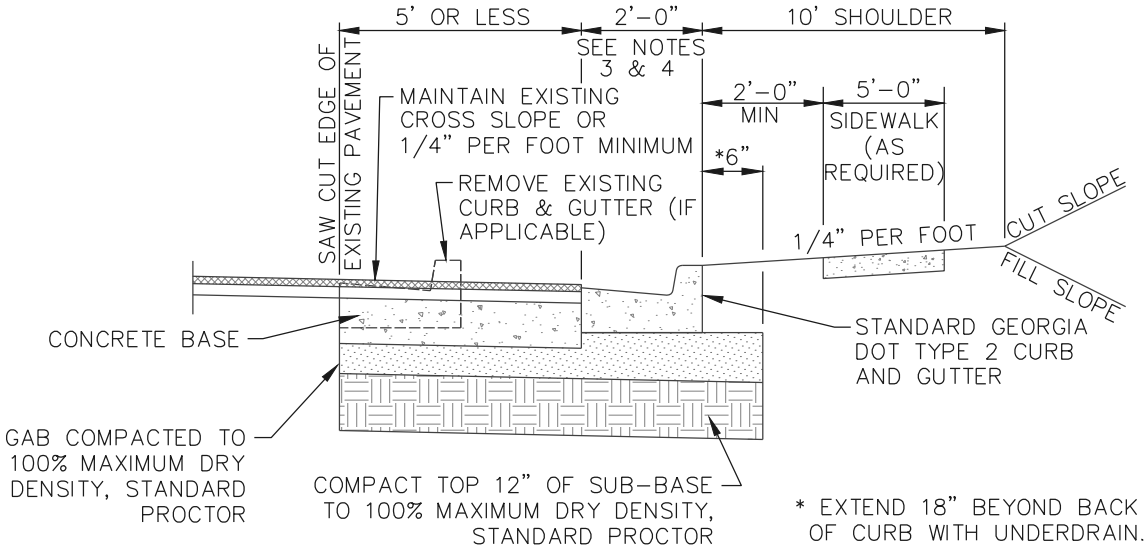
ENGINEERING SERVICES DIVISION

PAVEMENT WIDENING

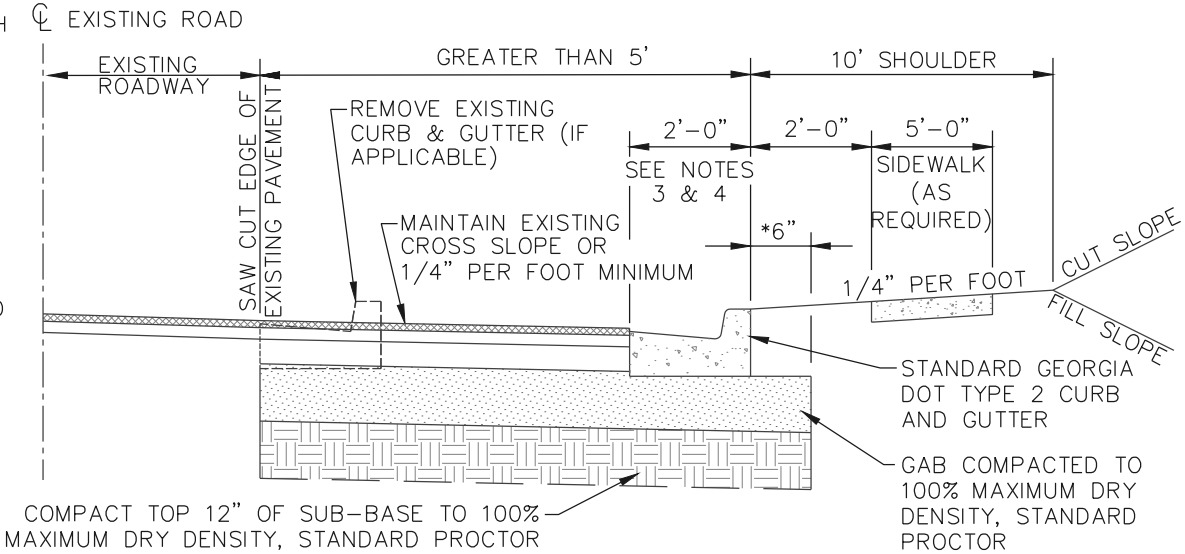
NOT TO SCALE

NOTES:

1. IF A DELAY IN PAVING IS EXPECTED, THE GRADED AGGREGATE BASE MAY BE PRIMED. PRIME COATS SHALL BE APPLIED IN ACCORDANCE WITH THE COLUMBIA COUNTY ENGINEERING DIVISION CONSTRUCTION SPECIFICATION 6.0.
2. A BITUMINOUS TACK COAT SHALL BE APPLIED BETWEEN EACH LIFT OF ASPHALTIC CONCRETE AND ON FACE OF SAW CUT ASPHALT EDGE AND CONCRETE GUTTER IN ACCORDANCE WITH COLUMBIA COUNTY ENGINEERING DIVISION CONSTRUCTION SPECIFICATION 6.0, OR AS DIRECTED BY THE COUNTY ENGINEER.
3. USE 30" CURB AND GUTTER ON MAJOR AND PRINCIPAL ARTERIALS OR MATCH EXISTING.
4. A GEORGIA DOT TYPE III FLUME, HOOD BACK INLET, OR CATCH BASIN IS REQUIRED AT THE END OF THE NEW CURB SECTION IF AN EXISTING DITCH SECTION IS PRESENT IN THE R/W.
5. SEE STANDARD DETAIL 1-2.1 FOR MINIMUM PAVEMENT THICKNESSES.
6. USE OF JOINT FABRIC FOR THE CONCRETE BASE SHALL BE REQUIRED UNLESS OTHERWISE DIRECTED BY THE COUNTY ENGINEER.
7. JOINTS IN CONCRETE BASE TO BE PLACED AT 50 FT INTERVALS, OR AS OTHERWISE DIRECTED BY THE COUNTY ENGINEER.
8. BOTH FILL AND CUT SLOPES SHALL BE 6:1 MAXIMUM, RESIDENTIAL; 3:1 MAXIMUM, OTHER.



TYPICAL WIDENING SECTION (5' WIDE OR LESS)
LOCAL STREETS, MAJOR AND MINOR COLLECTORS, AND ALL ARTERIALS



TYPICAL WIDENING SECTION (GREATER THAN 5' WIDE)

STANDARD DETAIL NUMBER
1 - 2
ISSUE DATE: 3/3/2022

MINIMUM THICKNESS		
MATERIAL	LOCAL/COLLECTOR	ARTERIAL
CLASS B CONCRETE (4,000 psi)	8"	10"
9.5 MM SP OR 12.5 MM SP	3"	3"

5' WIDE OR LESS

MINIMUM THICKNESS		
MATERIAL	LOCAL/COLLECTOR	ARTERIAL
GAB	10"	10"
25 MM SP	3"	4"
19 MM SP	2"	3"
12.5 MM SP	1½"	1½"

GREATER THAN 5' WIDE

NOTE:
BASED ON THE WIDTH OF THE WIDENING, CONTRACTOR SHALL CONSTRUCT PAVEMENT WIDENINGS IN ACCORDANCE WITH THE RESPECTIVE MINIMUM PAVEMENT SECTION THICKNESSES ABOVE OR SHALL MATCH THE EXISTING PAVEMENT SECTION THICKNESSES, WHICHEVER IS GREATER.

PAVEMENT WIDENING CHART

NOT TO SCALE

Approved By: _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____

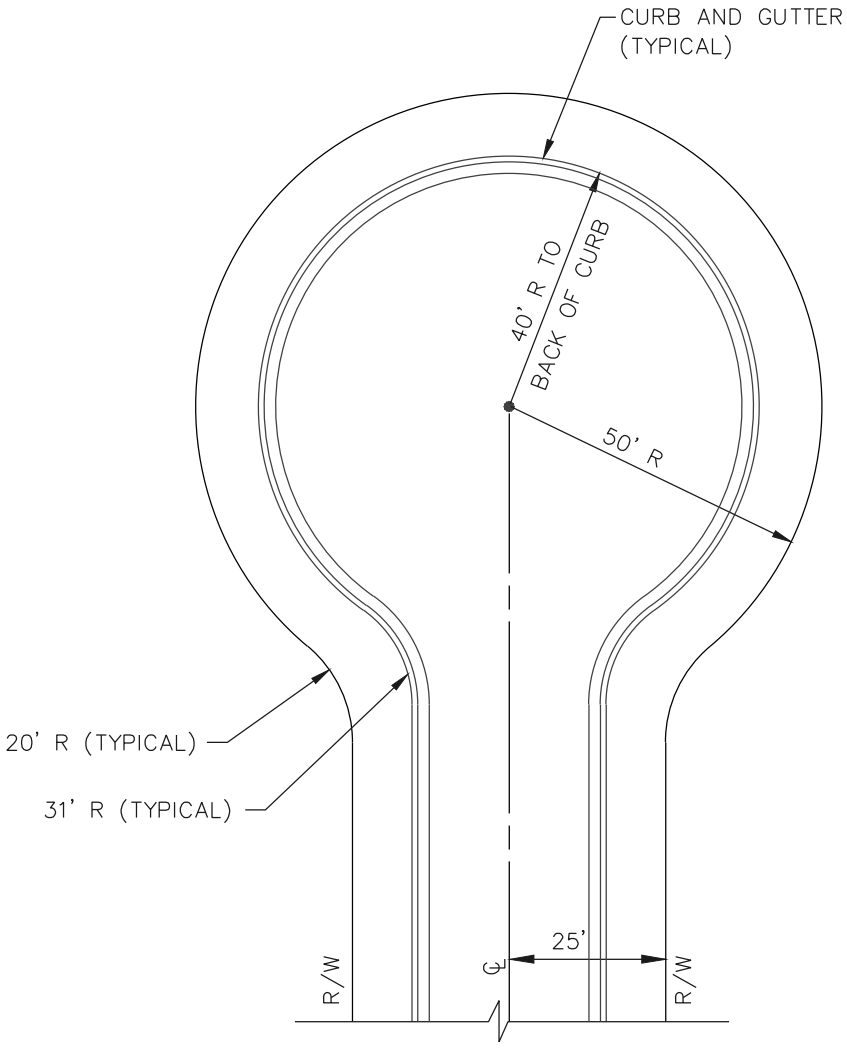
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

1–2.1

ISSUE DATE: 3/3/2022

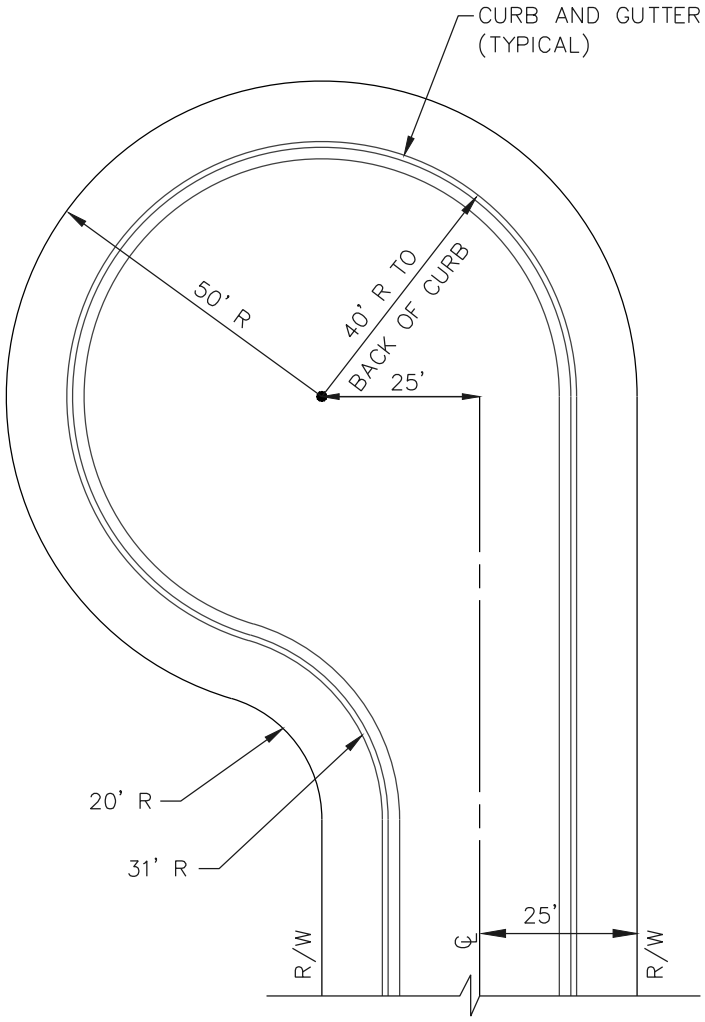


NOTE:
1. RADIUS MEASUREMENTS ARE TO BACK OF CURB UNLESS INDICATED OTHERWISE.

TYPICAL CUL-DE-SAC

NOT TO SCALE

Approved By: _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____	COLUMBIA COUNTY GEORGIA	ENGINEERING SERVICES DIVISION	STANDARD DETAIL NUMBER 1-3 ISSUE DATE: 3/3/2022

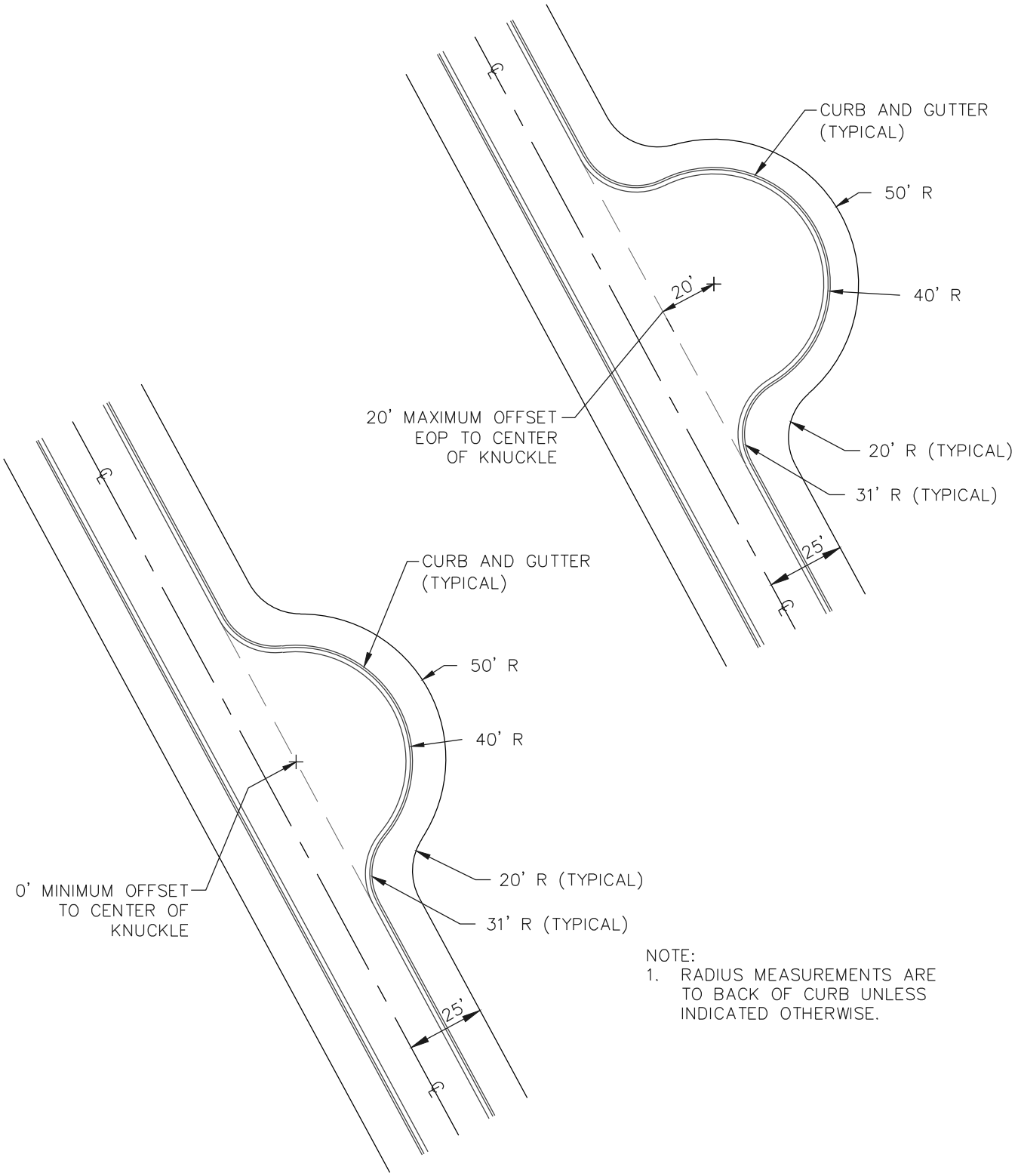


NOTE:
1. RADIUS MEASUREMENTS ARE TO BACK OF CURB UNLESS INDICATED OTHERWISE.

OFFSET CUL-DE-SAC

NOT TO SCALE

Approved By: _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____	COLUMBIA COUNTY GEORGIA	ENGINEERING SERVICES DIVISION	STANDARD DETAIL NUMBER 1 – 4 ISSUE DATE: 3/3/2022



NOTE:
1. RADIUS MEASUREMENTS ARE TO BACK OF CURB UNLESS INDICATED OTHERWISE.

KNUCKLE CUL-DE-SACS

NOT TO SCALE

Approved By: _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____

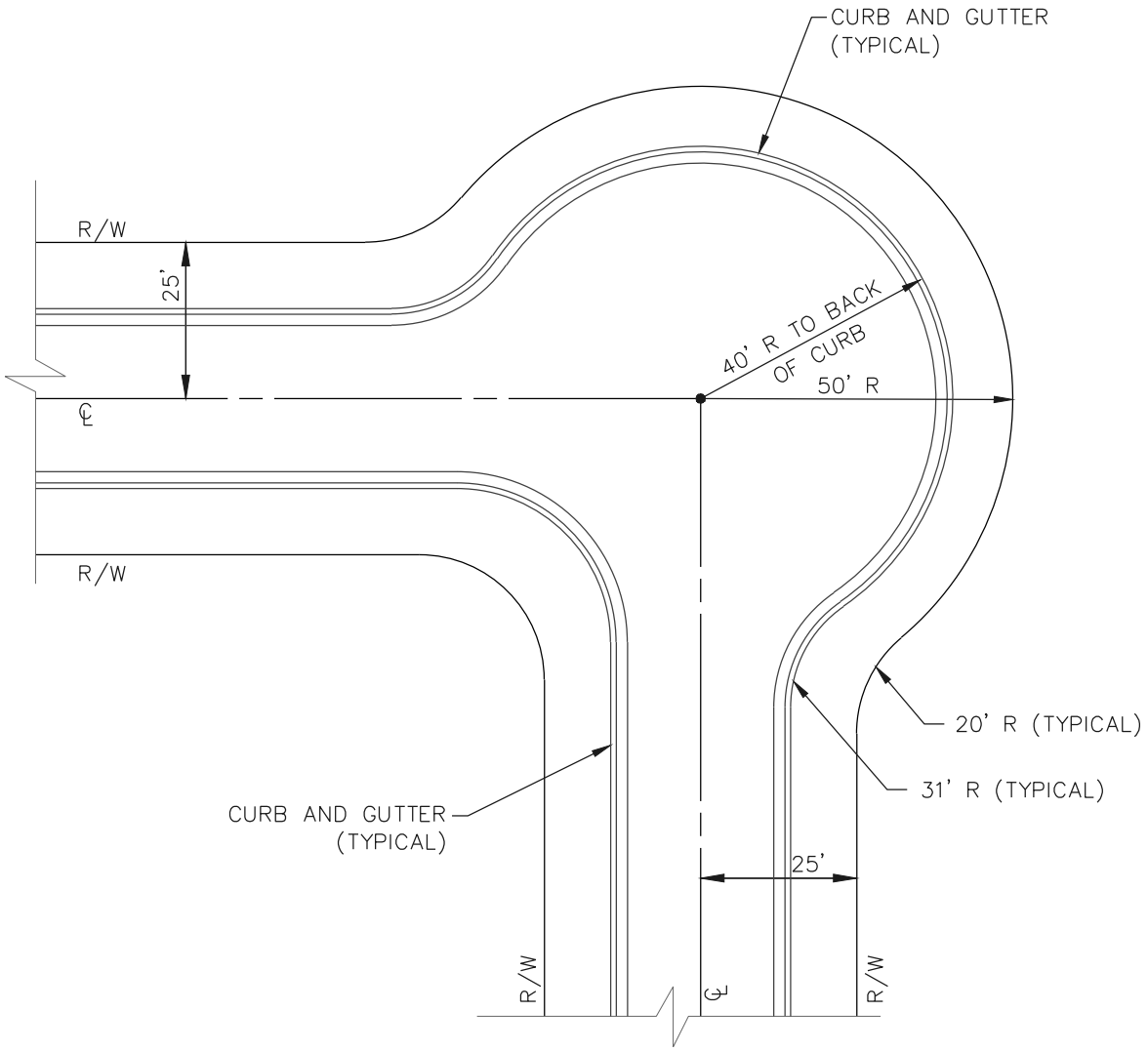
COLUMBIA COUNTY
GEORGIA

ENGINEERING
SERVICES
DIVISION

STANDARD DETAIL
NUMBER

1-5

ISSUE DATE: 3/3/2022



NOTE:
1. RADIUS MEASUREMENTS ARE TO BACK OF CURB UNLESS INDICATED OTHERWISE.

BUBBLE CUL-DE-SAC

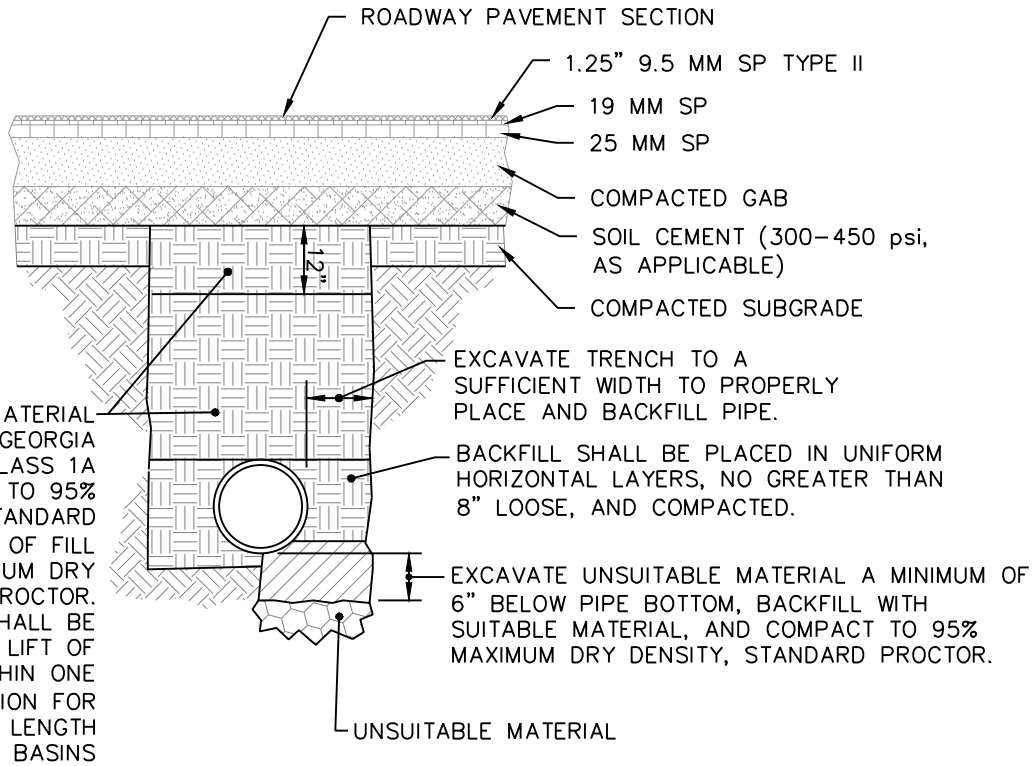
NOT TO SCALE

Approved By: _____	Date: _____	COLUMBIA COUNTY GEORGIA	ENGINEERING SERVICES DIVISION
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		

STANDARD DETAIL NUMBER

1-6

ISSUE DATE: 3/3/2022



NOTES:

1. ALL COMPACTION DENSITIES SHALL BE IN ACCORDANCE WITH ASTM D698, STANDARD PROCTOR.
2. ALL WORK SHALL BE INSPECTED DURING CONSTRUCTION BY THE COUNTY ENGINEER BEFORE INSTALLING ANY BACKFILL MATERIAL.
3. PAVEMENT SECTION TO BE PLACED AFTER PIPE PLACEMENT AND COMPACTION OF BACKFILL UNLESS ADVANCED NOTIFICATION OTHERWISE IS PROVIDED BY THE COUNTY ENGINEER.
4. CONTRACTOR MAY BACKFILL TRENCHES WITHIN ROADWAY WITH #57 STONE IN THE ABSENCE OF THE COUNTY ENGINEER.

TYPICAL TRENCH EXCAVATION

ROADWAY

NOT TO SCALE

Approved By:		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	

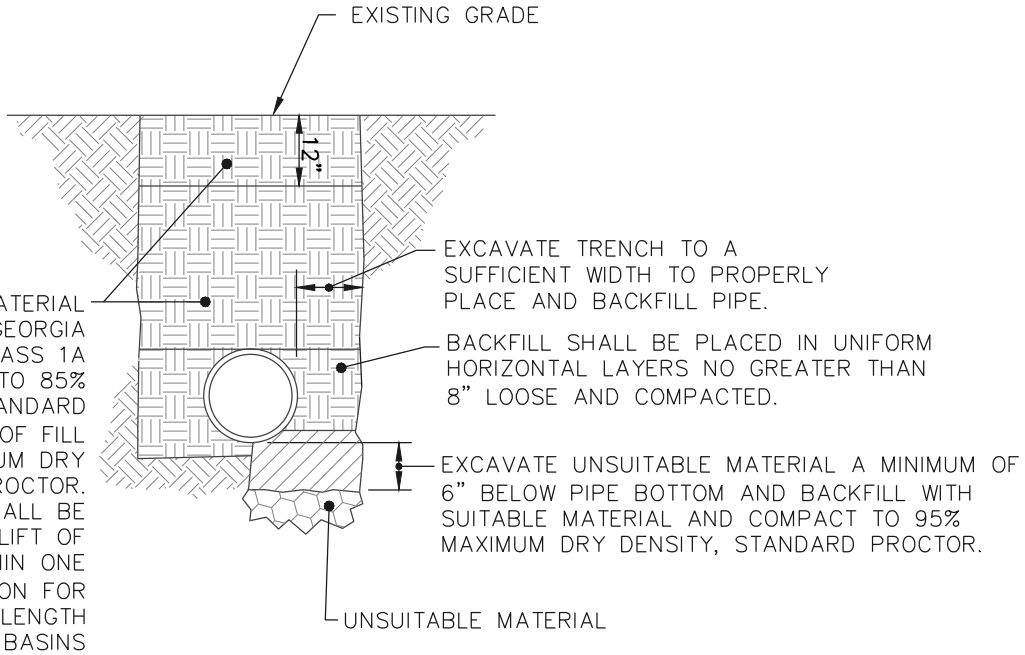
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

1 – 7

ISSUE DATE: 3/3/2022



NOTES:

1. ALL COMPACTION DENSITIES SHALL BE IN ACCORDANCE WITH ASTM D698, STANDARD PROCTOR.
2. ALL WORK SHALL BE INSPECTED DURING CONSTRUCTION BY THE COUNTY ENGINEER BEFORE INSTALLING ANY BACKFILL MATERIAL UNLESS ADVANCED NOTIFICATION OTHERWISE IS PROVIDED BY THE COUNTY ENGINEER.
3. CONTRACTOR MAY BACKFILL NON-ROADWAY TRENCHES WITH #57 STONE IN THE ABSENCE OF COUNTY ENGINEER.

TYPICAL TRENCH EXCAVATION

NON-ROADWAY

NOT TO SCALE

Approved By: _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		

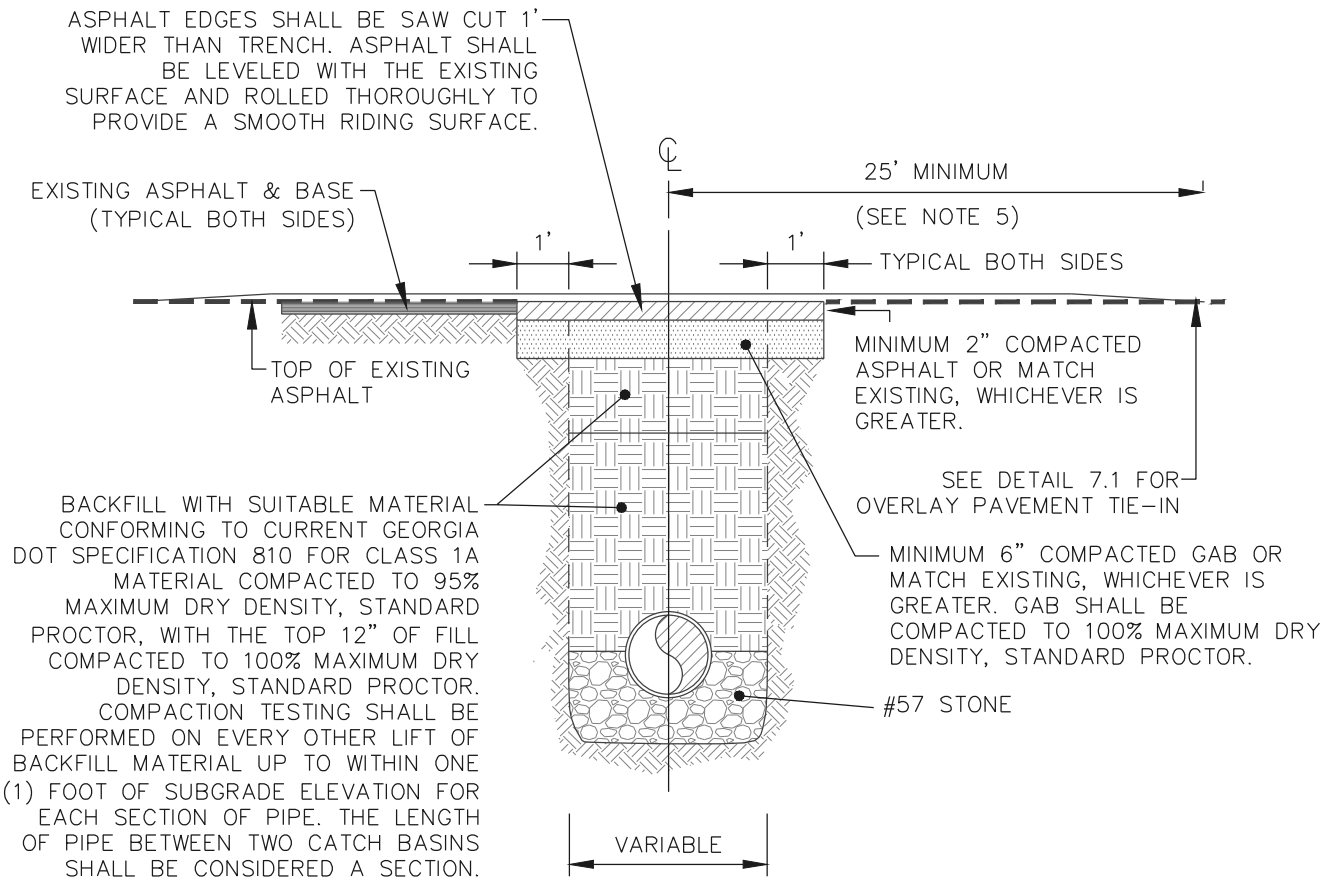
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

1-8

ISSUE DATE: 3/3/2022



ON LONGITUDINAL CUTS EXCEEDING 150' IN LENGTH, THE ENTIRE WIDTH OF ROADWAY SHALL BE RESURFACED, 25' BEYOND THE CUTS.

NOTES:

1. ALL STREET CUTS SHALL BE COVERED WITH STEEL PLATES OF SUFFICIENT THICKNESS TO SPAN THE CUT WITHOUT NOTICEABLE DEFLECTION. PLATES SHALL REMAIN IN PLACE UNTIL PAVING IS COMPLETED. ANY PAVEMENT MARKINGS AFFECTED BY THE CUT SHALL BE REINSTALLED TO ORIGINAL STATUS.
2. ALL COMPACTION DENSITIES SHALL BE IN ACCORDANCE WITH ASTM D698, STANDARD PROCTOR.
3. ALL WORK SHALL BE INSPECTED DURING CONSTRUCTION BY THE COUNTY ENGINEER BEFORE INSTALLING ANY BACKFILL MATERIAL UNLESS ADVANCED NOTIFICATION OTHERWISE IS PROVIDED BY THE COUNTY ENGINEER.
4. CONTRACTOR MAY BACKFILL TRENCHES WITHIN ROADWAY WITH #57 STONE IN THE ABSENCE OF THE COUNTY ENGINEER.
5. USE A MINIMUM OVERLAY OF 1.25" 9.5 MM SP TYPE II, OR AS DIRECTED BY THE COUNTY ENGINEER.

PAVEMENT CUT REPAIR

METHOD #1 (PREFERRED)

NOT TO SCALE

Approved By: _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		

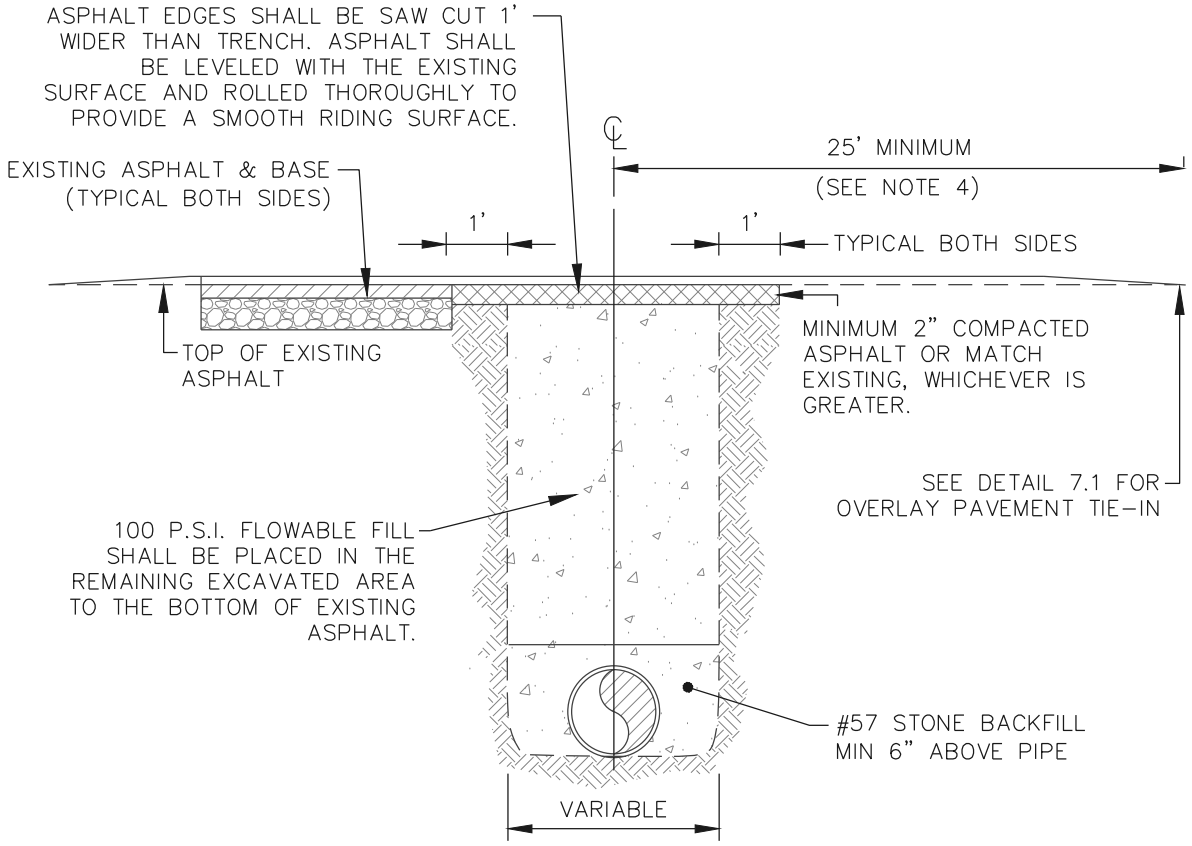
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

1 – 9

ISSUE DATE: 3/3/2022



NOTES:

1. THIS PAVEMENT CUT REPAIR METHOD IS NOT PERMITTED FOR USE WITH WATER AND SANITARY SEWER PIPE OR WHEN IN CONFLICT WITH WATER OR SANITARY SEWER PIPE.
2. ALL STREET CUTS SHALL BE COVERED WITH STEEL PLATES OF SUFFICIENT THICKNESS TO SPAN THE CUT WITHOUT NOTICEABLE DEFLECTION. PLATES SHALL REMAIN IN PLACE UNTIL PAVING IS COMPLETED. ANY PAVEMENT MARKINGS AFFECTED BY THE CUT SHALL BE REINSTALLED TO ORIGINAL STATUS.
3. ALL WORK SHALL BE INSPECTED DURING CONSTRUCTION BY THE COUNTY ENGINEER BEFORE INSTALLING ANY BACKFILL MATERIAL.
4. USE A MINIMUM OVERLAY OF 1.25" 9.5 MM SP TYPE II, OR AS DIRECTED BY THE COUNTY ENGINEER.

PAVEMENT CUT REPAIR

METHOD #2

NOT TO SCALE

Approved By: _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____

COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

1-10

ISSUE DATE: 3/3/2022

NOTES

1. UNDERDRAIN BEHIND CURB SHALL BE USED IN ALL CUT SECTIONS 3 FEET OR GREATER, WHERE SUBSURFACE WATER IS PRESENT, AND IN IRRIGATED ISLANDS, MEDIANS, AND ENTRANCES IN PUBLIC R/W, OR AS DIRECTED BY COUNTY ENGINEER.
2. A LINE ITEM SHOULD BE INCLUDED WITHIN THE CONTRACT DOCUMENT WHETHER UNDERDRAIN BEHIND CURB IS ANTICIPATED OR NOT.
3. UNDERDRAIN SHALL CONNECT TO STORM STRUCTURES WITH A MAXIMUM DISTANCE BETWEEN OUTLETS AT 500' WHERE CONDITIONS PERMIT.
4. LATERAL PIPE UNDER PAVEMENT SHALL BE SCHEDULE 40 OR HEAVIER, 4"SOLID PIPE WITH SUITABLE STANDARD FITTINGS (ELBOWS, WYES, OR TEES). MUST HAVE A MINIMUM OF 12" COVER.
5. PERFORATED UNDERDRAIN PIPE SHALL BE INSTALLED COMPLETE PRIOR TO PLACING PERVIOUS BASE OR DRAINAGE COURSE.
6. MINIMUM GRADIENT FOR UNDERDRAIN PIPE SHALL BE 0.50%.
7. MINIMUM GRADIENT FOR LATERAL PIPE SHALL BE 1.00%.
8. IRRIGATION IS PROHIBITED IN ISLANDS AND MEDIANS UNLESS UNDERDRAIN AND LATERAL PIPING IS INSTALLED DURING THE CONSTRUCTION OF THE STREETS. AN ENCROACHMENT AND MAINTENANCE AGREEMENT BETWEEN COUNTY AND DEVELOPER IS REQUIRED PRIOR TO APPROVAL OF FINAL PLAT TO ALLOW PRIVATE IRRIGATION IN PUBLIC ISLANDS, MEDIANS AND RIGHT-OF-WAY. PLACEMENT OF IRRIGATION CONDUIT IS RECOMMENDED CONCURRENT TO INSTALLATION OF UNDERDRAIN SYSTEMS.

UNDERDRAIN BEHIND CURB AND GUTTER

NOT TO SCALE

Approved By: _____ Date: _____
Revision No. _____ Date: _____
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Revision No. _____ Date: _____

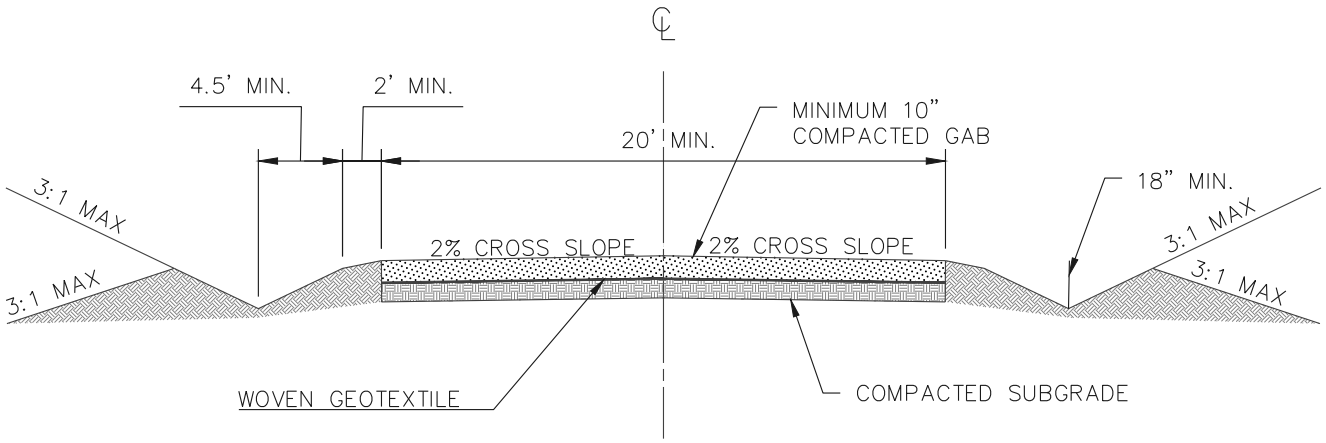
COLUMBIA COUNTY
GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

1—11

ISSUE DATE: 3/3/2022



NOTES:

1. MAXIMUM ROAD GRADE IS 3% FOR GAB TOPPING WITHOUT WRITTEN APPROVAL.
2. MAXIMUM ROAD GRADE IS 10% IF TOPPED WITH ASPHALT OR CONCRETE.
3. SUBGRADE AND GAB SHALL BE COMPACTED TO 95% STANDARD PROCTOR.
4. ASPHALT TOPPING SHALL ABE 2" 19MM AND 1.25" 12MM OR 9.5MM.
5. CONCRETE TOPPING SHALL BE MINIMUM 6" DEPTH, 3,000 PSI, AND FIBER REINFORCED. CONTROLS JOINTS SHALL BE TOOLED OR SAWED IN ALONG THE CENTER LINE AND EVERY 10' LONGITUDINALLY. EXPANSION JOINTS SHALL BE EVERY 50' AND AT ALL RIGID CONNECTIONS.
6. MAINTENANCE AND INSPECTION AGREEMENT MUST BE ACCEPTED BY THE FIRE MARSHAL AND FIRE CHIEF PRIOR TO ACCEPTANCE.
7. SURFACE MATERIAL, ROAD WIDTH, AND OTHER REQUIREMENTS ARE SUBJECT TO APPROVAL BY THE FIRE MARSHAL AND FIRE CHIEF.
8. DEVIATIONS FROM THIS PLAN MUST BE APPROVED IN WRITING BY THE COUNTY ENGINEER.

EMERGENCY ACCESS ROAD TYPICAL SECTION

NOT TO SCALE

Approved By: _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____

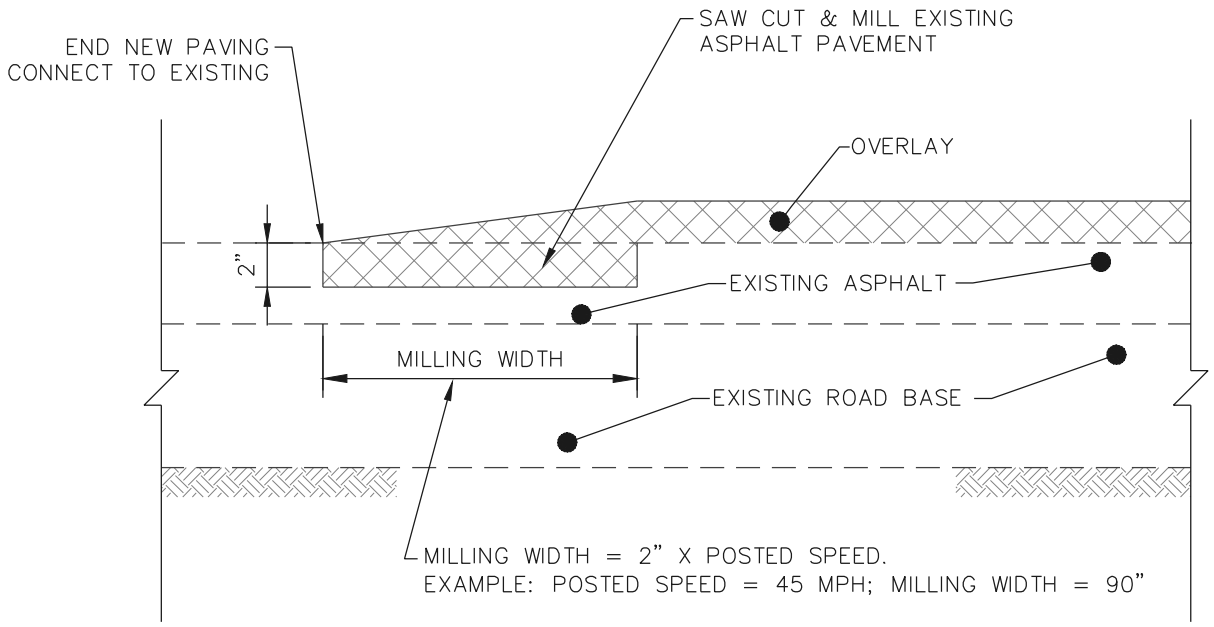
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

1–12

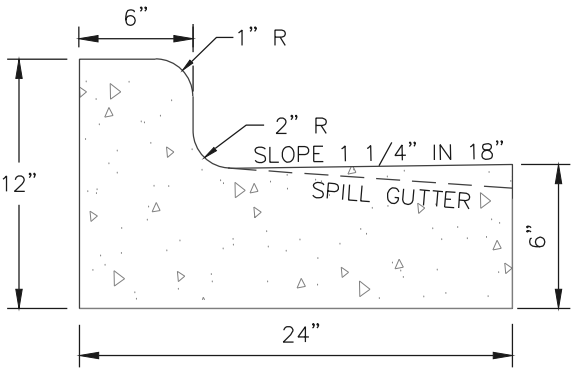
ISSUE DATE: 3/3/2022



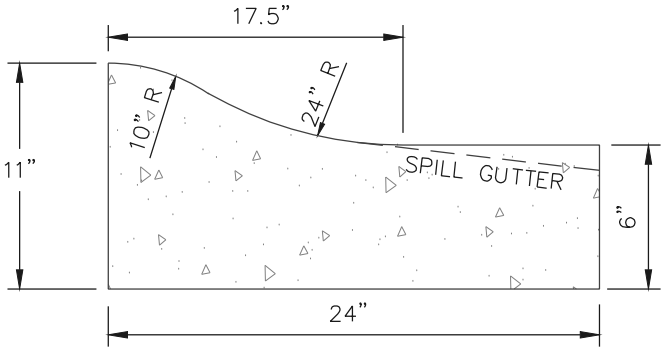
OVERLAY PAVEMENT TIE–IN

NOT TO SCALE

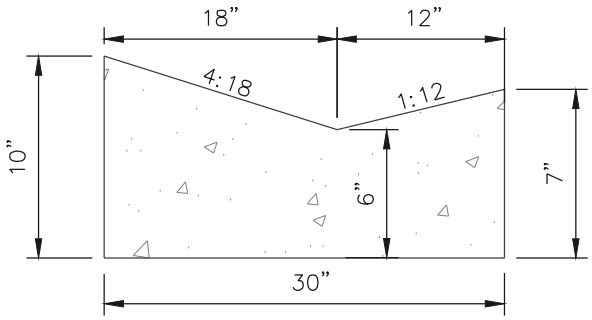
Approved By: _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____ Revision No. _____ Date: _____	COLUMBIA COUNTY GEORGIA	ENGINEERING SERVICES DIVISION	STANDARD DETAIL NUMBER 7–1 ISSUE DATE: 3/3/2022



STANDARD CURB AND GUTTER



ROLLED CURB AND GUTTER



VALLEY CURB

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 3000 psi.
2. CONTRACTION JOINTS SHALL BE PLACED SO THAT SECTIONS OF CURB AND GUTTER ARE NOT LESS THAN 5 FEET NOR MORE THAN 10 FEET IN LENGTH.
3. CONTRACTION JOINTS SHALL BE UNIFORMLY PLACED AND SHALL ALIGN WITH CORRESPONDING JOINTS IN SIDEWALK, WHERE ADJOINING.
4. EXPANSION JOINTS SHALL BE PLACED AT INTERVALS NOT TO EXCEED 50 FEET, RADIUS RETURNS, COLD JOINTS, AND ALL RIDGED CONNECTIONS.
5. CURB AND GUTTER SHALL TRANSITION TO A SPILL GUTTER UNIFORMLY WHILE FOLLOWING THE RATE OF SUPER ELEVATION WHERE APPLICABLE.
6. VERTICAL CURB OR HEADER CURB NOT ALLOWED IN COUNTY RIGHT-OF-WAY WITHOUT WRITTEN APPROVAL FROM COUNTY ENGINEER.

CONCRETE CURB AND GUTTER

NOT TO SCALE

Approved By: _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____

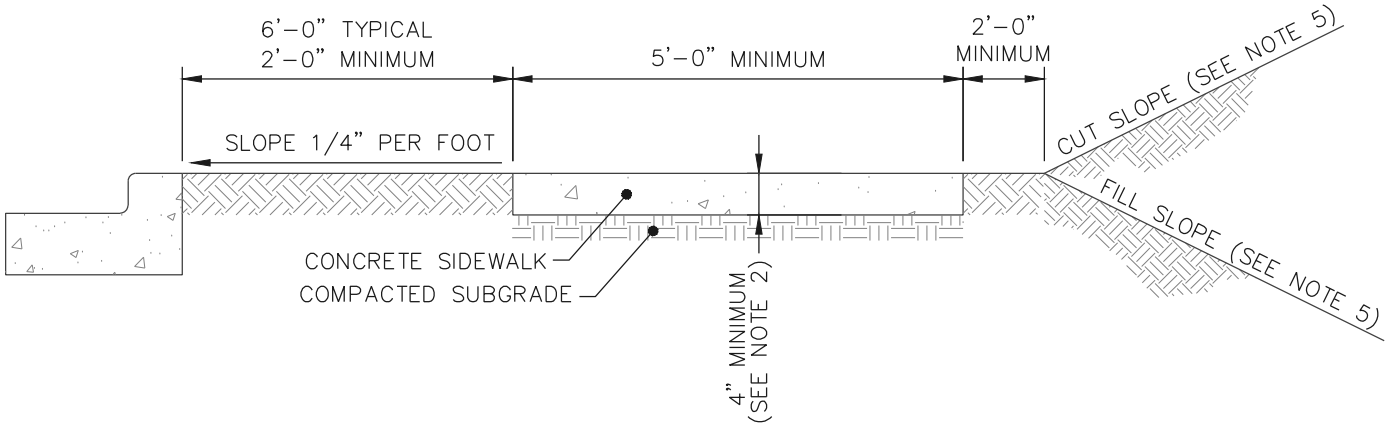
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

9-1

ISSUE DATE: 3/3/2022



NOTES:

1. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 3000 psi.
2. SIDEWALKS SHALL BE A MINIMUM OF 6" THICK WHERE CONNECTED THROUGH A DRIVEWAY.
3. CONTRACTION JOINTS SHALL BE PLACED SO THAT SECTIONS OF SIDEWALK ARE NOT LESS THAN 5 FEET IN LENGTH.
4. EXPANSION JOINTS SHALL BE PLACED AT INTERVALS NOT TO EXCEED 50 FEET, RADIUS RETURNS, COLD JOINTS, AND ALL RIDGED CONNECTIONS.
5. BOTH FILL AND CUT SLOPES SHALL BE 6:1 MAXIMUM, RESIDENTIAL; 3:1 MAXIMUM, OTHER.

CONCRETE SIDEWALK

NOT TO SCALE

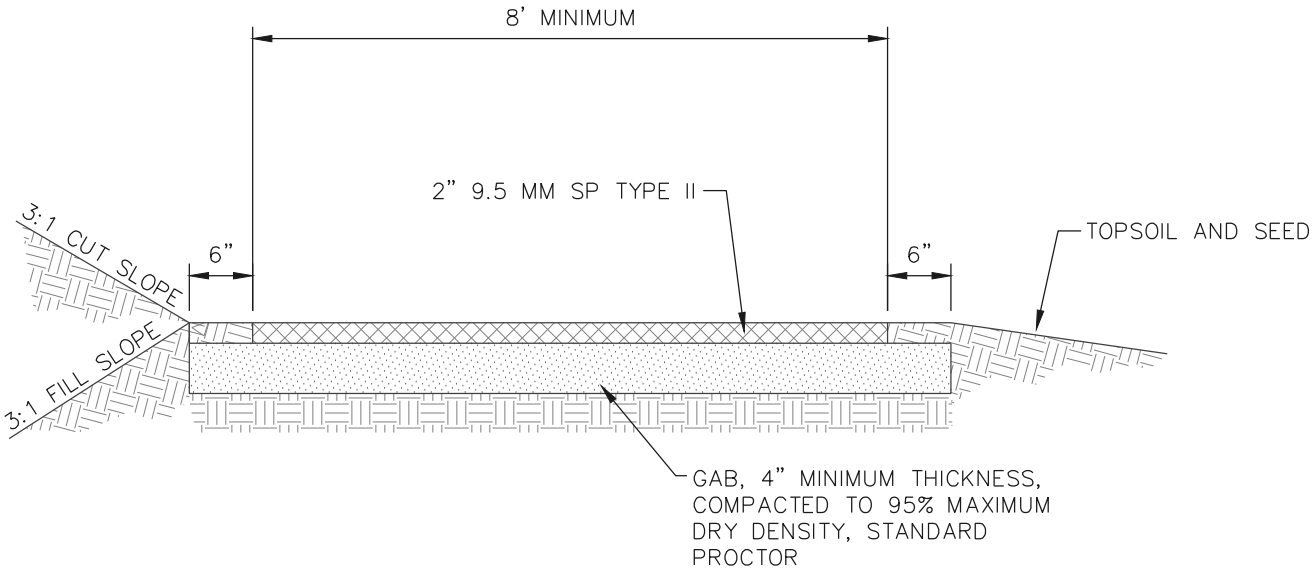
Approved By: _____	Date: _____
Revision No. _____	Date: _____
Revision No. _____	Date: _____
Revision No. _____	Date: _____
Revision No. _____	Date: _____
Revision No. _____	Date: _____

COLUMBIA COUNTY
GEORGIA

ENGINEERING
SERVICES
DIVISION

STANDARD DETAIL
NUMBER
10–1

ISSUE DATE: 3/3/2022



NOTES:

1. BOTH FILL AND CUT SLOPES SHALL BE 6:1 MAXIMUM, RESIDENTIAL; 3:1 MAXIMUM, OTHER.

BITUMINOUS SHARED USE PATH

NOT TO SCALE

Approved By: _____	Date: _____
Revision No. _____	Date: _____
Revision No. _____	Date: _____
Revision No. _____	Date: _____
Revision No. _____	Date: _____
Revision No. _____	Date: _____

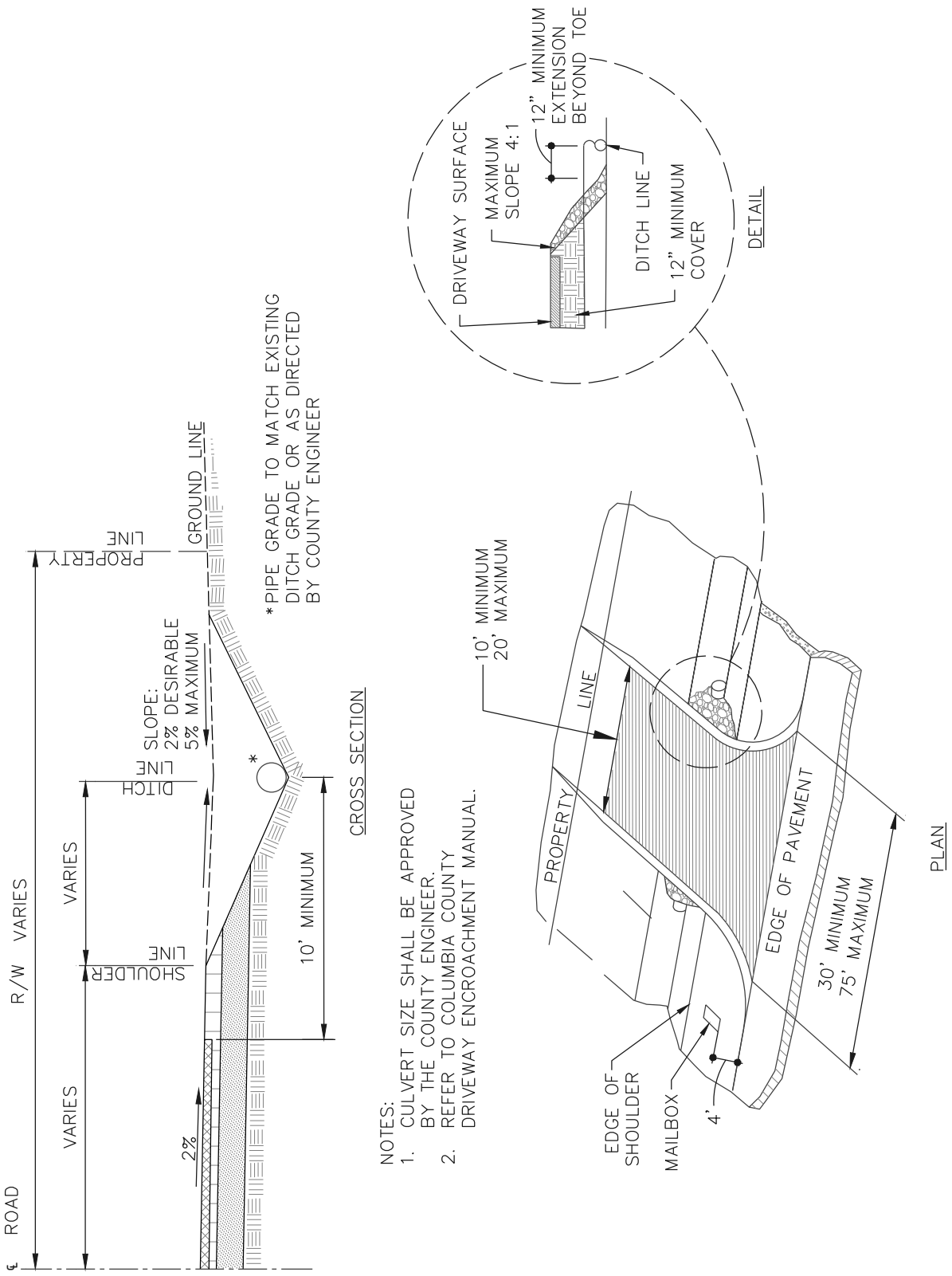
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

10–2

ISSUE DATE: 3/3/2022



NOTES:
1. CULVERT SIZE SHALL BE APPROVED BY THE COUNTY ENGINEER.
2. REFER TO COLUMBIA COUNTY DRIVEWAY ENCROACHMENT MANUAL.

PRIVATE DRIVEWAY CULVERT

NOT TO SCALE

Approved By: _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____
Revision No. _____ Date: _____

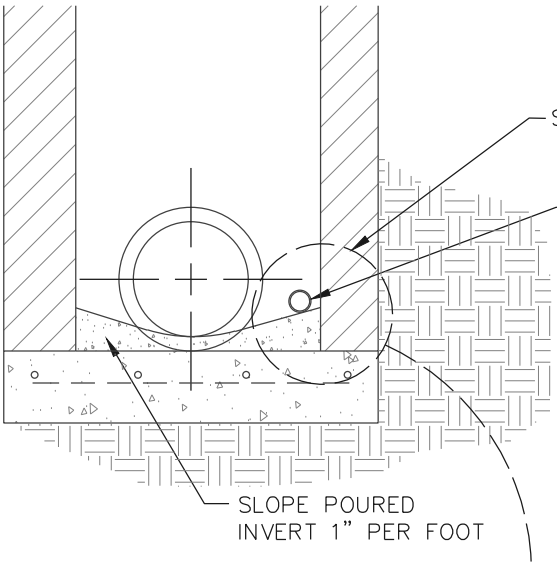
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

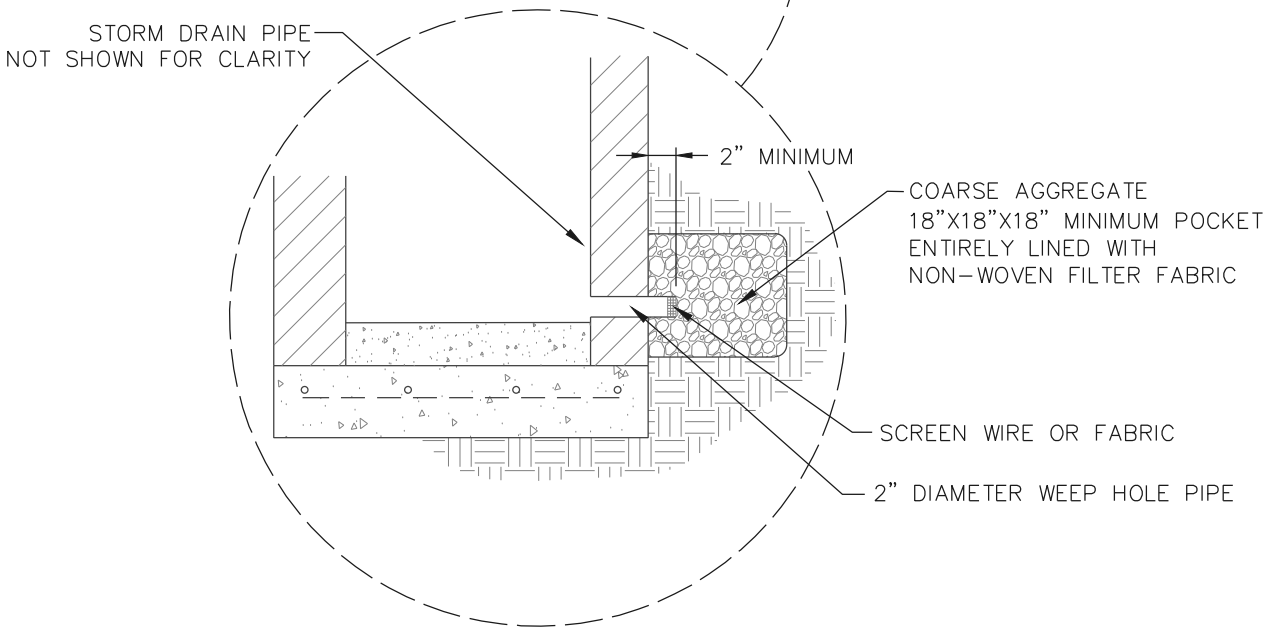
STANDARD DETAIL NUMBER

16–1

ISSUE DATE: 3/3/2022



SECTION DETAIL



INSET DETAIL

NOTE:

1. PLACE ONE (1) 2" DIAMETER WEEP HOLE PIPE IN ALL CATCH BASIN WALLS THAT CONTAIN AN INLET PIPE. THE INVERT OF THE WEEP HOLE PIPE SHALL BE FLUSH WITH THE POURED INVERT ON THE FLOOR OF THE CATCH BASIN OR AS DIRECTED BY THE COUNTY ENGINEER.

WEEP HOLES

NOT TO SCALE

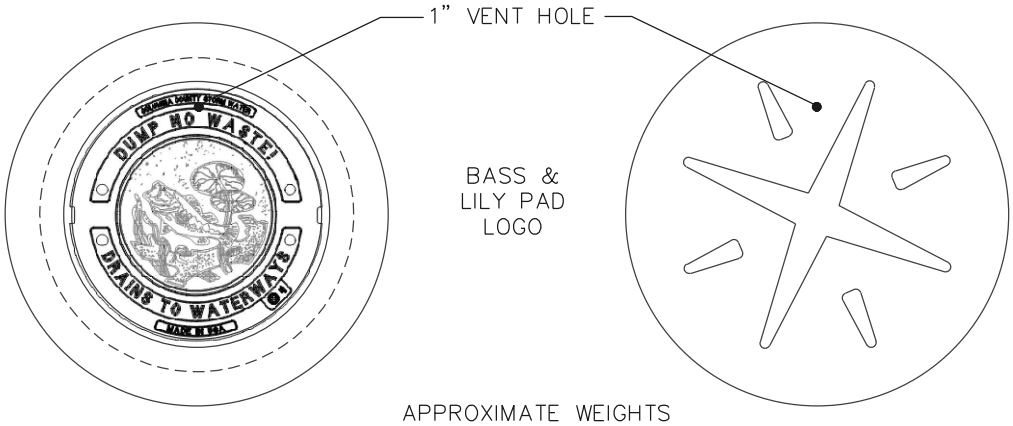
Approved By: _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		
Revision No. _____	Date: _____		

COLUMBIA COUNTY
GEORGIA

ENGINEERING
SERVICES
DIVISION

STANDARD DETAIL
NUMBER
16-2

ISSUE DATE: 3/3/2022



APPROXIMATE WEIGHTS

FRAME	90 LBS.
COVER	65 LBS. MIN.
TOTAL	155 LBS. MIN.

COVER FRAME

NOTES:

1. THE COVERS SHALL BE SUCH AS THOSE MANUFACTURED BY:
   - EAST JORDAN IRON WORKS MODEL V-1860-1(COVER) & G1860 (FRAME)
   - U.S. FOUNDRY MODEL 1259-LU
   - OR APPROVED EQUAL
2. CASTING DETAILS:
   - LOGO SHALL BE THE BASS AND LILY PAD
   - LETTERING ON THE TOP SHALL READ:
     "DUMP NO WASTE" (MINIMUM HEIGHT 1")
     "DRAINS TO WATERWAYS" (MINIMUM HEIGHT 1")
     "COLUMBIA COUNTY STORM WATER" (MINIMUM HEIGHT $\frac{1}{2}$")
     "MADE IN USA" (MINIMUM HEIGHT $\frac{1}{2}$")
     THE UNDER SIDE SHALL HAVE CAST INTO IT, THE DATE OF PRODUCTION, HEAT NUMBER, AND MANUFACTURER'S MARK OR SYMBOL.
3. THE COVER SHALL HAVE 1 (ONE) INCH DIAMETER VENT HOLES.
4. THE WEIGHT OF THE COVER SHALL BE MINIMUM 65 LBS.
5. MATERIAL USED IN THE CASTING SHALL BE ASTM A48 CLASS 35B.
6. THE LOAD RATING SHALL BE NON-TRAFFIC OR LIGHT DUTY. THESE COVERS SHALL BE USED IN NON-TRAFFIC AREAS ONLY.
7. ANY COVERS USED IN TRAFFIC AREAS SHALL BE TRAFFIC RATED.

STORM MANHOLE FRAME AND COVER

NON-TRAFFIC RATED

NOT TO SCALE

Approved By: _____ Date: _____
Revision No. _____ Date: _____
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Revision No. _____ Date: _____
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Revision No. _____ Date: _____

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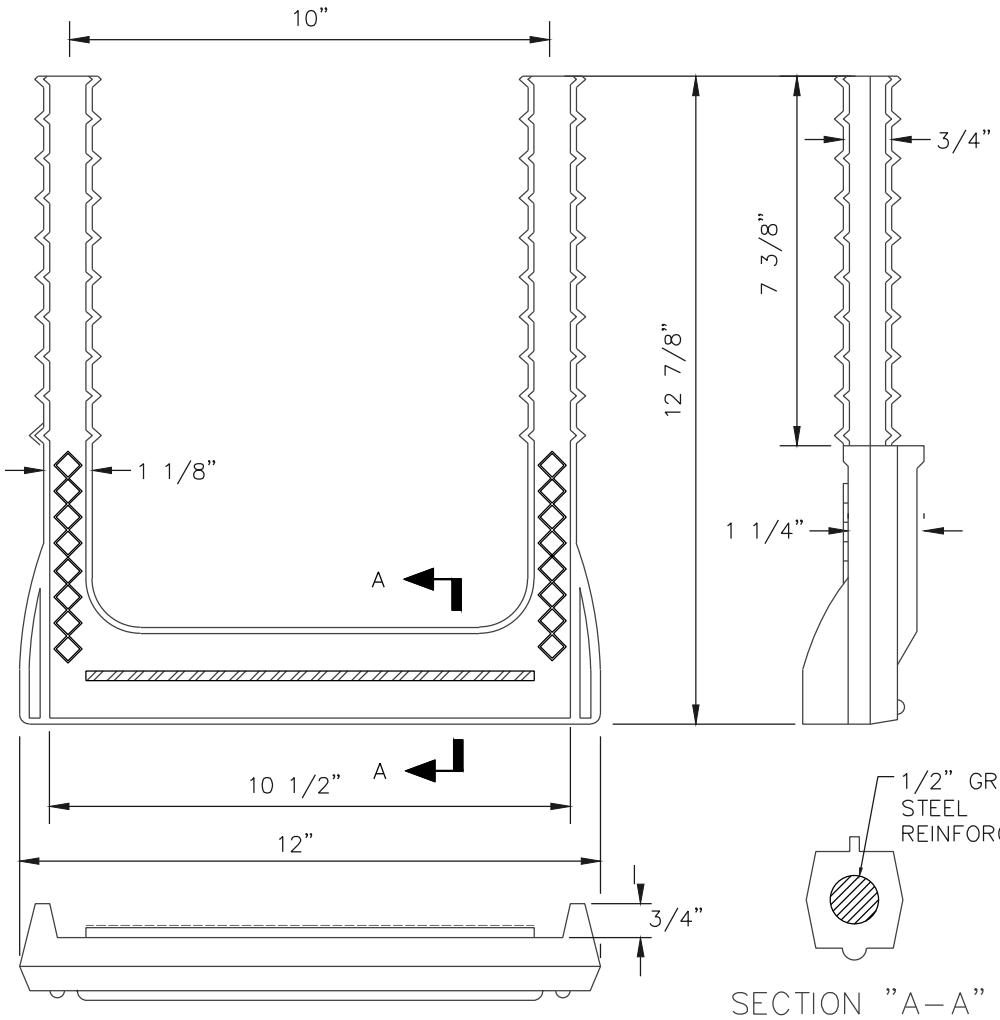
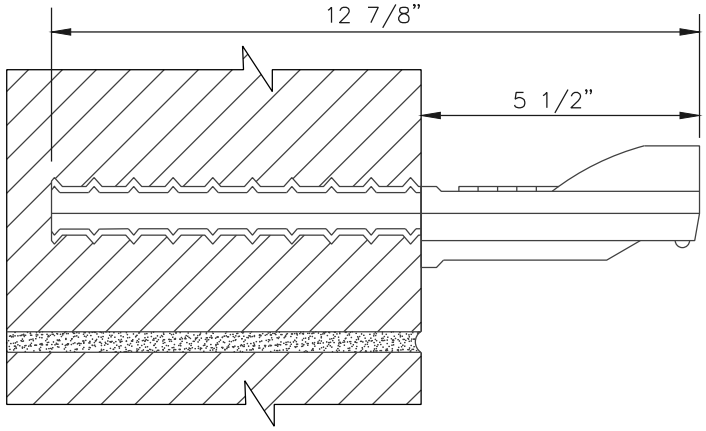
STANDARD DETAIL
NUMBER
16-3

ISSUE DATE: 1/13/2022



SECTION "A–A"



NOTES:
1. STEPS SHALL MEET REQUIREMENTS OF ASTM C–478, ASTM D–4101,ASTM A–615 & ASTHTO M–199.
2. TO BE USED IN BRICK OR CAST–IN–PLACE UNITS.

CATCH BASIN STEP

NOT TO SCALE

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Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	

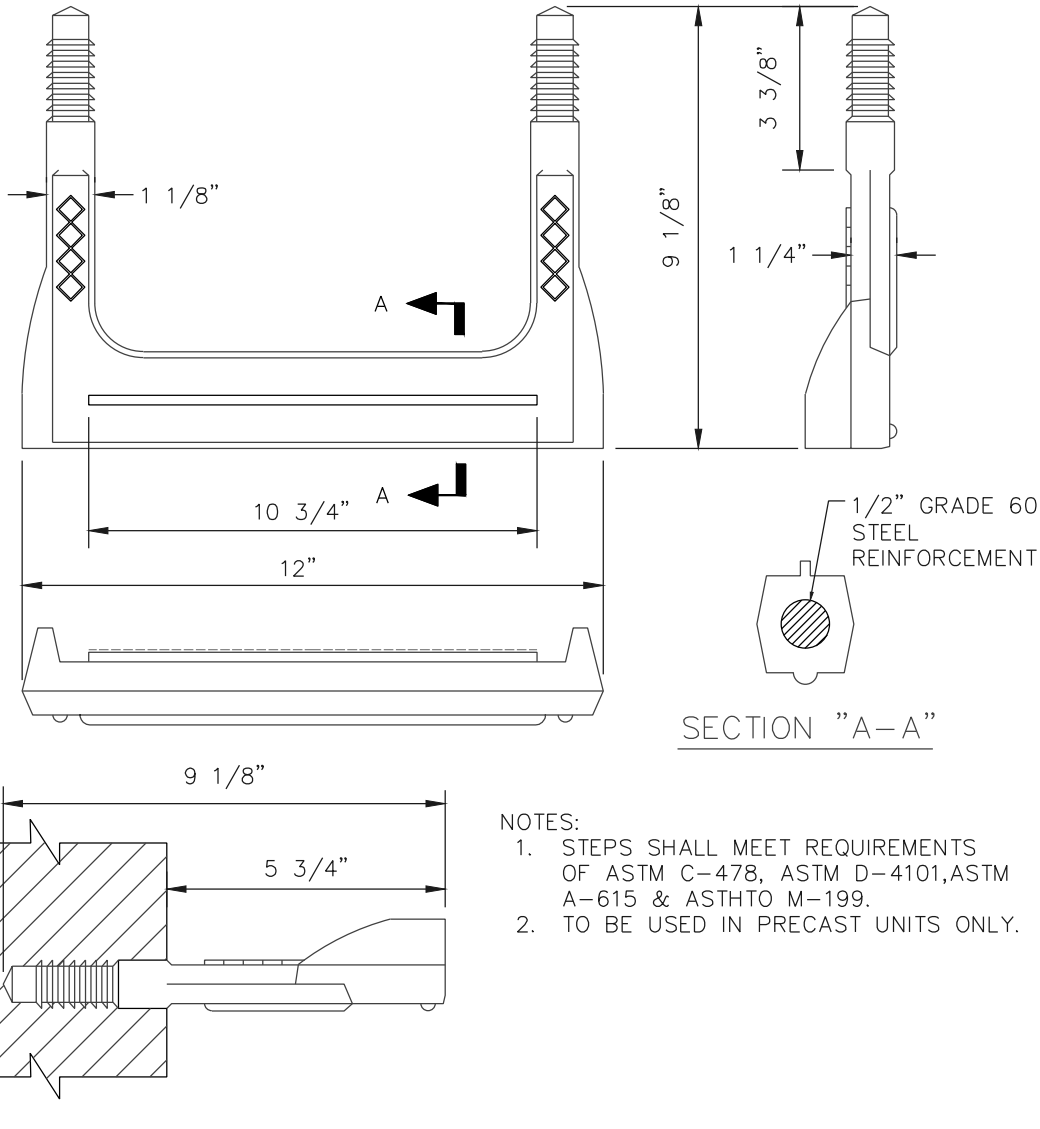
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

16–4

ISSUE DATE: 1/13/2022



NOTES:
1. STEPS SHALL MEET REQUIREMENTS OF ASTM C–478, ASTM D–4101,ASTM A–615 & ASTHTO M–199.
2. TO BE USED IN PRECAST UNITS ONLY.

PRECAST CATCH BASIN STEP

NOT TO SCALE

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Revision No.		Date:	
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Revision No.		Date:	
Revision No.		Date:	

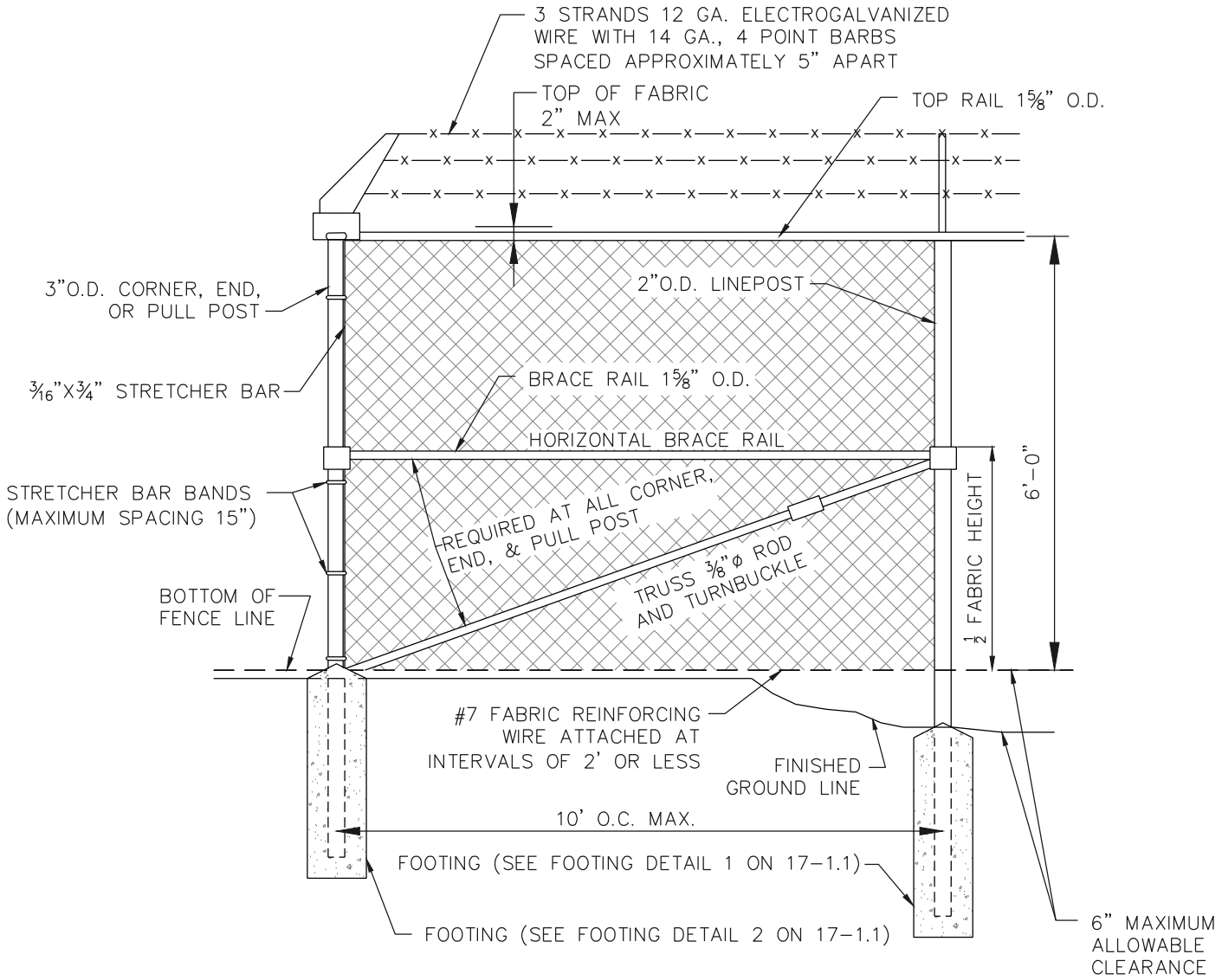
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

16–4.1

ISSUE DATE: 1/13/2022



CHAIN-LINK WIRE FENCE

(OVER 4FT HEIGHT)

NOTES:

1. FABRIC SHALL BE FASTENED TO LINE POST AND TOP RAIL POST AT INTERVALS NOT GREATER THAN 15".
2. FABRIC REINFORCING WIRE SHALL BE TIED TO FABRIC WITH GALVANIZED TIES OR CLIPS AT 2' O.C. MAXIMUM SPACING.
3. HORIZONTAL BRACE RAILS AND TRUSS BRACING SHALL BE REQUIRED AT ALL CORNER, END, AND PULL POSTS.
4. FABRIC SHALL BE 9 GA. 2" MESH, CLASS I, GALVANIZED IN CONFORMANCE WITH ASTM A392-63.

STORMWATER MANAGEMENT FACILITY FENCING

NOT TO SCALE

Approved By:		Date:	
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Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	

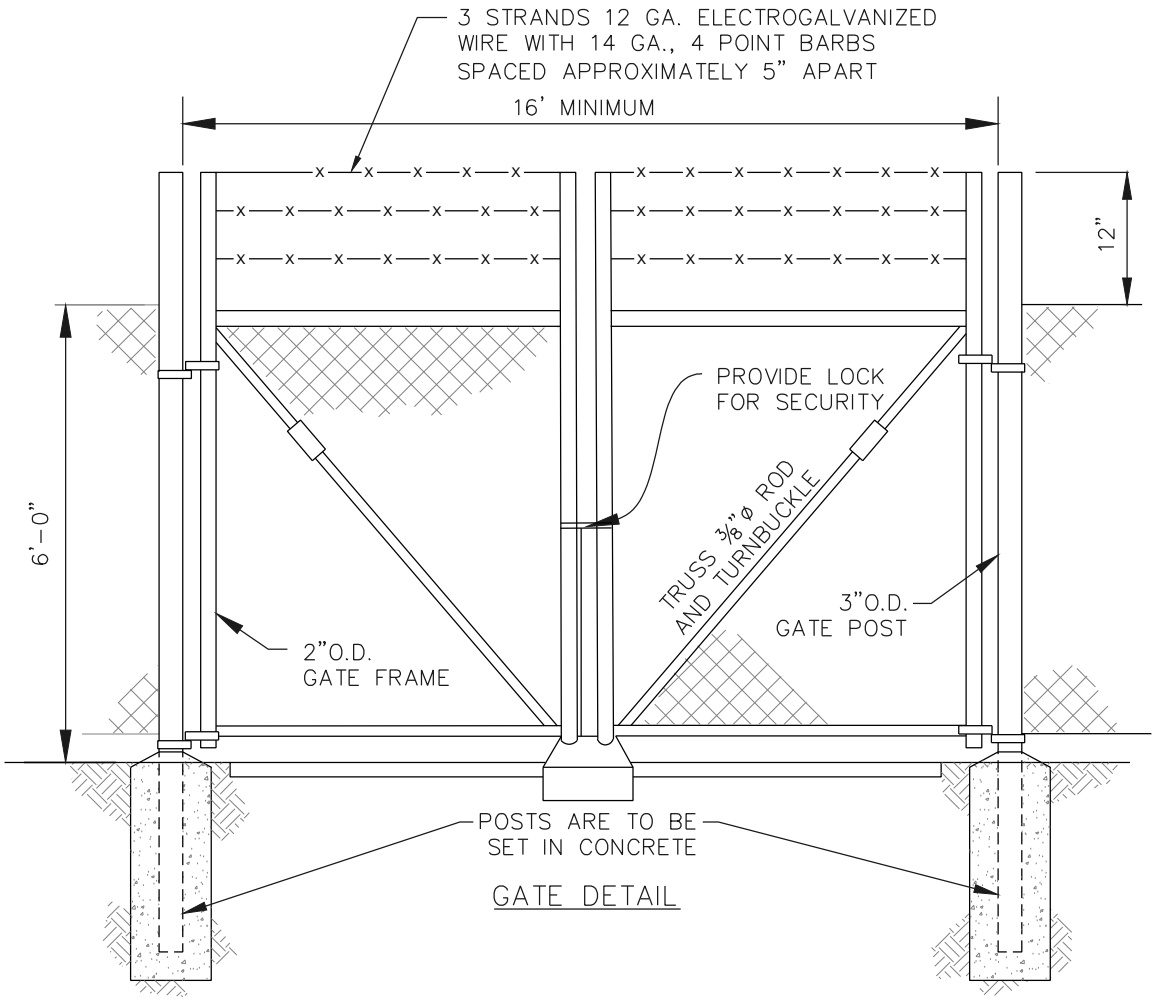
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

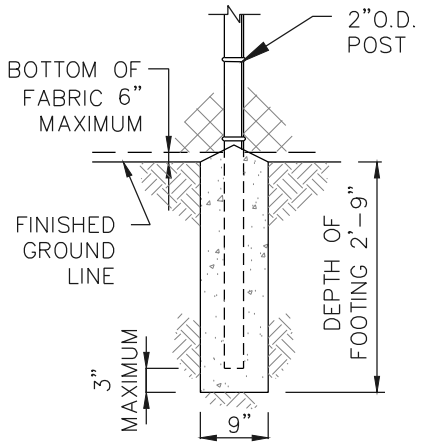
STANDARD DETAIL NUMBER

17-1

ISSUE DATE: 1/13/2022

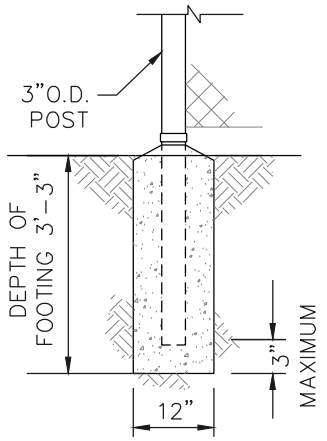


GATE DETAIL



FOOTING DETAIL 1

ALL LINE POSTS SHALL HAVE CONCRETE FOOTINGS AS SHOWN



FOOTING DETAIL 2

ALL CORNERS, END, PULL & GATE POSTS SHALL HAVE CONCRETE FOOTINGS AS SHOWN

STORMWATER MANAGEMENT FACILITY FENCING

NOT TO SCALE

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Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	

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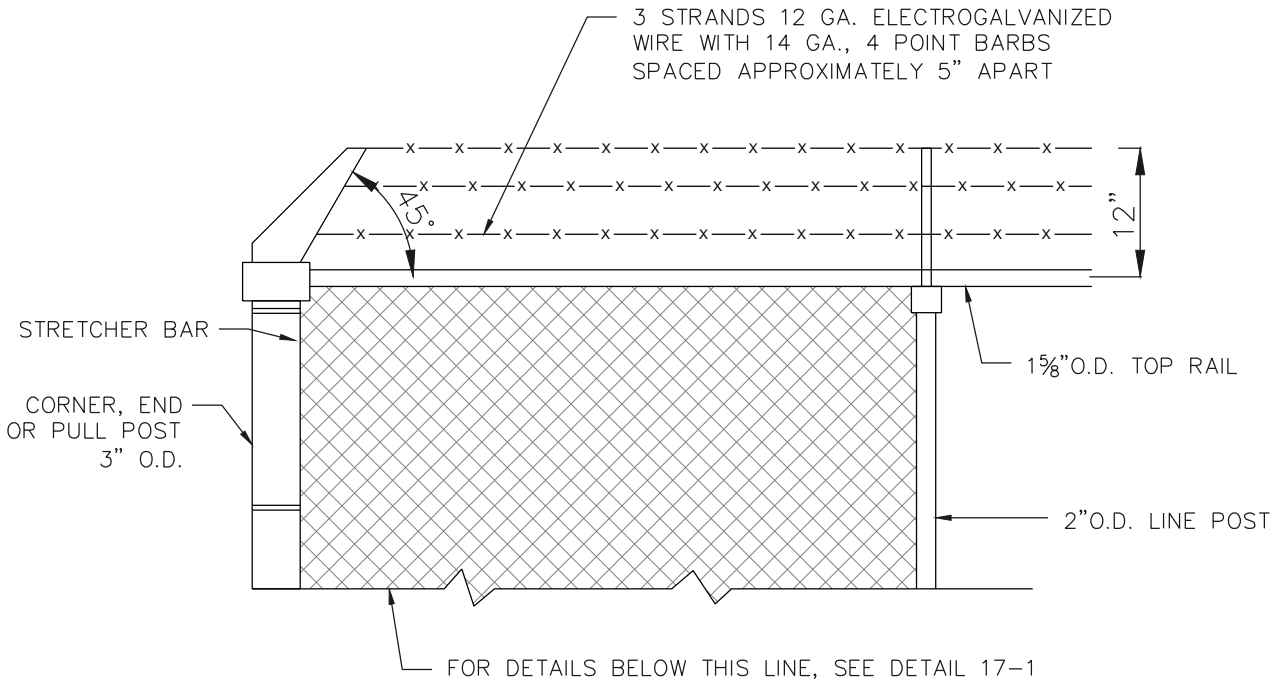
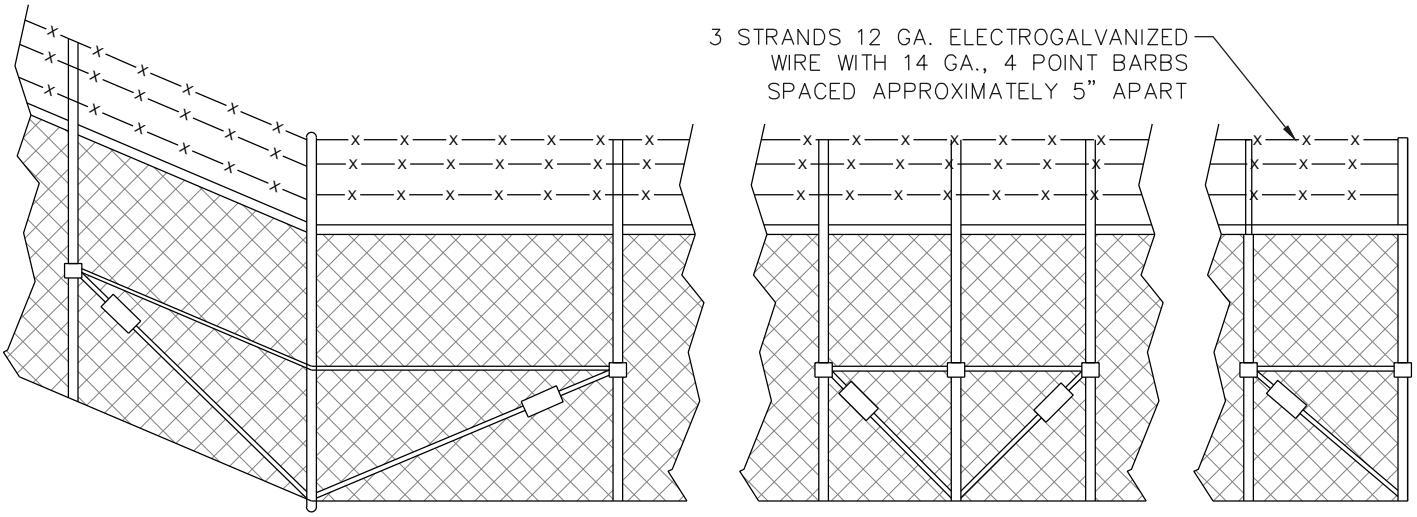
ISSUE DATE: 1/13/2022



DETAILS OF BARBED WIRE WITH EXTENSION ARMS FOR CHAIN LINK WIRE FENCE



METHOD OF BRACING END, CORNER, AND PULL POST

STORMWATER MANAGEMENT FACILITY FENCING

NOT TO SCALE

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Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	

COLUMBIA COUNTY
GEORGIA

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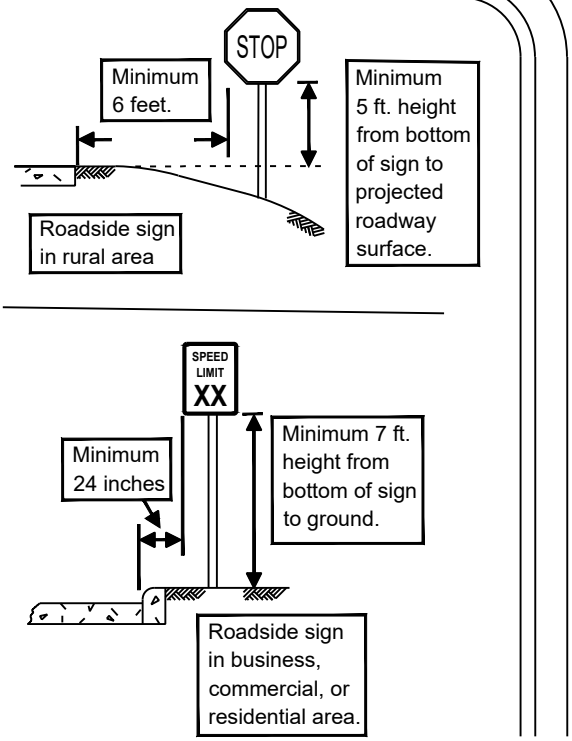
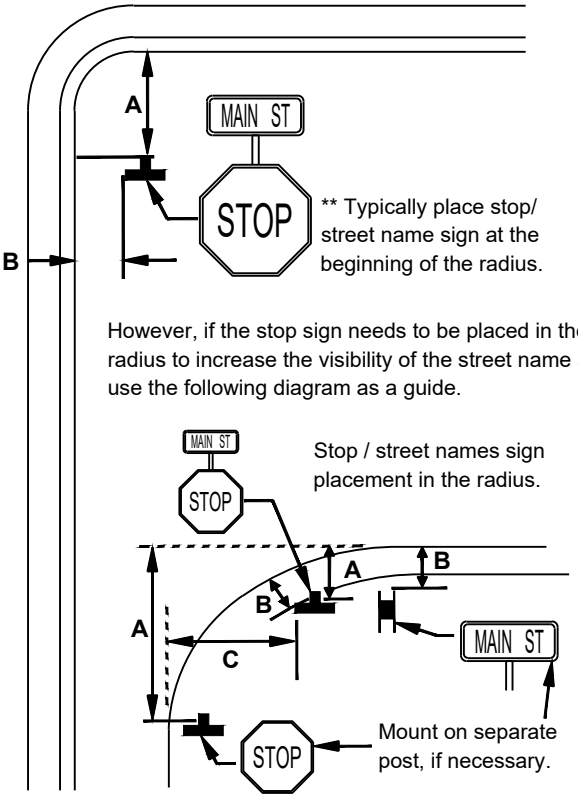
NUMBER

17–1.2

ISSUE DATE: 1/13/2022





However, if the stop sign needs to be placed in the radius to increase the visibility of the street name sign, use the following diagram as a guide.

A: May vary, but MAXIMUM distance is 50 feet and MINIMUM distance is 6 feet from travelway. for a Stop Sign.
B: For curb (>6") & gutter streets, lateral offset to edge of sign should be minimum of 24 inches from back of curb. For all other streets (ditch, raised edge, rolled curb, etc.), lateral offset to edge of sign should be a minimum of 2 feet from edge of pavement/curb for < 25 MPH and lateral offset to edge of sign should be a minimum of six feet for speeds > 25 MPH.
C: Distance will vary based on best location, but should never exceed six feet from projected edge of pavement extended and still meet condition B, if street markers not visible for main street after determining best location for Stop Sign, mount makers on separate post.
Every effort should be made to reduce foliage in the intersection ROW so that the typical stop sign placement maybe achieved .

TRAFFIC CONTROL DEVICES STANDARD LOCATIONS

Standards are based on the Federal Highway Administration's Manual on Uniform Traffic Control Devices, 2009 Edition

NOT TO SCALE

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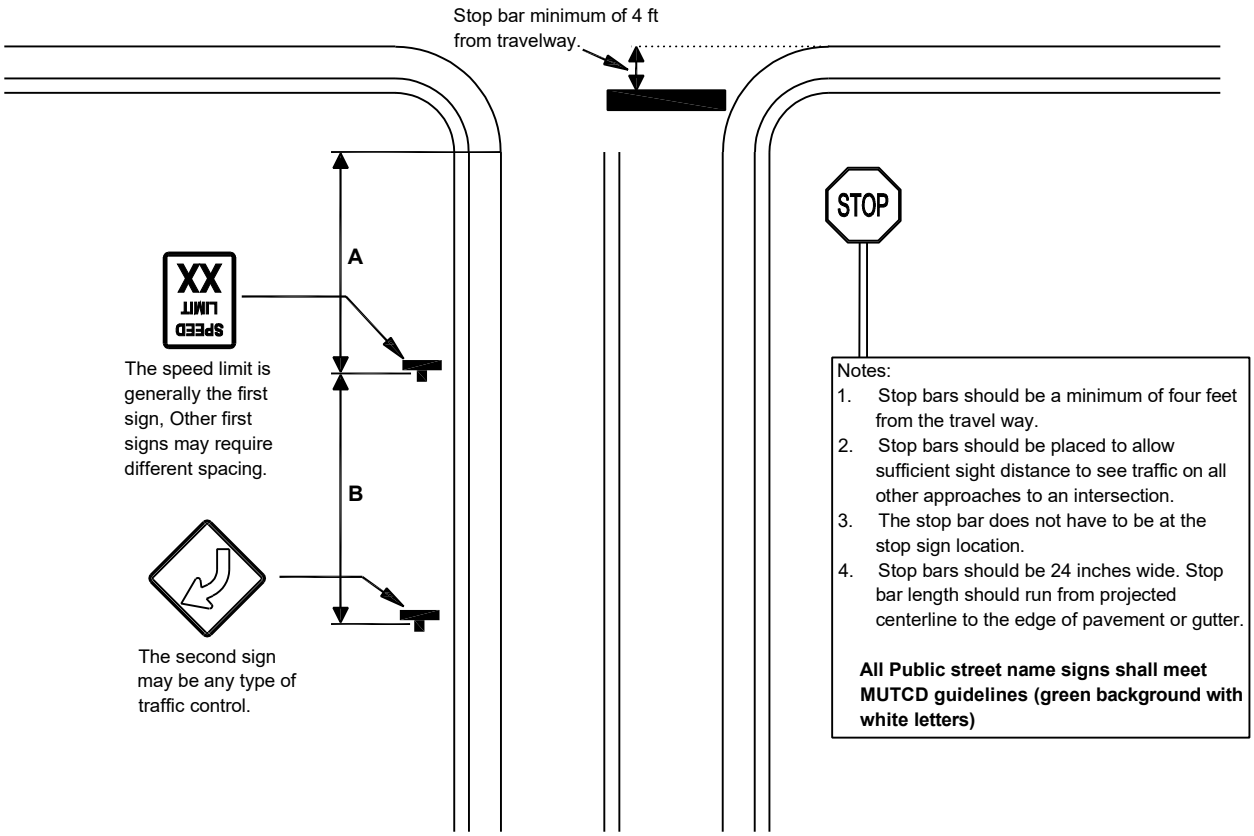
COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

T – 1

ISSUE DATE: 3/3/2022



Notes:
1. Stop bars should be a minimum of four feet from the travel way.
2. Stop bars should be placed to allow sufficient sight distance to see traffic on all other approaches to an intersection.
3. The stop bar does not have to be at the stop sign location.
4. Stop bars should be 24 inches wide. Stop bar length should run from projected centerline to the edge of pavement or gutter.

All Public street name signs shall meet MUTCD guidelines (green background with white letters)

Speed Limit of Road (MPH)	Distance Between Signs	
	A	B
25	100' to 200'	125'
30	125' to 225'	150'
35	200' to 300'	175'
40	300' to 400'	250'
45	325' to 450'	300'
50	350' to 500'	350'
55	400' to 550'	400'
60	450' to 600'	450'
65	500' to 650'	500'

A: Typical range of spacing between the first sign (typically speed limit) and the end of the radius (may increase distance based on lot sizes).
B: Desirable minimum spacing between signs.

Columbia County reserves the right to require additional signing, such as Stop Ahead, Curve Left, Cross Road, etc., as determined at the time of plan review or final platting.

Any other applicable sign installations should conform to the standards and requirements of the Federal Highway Administration's Manual on Uniform Traffic Control Devices, 2009 edition.

TRAFFIC CONTROL DEVICES STANDARD LOCATIONS

Standards are based on the Federal Highway Administration's Manual on Uniform Traffic Control Devices, 2009 Edition

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Revision No. _____ Date: _____
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COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

T – 2

ISSUE DATE: 3/3/2022

SPEED LIMIT	"L"	"B"	"S"
30 MPH	90'	50'	135
35 MPH	125'	50'	160
40 MPH	160'	50'	210
45 MPH	270'	100'	235
50 MPH	300'	100'	285
55 MPH	330'	100'	310

NOTE:
STORAGE LENGTHS ("S") ARE THE MINIMUM LENGTHS REQUIRED. REDUCED LENGTHS, AS JUSTIFIED BY A TRAFFIC STUDY, MAY BE CONSIDERED BY THE COUNTY ENGINEER. BUT IN NO CASE SHALL BE LESS THAN 100' ON COLLECTOR ROADS OR 150' ON ARTERIAL ROADS.

MINIMUM LANE SHIFT TAPER LENGTHS FOR CENTER LEFT TURN LANES ARE BASED ON THE FOLLOWING EQUATIONS:
1. FOR POSTED SPEEDS LESS THAN OR EQUAL TO 40 MPH, $L=WS^2/60$.
2. FOR POSTED SPEEDS EQUAL TO OR GREATER THAN 45 MPH, $L=WS$.

WHERE: L= MINIMUM TAPER LENGTH
W = WIDTH OF THE OFFSET FROM CENTERLINE AND/OR THE EDGE OF PAVEMENT.
S = POSTED SPEED LIMIT
S^2 = SPEED RAISED TO THE POWER OF 2

THE ABOVE TABLE AND DRAWING ARE BASED ON A SYMMETRICAL WIDENING OF SIX FEET (6') ABOUT THE CENTERLINE OF THE EXISTING ROAD.

MINIMUM DESIGN ELEMENTS OF LEFT TURN LANES

SYMMETRICAL WIDENING ABOUT THE ℄

NOT TO SCALE

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Revision No. _____ Date: _____
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COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

T – 3

ISSUE DATE: 3/3/2022

SPEED LIMIT	"L"	"B"	"S"
30 MPH	180'	50'	135
35 MPH	250'	50'	160
40 MPH	320'	50'	210
45 MPH	540'	100'	235
50 MPH	600'	100'	285
55 MPH	660'	100'	310

NOTE:
STORAGE LENGTHS ("S") ARE THE MINIMUM LENGTHS REQUIRED. REDUCED LENGTHS, AS JUSTIFIED BY A TRAFFIC STUDY, MAY BE CONSIDERED BY THE COUNTY ENGINEER, BUT IN NO CASE SHALL BE LESS THAN 100' ON COLLECTOR ROADS OR 150' ON ARTERIAL ROADS..

MINIMUM LANE SHIFT TAPER LENGTHS FOR CENTER LEFT TURN LANES ARE BASED ON THE FOLLOWING EQUATIONS:
1. FOR POSTED SPEEDS LESS THAN OR EQUAL TO 40 MPH, $L=WS^2/60$.
2. FOR POSTED SPEEDS EQUAL TO OR GREATER THAN 45 MPH, $L=WS$.

WHERE: L= MINIMUM TAPER LENGTH
W = WIDTH OF THE OFFSET FROM CENTERLINE AND/OR THE EDGE OF PAVEMENT.
S = POSTED SPEED LIMIT
S^2 = SPEED RAISED TO THE POWER OF 2

THE ABOVE TABLE AND DRAWING ARE BASED ON A TWELVE FOOT (12') LANE SHIFT TO ONE SIDE OF THE ROAD TO PROVIDE THE CENTER TURN LANE. ALL DISTANCES ARE MINIMUMS.

MINIMUM DESIGN ELEMENTS OF LEFT TURN LANES

ASYMMETRICAL WIDENING

NOT TO SCALE

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COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

T – 4

ISSUE DATE: 3/3/2022

NOTE:
1. TAPERS ARE NOT CURBED WHEN ADJOINING AN UNCURBED ROAD.

PREFERRED LENGTHS

SPEED LIMIT	"L"	"T"
25 MPH	50'	50'
30 MPH	75'	50'
35 MPH	100'	50'
40 MPH	150'	50'
45 MPH	175'	100'
50 MPH	225'	100'
55 MPH	250'	100'

NOTES:
1. STORAGE LENGTHS ("L") ARE DETERMINED BY THE TRAFFIC STUDY AND ARE THE MINIMUM LENGTHS.
2. FINAL STORAGE LENGTHS ("L") TO BE APPROVED BY THE COUNTY ENGINEER BASED ON FIELD CONDITIONS.

MINIMUM DESIGN ELEMENTS OF DECELERATION LANES

NOT TO SCALE

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COLUMBIA COUNTY
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ENGINEERING
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STANDARD DETAIL
NUMBER

T-5

ISSUE DATE: 3/3/2022

Approved By: _____ Date: _____

Revision No. _____ Date: _____

Revision No. _____ Date: _____

Revision No. _____ Date: _____

Revision No. _____ Date: _____

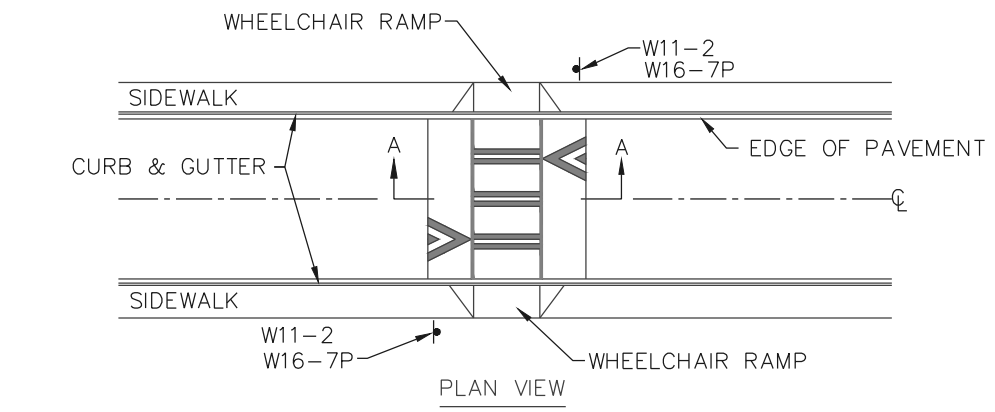
Revision No. _____ Date: _____

COLUMBIA COUNTY GEORGIA

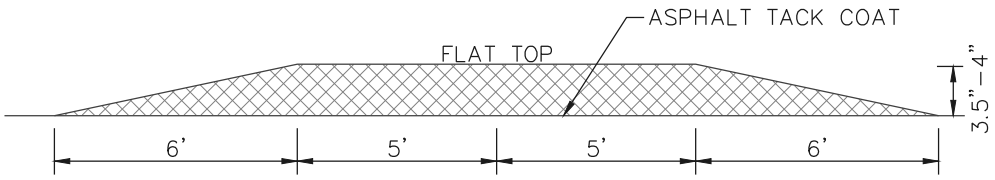
ENGINEERING SERVICES DIVISION

RAISED CROSSWALK

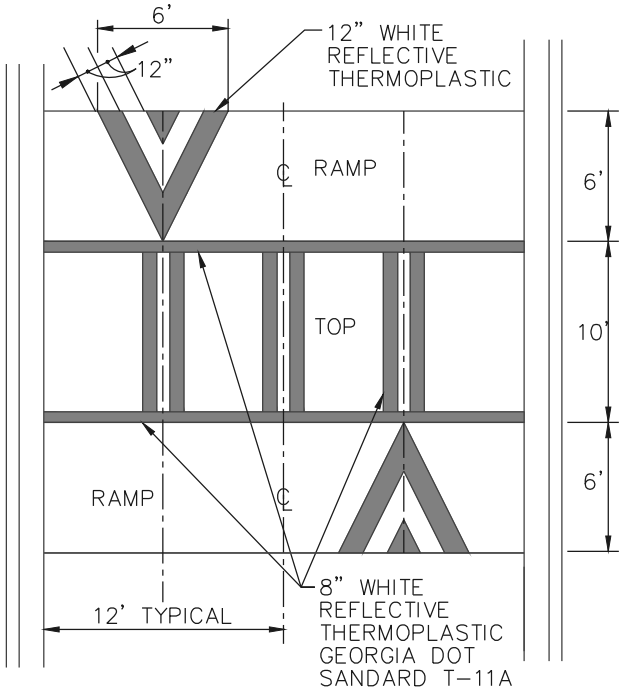
NOT TO SCALE



PLAN VIEW



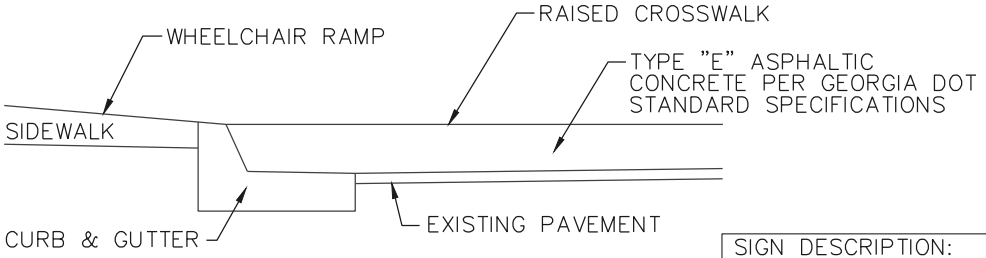
SECTION A–A



RAISED CROSSWALK MARKING DETAIL

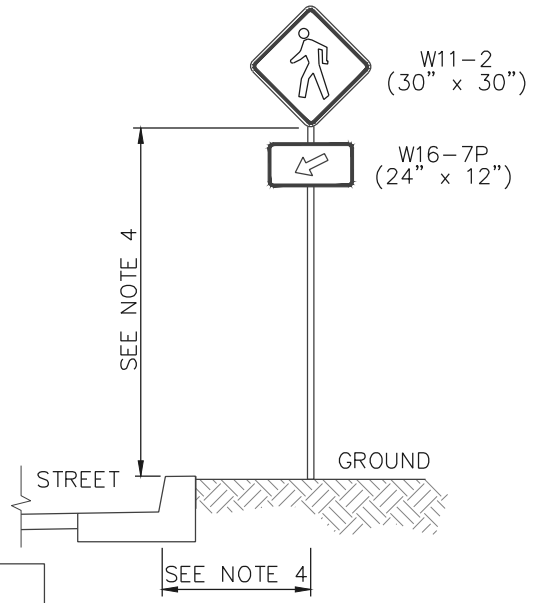
NOTES:

1. RAISED CROSSWALK MAY ONLY BE INSTALLED IN STREETS WITH GRADES LESS THAN 8%.
2. DROP INLETS ARE REQUIRED ON THE UPHILL SIDE OF THE RAISED CROSSWALK FOR DRAINAGE PURPOSES.
3. DRIVEWAYS SHALL NOT BE LOCATED WITHIN 5' OF RAISED CROSSWALK.
4. REFER TO TRAFFIC CONTROL DEVICES STANDARD LOCATIONS, DETAIL T–1 FOR SIGNAGE HEIGHT AND, LATERAL OFFSET DIMENSIONS.
5. SPEED HUMP SIGN (W17–1) WITH ADVISORY PLATE W13–1P (20 MPH) AND W16–9P (AHEAD) SHALL BE INSTALLED IN ADVANCE OF A RAISED CROSSWALK, IN BOTH DIRECTIONS OF TRAVEL. CONTRACTOR SHALL COORDINATE THE NUMBER AND LOCATION OF SIGNS WITH THE TRAFFIC DEPARTMENT PRIOR TO THE INSTALLATION OF RAISED CROSSWALKS.



SECTION B–B (WITH CURB)

SIGN DESCRIPTION:
W11–2 PEDESTRIAN
W16–7P DIAGONAL ARROW



TYPICAL SIGNAGE INSTALLATION

STANDARD DETAIL NUMBER

T–6

ISSUE DATE: 3/3/2022

Approved By:

Revision No. ____ Date: ____

Revision No. ____ Date: ____

Revision No. ____ Date: ____

Revision No. ____ Date: ____

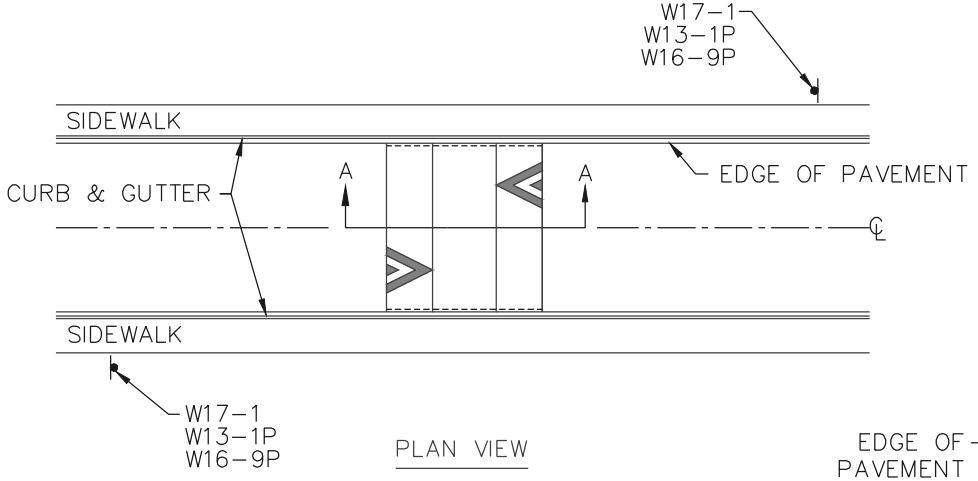
Revision No. ____ Date: ____

COLUMBIA COUNTY
GEORGIA

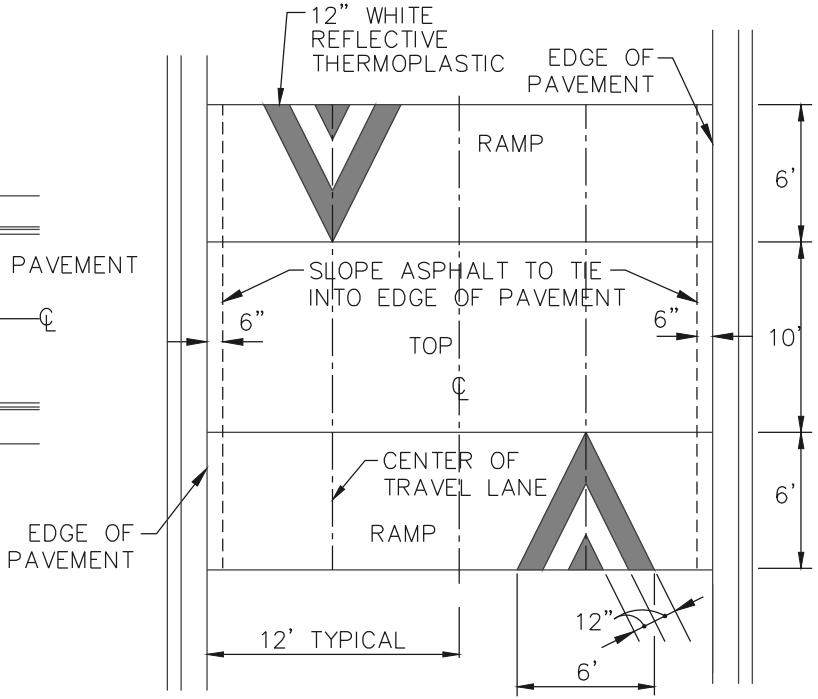
ENGINEERING
SERVICES
DIVISION

SPEED HUMP

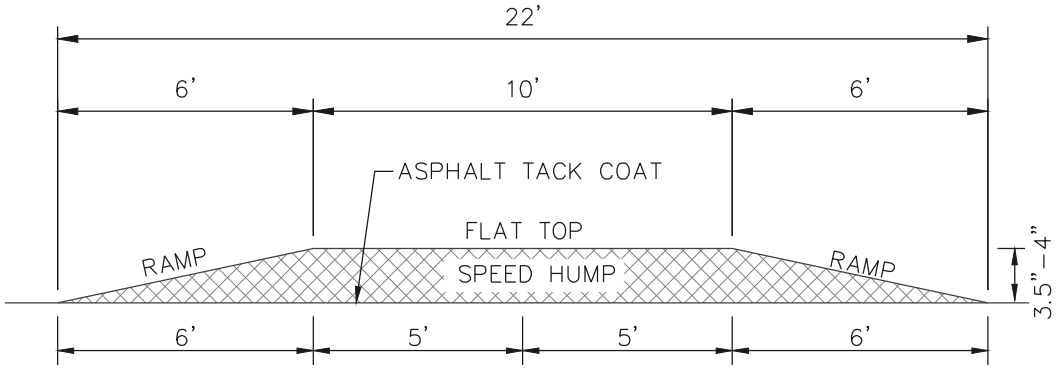
NOT TO SCALE



PLAN VIEW



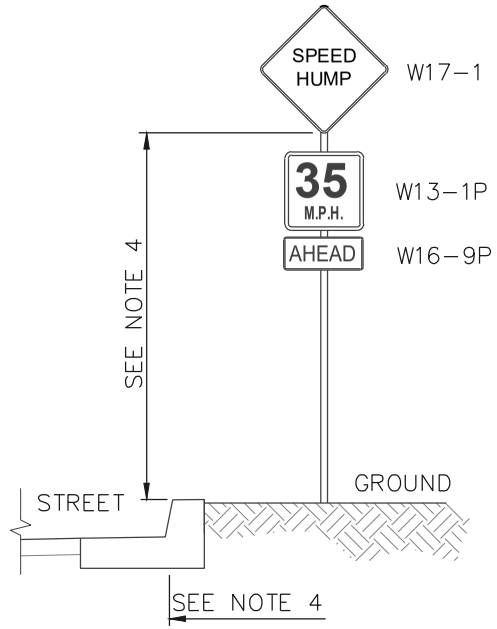
SPEED HUMP MARKING DETAIL



SECTION A–A

NOTES:

1. SPEED HUMP MAY ONLY BE INSTALLED IN STREETS WITH GRADES LESS THAN 8%
2. DRIVEWAYS SHALL NOT BE LOCATED WITHIN 5' OF SPEED HUMP.
3. REFER TO TRAFFIC CONTROL DEVICES STANDARD LOCATIONS, DETAIL T-1 FOR SIGNAGE HEIGHT AND LATERAL OFFSET DIMENSIONS.
4. SPEED HUMP SIGN (W17-1) WITH ADVISORY PLATE W13-1P (20 MPH) AND W16-9P (AHEAD) SHALL BE INSTALLED IN ADVANCE OF A SINGLE SPEED HUMP OR IN ADVANCE OF THE FIRST AND LAST SPEED HUMP OF A SERIES, IN BOTH DIRECTIONS OF TRAVEL. CONTRACTOR SHALL COORDINATE THE NUMBER AND LOCATION OF SIGNS WITH THE TRAFFIC DEPARTMENT PRIOR TO INSTALLATION OF SPEED HUMPS.



TYPICAL SIGNAGE INSTALLATION

STANDARD DETAIL NUMBER

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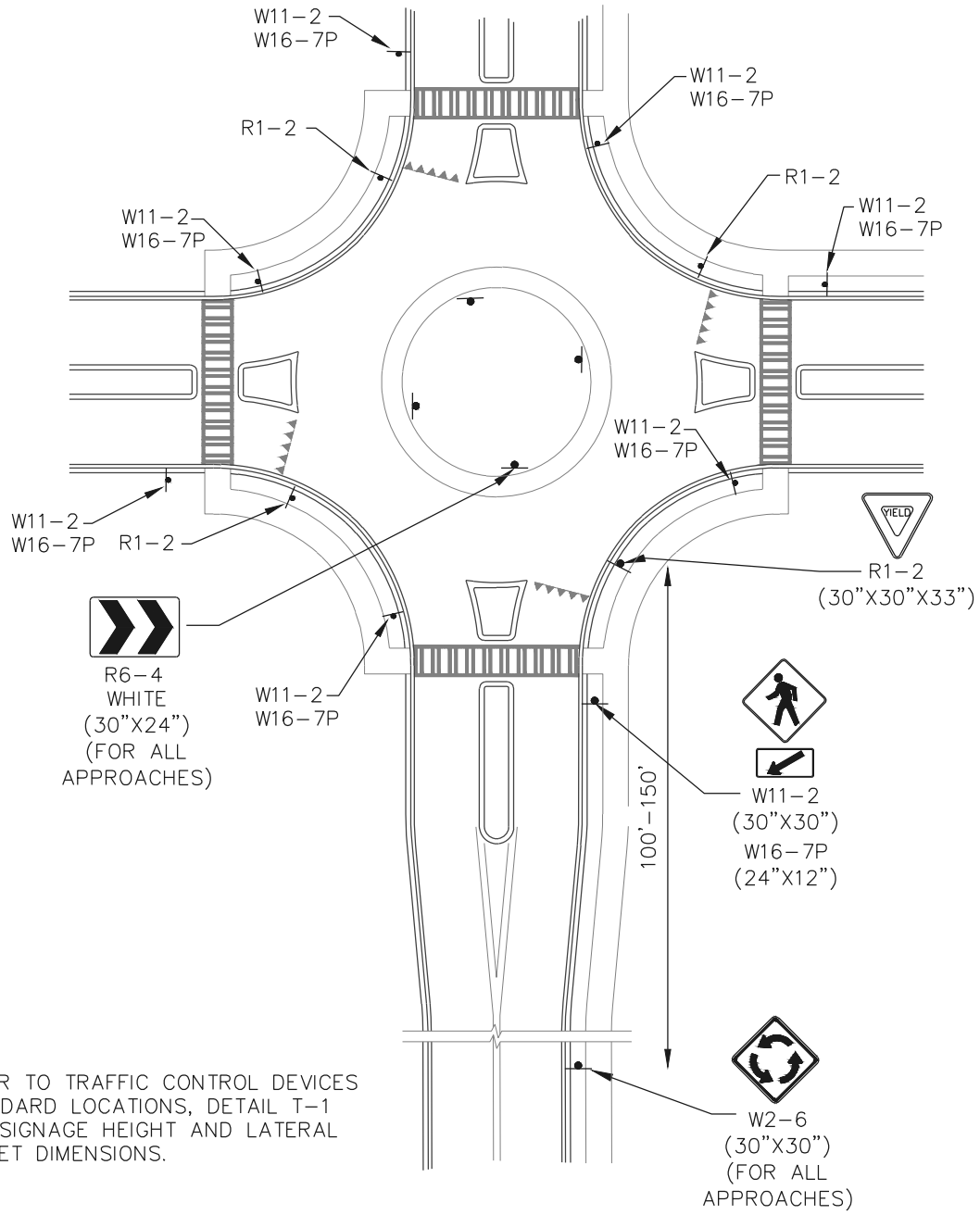
ISSUE DATE: 3/3/2022



NOTE:
1. REFER TO TRAFFIC CONTROL DEVICES STANDARD LOCATIONS, DETAIL T-1 FOR SIGNAGE HEIGHT AND LATERAL OFFSET DIMENSIONS.

ROUNDABOUT SIGNAGE

NOT TO SCALE

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Approved By: _____ Date: _____

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COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

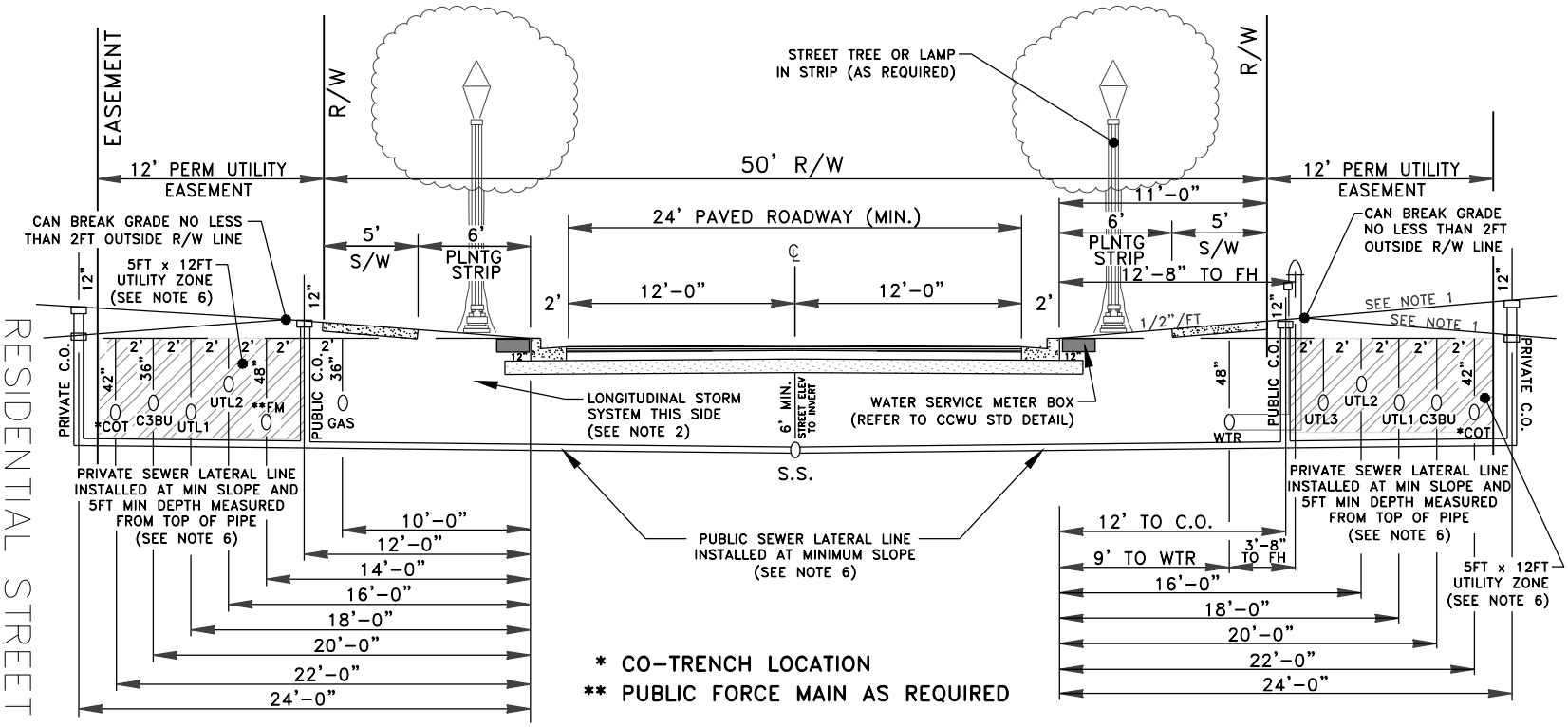
T – 9

ISSUE DATE: 3/3/2022

RESIDENTIAL STREET UTILITY SECTION

6 Ft. PLANTER STRIP

NOT TO SCALE



RESIDENTIAL STREET UTILITY SECTION – 6 Ft. PLANTER STRIP

SINGLE FAMILY RESIDENTIAL W/ DRIVEWAY ACCESS

NOTES:

1. FULL WIDTH OF THE RIGHT-OF-WAY AND PERMANENT UTILITY EASEMENTS MUST BE CLEARED & GRADED WITH A SLOPE OF $\frac{1}{2}$"/FT. UTILITY EASEMENT CAN BE GRADED TO MAXIMUM 6:1 IF DESIGN DICTATES THE NEED FOR A STEEPER TRANSITION TO BUILDING PAD GRADE. PERMANENT UTILITY EASEMENT IS ALLOWED TO SLOPE UP OR DOWN. A DOWNSLOPE MUST BREAK NO LESS THAN 2FT OUTSIDE R/W LINE.
2. ALL STORM LINES SHALL BE LOCATED OPPOSITE WATER LINES. A PARALLELISM OF STORM AND WATER LINE ON SAME SIDE IS NOT PERMITTED. STORM PIPING UNDER PAVEMENT MUST BE KEPT TO A MINIMUM.
3. ALL UTILITY DEPTHS ARE BASED ON TOP OF CURB, NOT ELEVATION DIRECTLY OVER UTILITY. UTILITY DEPTH REQUIREMENTS VARY AND SHOULD ALTERNATE TO HELP LIMIT DAMAGES TO ADJACENT FACILITIES DURING FUTURE REPAIRS.
4. HYDRANT LEAD LENGTH IS REDUCED PER THIS CROSS SECTION. A HYDRANT ANCHOR TEE IS REQUIRED WITH VALVE ANCHORED DIRECTLY TO TEE. AN ANCHOR COUPLING SHALL BE USED TO CONNECT THE HYDRANT FOOT TO THE VALVE. TEE + VALVE + ANCHOR COUPLING + HYDRANT = 3'-8" LAYING LENGTH.
5. MINIMUM 20FT DISTANCE FROM WATERLINE TO RESIDENTIAL STRUCTURE.
6. PUBLIC SEWER LATERAL LINE SHALL MEET COUNTY SPECIFICATION FOR MINIMUM SLOPE REQUIREMENT TO THE PUBLIC CLEANOUT. AT THE PUBLIC CLEANOUT, CONTRACTOR/ENGINEER IS ALLOWED TO RAISE THE GRADE OF THE PRIVATE SEWER LATERAL LINE IN ORDER TO MEET THE ELEVATION REQUIREMENT TO THE STRUCTURE WHILE MAINTAINING THE 5 FOOT MINIMUM DEPTH INSIDE THE UTILITY ZONE. THE 5 FOOT MINIMUM DEPTH IN UTILITY ZONE IS MEASURED FROM TOP OF CURB TO TOP OF LATERAL PIPE. PRIVATE SEWER LINE SHALL MEET THE COUNTY SPECIFICATION FOR MINIMUM SLOPE REQUIREMENT TO THE PRIVATE CLEANOUT.

* CO-TRENCH LOCATION
** PUBLIC FORCE MAIN AS REQUIRED.

RESIDENTIAL STREET UTILITY SECTION – 2 Ft. PLANTER STRIP

SINGLE FAMILY RESIDENTIAL W/ DRIVEWAY ACCESS

NOTES:

1. FULL WIDTH OF THE RIGHT-OF-WAY AND PERMANENT UTILITY EASEMENTS MUST BE CLEARED & GRADED WITH A SLOPE OF ½"/FT. UTILITY EASEMENT CAN BE GRADED TO MAXIMUM 6:1 IF DESIGN DICTATES THE NEED FOR A STEEPER TRANSITION TO BUILDING PAD GRADE. PERMANENT UTILITY EASEMENT IS ALLOWED TO SLOPE UP OR DOWN.
2. ALL STORM LINES SHALL BE LOCATED OPPOSITE WATER LINES. A PARALLELISM OF STORM AND WATER LINE ON SAME SIDE IS NOT PERMITTED. STORM PIPING UNDER PAVEMENT MUST BE KEPT TO A MINIMUM.
3. ALL UTILITY DEPTHS ARE BASED ON TOP OF CURB, NOT ELEVATION DIRECTLY OVER UTILITY. UTILITY DEPTH REQUIREMENTS VARY AND SHOULD ALTERNATE TO HELP LIMIT DAMAGES TO ADJACENT FACILITIES DURING FUTURE REPAIRS.
4. MINIMUM 20FT DISTANCE FROM WATERLINE TO RESIDENTIAL STRUCTURE.
5. PUBLIC SEWER LATERAL LINE SHALL MEET COUNTY SPECIFICATION FOR MINIMUM SLOPE REQUIREMENT TO THE PUBLIC CLEANOUT. AT THE PUBLIC CLEANOUT, CONTRACTOR/ENGINEER IS ALLOWED TO RAISE THE GRADE OF THE PRIVATE SEWER LATERAL LINE IN ORDER TO MEET THE ELEVATION REQUIREMENT TO THE STRUCTURE WHILE MAINTAINING THE 5 FOOT MINIMUM DEPTH INSIDE THE UTILITY ZONE. THE 5 FOOT MINIMUM DEPTH IN UTILITY ZONE IS MEASURED FROM TOP OF CURB TO TOP OF LATERAL PIPE. PRIVATE SEWER LINE SHALL MEET THE COUNTY SPECIFICATION FOR MINIMUM SLOPE REQUIREMENT TO THE PRIVATE CLEANOUT.

RESIDENTIAL STREET UTILITY SECTION

2 Ft. PLANTER STRIP

NOT TO SCALE

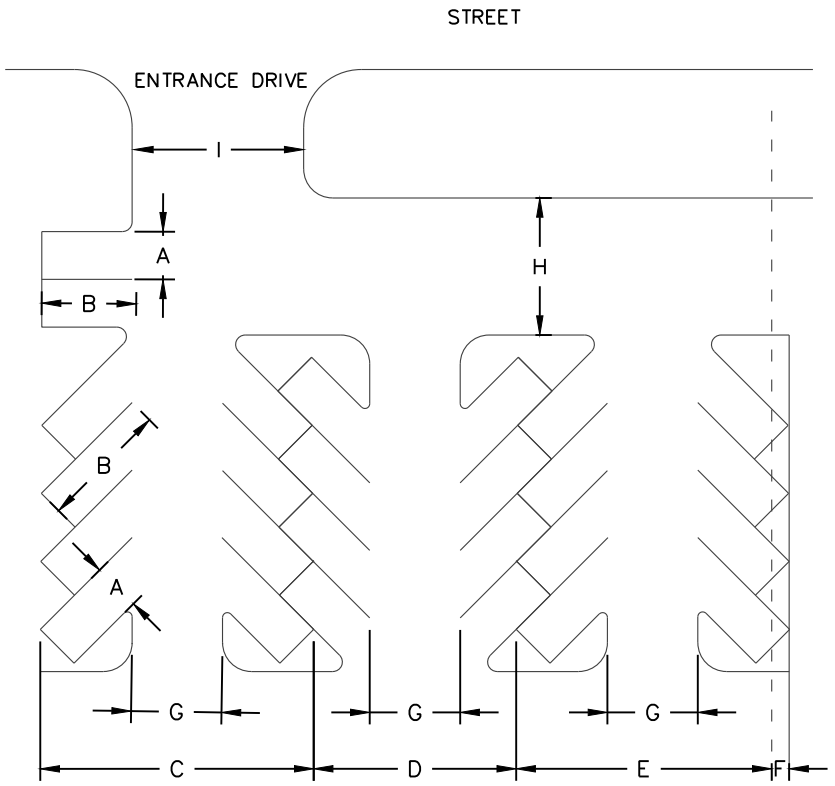
Approved By:		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	
Revision No.		Date:	

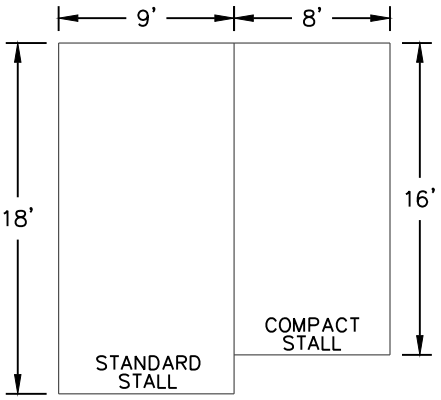
COLUMBIA COUNTY
GEORGIA

ENGINEERING
SERVICES
DIVISION

STANDARD DETAIL
NUMBER
T-10

ISSUE DATE: 3/3/2022





		GROUP I: STANDARD CARS					GROUP II: COMPACT CARS				
		° ANGLE OF PARK					° ANGLE OF PARK				
DIMENSION	KEY	0°	45°	60°	75°	90°	0°	45°	60°	75°	90°
Stall Width	A	8'-6"	9'-0"	9'-0"	9'-0"	9'-0"	7'-6"	8'-0"	8'-0"	8'-0"	8'-0"
Stall Depth	B	24'-0"	18'-0"	18'-0"	18'-0"	18'-0"	22'-0"	16'-0"	16'-0"	16'-0"	16'-0"
Module,Wall to Interlock	C	–	60'-0"	60'-0"	60'-0"	60'-0"	–	60'-0"	60'-0"	60'-0"	60'-0"
Module, Interlocking	D	–	60'-0"	60'-0"	60'-0"	60'-0"	–	60'-0"	60'-0"	60'-0"	60'-0"
Module, Interlocking to Curb Face	E	–	58'-0"	58'-0"	58'-0"	58'-0"	–	58'-0"	58'-0"	58'-0"	58'-0"
Bumper Overhang (Typical)	F	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"
Aisle Width (One-Way)	G	12'-0"	18'-0"	19'-0"	20'-0"	24'-0"	12'-0"	18'-0"	22'-0"	22'-0"	24'-0"
Aisle Width (Two-Way)	G	24'-0"	22'-0"	22'-0"	24'-0"	24'-0"	24'-0"	22'-0"	22'-0"	24'-0"	24'-0"
Cross Aisle/Access Drive (One-Way)	H	14'-0"	14'-0"	14'-0"	14'-0"	14'-0"	14'-0"	14'-0"	14'-0"	14'-0"	14'-0"
Cross Aisle/Access Drive (Two-Way)	H	24'-0"	24'-0"	24'-0"	24'-0"	24'-0"	24'-0"	24'-0"	24'-0"	24'-0"	24'-0"
Entrance Drive (One-Way)	I	Note: Driveway width and all access shall be in accordance with the "GDOT Driveway & Encroachment Manual".									
Entrance Drive (Two-Way)	I										

NOTES:

1. SEE SECTION "90-140 LANDSCAPING" OF COLUMBIA COUNTY CODE REGARDING LANDSCAPE REQUIREMENTS FOR PARKING LOTS AND ROAD FRONTAGES. PLEASE ALSO REVIEW SECTION "90-139 BUFFERS" AND "SCREENING REGARDING DESIGN OF BUFFERS."
2. COMPACT SPACES MUST BE APPROVED BY THE PLANNING DEPARTMENT DURING SITE PLAN REVIEW. SIGNAGE AND/OR PAVEMENT MARKINGS INDICATING COMPACT SPACES SHALL BE REQUIRED."
3. TYPICAL DIMENSIONS SHOWN MAY REQUIRE ADJUSTMENTS BY THE COUNTY FIRE MARSHAL AND/OR FIRE CHIEF IF WARRANTED BY SITE CONDITIONS.

PARKING LAYOUT DIMENSIONS

NOT TO SCALE

Approved By: _____ Date: _____
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COLUMBIA COUNTY GEORGIA

ENGINEERING SERVICES DIVISION

STANDARD DETAIL NUMBER

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