

APPENDIX A | ROAD CONSTRUCTION STANDARDS

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APPENDIX A | ROAD CONSTRUCTION STANDARDS

ARTICLE A.1 GENERAL INFORMATION

§A.1.1 ABBREVIATIONS

For the purpose of these regulations, abbreviations relating to streets and drainage are defined as follows:

- A. AASHTO – American Association of State Highway and Transportation Officials
- B. ADA – Americans with Disabilities Act
- C. ADAAG – Americans with Disabilities Act Accessibility Guidelines
- D. ASTM–American Society for Testing Materials
- E. CTC – County Transportation Committee
- F. CTC (SS) – the Charleston County Transportation Committee publication STANDARD SPECIFICATIONS FOR LOCAL GOVERNMENTS’ ROAD AND STREET CONSTRUCTION, latest edition.
- G. HOA –Homeowners’ Association
- H. MLW – Mean Low Water
- I. MSL – Mean Sea Level (Elevation 0.0 as determined by the NGVD 29 datum)
- J. MUTCD – Manual on Uniform Traffic Control Devices
- K. NGVD 29 – National Geodetic Vertical Datum of 1929
- L. SCDHEC/OCRM – South Carolina Department of Health and Environmental Control/Office of Ocean and Coastal Resource Management
- M. SCDOT – South Carolina Department of Transportation
- N. SCDOT (SS) – South Carolina Department of Transportation Standard Specifications for Highway Construction, latest edition
- O. USACOE – United States Army Corps of Engineer

§A.1.2 DEFINITIONS

For the purpose of these regulations, terms relating to streets and drainage are defined as follows:

- A. **BASE COURSE** – The layer or layers of specified or selected material of designated thickness or rate of application placed on a sub base or subgrade to comprise a component of the pavement structure to support the pavement or subsequent layer of construction.
- B. **BRIDGE** – A structure, including supports, erected over a depression or an obstruction; e.g., water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads.
- C. **CAUSEWAY** – An earthen structure with at least one side adjacent to a depression, wetland, or marsh that supports a track or passageway for carrying traffic or other moving loads.
- D. **CUL-DE-SAC** – The radial turnaround area at the end of a dead-end street.
- E. **CULVERT** – Any structure which provides an opening under any roadway or any other structure so named in the plans, excluding bridges.
- F. **DESIGN PROFESSIONAL** – An individual or firm appropriately licensed and registered in the State of South Carolina.
- G. **DETENTION** – The temporary restriction of storm water that is released at a predetermined or controlled rate.
- H. **DEVELOPER** – The legal or beneficial owner of a lot or of any land proposed for development; the holder of an option or contract to purchase; or any other person having an enforceable contractual interest in such land.
- I. **DRAINAGE EASEMENT** – The right of access of storm water runoff from adjacent drainage basins into the drainage way within the defined easement.
- J. **EARTH ROADS** – Those roads constructed of compacted earth material.
- K. **EASEMENT** – A privilege or right of use, access or enjoyment granted on, above, under, or across a particular tract of land by the landowner to another person or entity.
- L. **HOMEOWNERS' (OR PROPERTY OWNERS') ASSOCIATION** – A formally constituted, non-profit association or corporation made up of the property owners and/or residents of a defined area. The homeowners' or property owners' association may take responsibility for costs and up-keep of common open space or facilities, or enforce certain covenants and restrictions.
- M. **MAIN UTILITY LINES** – Those facilities, including piping, conduits, outlets, and other appurtenances necessary for the proper functioning of essential services to a development including water, electricity, gas, sanitary sewer, storm sewer, cable, communications, etc.

- N. MEAN SEA LEVEL – Elevation 0.0 as determined by the NGVD 29 datum.
- O. PAVED STREETS – Those streets for which the riding surface is constructed of a layer or layers of materials usually comprised of Portland cement concrete or asphaltic concrete.
- P. PAVEMENT – The uppermost layer of material placed on the street usually as the wearing or riding surface. The term is used interchangeably with “surface course” or “surfacing” and will usually imply Portland cement concrete or asphaltic concrete.
- Q. PLAT – A diagram drawn to an engineering scale showing all essential data pertaining to the boundaries and subdivision of a tract of land as determined by a professional land surveyor.
- R. PUBLIC WORKS DIRECTOR – The Director of the Department of Public Works for the County of Charleston or his authorized representative.
- S. RESPONSIBLE ENTITY – The unit of local government responsible under South Carolina law for the maintenance of the roadway and/or drainage system; or, in the case of private roadways and/or drainage systems, the owner of the property upon which the roadway and/or drainage system is located; or if existing, a homeowners’ association previously created to maintain the roadway and/or drainage system.
- T. RIGHT-OF-WAY – Land that has been or is being dedicated for the construction and maintenance of a road or street. Right-of-way may also be used to identify an area dedicated for use as part of a drainage system or utility corridor.
- U. ROADWAY – The entire area between the outside limits of construction, including structures, slopes, ramps, intersections, utilities, side ditches, channels, waterways, etc., necessary for proper drainage. This term shall, in general, be considered synonymous with street or road.
- V. ROCK ROADS – Those roads in which the riding surface is constructed of a layer or layers of material usually comprised of compacted rock or other aggregate materials
- W. STREET – A vehicular way, which may also serve in part as a way for pedestrian traffic, whether called a street, highway, thoroughfare, parkway, throughway, road, avenue, boulevard, lane, place, alley, mall, or other designation, including the entire area within the right-of-way.
- X. STUB STREET – A street that intersects another local street and extends, usually one lot deep, to the property line of the development or rear of the block being developed.
- Y. SUBGRADE – The top surface of a roadbed upon which the roadway structure and shoulders are constructed.

§A.1.3 INTRODUCTION

These standards provide specific information and design parameters regarding the construction of roads, ingress/egress easements, and drainage facilities. This document defines risks and responsibilities that are accepted by the responsible entity pertaining to the maintenance of the roads and drainage systems.

§A.1.4 OBJECTIVE

The primary objective is to ensure that property being subdivided is provided with access.

§A.1.5 SCOPE

These regulations shall apply in all unincorporated portions of Charleston County.

§A.1.6 PROPERTY ACCESS

It is the responsibility of the landowner/developer to provide access to the property being subdivided. Access to those properties shall be maintained and either privately or publicly owned. The ownership and maintenance status of the access shall be indicated on all submitted plats.

§A.1.7 LANDOWNER/DEVELOPER RESPONSIBILITIES

The landowner/developer is responsible for selecting the type of access to be provided for their subdivision. The classification of access will determine the party responsible for maintenance and the County's associated responsibilities, if any.

§A.1.8 DESIGN PROFESSIONAL/LAND SURVEYOR RESPONSIBILITIES

The design professional -of-record must be currently registered to practice in the State of South Carolina. The designs must either be prepared by, or under their direct supervision, in accordance with the Code of Laws of South Carolina, 1976, Title 40, Chapter 22, and Rules of Professional Conduct, including any revisions made thereto. The designs shall be based on sound engineering judgment and these standard specifications.

§A.1.9 COORDINATION WITH OTHER REVIEWING AGENCIES

The design professional-of-record shall provide a list of all regulatory permits required for the construction of all road and drainage systems. This list shall include the status of each permit, along with corresponding application numbers and dates.

The design professional-of-record shall provide a copy of all approved permits, deemed essential by the Public Works Director, to the Public Works Department prior to final approval of the construction plans.

§A.1.10 STORMWATER MANAGEMENT AND SEDIMENT CONTROL

All land-disturbing activities shall be in conformance with the Charleston County Storm water Management and Sediment Control Ordinance and all state and/or federal regulations that may be applicable.

The design professional shall prepare appropriate sediment and erosion control designs and show sufficient data, including material lists, details, and time schedules, to ensure best management practices are followed. The developer shall be responsible for ensuring that the design professional's designs are constructed in a timely manner and properly maintained throughout the duration of the development's construction period. If sediment is carried downstream as a result of inadequate design, improper construction, or maintenance neglect, the developer shall ensure that the eroded soil is removed from the downstream properties and legally disposed.

§A.1.11 ROAD CLASSIFICATIONS**A. PRIVATE ROADS**

Any road dedicated to an individual or entity other than Charleston County with an Ingress/Egress Easement (Maximum of 10 Lots) or a right-of-way dedicated to a Homeowners' Association. The easement holder retains ownership and maintenance responsibility for access and drainage.

B. PUBLIC ROADS (Minimum Standards)

Non-standard County Roads (Maximum of 10 Lots)

Surface: earth
Minimal drainage
Travel way minimum width determined on a per road basis
Lot drainage is each owner's responsibility

Secondary Rural Road (Maximum of 10 Lots)

Surface: earth
Minimal drainage (only roadside or sheet flow)
Travel way minimum width of 18'
Lot drainage is each owner's responsibility

Primary Rural Road

Surface: earth, rock, or pavement
Minimal drainage with outfall (only for the roadway)
Travel way minimum width of 20'
Lot drainage is each owner's responsibility

Secondary County Road

Surface: rock or pavement
Drainage plan required for property and roadway system
Open ditch drainage system
Travel way minimum width of 22'

Primary County Road

Surface: paved
Curb and gutter
Drainage plan required for property and roadway system
Enclosed pipe with limited open ditch drainage system
Travel way minimum width of 24'

§A.1.12 APPLYING ROAD CLASSIFICATIONS**A. PRIVATE ROAD**

The landowner/developer shall have the option to utilize any of the private road classifications for property subdivision regardless of region (see below).

B. PUBLIC ROAD

Roads that are to be constructed, dedicated, and accepted into the County maintenance system shall be constructed in accordance with one of the public road classification standards. The minimum required classification for the road would be determined by its location within the unincorporated portions of Charleston County. For road classification purposes, the unincorporated portions of Charleston County are divided into three regions.

1. Rural - Areas within the County that have a zoning classification of AGR, AG-10, AG-15, RM, and NRM.
2. Transitional - Areas within the County that have a zoning classification of M-12, RR-3, and AG-8.
3. Urban/Suburban - Areas within the County that have a zoning classification of R-4, RSM, MHP, OR, OG, CN, CT, CR, CC, and I.

Secondary Rural Roads will only be allowed in the rural region.

Primary Rural Roads will be allowed in the rural region and within the transitional region when the following conditions are met to the satisfaction of the Public Works Director:

The proposed road is a cul-de-sac or future expansion is limited. The lots being created are a minimum of 5 acres in size or the design professional demonstrates adequate lot and roadway drainage can be provided.

Secondary County Roads will be allowed in the rural region. They will also be allowed in the transitional region and urban/suburban region when the following conditions are met to the satisfaction of the Public Works Director:

The proposed road is a cul-de-sac or future expansion is limited.

The design professional demonstrates that storm water Best Management Practices can be utilized to satisfactorily address water quality requirements in conjunction with an open drainage system.

The lots are of sufficient size to accommodate an open drainage system.

The road system is an expansion to an existing open drainage system.

Primary County Roads will be allowed in all regions.

Public roads shall connect with an existing public roadway that has been accepted by a public agency (county, municipality, or state). Public roads shall

not rely upon a right-of-way that has only been dedicated but not accepted into a public maintenance system.

Streets within commercial and industrial developments shall be designed as Primary County Standard Streets unless approved otherwise, in writing, by the Public Works Director.

Non-standard County roads shall require County Council authorization.

If a land development plan exceeds the non-standard County road 10 lots maximum, construction shall be required to improve the non-standard road to the required County standards from its point of connection to an existing County standard or State public road.

ARTICLE A.2 PRIVATE ROAD STANDARDS

§A.2.1 GENERAL INFORMATION

A. INTRODUCTION

The private road standards provide the landowner/developer flexibility to determine the level of access and service provided to lots being created. The private road standards require the landowner/developer to be responsible for the extent and quality of property access and drainage. The landowner/developer is responsible for the establishment of standards for design, construction, and maintenance of the roadway and drainage systems and for items such as access for emergency service vehicles, school buses, mail couriers, and coordination of utilities. Note that public services are not guaranteed by Charleston County.

The private right-of-way shall be dedicated to a legally recognized or chartered entity. Private right-of-way shall not be dedicated to the public. Further, Charleston County is neither obligated nor responsible for private right-of-way maintenance.

B. LANDOWNER/DEVELOPER RESPONSIBILITIES

The landowner/developer is responsible for determining the type of access to be provided for his subdivided property. The landowner/developer shall be responsible for oversight and coordination of design and construction and for obtaining required approvals or permits from the appropriate agencies.

The landowner/developer is responsible for informing prospective property owners, whether solicited or unsolicited, of all conditions and responsibilities, or lack thereof, that have been placed on the property.

If access or drainage connects with a County right-of-way or easement, an encroachment permit shall be obtained prior to construction.

§A.2.2 INGRESS/EGRESS EASEMENT (Maximum of 10 Lots)

ADDITIONAL LANDOWNER/DEVELOPER RESPONSIBILITIES:

The landowner/developer shall determine the location of easement(s) and the type of access to be provided. The location of the easement(s) shall be clearly depicted and labeled on submitted plats or plans.

§A.2.3 PRIVATE RIGHT-OF-WAY DEDICATED TO A HOA WITH NO ROAD CONSTRUCTION REQUIRED (Maximum of 10 Lots)

ADDITIONAL LANDOWNER/DEVELOPER RESPONSIBILITIES:

The landowner/developer shall determine the location and size of proposed rights-of-way to be provided. All rights-of-way shall be clearly depicted on submitted plats or plans. The landowner/developer is responsible for determining the construction suitability and the accessibility of the defined right-of-way.

§A.2.4 PRIVATE RIGHT-OF-WAY CONSTRUCTED AND DEDICATED TO A HOA

ADDITIONAL LANDOWNER/DEVELOPER RESPONSIBILITIES:

The landowner/developer shall determine the location and size of rights-of-way to be provided and the standards for the design and construction of the roadway and drainage systems. The landowner/developer shall secure the necessary licensed, professional personnel to prepare designs, obtain required approvals and permits, and oversee construction.

§A.2.5 DESIGN PROFESSIONAL RESPONSIBILITY

The design professional-of-record must be currently registered to practice in the State of South Carolina.

§A.2.6 CONSTRUCTION PLAN SUBMISSION

Roadway and/or drainage construction plans shall be submitted to the Public Works Department for informational purposes prior to construction. The submission shall include three sets of the construction plans and specifications, and a copy of all required regulatory permits.

Subsequent plan revisions shall also be submitted prior to construction incorporation.

§A.2.7 COUNTY INSPECTION

All roadway and drainage work should be inspected by the Public Works Director for compliance with the submitted plans and specifications. The inspections will be performed to provide construction documentation.

The landowner/developer shall give a one-week notice prior to beginning work at the site. After the initial notice, a 24-hour notice shall be given prior to beginning each operation (or continuing an operation when the work has been disrupted for more than one work-day).

§A.2.8 CERTIFICATION FROM THE DESIGN PROFESSIONAL

The design professional shall provide a written statement certifying that to the best of his knowledge, the road and drainage infrastructure has been constructed in accordance with the submitted plans.

ARTICLE A.3 PUBLIC ROAD STANDARDS
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§A.3.1 GENERAL INFORMATION**A. LANDOWNER/DEVELOPER RESPONSIBILITY**

The landowner/developer is responsible for providing the County complete roadway and/or drainage system plans for the proposed development.

The landowner/developer shall secure licensed, professional personnel to prepare designs acceptable to the County;

The landowner/developer shall oversee and coordinate the presentations, reviews, and revisions of the designs with the appropriate agencies, and obtain required approvals and permits;

The landowner/developer shall provide field staking of the designs during the construction phase;

The landowner/developer shall coordinate County inspections

The landowner/developer shall provide required as-built records, record plats, etc.

The landowner/developer is responsible for providing competent construction personnel with appropriate equipment and skills to complete construction of the roadway and/or drainage systems in a manner acceptable to the County. The roadway and/or drainage systems must be constructed in accordance with approved plans, specifications, permits, codes, and any other documents referred to herein.

B. COORDINATION WITH OTHER REVIEWING AGENCIES

The design professional of record shall provide a list of all regulatory permits required for the construction of all road and drainage systems. This list shall include the status of each permit along with corresponding application numbers and dates.

The design professional-of-record shall provide a copy of all approved permits, deemed essential by the Public Works Director, to the Public Works Department prior to final approval of the construction plans.

C. COORDINATION WITH OTHER DEVELOPMENTS

Prior to acceptance of a proposed system which is dependent upon a contiguous system within an adjacent development, the County must have previously accepted or simultaneously accept the contiguous system.

D. RIGHT-OF-WAY WIDTH

The minimum right-of-way width for a roadway to be accepted into the County maintenance system is 50' unless otherwise approved by the Public Works Director.

E. PEDESTRIAN WAYS WITHIN PUBLICLY DEDICATED RIGHT-OF-WAY

When pedestrian ways are provided within the publicly dedicated right-of-way, they shall be constructed in accordance with Section A.4.1.C unless otherwise approved by the Public Works Director. For roadways with open roadside drainage systems, pedestrian ways shall be placed behind the swales or ditches. Additional right-of-way may be required to accommodate proposed pedestrian ways.

F. FEE SCHEDULE

Filing fees as established by County Council shall be submitted with the construction plans. These fees are nonrefundable. Previously unapproved plans that are significantly altered in concept and resubmitted must be accompanied by the appropriate fees.

G. GENERAL REQUIREMENTS FOR CONSTRUCTION PLAN APPROVAL

When preliminary subdivision approval has been granted by the Charleston County Planning Commission, the design professionals shall prepare and submit one copy of street plans and profiles, including typical sections, drainage data, etc., to the Public Works Department for review and approval prior to beginning construction of the street and drainage systems. The designer's seal, signature, and South Carolina registration number shall be affixed to the plans and specifications.

After reviewing the proposed documents for conformance with applicable County ordinances, the Public Works Director shall affix the appropriate stamp on the original drawing.

Prior to final plat approval, the landowner/developer shall furnish the Public Works Department with two sets of blueprints and one reproducible set of the approved stamped plans before initiating work.

Also, the landowner/developer shall furnish one (1) set of record drawing prints upon completion of the project.

When available, the Public Works Department requests an electronic data file of the approved plans including layout, road/right-of-way location, drainage easements, and other pertinent information that may be used to augment the County GIS. The landowner/developer is not responsible for ensuring that electronic data is compatible with the County's GIS system.

H. EXPIRATION DATE FOR COUNTY'S APPROVAL OF CONSTRUCTION PLANS

Construction plan and specification approvals have the same duration as the preliminary plat approval. Refer to Chapter 8, Subdivision Regulations, for approval duration information.

I. COUNTY INSPECTION

All work required by the County for the development being considered shall be inspected by the Public Works Director for compliance with the approved plans and specifications.

The Public Works Director will make inspections when:

The Public Works Director has approved construction plans and specifications.

Sufficient notice is given. The landowner/developer shall give a one-week notice prior to beginning work at the site. After the initial notice, a 24-hour notice shall be given prior to beginning each operation (or continuing an operation when the work has been disrupted for more than one work-day).

A final project inspection shall be performed prior to scheduling Council acceptance.

The Public Works Inspector shall have the authority to:

Certify that the construction and materials comply with the approved construction plans and these regulations;

Certify that material quantities comply with the approved construction plans.

Approve or reject materials and/or their installation in accordance with the approved construction plans, specifications, and these regulations;

Suspend work with the concurrence of the Public Works Director.

J. SITE CLEANUP AND FINISH GRADING

Prior to street and drainage system acceptance, the right-of-way and drainage easements shall be cleared of all construction trash and debris. Lots or other areas designated on the approved plans requiring fill or grading shall also be completed.

K. MAINTENANCE GUARANTEES

Street and storm water management/drainage systems that are to be dedicated to Charleston County for public maintenance shall be under warranty for all defects and failures for a period of two years. Prior to Final Plat approval, the developer shall provide written verification of financial responsibility for correction of defects and/or failures to systems to be dedicated to the County. The warranty (minimally established at 10 percent of the construction cost)

shall be in an amount satisfactory to the Public Works Director and effective for a period of two years from County Council's acceptance date. The financial warranty shall be in the form of a no-contest, irrevocable bank letter of credit, a performance and payment bond underwritten by an acceptable South Carolina licensed corporate surety, or a cashier's check. Payment is subject to County Attorney approval of the guarantee to determine that the interests of Charleston County are fully protected. If a cashier's check is utilized, then the opinion of counsel may be waived. The Public Works Department shall maintain surveillance over the system and provide written notification to the landowner/developer if repair work is required during the warranty period. The Public Works Department shall identify defects not considered to be a public safety issue and notify the landowner/developer of such defects. The landowner/developer shall have 30 days to prepare and submit a schedule of corrective actions for approval by the Public Works Director. If defects are not satisfactorily repaired within the approved schedule, the Public Works Department will resolve the defects and bill the bonding company accordingly. The Public Works Department shall address public safety defects immediately. Subsequently, the bonding company will be billed for reimbursement.

§A.3.2 SECONDARY RURAL ROAD STANDARDS (Maximum of 10 lots)

A. GENERAL DESIGN REQUIREMENTS

Required Right-Of-Way:

The minimum right-of-way width is 50'.

Required Minimum Street Section:

Streets shall be constructed to minimum earth street standards and have a minimum travel way width of 18'.

Required Minimum Street Elevations:

The minimum street centerline elevation at finish grade shall be 6.5' above Mean Sea Level.

Required Minimum Profile Gradient:

The minimum street profile centerline gradient shall be 0.4% except for causeways where land areas adjacent to the road embankment are jurisdictional wetlands or critical area.

Street Centerline Minimum Curve Radius Criteria:

Street centerline curve radii shall meet AASHTO guidelines for the design speed limit.

Where streets are designed for less than 30 mph speed limit, the design professional shall provide supporting design data, including traffic control signage.

All roads shall be designed with a minimum road centerline radius of 125'.

Horizontal sight distances shall be considered in the design process.

Vertical curves shall have a minimum length of 100'.

B. ROADWAY DRAINAGE DESIGN

The roadway drainage design must show, at a minimum, how the drainage is directed away from the travel way.

C. CONSTRUCTION PLANS AND SPECIFICATIONS

The construction plans shall clearly show all work to be performed in plan view, profile, cross section, details, and specifications. Specifications providing written descriptions of the work, workmanship, appearance, materials, etc., and/or special provisions may either be shown on the drawings or presented in booklet form separate from the drawings. Specifications shall comply with the CTC (SS) or SCDOT (SS), unless otherwise directed by the Public Works Director.

The following standards shall be observed and the information listed below shall be provided in the design and preparation of plans, profiles, details, drainage plans, and written specifications for construction:

Include a copy of the approved preliminary plat.

Plans and profiles shall be prepared on 24" x 36" or 22" x 34" sheets, having a profile at the bottom and a plan view at the top, with both the plan and profile stationing oriented in the same direction.

All elevations shall be referenced to the Mean Sea Level Datum for NGVD 29.

Scales shall be: vertical 1" = 2' and horizontal 1" = 50' or larger.

The following shall be shown in the plan view:

Stations along the centerline of the proposed road with appropriate ties at intersecting streets.

The width of the right-of-way and names of proposed roads and existing roads.

Alignment information, curve data with P.C., P.T., and P.I. angle points, as well as angles at intersections.

Arrows indicating the direction of drainage flow within the right-of-way.

Size, type, and location of trees proposed to remain within the clearing limits of the road right-of-way.

DHEC/OCRM Critical Line and USACOE jurisdictional wetland delineations which relate to the right-of-way or easements.

Benchmarks with locations, descriptions, coordinates, datum, etc.

Details shall show sight distances, traffic control devices, design speeds for roads and other related information.

Other general construction details required to define the scope of work.

Profiles shall show:

Existing street centerline elevations showing all breaks in grade, but in no case more than 100' apart. Profiles shall include existing streets to which ties are being made with elevations extending approximately 200' from the intersection.

Proposed street centerline profile with centerline elevations every 50' on vertical curves and at 100' along tangents and at intersections.

Statement to be placed by design professionals on road and drainage plans: "ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF THE CHARLESTON COUNTY ZONING AND LAND DEVELOPMENT REGULATIONS."

Statement to be signed by the owner or the authorized agent of the owner: "I certify as an agent for or as a record owner, lessee, or record easement holder, I have, or will have prior to undertaking the work the necessary approval or permission from all other persons with a legal interest in said property to conduct the work proposed in the approved subdivision construction plans."

D. CLEARING AND GRUBBING

Except as otherwise stated herein, all Secondary Rural Road rights-of-way shall be cleared and grubbed for a minimum width of 40'. Any/all tree canopies shall be pruned to a minimum height of 15'. This work shall include the removal and disposal of all trees, stumps, brush, rubbish, roots, and other objectionable materials.

§A.3.3 PRIMARY RURAL ROAD STANDARDS

A. GENERAL DESIGN REQUIREMENTS

Required Right-Of-Way:

The minimum right-of-way width is 50'.

Required Minimum Street Section:

Streets shall have a minimum travel way width of 20'. The travel surface shall be at least equal to the type of surface with which it is being connected (pavement, rock, or earth). If development characteristics warrant, the Public Works Director can approve a reduction in the surface

type. Written requests for a reduction in surface type shall be directed to the Public Works Director with an accompanying justification statement.

Required Minimum Street Elevations:

The minimum street centerline elevation at finish grade shall be 6.5' above Mean Sea Level.

Required Minimum Profile Gradient:

The minimum street profile centerline gradient shall be 0.4% except for causeways where land areas adjacent to the road embankment are jurisdictional wetlands or critical areas.

Street Centerline Minimum Curve Radius Criteria:

Street centerline curve radii shall meet AASHTO guidelines for the design speed limit.

Where streets are designed for less than a) 30 mph speed limit, the design professional shall provide supporting design data, including traffic control signage.

All roads shall be designed with a minimum road centerline radius of 125'.

Horizontal sight distances shall be considered in the design process.

Vertical curves shall have a minimum length of 100'.

B. ROADWAY DRAINAGE DESIGN

For roadways with open roadside swale ditches, the swale ditches shall be graded as shown on details in Art. A.6. The drainage plan shall show how the roadway drainage will be conveyed to an outfall or wetland. Roadside swale drainage ditches and driveway pipes shall be designed for a five (5) year Average Return Frequency storm (minimum driveway pipe size shall be 15" in diameter). Cross drains, outfall ditches and piped systems shall be designed for a 10 year Average Return Frequency storm. Average Return Frequencies are defined in Section A.4.2.D. Roadside ditch inverts shall parallel the finished road longitudinal gradient except as otherwise approved by the Public Works Director. Drainage shall not be carried in roadside ditches for a distance exceeding 700' (accumulated distance) except as otherwise approved by the Public Works Director.

C. CONSTRUCTION PLANS AND SPECIFICATIONS

The construction plans shall clearly show all work to be performed in plan view, profile, cross section, details, and specifications. Specifications providing written descriptions of the work, workmanship, appearance, materials, etc., and/or special provisions may either be shown on the drawings or presented in booklet form separate from the drawings. Specifications shall comply with the CTC (SS) or SCDOT (SS), unless otherwise directed by the Public Works Director.

The following standards shall be observed and the information listed below shall be provided in the design and preparation of plans, profiles, details, drainage plans, and written specifications for construction:

Include a copy of the approved preliminary plat.

Plans and profiles shall be prepared on 24" x 36" or 22" x 34" sheets, having a profile at the bottom and a plan view at the top, with both the plan and profile stationing oriented in the same direction.

All elevations shall be referenced to the Mean Sea Level Datum for NGVD 29.

Scales shall be: vertical 1" = 2' and horizontal 1" = 50' or larger.

The following shall be shown in the plan view:

Stations along the centerline of the proposed road with appropriate ties at intersecting streets.

The width of the right-of-way and names of proposed roads and existing roads.

Alignment information, curve data with P.C., P.T., and P.I. angle points, as well as angles at intersections.

Arrows indicating the direction of drainage flow within the right-of-way.

Size, type, and location of trees proposed to remain within a road right-of-way or drainage easement.

Existing and proposed drainage structures and drainage easements along with rights-of-way and drainage way cross sections.

DHEC/OCRM Critical Line and USACOE jurisdictional wetland delineations which relate to the right-of-way or easements.

Benchmarks with locations, descriptions, coordinates, datum, etc.

Details shall show pond outfall structures, sight distances, traffic control devices, design speeds for roads, and other related information.

Other general construction details required to define the scope of work.

Profiles shall show:

Existing street centerline elevations showing all breaks in grade, but in no case more than 100' apart. Profiles shall include existing streets to which ties are being made with elevations extending approximately 200' from intersections.

Proposed street centerline profile with centerline elevations every 50' on vertical curves and at every 100' along tangents and at intersections.

Vertical curve data.

Proposed and existing storm drains, sanitary sewers, water mains, pipe under drains, and cross line pipes.

Statement to be placed by design professionals on road and drainage plans: "ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF THE CHARLESTON COUNTY ZONING AND LAND DEVELOPMENT REGULATIONS."

Statement to be signed by the owner or the authorized agent of the owner: "I certify as an agent for or as a record owner, lessee, or record easement holder, I have, or will have prior to undertaking the work the necessary approval or permission from all other persons with a legal interest in said property to conduct the work proposed in the approved subdivision construction plans."

D. CLEARING AND GRUBBING

Except as otherwise stated herein, all Primary Rural Road rights-of-way shall be cleared and grubbed for a minimum width of 50'. Any/all tree canopies shall be pruned to a minimum height of 15'. This work shall include the removal and disposal of trees, stumps, brush, rubbish, roots, and other objectionable materials.

E. CLEARING OF DRAINAGE EASEMENTS

The full width of all drainage easements shall be cleared of trees, buildings, fences, stumps, brush, logs, rubbish, roots, overhanging tree limbs, overhanging utility wires or cables, or any other item that may, in the judgment of the Public Works Director, interfere with the drainage facility or the maintenance of the facility. Existing obstacles may be left in place upon approval of the Public Works Director provided that all of the following criteria are met: a) the drainage system or the obstacle cannot be easily relocated; b) adequate and safe operational easement space for maintenance by mechanized equipment is provided; c) the drainage way is not obstructed; and d) the drainage easement width is increased to accommodate the obstructions.

§A.3.4 SECONDARY COUNTY ROAD STANDARDS

A. GENERAL DESIGN REQUIREMENTS

Required Right-Of-Way:

The minimum right-of-way width is 50', however;

The road right-of-way must be of sufficient width to provide for the following:

Drainage;

Pavement or rock travel way;

Shoulders;

Signage;

Trees; and

Utilities such as street lights and overhead/underground utility lines (electric, telephone, cable TV, gas, water, and sewer).

Required Minimum Street Section:

Streets shall have a minimum travel way width of 22'. The travel surface shall be at least equal to the type of surface with which it is being connected (pavement or rock). If development characteristics warrant, the Public Works Director can approve a reduction in the surface type. Written requests for a reduction in surface type shall be directed to the Public Works Director with an accompanying justification statement.

Required Minimum Street Elevations:

The minimum street centerline elevation at finish grade shall be 6.5' above Mean Sea Level.

Required Minimum Profile Gradient:

The minimum street profile centerline gradient shall be 0.4% except for causeways where land areas adjacent to the road embankment are jurisdictional wetlands or critical areas.

Street Centerline Minimum Curve Radius Criteria:

Street centerline curve radii shall meet AASHTO guidelines for the design speed limit.

Where streets are designed for less than a 30 mph speed limit, the design professional shall provide supporting design data, including traffic control signage.

All roads shall be designed with a minimum road centerline radius of 125'.

Horizontal sight distances shall be considered in the design process.

Vertical curves shall have a minimum length of 100'.

B. GENERAL REQUIREMENTS FOR DESIGN OF DRAINAGE SYSTEMS

The design of drainage facilities for a development must be done with consideration being given to the entire drainage basin. Provisions must be made to receive and manage runoff from upstream areas and to ensure that downstream areas are not adversely impacted by discharges or runoff. The current zoning of upstream properties and associated runoff factors representing that land use, assumed to be fully developed, shall be used in determining design runoff rates and quantities. It is not to be assumed that existing developed properties without storm water detention systems will have them in the future.

C. ROADWAY DRAINAGE DESIGN

For roadways with open roadside swale ditches; the swale ditches shall be graded as shown on details in Art. A.6. The drainage plan shall show the drainage basin areas contributing storm water runoff to the roadside ditches. Roadside swale drainage ditches and driveway pipes shall be designed for a five (5) year Average Return Frequency storm (minimum driveway pipe size shall be 15" in diameter). Cross drains, outfall ditches and piped systems shall be designed for a 10 year Average Return Frequency storm. Average Return Frequencies are defined in Section A.4.2.D. The invert elevation of the roadside swale ditch shall be no less than 18" and no greater than 24" inches below the corresponding centerline street finish grade elevation and longitudinal grades shall be no less than 0.4% nominal grade, unless otherwise approved by the Public Works Director. Roadside ditch inverts shall parallel the finish road longitudinal gradient except as approved by the Public Works Director. Drainage shall not be carried in roadside ditches for a distance exceeding 700' (accumulated distance) except as approved by the Public Works Director.

Outfall ditches to wetland areas shall be piped for a minimum length of 20' at their outfall ends; or an alternative means of defining wetlands' limits for maintenance identification purposes shall be submitted for consideration.

D. MAINTENANCE PLAN

When detention or retention facilities are required by local or state agencies or proposed by the design professional, a comprehensive storm water management system maintenance plan must be submitted for approval by the Public Works Director. The maintenance plan shall address: frequency of maintenance, disposal of material, access to the facility, and other site specific data. The responsible entity shall acknowledge in writing their maintenance obligation and their assent to the maintenance plan. All storm water runoff and maintenance requirements described herein shall be applicable.

Charleston County will maintain public detention facilities to ensure that public drainage systems function as designed (stage-storage capacity of the ponds remain adequate). Any facility not maintained by Charleston County shall be maintained by another responsible entity. Acceptable arrangements for proper and perpetual maintenance shall be presented to Charleston County at the

time of the project's final construction inspection. Detention ponds, lakes, or impoundments which function as a conveyance of storm water downstream of the proposed development require dedicated drainage easements and maintenance shelves constructed along those systems in accordance with these regulations, unless otherwise approved by the Public Works Director.

E. CONSTRUCTION PLANS AND SPECIFICATIONS

The construction plans shall clearly show all work to be performed in plan view, profile, cross section, details, and specifications. Specifications providing written descriptions of the work, workmanship, appearance, materials, etc., and/or special provisions may either be shown on the drawings or presented in booklet form separate from the drawings. Specifications shall comply with the CTC (SS) or the SCDOT (SS), unless otherwise directed by the Public Works Director.

The following standards shall be observed and the information listed below shall be provided in the design and preparation of plans, profiles, details, drainage plans, and written specifications for construction:

Include a copy of the approved preliminary plat.

Plans and profiles shall be prepared on 24" x 36" or 22" x 34" sheets, having a profile at the bottom and a plan view at the top, with both the plan and profile stationing oriented in the same direction.

All elevations shall be referenced to the Mean Sea Level Datum for NGVD 29.

Scales shall be: vertical 1" = 2' and horizontal 1" = 50' or larger.

The following shall be shown in the plan view:

Stations along the centerline of the proposed road with appropriate ties at intersecting streets.

The width of the right-of-way and names of the proposed roads and existing roads.

Alignment information, including curve data with P.C., P.T., and P.I. angle points, as well as angles at intersections.

Arrows indicating the direction of drainage flow within the right-of-way, along drainage ways, through lots, and at intersections.

Existing and proposed utility lines and utility easements.

Size, type, and location of trees proposed to remain within a road right-of-way or drainage easement.

Road cross sections with sidewalks (when required).

Existing and proposed drainage structures and drainage easements along with rights-of-way and drainage way cross sections.

DHEC/OCRM Critical Line and USACOE jurisdictional wetlands.

Details shall show pond outfall structures, sight distances, traffic control devices, design speeds for roads, and other related information.

Benchmarks with locations, descriptions, coordinates, and datum, etc.
Other general construction details required to define the scope of work.

Profiles shall show:

Existing street centerline elevations showing all breaks in grade, but in no case more than 100' apart. Profiles shall include existing streets to which ties are being made with elevations extending approximately 200' from intersections.

Proposed street centerline profile with centerline elevations every 50' on vertical curves and at every 100' along tangents and at intersections.

Vertical curve data.

Proposed and existing storm drains, sanitary sewers, water mains, pipe under drains, and cross line pipes.

Proposed grades of all ditches and swales on or off site. Show existing grades of incoming and outfall drainage ways for 200' upstream/downstream if no grade changes are proposed.

An overall drainage plan shall be submitted along with the plans and profiles and detail sheets.

The drainage plan sheet shall show the street layout and the entire drainage system to be constructed or improved along with the sizes and invert elevations of drainage pipes, the widths of proposed and existing drainage easements, the direction of drainage flow (using arrows), detention ponds, outfall structures, lot drainage, and existing canals, tidal streams, etc.

The drainage plan shall include pertinent drainage data such as drainage areas, runoff coefficients, times of concentration (with computations), runoff volumes, soils data, detention pond routing, pond crest elevations, and other related information.

Statement to be placed by design professionals on road and drainage plans:
"ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF THE CHARLESTON COUNTY ZONING AND LAND DEVELOPMENT REGULATIONS."

Statement to be signed by the owner or the authorized agent of the owner: "I certify as an agent for or as a record owner, lessee, or record easement holder, I have, or will have prior to undertaking the work the necessary approval or

permission from all other persons with a legal interest in said property to conduct the work proposed in the approved subdivision construction plans.”

F. CLEARING AND GRUBBING

Except as otherwise stated herein, all Secondary County Road rights-of-way shall be cleared and grubbed for the full width of the right-of-way. Any/all tree canopies shall be pruned to a minimum height of 15'. This work shall include the removal and disposal of all trees, stumps, brush, rubbish, roots, and other objectionable materials.

G. CLEARING OF DRAINAGE EASEMENTS

The full width of all drainage easements shall be cleared of all trees, buildings, fences, stumps, brush, logs, rubbish, roots, overhanging tree limbs, overhanging utility wires or cables, or any other item that may, in the judgment of the Public Works Director, interfere with the drainage facility or the maintenance of the facility. Existing obstacles may be left in place upon approval of the Public Works Director provided that all of the following criteria are met: a) the drainage system or the obstacle cannot be easily relocated; b) adequate and safe operational easement space for maintenance by mechanized equipment is provided; c) the drainage way is not obstructed; and d) the drainage easement width is increased to accommodate the obstructions.

§A.3.5 PRIMARY COUNTY ROAD STANDARDS

A. GENERAL DESIGN REQUIREMENTS

Required Right-Of-Way:

The minimum right-of-way width is 50', however;

The road right-of-way must be of sufficient width to provide for the following:

Drainage;

Pavement and curb and gutter;

Shoulders;

Trees;

Signage;

Sidewalks where installed (or required); and

Utilities such as street lights and overhead/underground utility lines (electric, telephone, cable TV, gas, water, and sewer).

Required Minimum Street Section:

Streets shall be constructed as paved streets and conform to details in Art. A.6.

Streets shall be constructed with curb and gutter; and

Streets shall have a minimum travel way width of 24'.

Required Minimum Street Elevations:

The minimum street centerline elevation at finish grade shall be 6.5' above Mean Sea Level.

Required Minimum Profile Gradient:

The minimum street profile centerline gradient shall be 0.4% except for causeways where land areas adjacent to the road embankment are jurisdictional wetlands or critical areas.

Additionally, for streets using an asphalt gutter, a minimum centerline gradient of 0.5% is required.

Street Centerline Minimum Curve Radius Criteria:

Street centerline curve radii shall meet AASHTO guidelines for the design speed limit.

Where streets are designed for less than 30 mph speed limit, the design professional shall provide supporting design data, including traffic control signage.

All roads shall be designed with a minimum road centerline radius of 125'.

Horizontal sight distances shall be considered in the design process.

Vertical curves shall have a minimum length of 100'.

B. TYPE OF CURB AND GUTTER

Concrete Curb and Gutter:

Either upright curb and gutter or roll curb and gutter may be used (see details in Art. A.6). The minimum width for the upright curb and gutter shall be 1" and 2' for roll curb and gutter. The maximum If upright curb and gutter is utilized, driveway entrances for subdivision lots shall be shown on the construction plans and constructed as part of the development.

The distance between expansion joints unless specified otherwise herein, shall be in accordance with the CTC (SS) or the SCDOT (SS).

Asphalt Curb and Gutter:

Asphalt curb and gutter sections shall be submitted for approval. All work, materials, methods, and equipment, unless specified otherwise herein, shall be in accordance with the CTC (SS) or the SCDOT (SS).

C. GENERAL REQUIREMENTS FOR DESIGN OF DRAINAGE SYSTEMS

The design of drainage facilities for a development must be done with consideration being given to the entire drainage basin. Provisions must be made to receive and manage runoff from upstream areas and to ensure that downstream areas are not adversely impacted by discharges or runoff. The current zoning of upstream properties and associated runoff factors representing that land use, assumed to be fully developed, shall be used in determining design runoff rates and quantities. It is not to be assumed that existing developed properties without storm water detention systems will have them in the future.

Also, drainage design requirements for the entire development shall conform to Section A.4.2.

D. ROADWAY DRAINAGE DESIGN

Storm water systems conveying flow to or from streets shall be piped unless otherwise approved by the Public Works Director.

Curb inlet structures shall be located so that drainage shall not be carried in gutters for a distance exceeding 500' (accumulated distance). The five (5) year Average Return Frequency storm shall not cause water to flow onto the road for a width greater than 5'. Culvert piping running longitudinally with the street shall not be located under the pavement or curb and gutter, nor shall it conflict with the normal location of under drains.

E. SUBSURFACE DRAINAGE

Where pipe under drains are required, their centerline shall be located 2.5', at a minimum, behind the back of the curb and they shall be properly connected to a permanent drainage outlet, such as a catch basin, junction box, or a manhole.

Piped under drains shall conform to the under drain details in Art. A.6. Under drain inverts shall be a minimum of 24" below the bottom of the curb and above any static lake/pond elevation.

Suitable outlets for the pipe under drains shall be provided in the drainage system design.

Pipe under drains shall be installed at low points in the grade on both sides of the street for a minimum distance of 100' in each direction along the street; except at locations where the design engineer can demonstrate to the satisfaction of the Public Works Director that the water table will not be within 24" of centerline subgrade elevation.

Pipe under drains, where required, shall be installed before the base course is placed.

Pipe under drains shall be placed in other locations as determined by the design professional or as required by the Public Works Director during construction.

Pipe under drains shall be properly laid on grade and in accordance with these specifications and the CTC (SS) or the SCDOT (SS) and shall not be covered until they have been inspected and approved by the Charleston County Public Works Department.

Alternative under drain designs shall be presented to the Public Works Director for review and approval.

F. MAINTENANCE PLAN

When detention or retention facilities are required by local or state agencies or proposed by the design professional, a comprehensive storm water management system maintenance plan must be submitted for approval by the Public Works Director. The maintenance plan shall address: frequency of maintenance, disposal of material, access to the facility, and other site specific data. The responsible entity shall acknowledge in writing their maintenance obligation and their assent to the maintenance plan. All storm water runoff and maintenance requirements described herein shall be applicable.

Charleston County will maintain public detention facilities to ensure that public drainage systems function as designed (stage-storage capacity of the ponds remain adequate). Any facility not maintained by Charleston County shall be maintained by another responsible entity. Acceptable arrangements for proper and perpetual maintenance shall be presented to Charleston County at the time of the project's final construction inspection. Detention ponds, lakes, or impoundments which function as a conveyance of storm water downstream of the proposed development shall require dedicated drainage easements and maintenance shelves constructed along those systems in accordance with these regulations, unless otherwise approved by the Public Works Director.

G. CONSTRUCTION PLANS AND SPECIFICATIONS

The construction plans shall clearly show all work to be performed in plan view, profile, cross section, details, and specifications. Specifications providing written descriptions of the work, workmanship, appearance, materials, etc., and/or special provisions may either be shown on the drawings or presented in booklet form separate from the drawings. Specifications shall comply with the CTC (SS) or the SCDOT (SS), unless otherwise directed by the Public Works Director.

The following standards shall be observed and the information listed below shall be provided in the design and preparation of plans, profiles, details, drainage plans, and written specifications for construction:

Include a copy of the approved preliminary plat.

Plans and profiles shall be prepared on 24" x 36" or 22" x 34" sheets, having a profile at the bottom and a plan view at the top, with both the plan and profile stationing oriented in the same direction.

All elevations shall be referenced to the Mean Sea Level Datum for NGVD 29).

Scales shall be: vertical 1" = 2' and horizontal 1" = 50' or larger.

The following must be shown in the plan view:

names of the proposed roads and existing Stations along the centerline of the proposed road with appropriate ties at intersecting streets.

The width of the right-of-way and roads.

Alignment information, including curve data with P.C., P.T., and P.I. angle points, as well as angles at intersections.

Arrows indicating the direction of drainage flow within the right-of-way, along drainage ways, through lots, and at intersections.

Existing and proposed utility lines and utility easements.

Size, type, and location of trees proposed to remain within a road right-of-way or drainage easement.

Road cross sections with pedestrian paths (when required).

Existing and proposed drainage structures and drainage easements along with rights-of-way and drainage way cross sections.

DHEC/OCRM Critical Line and USACOE jurisdictional wetlands.

Benchmarks with locations, descriptions, coordinates, and datum, etc.

Details shall show pond outfall structures, sight distances, traffic control devices, design speeds for roads, and other related information.

Other general construction details required to define the scope of work.

Profiles shall show:

Existing street centerline elevations, showing all breaks in grade, but in no case more than 100' apart. Profiles shall include existing streets to which ties are being with elevations extending approximately 200' from intersections.

Proposed street centerline profile with centerline elevations every 50' on vertical curves and at every 100' along tangents and at intersections.

Vertical curve data.

Proposed and existing storm drains, sanitary sewers, water mains, pipe under drains, and cross line pipes.

Proposed grades of all ditches and swales on or off site. Show existing grades of incoming and outfall drainage ways for 200' upstream/downstream if no grade changes are proposed. An overall drainage plan shall be submitted along with the plans and profiles and detail sheets.

An overall drainage plan shall be submitted along with the plans and profiles and detailed sheets.

The drainage plan sheet shall show the street layout and the entire drainage system to be constructed or improved, along with the sizes and invert elevations of drainage pipes, the widths of proposed and existing drainage easements, the direction of drainage flow (using arrows), detention ponds, outfall structures, lot drainage, and existing canals, tidal streams, etc.

The drainage plan shall include pertinent drainage data such as drainage areas, runoff coefficients, times of concentration (with computations), runoff volumes, soils data, detention pond routing, pond crest elevations, and other related information.

Statement to be placed by design professionals on road and drainage plans: "ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF THE CHARLESTON COUNTY ZONING AND LAND DEVELOPMENT REGULATIONS."

Statement to be signed by the owner or the authorized agent of the owner: "I certify as an agent for or as a record owner, lessee, or record easement holder, I have, or will have prior to undertaking the work the necessary approval or permission from all other persons with a legal interest in said property to conduct the work proposed in the approved subdivision construction plans."

H. PIPING AND EASEMENTS

Unless justification is provided, to the satisfaction of the Public Works Director, all drainage easements within the urban areas of the County shall be required to be piped except: a) swales with depths less than 24" having 5:1 side slopes and wholly contained within the easement, and b) canals (designed for a capacity exceeding that of an equivalent 36" diameter pipe).

I. CLEARING AND GRUBBING

Except as otherwise stated herein, all Primary County Road rights-of-way shall be cleared and grubbed for the full width of the right-of-way. Any/all tree canopies shall be pruned to a minimum height of 15'. This work shall include the removal and disposal of trees, stumps, brush, rubbish, roots, and other objectionable materials.

For streets constructed with upright or roll curb and gutter, selected specimen trees may be permitted to remain within the right-of-way when the following conditions are met:

- 1) Trees are healthy, of aesthetic value, and are firmly rooted with the base of the tree being at or near the elevation of the curb or edge of pavement.
- 2) The distance from the back of the curb to the nearest face of the tree is not less than 5'.
- 3) Additional right-of-way is provided where necessary.

Where under drains are required, the tree(s) shall be removed or the right-of-way shall be relocated.

J. CLEARING OF DRAINAGE EASEMENTS

The full width of all drainage easements shall be cleared of all trees, buildings, fences, stumps, brush, logs, rubbish, roots, overhanging tree limbs, overhanging utility wires or cables, or any other item that may, in the judgment of the Public Works Director, interfere with the drainage facility or the maintenance of the facility. Existing obstacles may be left in place upon approval of the Public Works Director provided that all of the following criteria are met: a) the drainage system or the obstacle cannot be easily relocated; b) adequate and safe operational easement space for maintenance by mechanized equipment is provided; c) the drainage way is not obstructed; and d) the drainage easement width is increased to accommodate the obstructions.

§A.3.6 NON-STANDARD COUNTY ROAD STANDARDS

A. GENERAL DESIGN REQUIREMENTS:

1) Required Right-of-Way:

The minimum right-of-way width shall be the width of the traveled way plus 5' on either side.

2) Required Minimum Road Section:

Roads are not constructed to minimum earth road standards.

3) Required Minimum Road Elevations:

The minimum road centerline elevation at finish grade shall be 6.5' above Mean Sea Level, if possible.

4) Required Minimum Profile Gradient: N/A.

5) Road Centerline Minimum Curve Radius Criteria: N/A.

B. ROADWAY DRAINAGE DESIGN

The roadway drainage design must show, at a minimum, how the drainage is directed away from the travel way.

C. Construction Plans and Specifications: N/A.

ARTICLE A.4 DESIGN AND CONSTRUCTION REQUIREMENTS**§A.4.1 ROAD DESIGN****A. STREET INTERSECTION LAYOUT**

Street intersections shall not include more than four street approaches. Streets shall be designed to intersect at right angles whenever possible. Sight distance easements shall be shown and dedicated on the record drawings of the development, and should reflect a triangular area as determined by details in Art. A.6. Within this triangle, there shall be no sight-obscuring or partial sight-obscuring wall, fence, sign, or full-grown foliage higher than 30" above the edge of pavement. In the case of trees, there shall be no foliage lower than 15' above the top of curb grade when foliage is saturated with rain. Vertical measurement shall be made by the Public Works Director from the top of the nearest curb or, if no curb exists, from the edge of the nearest traveled roadway finish-grade surface. Offsets of local streets shall have a minimum of 125' between centerlines.

B. TRAFFIC CONTROL AND ROAD NAME SIGNS

All traffic control and road name signs shall be installed at no cost to the County as part of the development. The design professional shall show the location and type of signs to be installed on the construction plans and specifications. All traffic control signs shall conform to the requirements of the Manual on Uniform Traffic Control Devices for Streets and Highways. All road name signs in proposed publicly maintained rights-of-ways should be constructed as indicated by details in Art. A.6.

In the event a road name sign is request on a County non-standard road, approval must be obtained from the County Public Works Department. Details and color-coding are indicated in Article A.6.

C. ADA REQUIREMENTS

All pedestrian ways and curb construction shall be in accordance with the latest edition of the Americans with Disabilities Act Accessibility Guidelines (ADAAG).

D. SPECIFIC RIGHT-OF-WAY INFORMATION**1. CAUSEWAYS**

Streets to be constructed on causeways shall meet all of the requirements contained within these specifications and the causeway shall also meet the following requirements:

The minimum street centerline elevation at finish grade shall be 6.5' above Mean Sea Level.

The minimum side slopes shall be 2:1, preferably 3:1(Horizontal/vertical).

The minimum top width of the roadway shall be as defined by the road classification plus 6' wide shoulders (as measured from the edge of travel

way to the face of the guide rail) if SCDOT standard guide rails are constructed. If no guide rails are constructed, 9' wide shoulders shall be required on each side of the travel way.

The developer shall provide copies of the approved permits or application ID numbers from all applicable regulatory agencies should expanding the causeway roadbed beyond the toe of the original roadbed be required.

2. BRIDGES

Bridges shall be designed in accordance with the AASHTO Standard Specifications for Highway Bridges, current edition and interims, as well as meet the following requirements:

Live Load: HS 20-44 loading or an alternate military loading, whichever produces the greatest stress.

The minimum travel way centerline elevation shall be 6.5' above Mean Sea Level.

The minimum width of the bridge shall be 24' clear roadway width.

The minimum clear width for all bridges on streets with curbed approaches should be the same as -the curb to curb width of the approaches, but not less than 24' clear roadway width.

For streets with shoulders and no curbs, the clear bridge width preferably should be the same as the roadway width. However, in no case should it be less than 24' or the travel way width plus 2' each side, whichever is greater.

Pedestrian ways on the approaches shall be carried across all new structures.

SCDOT standard guide rails shall be required.

All bridges shall be concrete structures supported on concrete piles.

The developer shall provide copies of approved permits from applicable regulatory agencies for the construction of bridges.

The Public Works Director may consider design alternatives to the aforementioned standards. Any request for design alternatives must be submitted in writing and include details and justifications for each requested alternative. Written approval by the Public Works Director of the requested alternative is required prior to proceeding with construction.

3. STUB STREETS

Stub streets extending to the boundary or property line of the subdivision shall be constructed simultaneously with the other streets in the development and shall be constructed in the same manner.

4. CUL-DE-SAC STREETS

Cul-de-sacs shall be provided at the terminus of closed end streets with minimum dimensions as indicated below.

Circular turnaround: See details in Art.A.6.

Y or T turnaround: Permissible only where a cul-de-sac street serves 20 dwelling units or less and upon approval by the Public Works Director. The design engineer must demonstrate that the road configuration will allow both emergency and service vehicles to turn around.

5. TEMPORARY CUL-DE-SACS

Temporary cul-de-sacs shall be provided when incremental road construction and/or phasing is requested by the developer. Temporary cul-de-sacs shall be constructed as required by this section. Unpaved temporary cul-de-sacs shall require an additional 2" (compacted depth) of base course.

6. CONSTRUCTION ACCESS

The design professional shall identify the development's construction access routes and submit its proposed road section and surface course design for approval by the Public Works Director.

7. INVERTED CROWN ROADS

The use of inverted crown roads will require the written approval of the Public Works Director. Requests for the use of an inverted crown road shall be in writing and include an explanation of why a typical crown roadway section cannot be used. Inverted crown roads shall only be considered for paved road surfaces.

E. PEDESTRIAN WAYS WITHIN PUBLICLY DEDICATED RIGHT-OF-WAY

When placed within the public right-of-way, pedestrian ways shall be constructed as specified below:

Asphalt Sidewalk:

An asphalt sidewalk shall have a minimum asphalt thickness of 1-1/2" inches and a minimum base course thickness of 4". The minimum width for pedestrian ways shall be 4'. All work, materials, methods, and equipment, unless specified otherwise herein, shall be in accordance with the CTC (SS) or the SCDOT (SS).

For additional ADA requirements see Section A.4.1.D.2 Bridges.

Concrete Sidewalk:

A concrete sidewalk shall have a minimum thickness of 4" except at driveways where the minimum thickness shall be 6". Transverse

expansion joints shall be placed at intervals of not more than 50'. The minimum width for pedestrian ways shall be 4'. All work, materials, methods, and equipment, unless specified otherwise herein, shall be in accordance with the CTC (SS) or the SCDOT (SS).

F. ROAD SURFACES TYPES

1. EARTH ROADS

The County standard earth roadway is identical in cross section to a County standard paved road except that roadbed stabilization may require that material be mixed into the existing soil material, as needed, to a depth of 6" to achieve suitable compaction. The crown shall be 6". County Public Works' inspectors will determine whether the prepared subgrade material and earth road overlay soil are acceptable.

A suitable soil is required for a minimum depth of 18" to provide a street that will serve the traffic needs in extremely dry, normal, and in wet weather. Where necessary, a stabilizing type soil shall be added and properly mixed with the soil in place for a depth of not less than .6".

Earth roads, when intersecting with an existing paved road, shall have a paved apron extending to the paved road's right-of-way and when intersecting with a rocked road, shall have a rocked apron extending to the rocked road's right-of-way.

2. ROCK ROADS

The County standard rock roadway is also identical in cross section to a County standard paved road except that the subgrade is mixed with a 4" minimum aggregate base course worked into the top 2" of the existing subgrade, creating a 6" deep compacted rock surface, meeting the CTC (SS) or the SCDOT (SS). The road crown shall be a minimum of 6". The rock material shall be Crusher-Run granite aggregate unless otherwise approved by the Public Works Director.

Rocked roads, when intersecting with an existing paved road, shall have a paved apron extending to the edge of the paved road's right-of-way.

3. PAVED ROADS

The County standard paved roadway is shown in detail in Art. A.6. The County standard asphalt pavement is a minimum 2" compacted hot plant mix asphaltic concrete meeting the CTC (SS) or the SCDOT (SS) type one, or equal. Asphaltic concrete material is to be placed on a minimum compacted base course meeting the CTC (SS) or the SCDOT (SS), and an approved subgrade (see pavement design below).

G. PAVEMENT DESIGN

1. PAVEMENT BASE AND SURFACE COURSES

The base course shall meet the CTC (SS) or the SCDOT (SS). The width of the base course shall be 12" greater than the width of the surface course; i.e., 6" on each side of the roadway. The compacted depth of the base course shall be 6" or greater as approved by the Public Works Director. After the base course has been properly blended, mixed, wetted, shaped, and compacted to the approved typical section and has been seasoned sufficiently and proof-rolled, the surface course shall be applied. Proof-rolling shall be accomplished as described in the CTC (SS) or the SCDOT (SS) for the proof-rolling of the subgrade except that the minimum total weight of the testing vehicle shall be in the 30-35 ton range.

The surface course materials, placement, and protection shall meet the requirements of the SCDOT (SS) type C or equal. The compacted depth of the surface course shall be no less than 2" or greater as approved by the Public Works Director. Weather and seasonal restrictions to placement of the bituminous materials are described in the CTC (SS) or the SCDOT (SS).

2. PAVEMENT SECTION FOR TYPICAL RESIDENTIAL ROADWAY

The County standard asphalt pavement section for use on residential roadways is a minimum 2" compacted hot plant mix asphaltic concrete meeting the CTC (SS) or the SCDOT (SS), type one or equal. This material is to be placed on a 6" minimum compacted base course meeting the CTC (SS) Section 306, and an approved subgrade. A prime coat meeting the CTC (SS) or the SCDOT (SS) is required when the base course will not be paved within two weeks.

Roadways serving large residential areas or phased subdivisions may require pavement designs, exceeding the minimum requirements, as determined by the Public Works Director.

3. PAVEMENT DESIGN FOR COMMERCIAL/INDUSTRIAL USE ROADWAYS

The design engineer shall provide a pavement design for all roadways that serve commercial and industrial uses. The design shall include at a minimum 2" of compacted hot plant mix asphaltic concrete meeting the CTC (SS) or the SCDOT (SS) type one, or equal, and a minimum 6" of compacted base course meeting the CTC (SS) or the SCDOT (SS), with an approved subgrade. The pavement design shall include information on anticipated traffic counts, traffic loadings, and site-specific soils. Further, the Public Works Director may require other pertinent information. A site-specific geotechnical report prepared by a Geotechnical Engineer shall be provided to substantiate/justify the proposed design for the entire length of the roadways to be constructed. A prime coat meeting the CTC (SS) or the SCDOT (SS) is required when the base course will not be paved within two weeks.

4. ALTERNATIVE PAVEMENT DESIGNS

The County will consider alternative pavement materials designs. The design professional should present appropriate design data including laboratory tests of foundation soils to substantiate/justify the proposal.

H. ROAD CONSTRUCTION

1. SOIL TESTING

The Public Works Director will determine the quality of foundation soils by visual observations and adequate soil testing provided by the design professional. Without such testing, the Public Works Director will utilize judgment and experience to determine the quality of the foundation material and shall require appropriate action including, but not limited to, undercutting or mucking and replacing the excavated material with suitable earth materials. The soil-testing program shall be presented to, and approved by, the Public Works Director prior to the beginning of the testing. The testing program shall show the number and approximate locations of borings, sampling depths, and type of test to be made. Ample notice of testing schedules shall be given and a copy of all results, including recommendations, shall be provided upon completion of the tests.

The testing program may establish levels or degrees of testing. For example, the testing program may call for a minimum number of tests for determination of general soil classifications and water table data for preliminary site evaluation. For the design of pavement, the testing program shall include, but is not limited to, the determination of the maximum elevation of the groundwater table, the soil classification according to the Unified Soil Classification System (laboratory test determination), and the California Bearing Ratio (CBR) (laboratory test determination utilizing 96 hour saturation). Proctor testing for determination of optimum moisture and maximum density using the modified Proctor-Test ASTM D 1557 Method A, and field moisture and density tests may be required by the Public Works Director.

2. GRADING

Streets shall be graded to the designed typical section in accordance with the approved plans and profiles. Grade stakes shall be set on centerlines at intervals of not more than 100' on tangent grades and not more than 50' on vertical curves. Additional grade stakes may be required to ensure that the final grade matches the designed typical section in the profile.

Grading work, materials, methods, and equipment, unless approved otherwise, shall be in accordance with the requirements of the CTC (SS) or the SCDOT (SS).

No base or surfacing materials shall be placed before the subgrade is inspected and approved by the Public Works Director.

In general, soils classified lower than "SC," according to the Unified Soil Classification System, are not acceptable for the upper 24" of the subgrade.

The compacted subgrade shall be proof-rolled prior to placement of any base or surfacing materials. Testing shall be performed in the presence of the Public Works Director. The testing procedure shall consist of driving a loaded tandem truck (10 cubic yard minimum load capacity, 30-35 ton minimum total weight), or other equivalent vehicle (as determined by the Public Works Director) at slow-walking speed longitudinally along the length of the roadway test area. Any areas exhibiting pumping or breaking of the surface shall be stabilized or removed to appropriate depth and replaced with suitable material, recompacted, and retested.

3. SUBGRADE

Work shall consist of the construction and preparation of the subgrade - that part of the roadway intended to receive the base course, pavement, pedestrian way, curb, curb and gutter, and/or shoulders.

Roads shall be graded to the designed typical section in accordance with the approved plan and profile, and shall be free of roots, trash, and other unsuitable materials for a minimum depth of 24" below the finished subgrade.

A suitable soil is required for a minimum depth of 18" immediately below the base course to provide a road that will serve the traffic needs in extremely dry, normal, and in wet weather. Where necessary, a stabilizing type soil shall be added and properly mixed with the soil in place for a depth of not less than 6"

When unstable material is encountered and it is necessary to perform mucking work, the roadway shall be mucked for its entire width, ditch line to ditch line or extending 2' beyond the backs of curbs; backfilled with a suitable, stable-type soil; and properly compacted. All objectionable loose rock or boulders shall be removed or broken off to a depth of not less than 24" below the surface of the subgrade.

The subgrade is to be sufficiently wetted and shall be compacted for a width extending 2' outside the edges of the proposed pavement before the base course is placed.

The subgrade, from a distance of 24" outside the area to be occupied by the pavement or curb and gutter, shall be compacted to not less than 95 percent of maximum density. The compaction shall be accomplished by using suitable construction procedures with the subgrade at optimum construction moisture content. Sprinkling to secure proper compaction may wet the subgrade. ASTM D 1557 Method A will determine maximum densities.

The subgrade shall be maintained in a smooth and compacted condition, free from ruts and depressions, and shall be adequately drained. In no case shall any base, surface course or pavement be placed on a frozen, muddy, or unstable subgrade. Storing or stockpiling of materials directly on the subgrade will not be permitted except with the approval of the Public Works Director.

4. SEEDING AND MULCHING

All unpaved areas within the right-of-way shall be seeded and mulched. The developer shall be responsible for maintenance of such seeded and mulched areas as described in the CTC (SS) or the SCDOT (SS) until the street and/or drainage system is accepted into the County maintenance system.

§A.4.2 DRAINAGE DESIGN

A. DESIGN METHODS AND CRITERIA

The design professional may use generally accepted design procedures to determine runoff quantities. The Modified Rational Method or the Modified Soil Conservation Service Method is typically used by the Charleston County Public Works Department to review submitted designs. The design professional shall submit data showing the drainage basin, the location of areas of differing imperviousness, the runoff factors for each zone of imperviousness, and the data for rainfall and time factors used in the determination of peak runoff rates. The design should consider seasonal high water table elevations. The design must take into consideration the channeled runoff. The design shall comply with water quality standards established by Federal, State, and Local regulations.

B. APPROVED OUTFALLS

All street and development drainage shall be discharged into either:

A tidal stream of adequate size;

A running stream with continuous flow (freshwater creek or river) of adequate size;

An existing drainage way (pipe, ditch, or canal) of adequate size for which there is an adequate easement, and which is maintained by Charleston County or another responsible public agency; or

A wetland or critical area capable of receiving the discharge without it negatively impacting any property adjacent thereto.

The outlet or receiving area must be of sufficient size and grade, etc. to receive the anticipated quantity of runoff from each contributing drainage basin along the route of the outlet in addition to the anticipated increase in quantity of runoff from the subject development. Where the proposed outlet ends, or near the South Carolina DHEC-OCRM Critical Line, the construction plans shall clearly show that there is an outlet of adequate size and slope to the final point of discharge. The entire length of the outlet, except approved portions within the South Carolina DHEC-OCRM Critical Area, shall be constructed on dedicated drainage easements with cleared, stable maintenance shelves for continued maintenance of the drainage way. The entire development's outlet, from sources of collection of runoff to final point of discharge, shall be evaluated by

the design professional and upgraded by the developer as deemed necessary by the Public Works Director at no cost to the County.

C. DRAINAGE AND OTHER WORK INVOLVING ANOTHER PUBLIC AGENCY

When drainage is discharged into a drainage way maintained by, or intended for maintenance by, a public agency other than Charleston County Public Works, or if work is to be done within the road right-of-way of a public agency other than Charleston County, written approval must be obtained from that public agency. A copy of this approval must be furnished to the Public Works Director prior to commencing work.

D. RAINFALL DETERMINATION

The peak runoff rates shall be determined based on the storm time/rainfall rate following a pattern Type-III Rainfall Hydrograph as defined in the Soil Conservation Service Manual TR-55.

The design recurrence interval shall be taken to be 10 years for the collector system within the subject development, 25 years for any channeled drainage flowing through the development, and 25 years for any primary outfall drainage way from the development.

Average Return Frequencies (24 hour) are defined as

1-year - 3.8 inches	2-year - 4.6 inches	5-year - 5.9 inches
10-year - 7.0 inches	25-year - 8.0 inches	
50-year - 8.9 inches	100-year - 10.2 inches	

Or as revised by the South Carolina State Climatology Office.

E. DETENTION POND DESIGN CRITERIA

The peak release rate of storm water from all developments where detention is utilized shall not exceed the peak storm water-runoff rate from the area in its pre-developed state for all intensities, up to and including the 25-year frequency storm.

The design professional shall provide information required to support the pond design shown. Calculations shall be signed and sealed by the design professional and shall include stage-storage volumes, areas, depths, summary information (to include pond crest information, outfall flow rates, and computer program information), etc. Pond design shall include the proposed static water level and the two-year, 10-year, and 25-year frequency storm crest elevations. These elevations shall be shown on the drainage plans, as well as the proposed 1' contour lines from the pond bottom to 1' above the 25-year frequency storm crest elevation.

Static water elevation in ponds shall not be less than 3' below the finished centerline elevation of the road in the general area and ponds shall not encroach on the road right-of-way at any time.

The design should provide outfall structures that are low maintenance in nature as approved by the Public Works Director.

The design shall provide an emergency spillway. The location, structure, invert elevations, and outlet of the emergency spillway shall be shown on the construction plans. The design shall address the 50-year and 100-year frequency storm flow rates through the emergency spillway to an approved outfall (drainage easements will be required for the emergency outfall route). Projected flood limits on downstream properties for these storm flow rates are also to be shown on the drainage plan.

All detention facilities that require public maintenance shall be provided with access for maintenance via a constructed 30' wide drainage right-of-way from the nearest road to the facility. Plans shall include a barrier structure at the primary road right-of-way to limit vehicular access. The detention facility or pond shall include a 20' wide cleared shelf with easement around the top perimeter of the facility for maintenance access.

For all publicly maintained detention facilities, a public drainage easement shall be dedicated over the entire facility, including the outfall and emergency spillway. For privately-maintained detention facilities, a private drainage right-of-way must provide access to the pond, the pond's outfall, and all areas defined by the pond maintenance plan.

Dry ponds shall be designed with 3:1 (horizontal: vertical) side slopes and shall drain dry within 72 hours.

Retention or wet ponds shall be designed with 3:1 (horizontal: vertical) side slopes above the static water level and 2:1 (horizontal: vertical) side slopes below the static water level; shall have a minimum depth of 6'; and shall be stocked with mosquito larvae-eating fish. Charleston County Mosquito Control should be consulted regarding fish stocking information.

F. INFILTRATION/EXFILTRATION DRAINAGE SYSTEMS

Charleston County will discourage any drainage system that is dependent solely upon infiltration/exfiltration of storm water runoff for the proper functioning of the system.

Any such system shall be approved only by specific authority of the Public Works Director shall approve any such system.

Charleston County will not maintain or be responsible for any infiltration/exfiltration facilities. Any such facility shall be maintained by a responsible entity of, or for, the development, and arrangements for proper and perpetual maintenance shall be guaranteed to Charleston County prior to the approval of the development.

G. ADDITIONAL ROAD DRAINAGE REQUIREMENTS

The Public Works Director will independently evaluate any storm drainage piping (other than cross-line pipes) designed to be placed at a depth or location such that the repair of that culvert would adversely impact the flow of vehicular traffic. Culvert piping crossing under the street shall be at an angle of not more than 30 degrees from the perpendicular of the street.

Pipeline discharge capacities shall exceed maximum peak runoff rates. Ponding or head pressure shall not be considered in pipeline size determination. Computations for all drainage way size determinations shall be provided to the Public Works Director. Drainage ways located laterally off of the street should be piped to the back lot line or for the first 150' from the street right-of-way line, whichever comes first.

Where a drainage outlet pipe extends into a lake or other similar outlet, rip-rap shall be placed under and around the end joint or joints of pipe as needed and on slopes at the end of the pipe.

Minimum longitudinal slope shall be 0.4% except where specifically approved in writing by the Public Works Director.

Submerged piping or partially submerged piping shall not be used unless where specifically approved in writing by the Public Works Director. Submerged pipe systems shall require a means of accessing the submerged pipe for maintenance purposes.

Catch basins or junction boxes shall not be located within the radius portion of street intersections. No manhole covers or water valves will be located within the curb or gutter area or within the paved area of the roadway.

To allow for backfill and compaction operations, 2' minimum horizontal clearance between pipelines or structures shall be provided. Reinforced concrete or rip-rap of a material and gradation approved by the Public Works Director shall be placed at the ends of all culverts, bends, or junction points in drainage ways and/or other locations as determined by the Public Works Director (see details in Art. A.6.).

H. ADDITIONAL DRAINAGEWAY REQUIREMENTS

Where drainage is directed into an existing ditch, canal, or tidal stream by use of an open ditch or pipeline, the elevation at the bottom of the existing ditch, canal, or tidal stream at the point of entry, and approximately 100' upstream and downstream, shall be shown on the drainage plans. In addition, the elevation of the bottom of the inlet ditch or invert elevation of inlet pipe at the outlet end shall be shown along with the bottom width of the existing canal or tidal stream.

Where drainage ways are piped, catch basins shall be provided as required to appropriately receive and discharge incoming drainage. In no case shall the catch basins be more than 300' apart.

Junction boxes with stubs shall be constructed at both ends of cross-line pipes for cross-ditches, at the outlet end of cross line pipes at outlet ditches, and at other locations as appropriate. Reinforced concrete pipes of the required sizes shall be used for all inlet and outlet stubs. Stub pipes of the required sizes shall be used to convey the street ditch drainage into the junction boxes and the inlet invert of the stub shall normally be installed approximately 0.3' below the street ditch grade. Stub pipes shall be extended a minimum of 20' from the

junction box to provide maintenance vehicle access to maintenance shelves along outfall ditches.

For minor swale ditches of 1' depth or less along side or rear lot lines that only drain a small interior area and where street drainage is not involved, a drainage easement not less than 15' in width may be utilized.

I. DRAINAGE AND EROSION CONTROL STRUCTURES AND MATERIALS

All work, materials, methods, and equipment, unless otherwise specified herein, shall be in accordance with the requirements of the CTC (SS).

All concrete pipes shall conform to A.S.T.M. Specifications C-76, Class III, Wall B. Joints shall conform to A.S.T.M., C-443. Jointing materials shall be all-weather preformed joint sealant.

Metal pipes shall be approved by the Public Works Director and shall be installed as per the recommendations of the manufacturer for their intended use. For metal piping subject to saltwater exposure, only approved aluminum piping may be used.

Other piping materials shall be considered. Specifications should be submitted to the Public Works Director along with the design data and construction plans showing the specific intended use. Materials and methods approved by the SCDOT will be considered upon submittal of SCDOT documentation and recommendations pertaining to the use of such materials.

Ample cover shall be provided to properly protect pipelines during construction as well as for designed usage. Minimum allowable cover for pipe at subgrade shall be not less than 6" for paved areas, and 12" for unpaved areas and in no case less than that recommended by the manufacturer.

Minimum cover for other materials and usages shall be considered at the time of submittal of construction plans to the Public Works Director.

All structures shall be shown clearly on the construction plans with details to show all lines, grades, elevations, joints, reinforcing, materials of construction, etc. All appropriate specification data shall be shown on the construction plans.

Junction boxes, curb inlets, outfall boxes, or any other enclosed drainage structure exceeding 4'6" in depth shall be constructed with interior step fixtures.

Precast concrete structures will be considered. Design and specification data should be submitted to the Public Works Director along with the design and construction plans showing the specific intended use.

A performance bond guaranteeing restoration work must be posted with Charleston County and remain in effect for a period of two years from the date of acceptance of the restoration work (date of release by the Director of the Department of Public Works). This bond must be in a format approved by the County Attorney and in accordance with terms and conditions of Chapter 8, Subdivision Regulations.

J. OPEN CHANNEL BAFFLES

Baffles of an approved design shall be constructed in open channels where the gradient is 0.70 percent or greater and shall be spaced as shown:

Gradient (percent)	Spacing (feet)
0.70 to 0.99	100 (Max.)
1.00 to 1.49	75 (Max.)
1.50 to 1.99	50 (Max.)
2.00 to 3.00*	50 (Max.)

*Where the gradient is two percent or greater for an open channel, additional easement width equal to the maximum depth of the channel shall be provided. For a gradient greater than three percent, the channel shall be piped unless otherwise approved by the Public Works Director.

K. EASEMENTS FOR STORM DRAINAGE FACILITIES

Drainage easements shall be provided for all drainage facilities intended to be included in the maintenance program of Charleston County. The easement shall provide adequate space for access to the facility; adequate space for the operations involved in cleaning, repairing, reconstructing, material storage and dewatering, and hauling materials to or from the area; adequate space for turning and maneuvering of the equipment; and adequate space for the sloshing and splashing of the materials being handled.

The portions of the easement intended for equipment operations shall have suitable foundations to support the maintenance equipment and shall be graded to drain the working area but not graded to slopes or elevations causing difficulty in the operation of the maintenance equipment. Maximum lateral grade for areas in which draglines may be used in the maintenance operations shall be five percent.

Minimum drainage easement widths shall be no less than the following:

REQUIRED DRAINAGE EASEMENT WIDTHS FOR PIPED DRAINAGEWAYS

PIPE SIZE (MAXIMUM)	MINIMUM DEPTH TO INVERT	WIDTH OF DRAINAGE EASEMENT
18" \geq and \leq 24"	5.0'	12'- 16'
24" $<$ and \leq 42"	5.0'-7.0'	16'-20'
42" $<$ and \leq 54"	7.0'	20'-24'
54" $<$ and \leq 72"	7.0'-9.0'	24'-30'

For depths greater than shown, larger pipe sizes, or multiple lines of pipe, additional easement width, as required by the Public Works Director, shall be provided. Required drainage easement widths for open ditches shall be as shown on details in Art. A.6. The side slope of an open ditch shall not exceed 2:1, and, subject to soil stability, may be required to be flatter.

ARTICLE A.5 ENCROACHMENTS

§A.5.1 ENCROACHMENTS AND WORK WITHIN RIGHTS-OF-WAY AND DRAINAGE EASEMENTS

A. INTRODUCTION

This section is intended to provide a general guideline for the design and construction of structures that may be located within rights-of-way or drainage easements that have been, or will be, accepted into the Charleston County maintenance system. No work shall be commenced until an encroachment permit for such work has been obtained from the Public Works Director.

B. ENCROACHMENT PERMITS - GENERAL

Any permanent or temporary construction or placement of any structure or object (sign, fence, etc.) within a Charleston County drainage easement or road right-of-way must receive an encroachment permit from the Public Works Director prior to the beginning of work or emplacement of structure or object.

The encroaching entity will submit all permit requests on the Charleston County APPLICATION FOR ENCROACHMENT PERMIT FORM for review. Application fees will be in accordance with current Charleston County User Fee schedules. Permits will be approved or denied by the Public Works Director within 30 days of receipt.

If, in the opinion of Charleston County, the South Carolina Department of Transportation, or any other public agency, it should ever become necessary to relocate or remove the encroachment, or any part thereof, due to the improvement, relocation, or widening of the road, street, or drainage system, or for any other reason, such moving or removing will be done on demand of the Public Works Director at the expense of the permittee.

Adequate provisions shall be made for the protection of the traveling public at all times when performing work under an encroachment permit. During the progress of the work, all necessary detours, barricades, warning signs, and flagmen will be provided by, and at the expense of, the permittee to ensure safety.

Restoration work shall be immediately accomplished to return the road and/or drainage system to prior condition or better. The liability of the permittee will not be released until all work is inspected and approved by the Public Works Director.

C. TYPES OF ENCROACHMENTS WITHIN PUBLIC RIGHTS-OF-WAY AND EASEMENTS

1. SPRINKLER SYSTEMS

Water-sprinkling systems shall not be permitted within the right-of-way except as specified herein. Sprinkler systems may be placed along the right-of-way (immediately outside the right-of-way) with appropriate easements conveyed to the agency responsible for such system. Charleston County will not accept responsibility for any such system. At locations where water supply lines must cross the street right-of-way, such facilities shall be shown on the street construction plans and specifications. Such water supply lines shall be placed a minimum of 36" below the centerline street finish grade elevation and shall be placed in conduit. Sprinkler systems may be approved at island locations within the right-of-way. At such locations, the curb shall be upright curb (not roll curb and gutter). The sprinkler heads shall be in a protected location as approved by the Public Works Director. An appropriate water cutoff shall be provided in an underground box outside the street right-of-way. Under-drain systems shall be placed within islands served by an irrigation system. Encroachment permits shall be required for all sprinkler systems within the right-of-way.

2. LANDSCAPING AND PLANTING

Any proposed landscaping and planting within a proposed publicly-maintained right-of-way should be shown on the construction plans along with a planting schedule. Plants that may inhibit maintenance or obstruct sight distances will not be permitted. Encroachment permits shall be required for all landscaping/planting within the right-of-way. Planting will not be accepted by Charleston County for maintenance; if a permanent maintenance plan is not submitted, for approval by the Public Works Director, planting will not be permitted.

3. SUBDIVISION ENTRANCE SIGNS

Subdivision name signs at entrances to developments shall be in compliance with Chapter 11, Development Standards. Building permits must be obtained prior to installation of such entrance signs. Subdivision name signs will be located outside the road right-of-way except those signs located within a roadway median. All signs shall be located outside of the sight easement.

Such signs, foundations for future signs, and conduit for electrification of signs shall be shown on the construction plans and an encroachment permit obtained prior to construction. Approval of the plans by the Public Works Director does not imply or guarantee the approval of other entities.

4. UTILITIES

The proposed concept for the location of all underground utility lines, including water, sanitary sewer, gas, electrical, telephone, or television cables, shall be shown utilizing typical street plans, cross sections, and profiles. Non-typical locations, such as areas around trees, shall be shown in sufficient detail for review and approval. Utility lines shall be located so that they will not interfere with the proper functioning of the

drainage system. For streets where the curb and gutter section is used, underground utility main lines shall be a minimum of 5' behind the back of the curb. For streets where the swale ditch section is used, utility main lines shall be installed not less than 15' from the centerline of the street and not less than 5' from the edge of the pavement.

The minimum allowable cover over the top of the utility encroachment or other apparatus shall be 36". Deviations to the 36" cover requirement must be presented in the cross section format along with a written justification and submitted to the Public Works Director for approval.

No work on utility lines within the limits of the proposed publicly-maintained rights-of-way shall commence until the street plans showing the proposed locations of the utility lines have been approved. In case any utility location is not provided, the developer shall be responsible for notifying the utility that installation work within the proposed publicly-maintained right-of-way or drainage easement will require the approval of the Public Works Director.

Unapproved utility work within the right-of-way or drainage easement will result in an immediate supervision of inspections until such time as the utility plans have been reviewed and approved by the Public Works Director.

Ditches and trenches dug within the street right-of-way for utilities and/or other purposes shall be properly backfilled. Backfill material shall be select material, mechanically compacted in 6" layers. Backfill material shall be mixed or wetted as required by the Public Works Director. Backfill under areas to be paved or areas within 5' of pavement shall be compacted to no less than 95 percent of maximum density. Remaining areas shall be compacted to 90 percent of maximum density. ASTM D 1557 Method A will determine maximum densities.

Where utilities have been designed to be placed at a depth or location such that the repair of that utility would adversely impact the flow of vehicular traffic, the design professional shall either address such concerns to the satisfaction of the Public Works Director or redesign the utility layout.

Utilities crossing under the street shall be at an angle of not more than 30 degrees from the perpendicular to the street.

The jetting or uncontrolled tunneling of utility lines under a paved street is not permitted. The cutting of the pavement is not permitted except under extreme circumstances and only as permitted by the Public Works Director.

Where utilities are designed to be placed at a depth or location such that the repair of that utility would adversely impact the flow of vehicular traffic, the Design Professional shall either address such concerns to the satisfaction of the Public Works Director or redesign the utility layout.

Proposed street lighting facilities shall be shown on the street construction plans submitted to the Department of Public Works for approval. Street light poles shall be placed outside the right-of-way unless specifically approved by the Public Works Director.

Fire hydrants shall be shown on the construction plans, located at the edge of the right-of-way within a few feet of the property corner of two adjoining lots, or located as otherwise approved by the Public Works Director.

When dry fire hydrants are required, permanent access shall be shown on the construction plans. Access design must provide adequate space and suitable surface materials for emergency vehicle maneuverability. The design professional shall submit written approval of the design from the local fire service provider.

The Public Works Director will only permit utilities other than drainage facilities within drainage easements upon specific written authorization.

D. ZONING PERMITS

The Charleston County Zoning Administrator will review encroachment permit applications for signs or structures within public rights-of-way for compliance with this ordinance. No encroachment permits for signs, other than traffic control, will be issued without the written approval of the Zoning Administrator. Approval by the Zoning Administrator does not ensure approval by the Public Works Director.

E. RESTORATION OF ROADS

Restoration is intended to aid proper County road maintenance. Any entity performing work within a County right-of-way that will damage an existing road, drainage system, or structure must ensure that the systems will be returned to a condition equal to or better than that prior to proposed/current construction work.

Any utility, public agency, or other entity or person performing work in a County right-of-way or easement must obtain an encroachment permit prior to beginning any construction. The applicant shall furnish information on the encroachment permit application detailing all work. Details on restoration of all disturbed areas or utilities will also be provided on the encroachment permit application.

Restoration work will return the road, drainage system, and any impacted utilities to prior condition or better. The liability of the permittee will not be released until all work is inspected and approved by the Public Works Director.

ARTICLE A.6 STANDARD CONSTRUCTION DETAILS

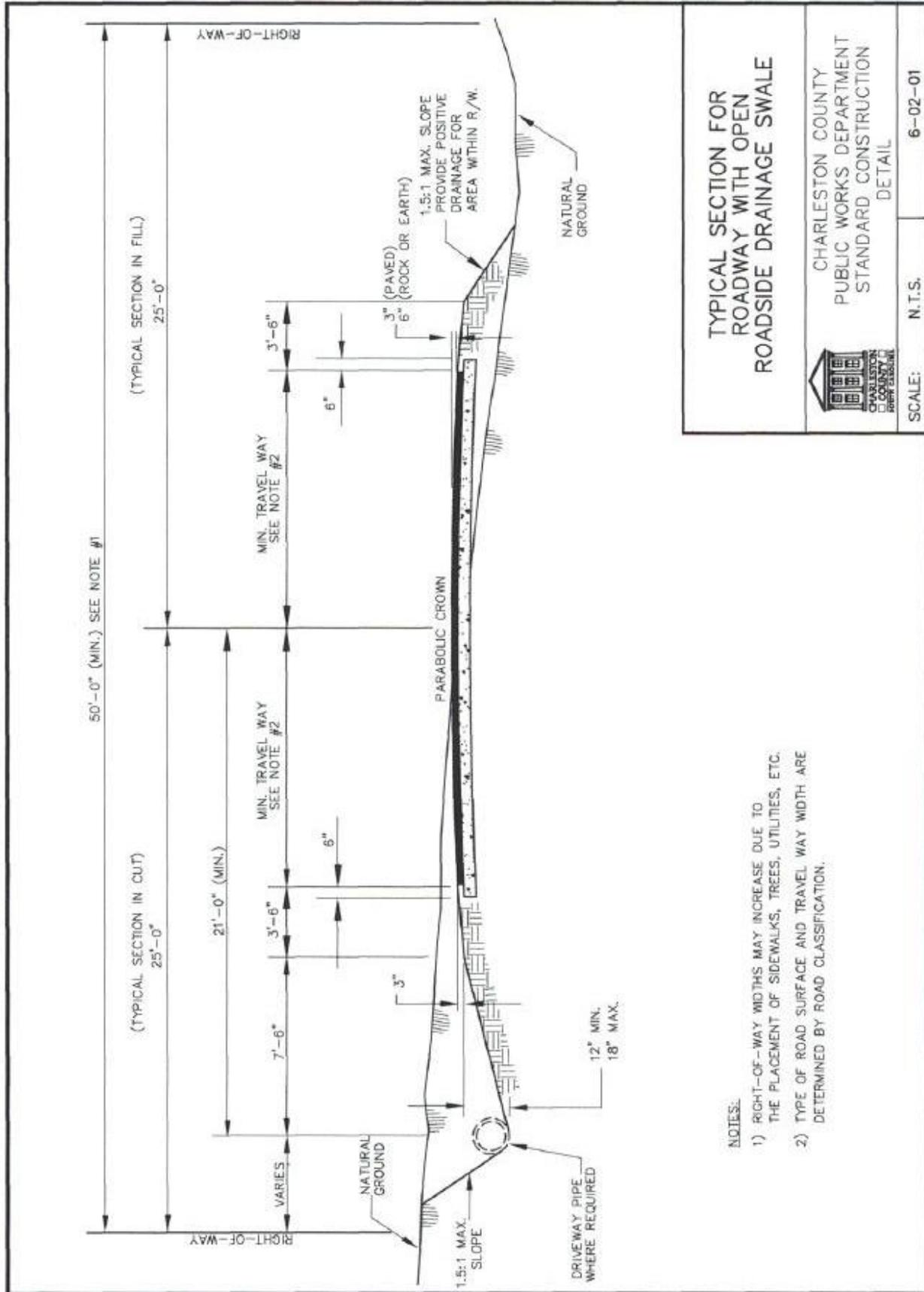
§A.6.1 INTRODUCTION

This section is intended to provide a guideline for the preparation of cross sections, construction details, and miscellaneous pictorial data required for the

completion of the construction plans and specifications for road and drainage systems that are intended to be in the maintenance systems of the County, or in developments that must be constructed to County standards. These detail drawings are representative of the minimum standards required by the County. However, the design engineer is responsible for the preparation of detail drawings showing clearly what is actually expected to be constructed on the ground.

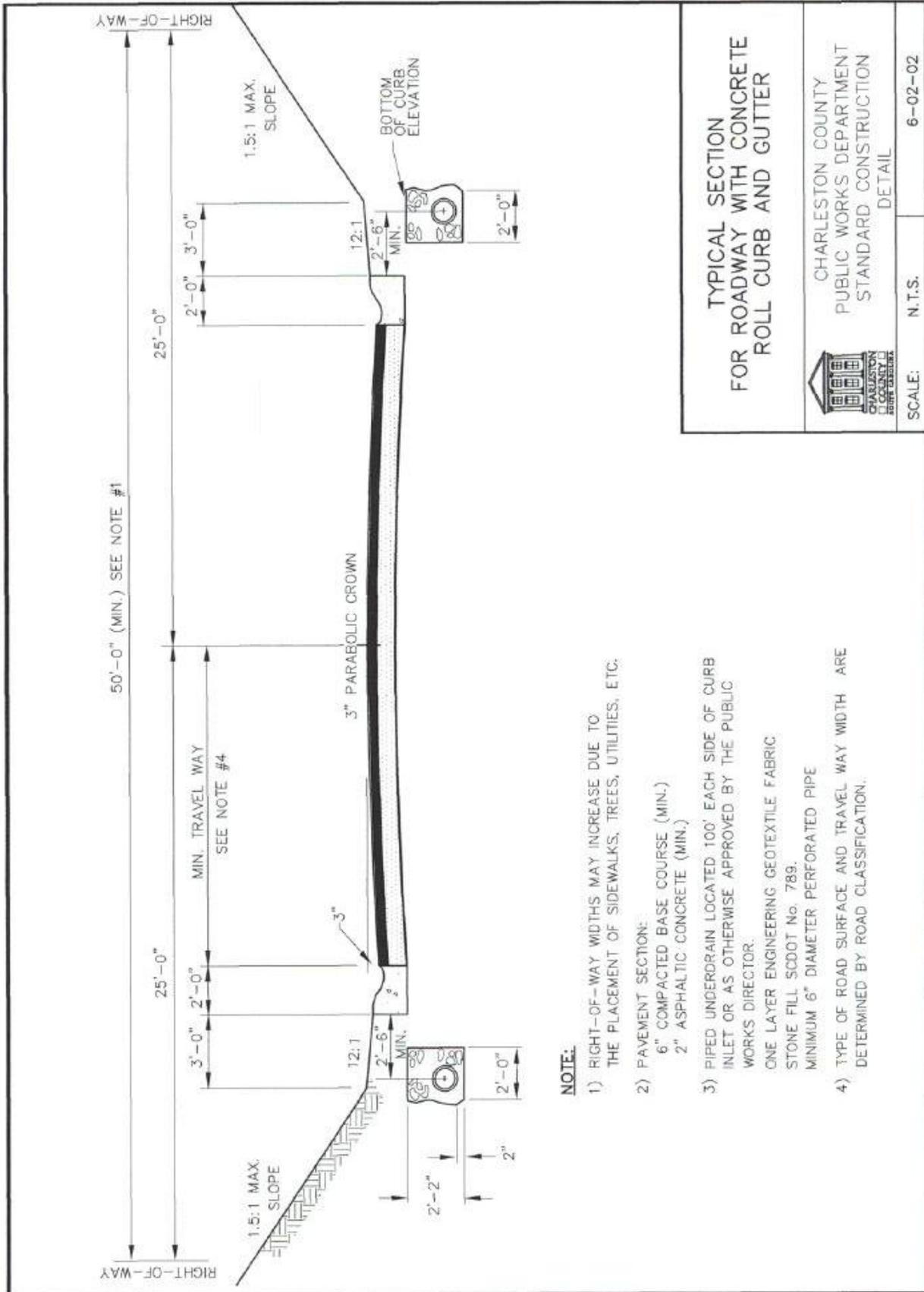
§A.6.2 INDEX OF DRAWINGS

Typical section for roadway with open roadside drainage swale
Typical section for roadway with concrete roll curb and gutter
Typical section for roadway with median island
Typical section for roadway with asphalt swale
Typical section for roadway with inverted crown
Pavement cut for installation of utilities
Urban street typical cul-de-sac plan view
Typical concrete driveway plan view and profile (roadway with open ditches)
Typical asphalt driveway plan view and profile (roadway with open ditches)
Typical section concrete curb and gutter
Concrete gutter at street intersection plan view
Concrete gutter at street intersection reinforcing details
Typical sidewalk section with curb and gutter
Typical sidewalk section with roadside ditch
Masonry curb inlet drainage structure detail
Masonry junction box detail
Grate type yard inlet detail
Type Nine yard inlet detail
Pre-cast concrete storm drainage manhole
Typical section - trapezoidal ditch
Typical section— swale type ditch
Pipe outlet to ditch with concrete slab
Pipe outlet to ditch with riprap
Rip rap detail at end of pipe
Rip rap detail at intersection of ditches
Rip rap detail at bend in ditch
Typical street name sign installation
Horizontal sight distance detail



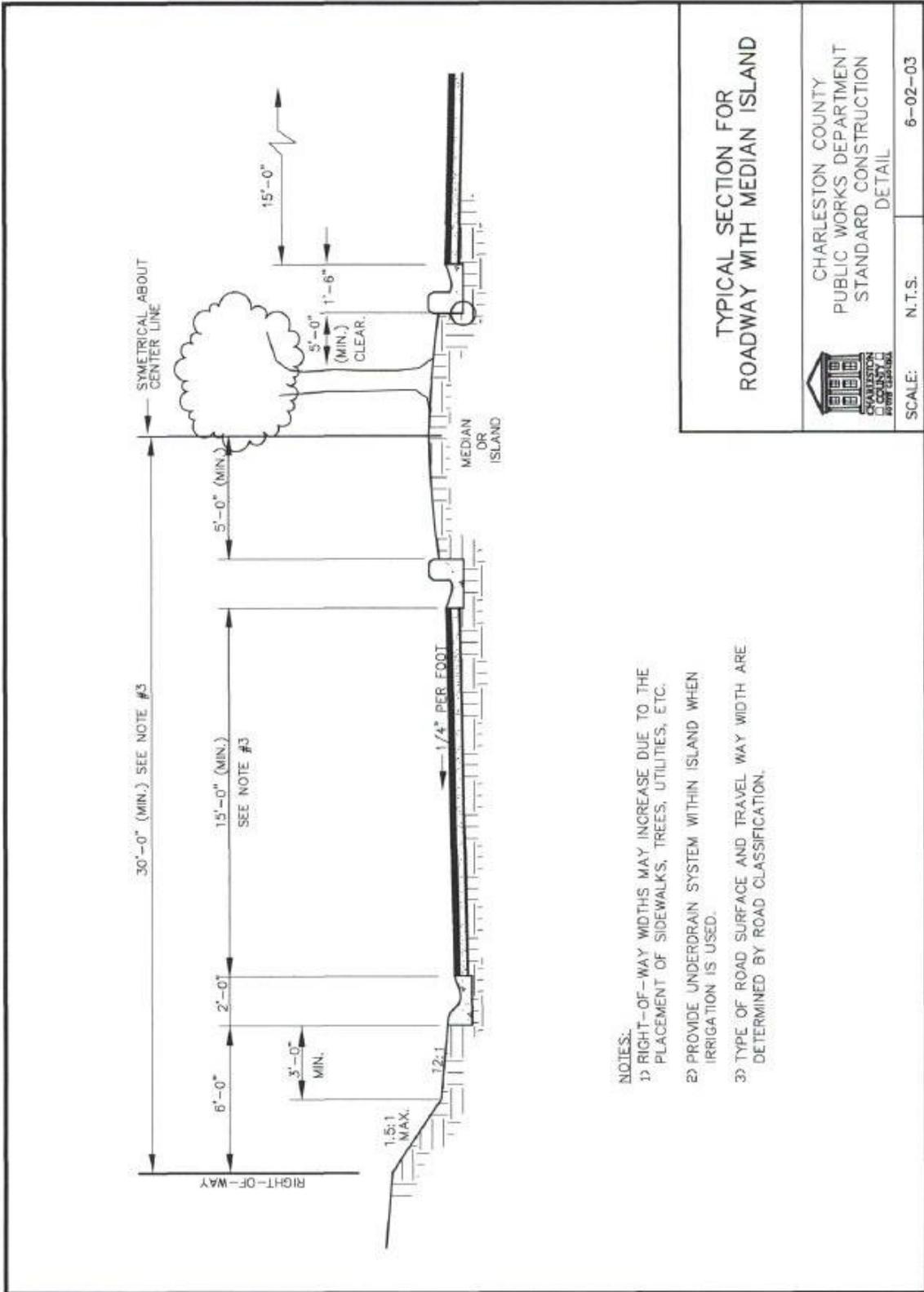
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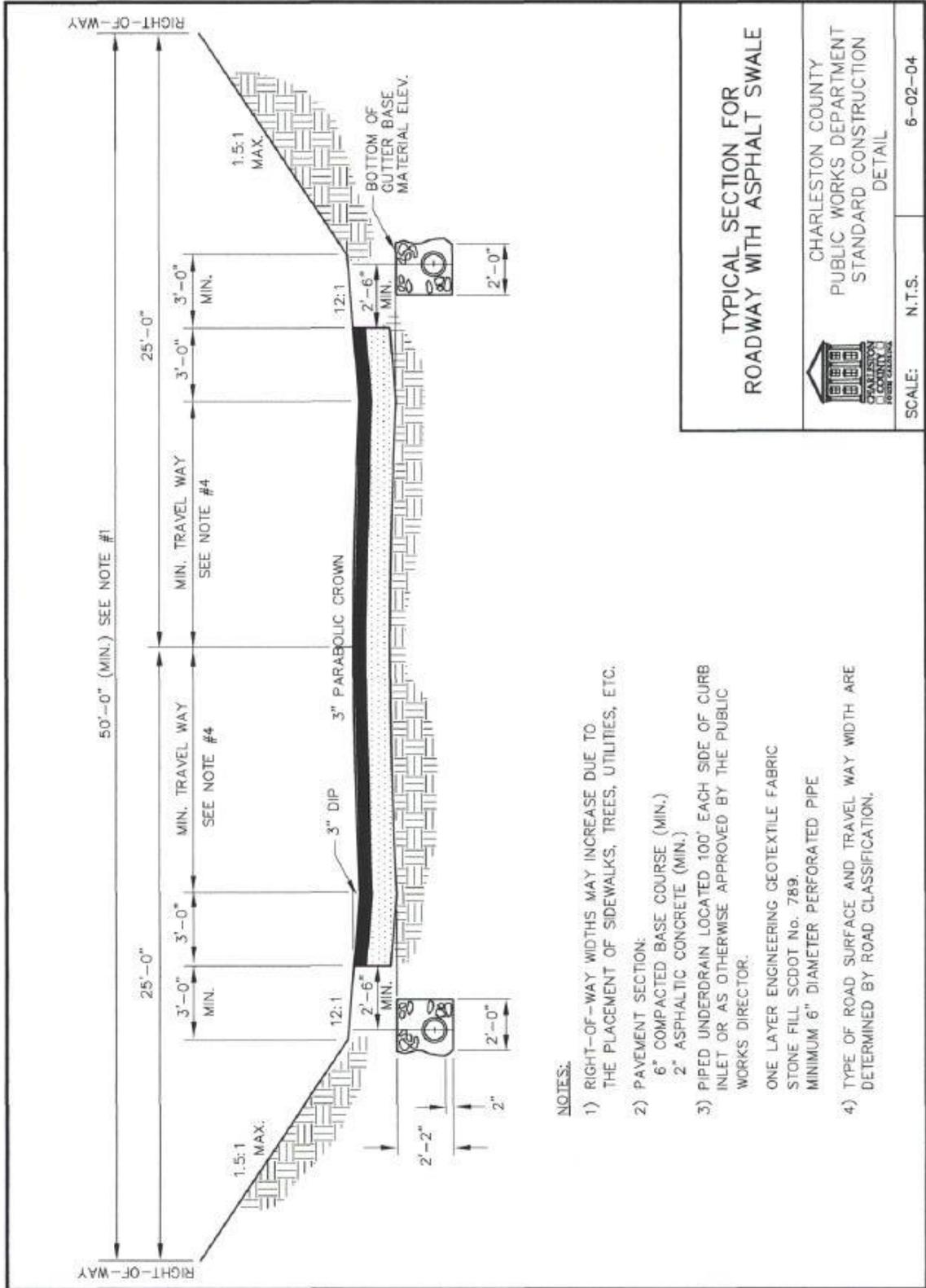
- 1) RIGHT-OF-WAY WIDTHS MAY INCREASE DUE TO THE PLACEMENT OF SIDEWALKS, TREES, UTILITIES, ETC.
- 2) TYPE OF ROAD SURFACE AND TRAVEL WAY WIDTH ARE DETERMINED BY ROAD CLASSIFICATION.

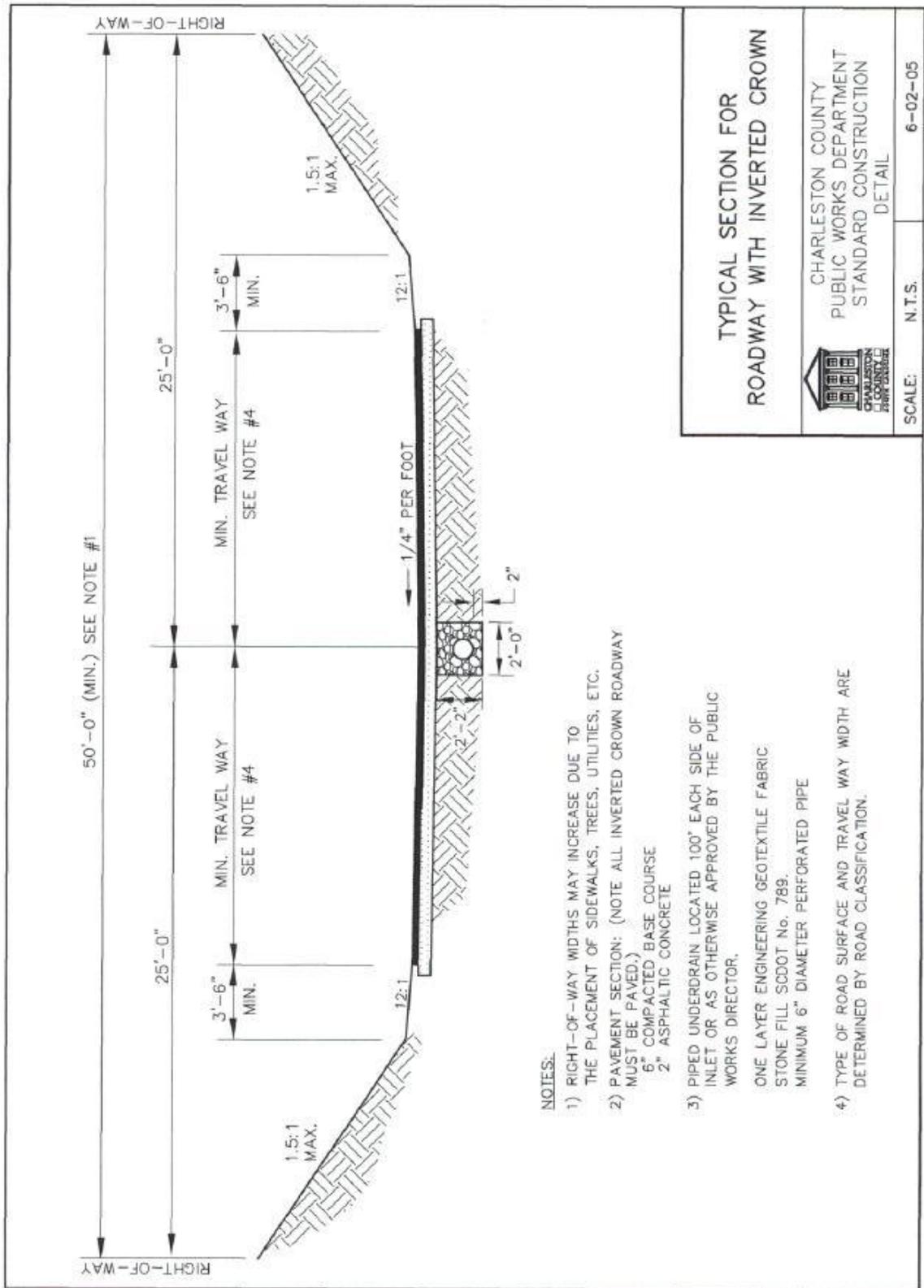


NOTE:

- 1) RIGHT-OF-WAY WIDTHS MAY INCREASE DUE TO THE PLACEMENT OF SIDEWALKS, TREES, UTILITIES, ETC.
- 2) PAVEMENT SECTION:
 6" COMPACTED BASE COURSE (MIN.)
 2" ASPHALTIC CONCRETE (MIN.)
- 3) PIPED UNDERDRAIN LOCATED 100' EACH SIDE OF CURB INLET OR AS OTHERWISE APPROVED BY THE PUBLIC WORKS DIRECTOR.
 ONE LAYER ENGINEERING GEOTEXTILE FABRIC
 STONE FILL SCOOT No. 789.
 MINIMUM 6" DIAMETER PERFORATED PIPE
- 4) TYPE OF ROAD SURFACE AND TRAVEL WAY WIDTH ARE DETERMINED BY ROAD CLASSIFICATION.

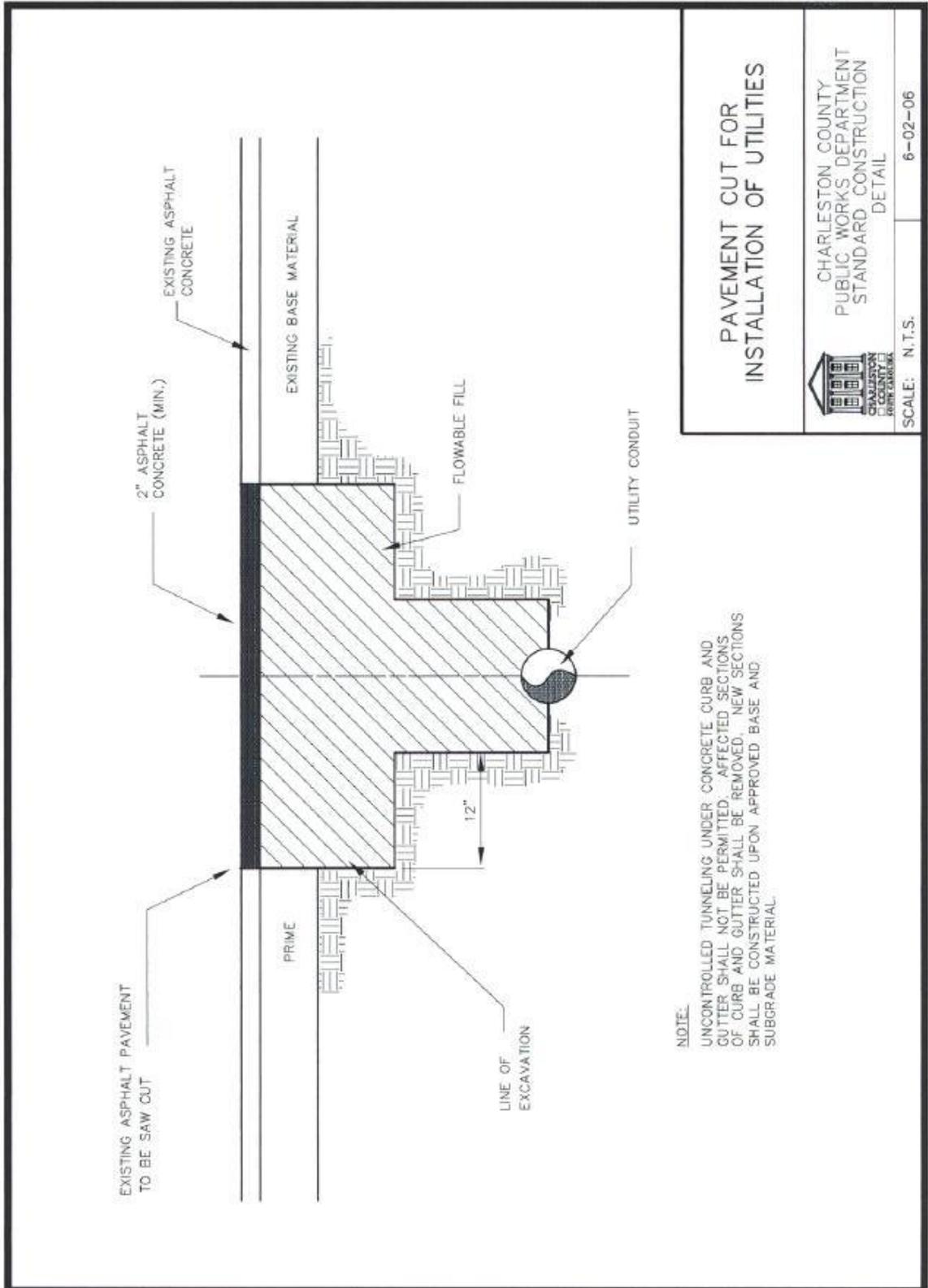


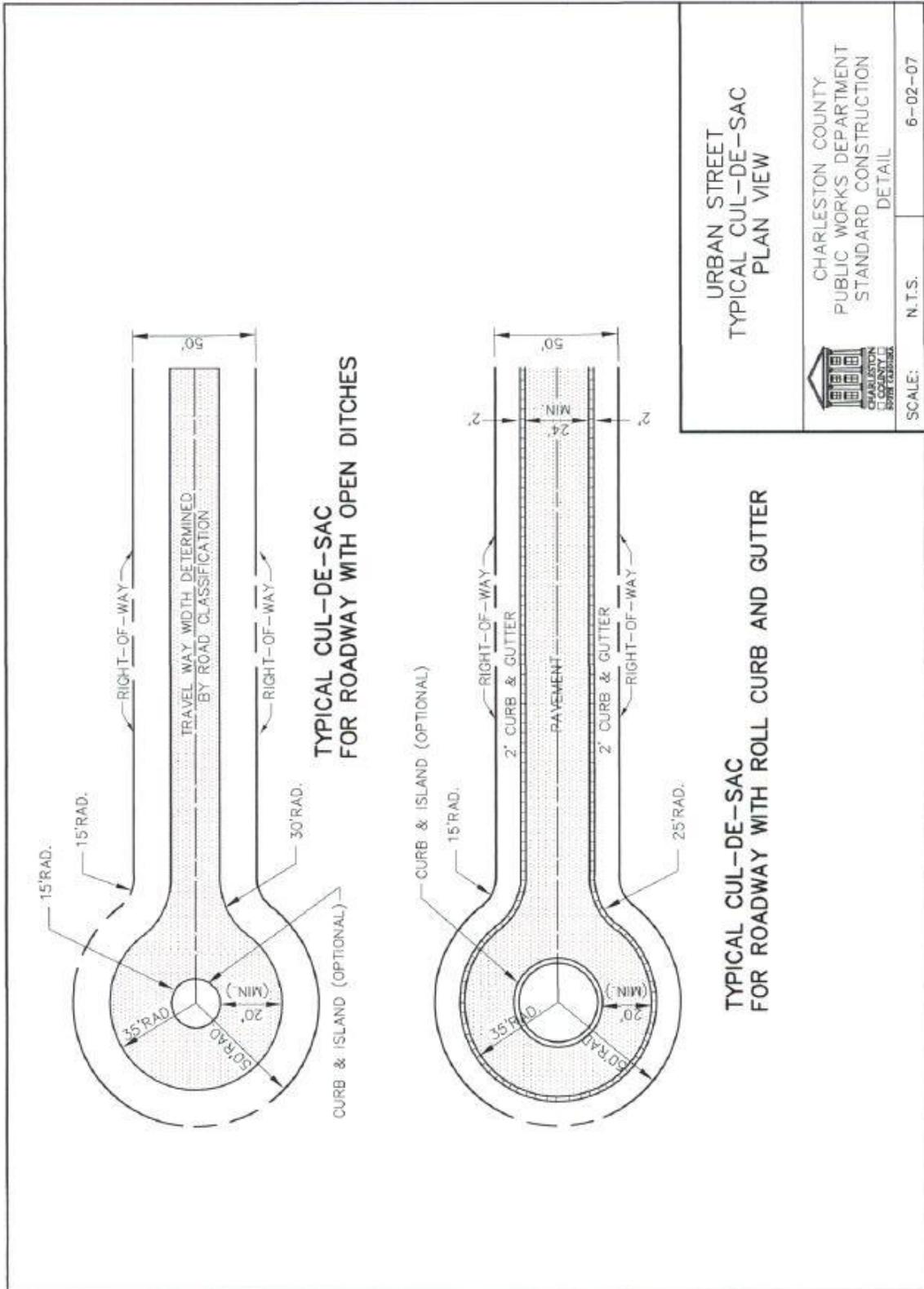


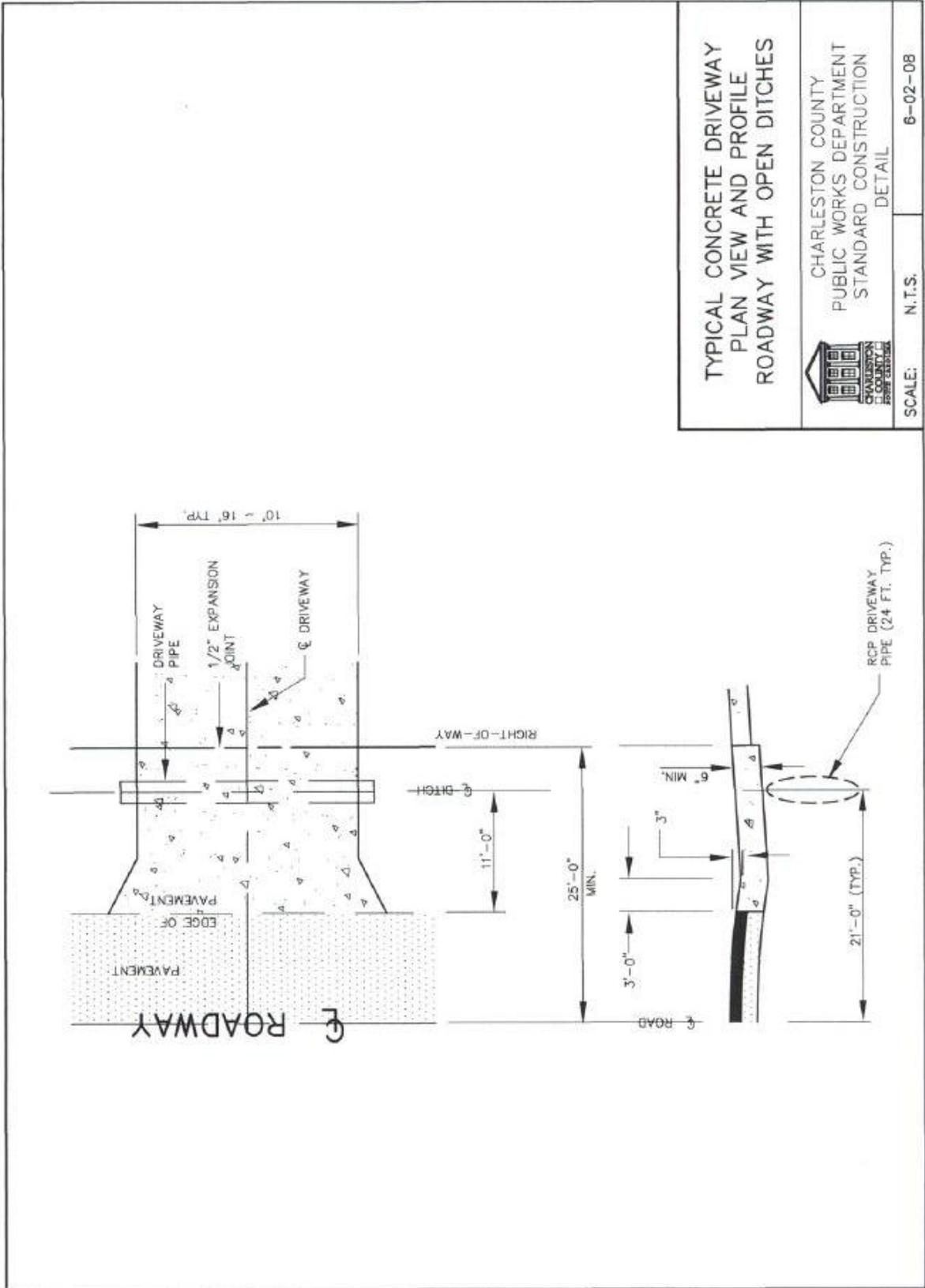


NOTES:

- 1) RIGHT-OF-WAY WIDTHS MAY INCREASE DUE TO THE PLACEMENT OF SIDEWALKS, TREES, UTILITIES, ETC.
- 2) PAVEMENT SECTION: (NOTE ALL INVERTED CROWN ROADWAY MUST BE PAVED.)
 6" COMPACTED BASE COURSE
 2" ASPHALTIC CONCRETE
- 3) PIPED UNDERDRAIN LOCATED 100' EACH SIDE OF INLET OR AS OTHERWISE APPROVED BY THE PUBLIC WORKS DIRECTOR.
 ONE LAYER ENGINEERING GEOTEXTILE FABRIC
 STONE FILL SCODT No. 789.
 MINIMUM 6" DIAMETER PERFORATED PIPE
- 4) TYPE OF ROAD SURFACE AND TRAVEL WAY WIDTH ARE DETERMINED BY ROAD CLASSIFICATION.



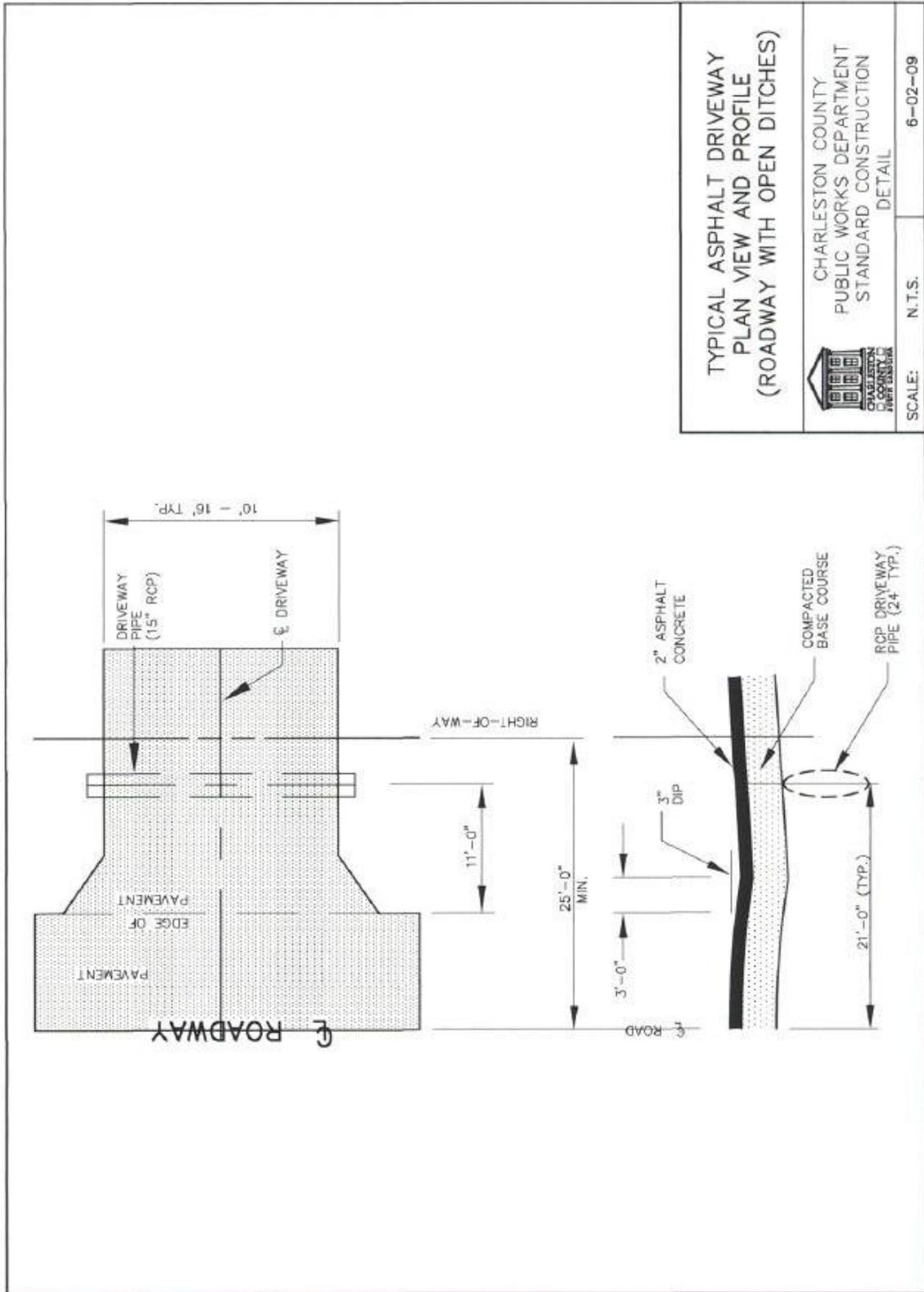




TYPICAL CONCRETE DRIVEWAY
 PLAN VIEW AND PROFILE
 ROADWAY WITH OPEN DITCHES


 CHARLESTON COUNTY
 PUBLIC WORKS DEPARTMENT
 STANDARD CONSTRUCTION
 DETAIL

SCALE: N.T.S. 6-02-08

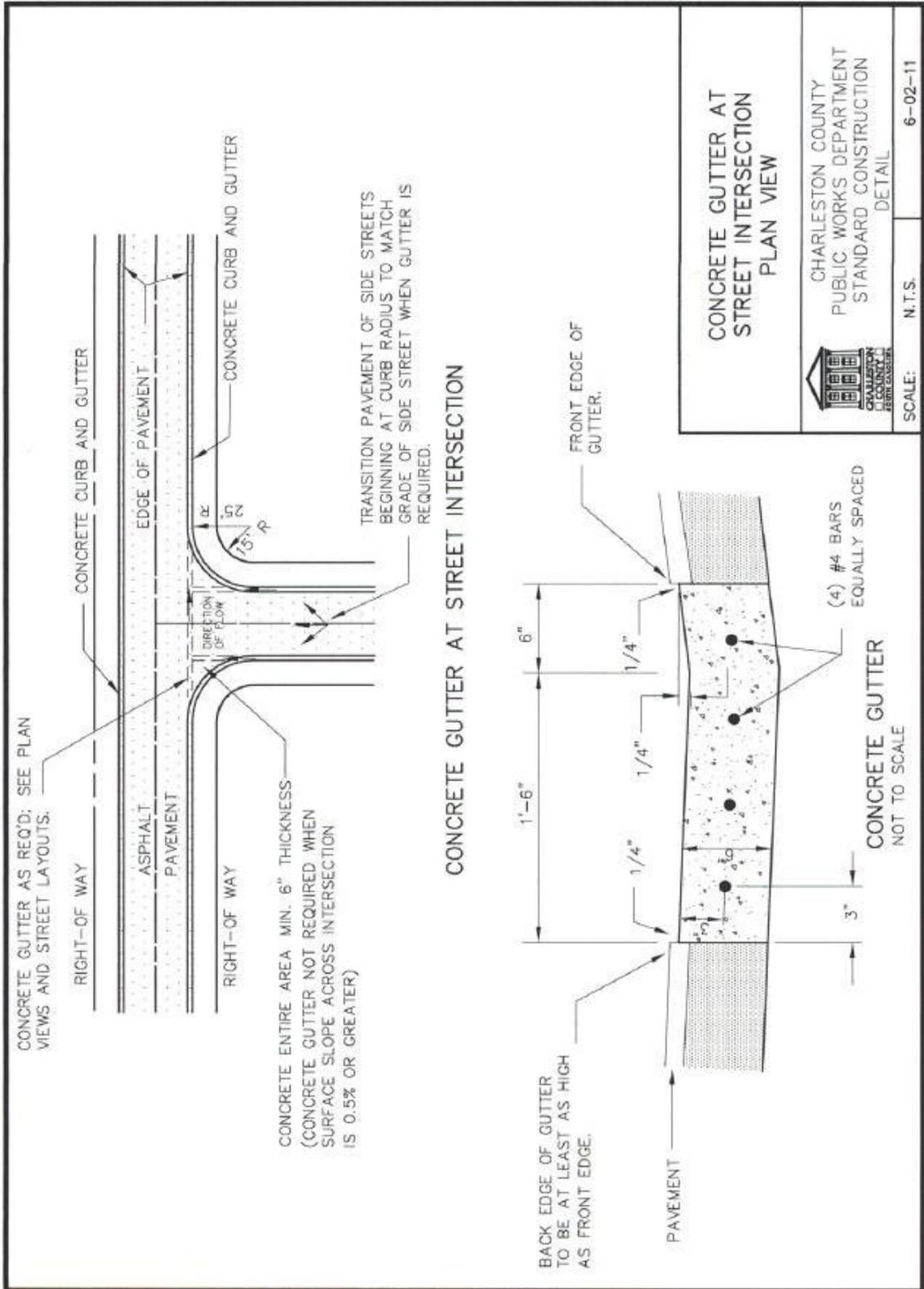


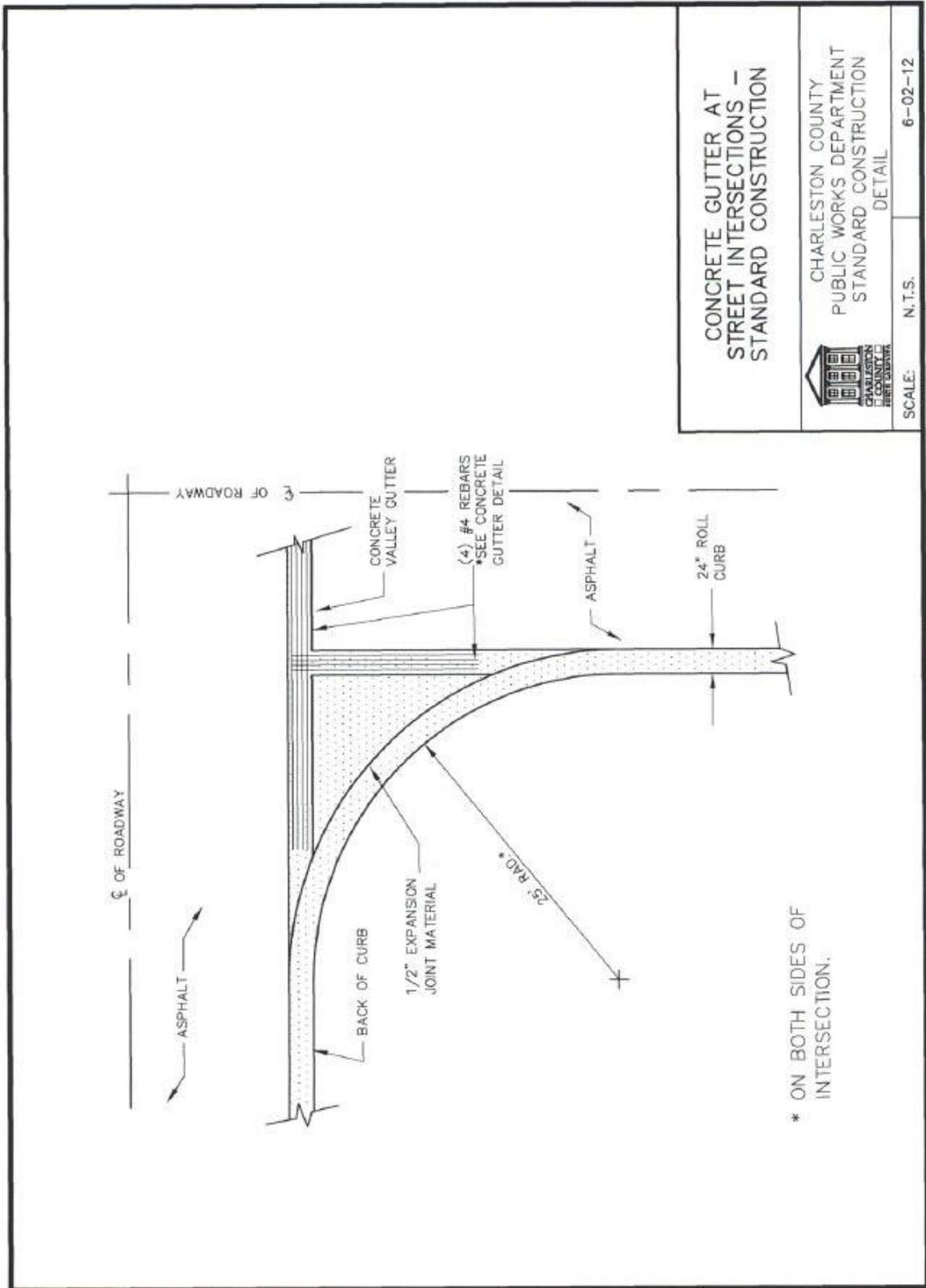
TYPICAL ASPHALT DRIVEWAY
 PLAN VIEW AND PROFILE
 (ROADWAY WITH OPEN DITCHES)



CHARLESTON COUNTY
 PUBLIC WORKS DEPARTMENT
 STANDARD CONSTRUCTION
 DETAIL

SCALE: N.T.S. 6-02-09

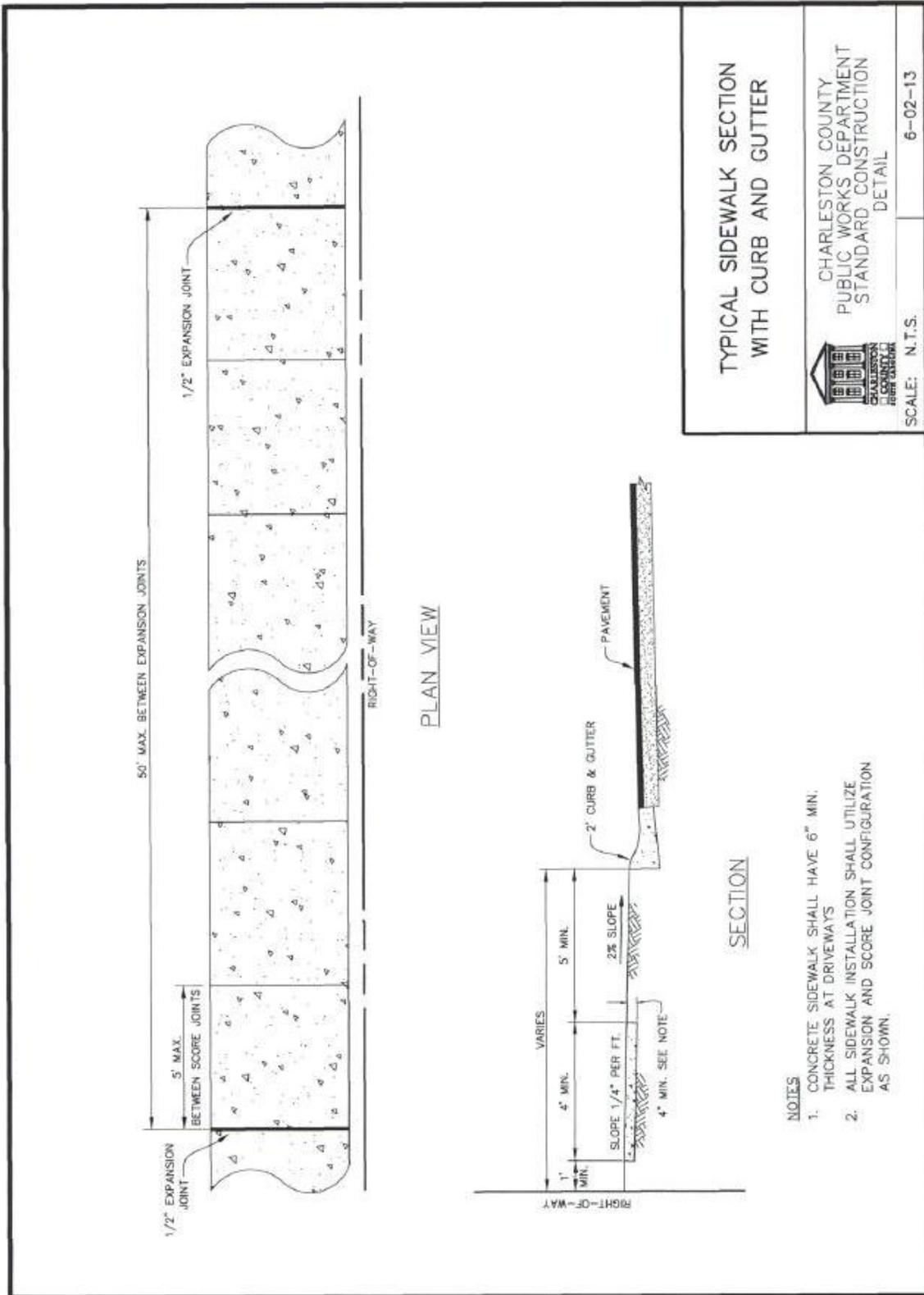




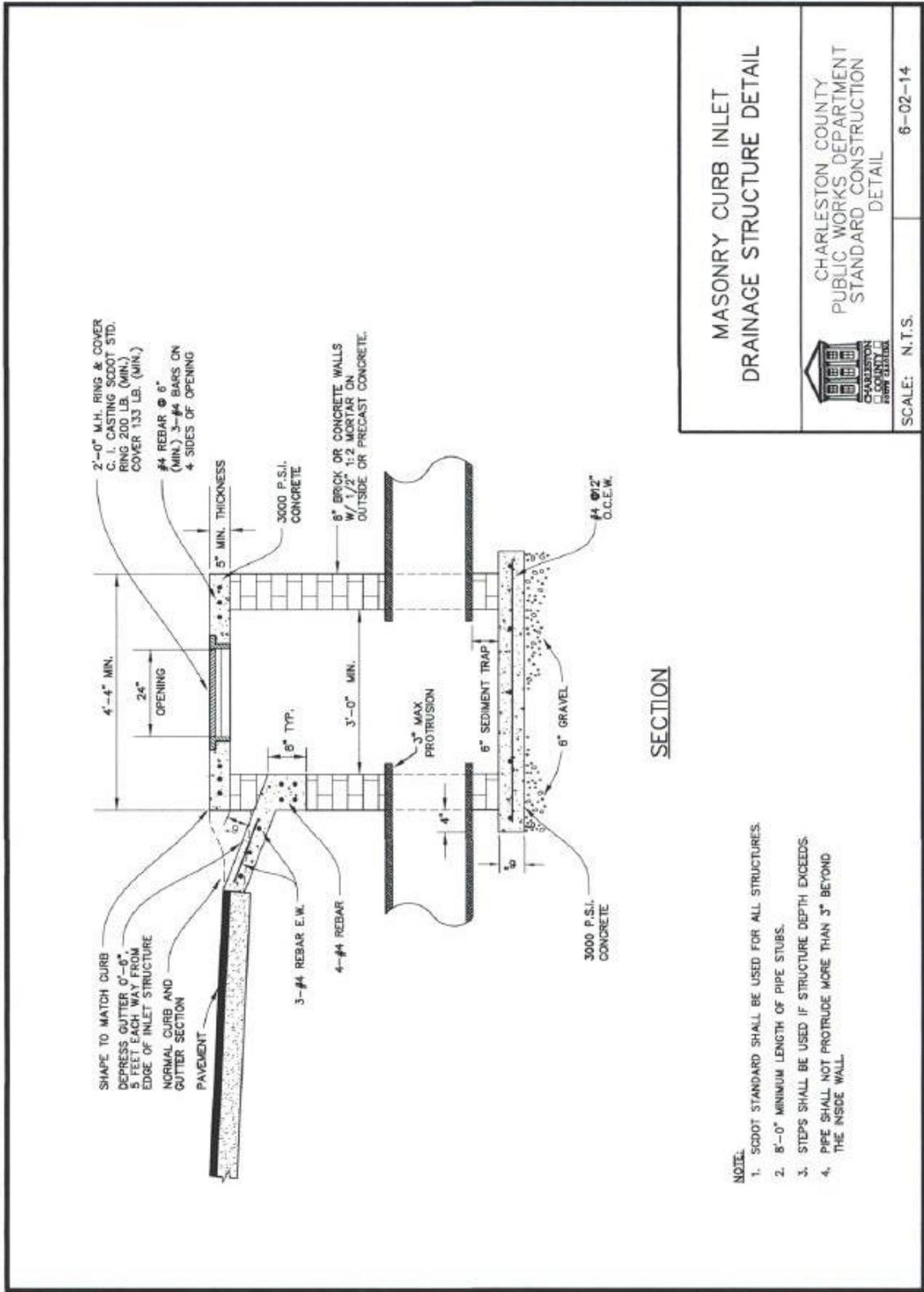
CONCRETE GUTTER AT STREET INTERSECTIONS – STANDARD CONSTRUCTION

CHARLESTON COUNTY
PUBLIC WORKS DEPARTMENT
STANDARD CONSTRUCTION
DETAIL

SCALE: N.T.S. 6-02-12



- NOTES**
1. CONCRETE SIDEWALK SHALL HAVE 6" MIN. THICKNESS AT DRIVENWAYS
 2. ALL SIDEWALK INSTALLATION SHALL UTILIZE EXPANSION AND SCORE JOINT CONFIGURATION AS SHOWN.

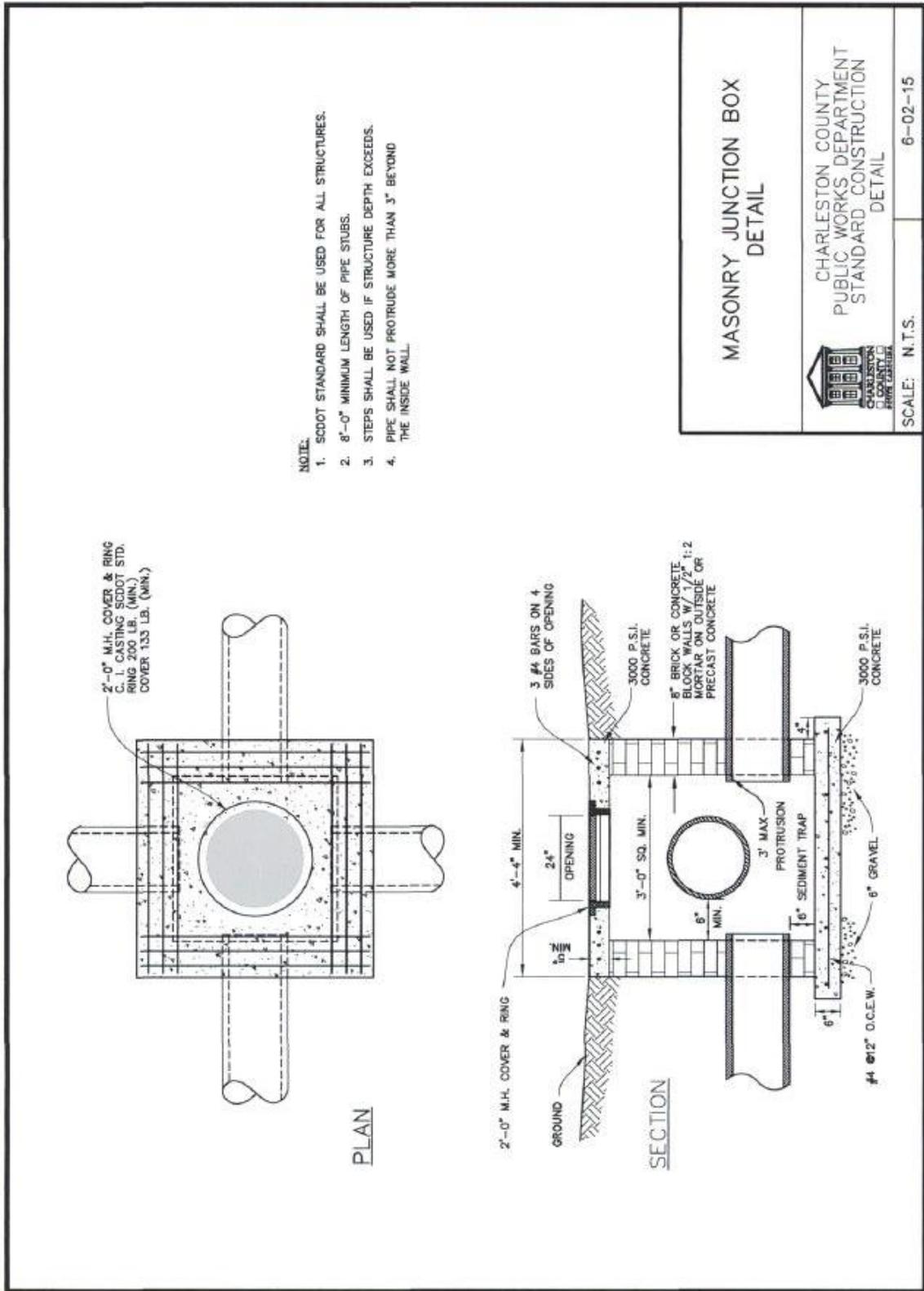


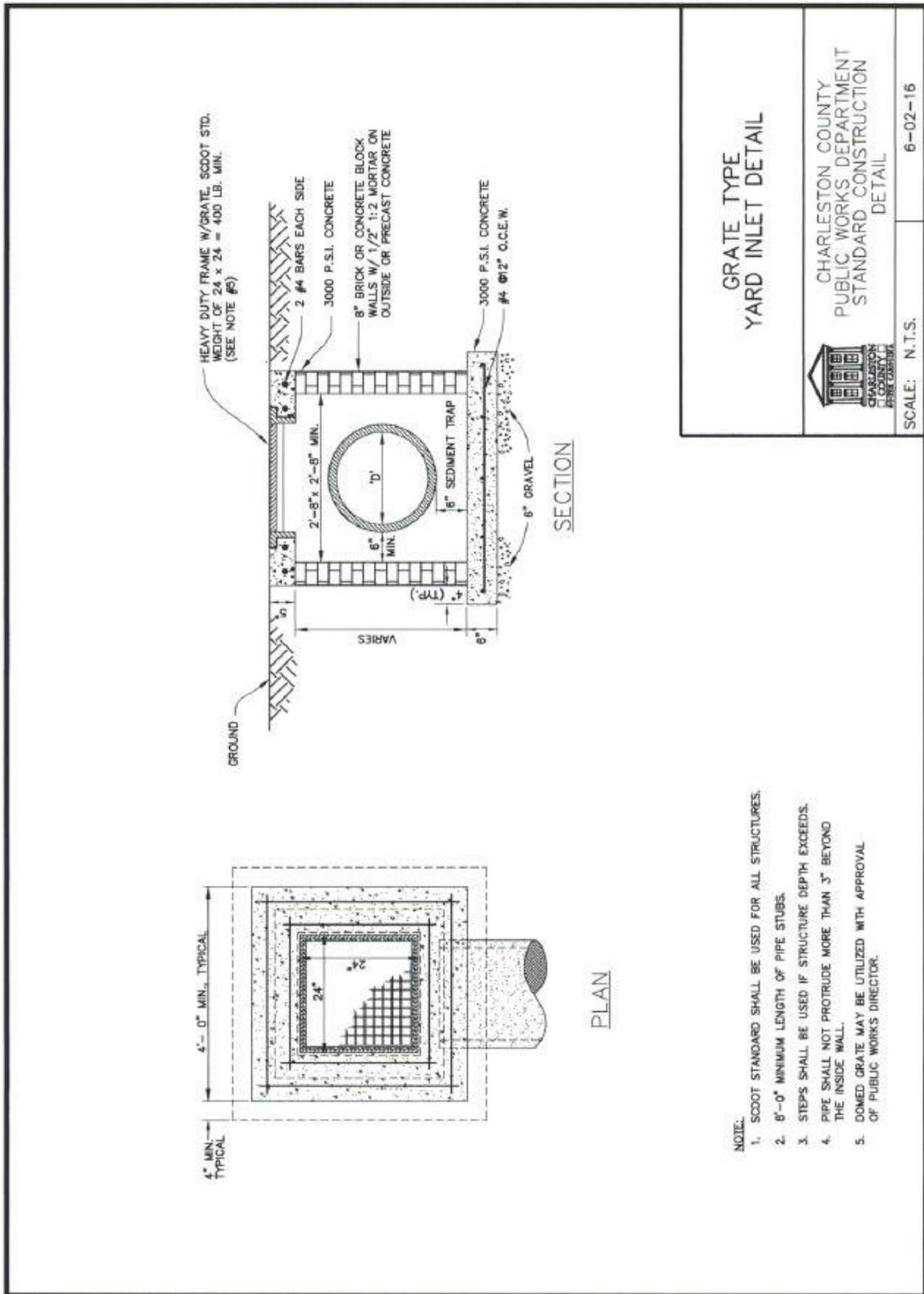
MASONRY CURB INLET
DRAINAGE STRUCTURE DETAIL



CHARLESTON COUNTY
PUBLIC WORKS DEPARTMENT
STANDARD CONSTRUCTION
DETAIL

SCALE: N.T.S. 6-02-14





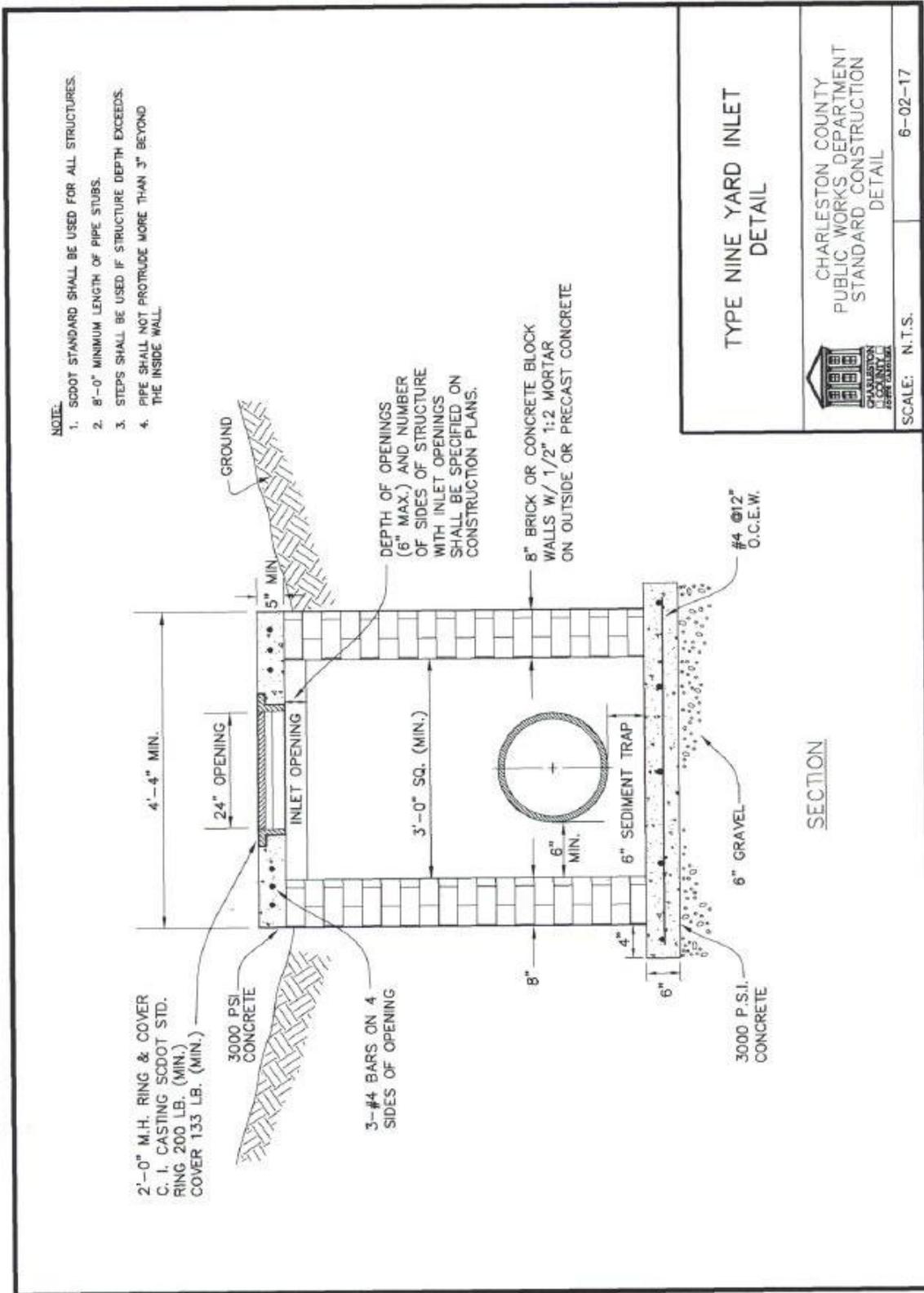
GRATE TYPE
YARD INLET DETAIL

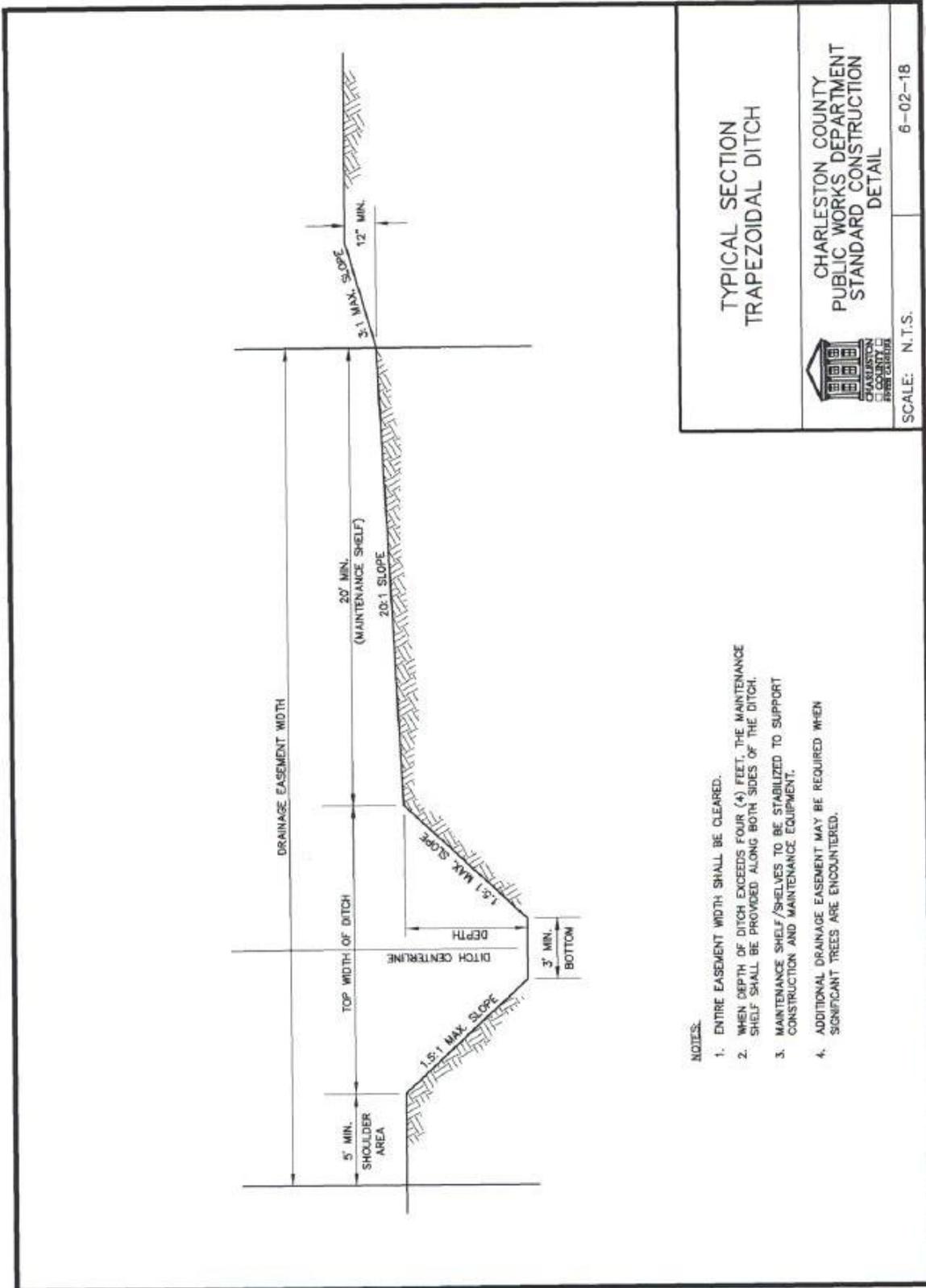


CHARLESTON COUNTY
PUBLIC WORKS DEPARTMENT
STANDARD CONSTRUCTION
DETAIL

SCALE: N.T.S.

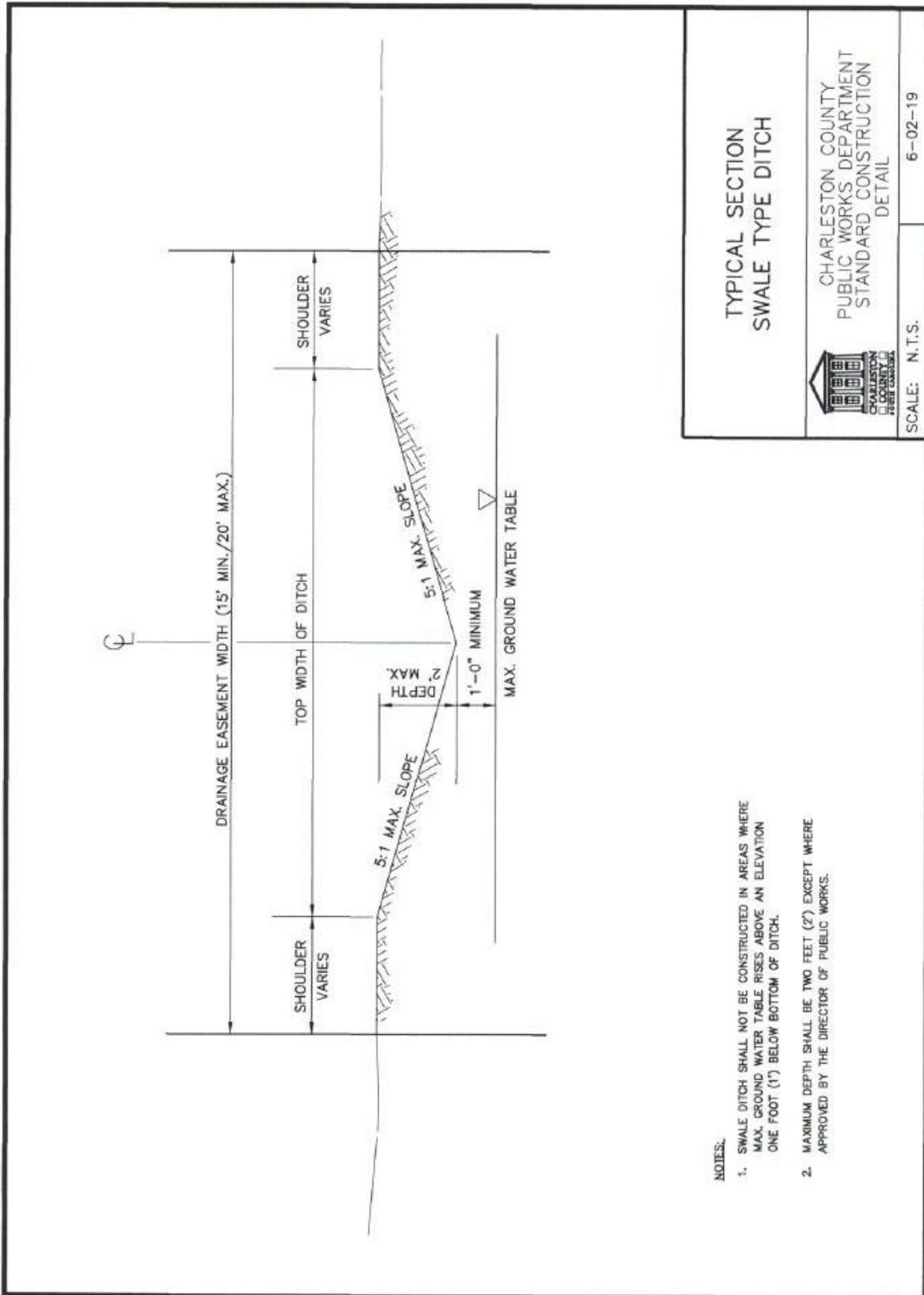
6-02-16





NOTES:

1. ENTIRE EASEMENT WIDTH SHALL BE CLEARED.
2. WHEN DEPTH OF DITCH EXCEEDS FOUR (4) FEET, THE MAINTENANCE SHELF SHALL BE PROVIDED ALONG BOTH SIDES OF THE DITCH.
3. MAINTENANCE SHELF/SHELVES TO BE STABILIZED TO SUPPORT CONSTRUCTION AND MAINTENANCE EQUIPMENT.
4. ADDITIONAL DRAINAGE EASEMENT MAY BE REQUIRED WHEN SIGNIFICANT TREES ARE ENCOUNTERED.



TYPICAL SECTION
SWALE TYPE DITCH

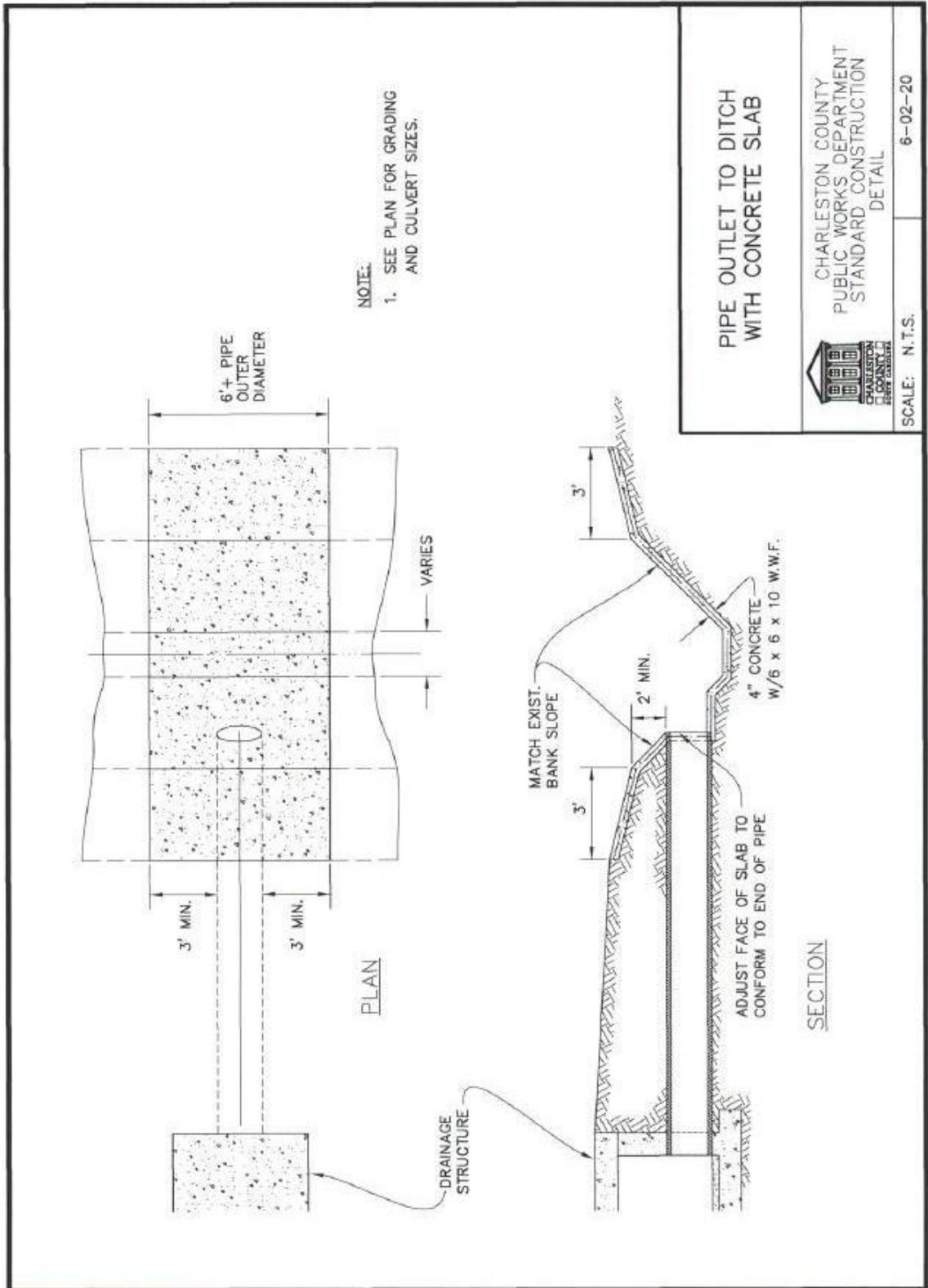
CHARLESTON COUNTY
PUBLIC WORKS DEPARTMENT
STANDARD CONSTRUCTION
DETAIL

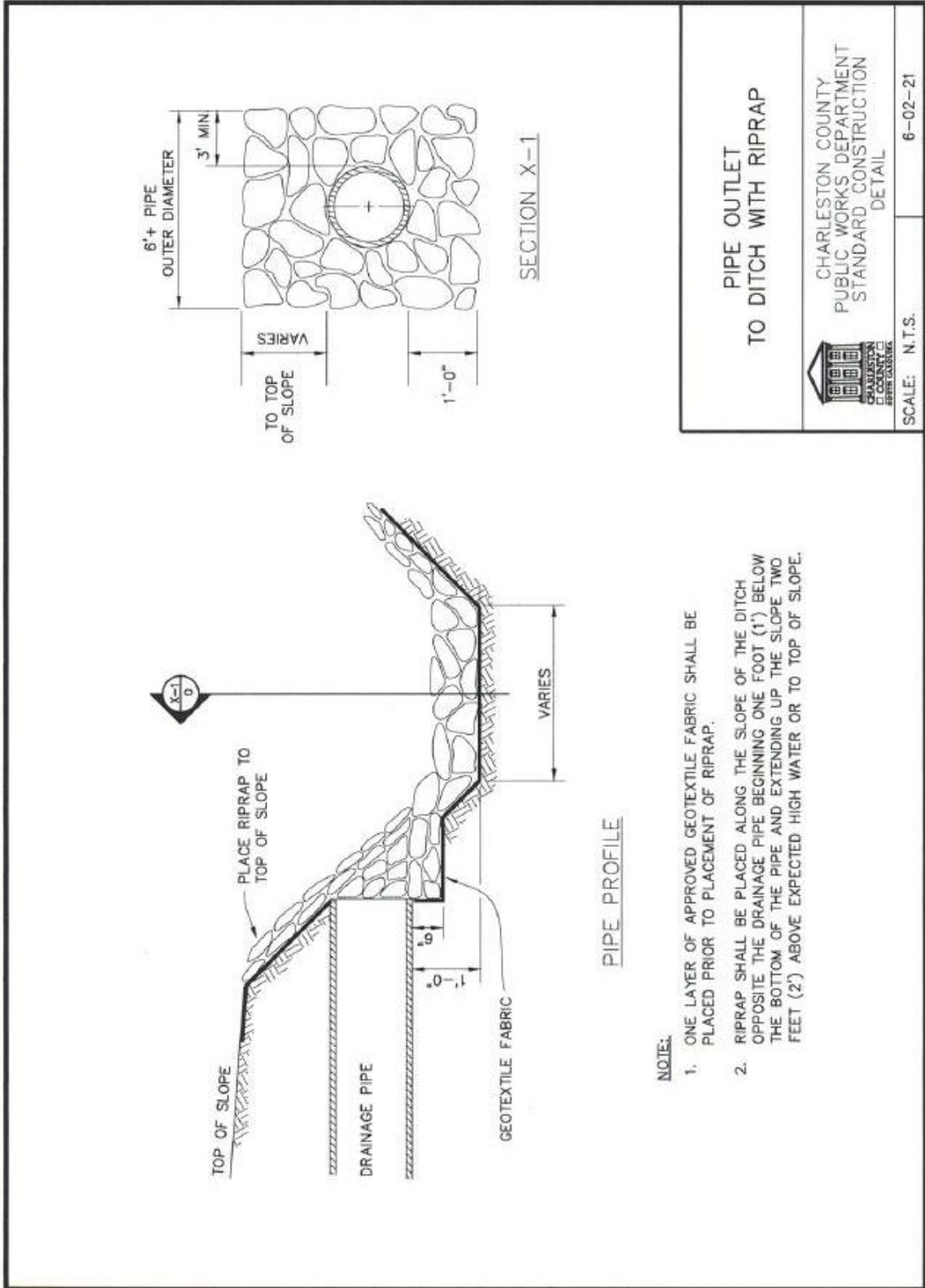


SCALE: N.T.S. 6-02-19

NOTES:

1. SWALE DITCH SHALL NOT BE CONSTRUCTED IN AREAS WHERE MAX. GROUND WATER TABLE RISES ABOVE AN ELEVATION ONE FOOT (1') BELOW BOTTOM OF DITCH.
2. MAXIMUM DEPTH SHALL BE TWO FEET (2') EXCEPT WHERE APPROVED BY THE DIRECTOR OF PUBLIC WORKS.





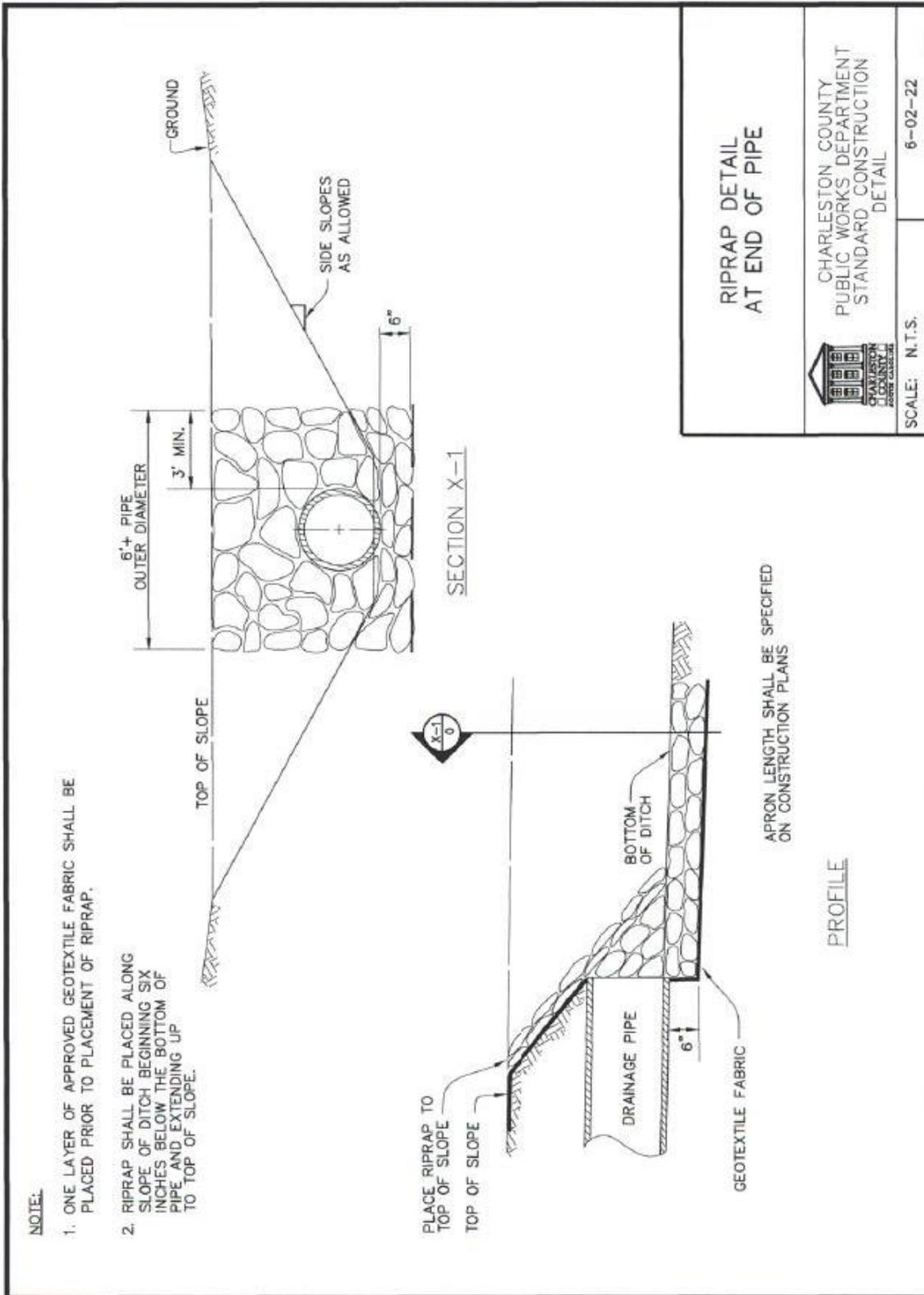
**PIPE OUTLET
TO DITCH WITH RIPRAP**



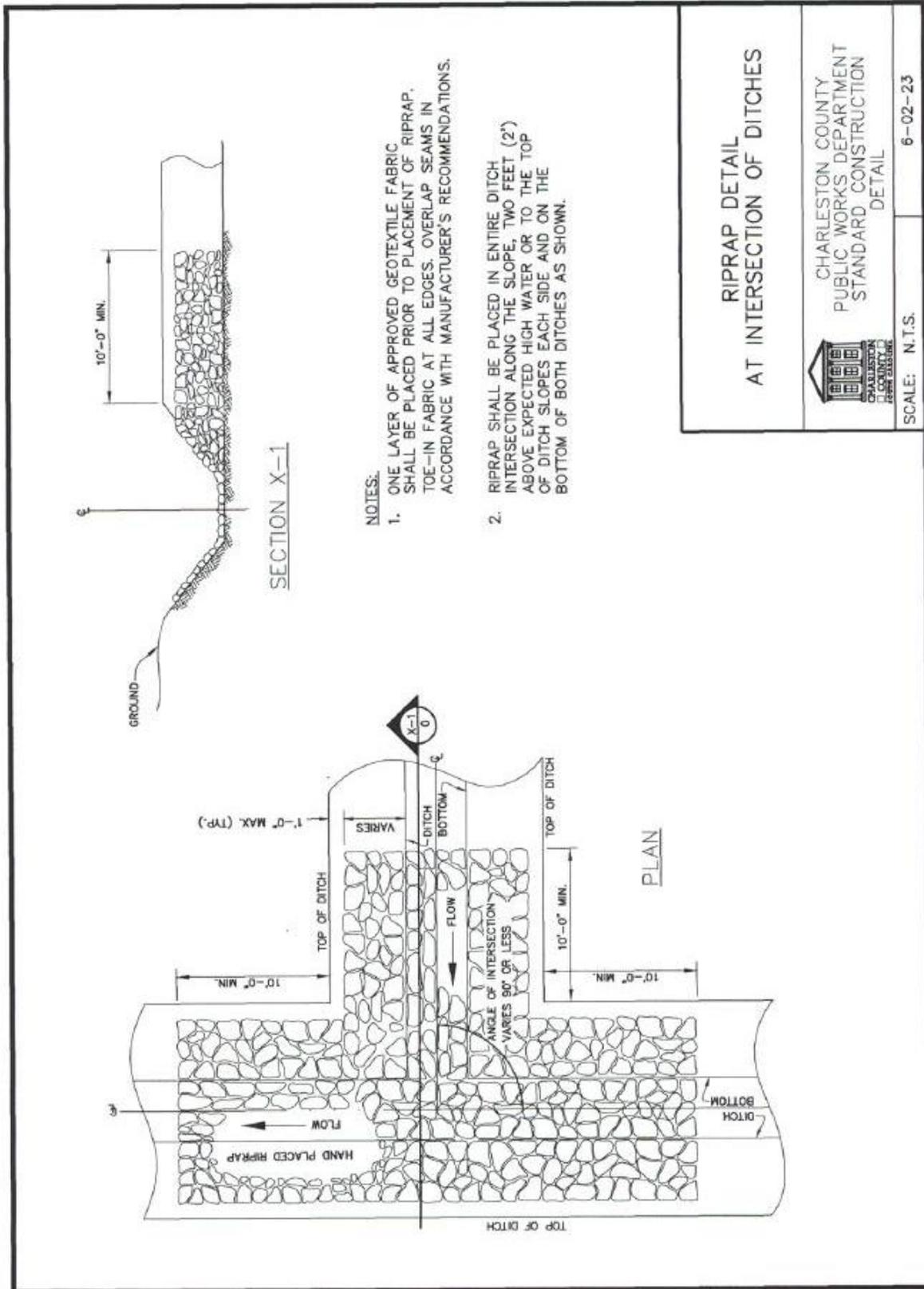
CHARLESTON COUNTY
PUBLIC WORKS DEPARTMENT
STANDARD CONSTRUCTION
DETAIL

SCALE: N.T.S.

6-02-21



<p>RIPRAP DETAIL AT END OF PIPE</p>	
<p>CHARLESTON COUNTY PUBLIC WORKS DEPARTMENT STANDARD CONSTRUCTION DETAIL</p>	
<p>SCALE: N.T.S.</p>	<p>6-02-22</p>



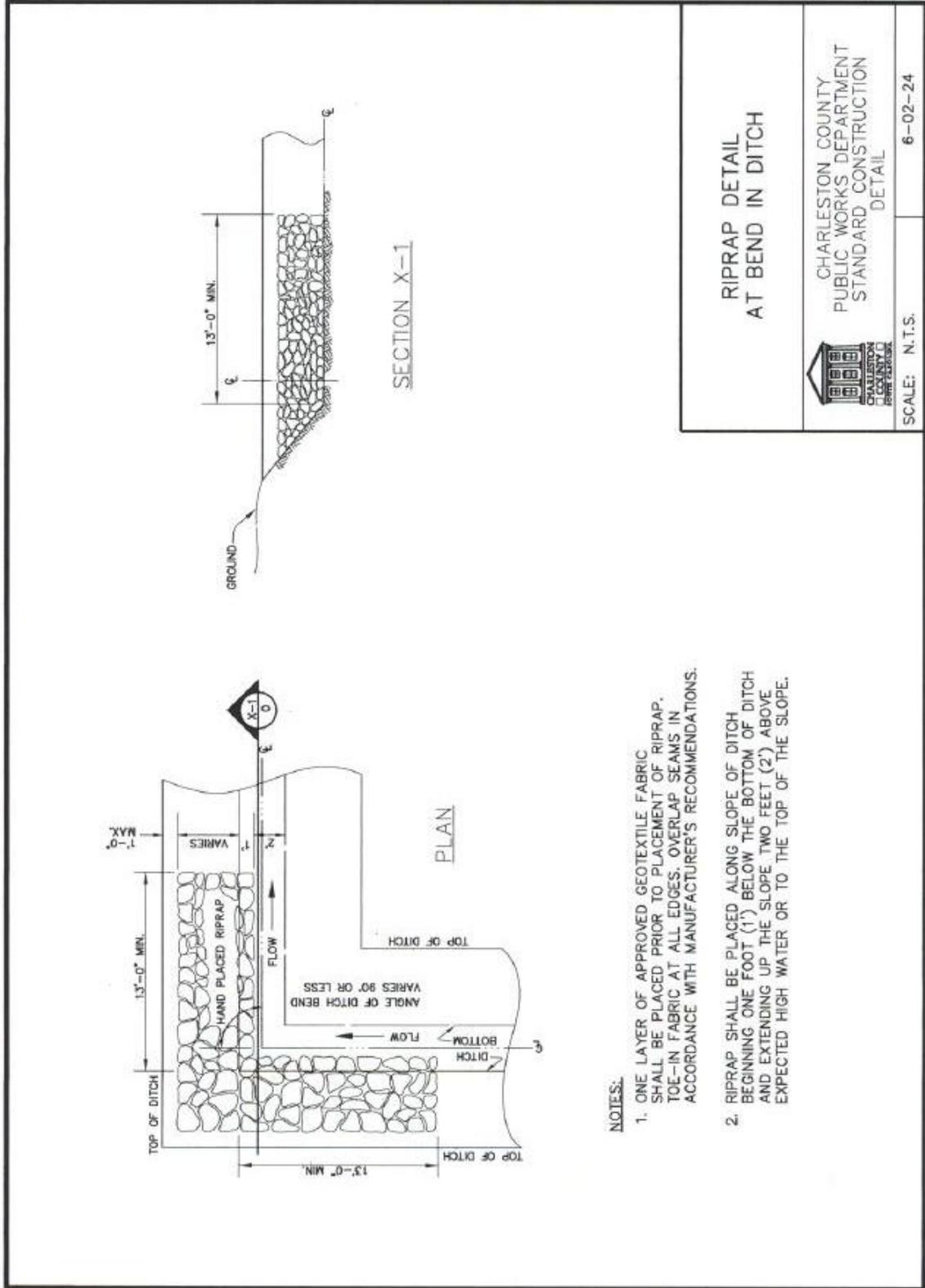
- NOTES:**
1. ONE LAYER OF APPROVED GEOTEXTILE FABRIC SHALL BE PLACED PRIOR TO PLACEMENT OF RIPRAP. TOE-IN FABRIC AT ALL EDGES. OVERLAP SEAMS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 2. RIPRAP SHALL BE PLACED IN ENTIRE DITCH INTERSECTION ALONG THE SLOPE, TWO FEET (2') ABOVE EXPECTED HIGH WATER OR TO THE TOP OF DITCH SLOPES EACH SIDE AND ON THE BOTTOM OF BOTH DITCHES AS SHOWN.

**RIPRAP DETAIL
AT INTERSECTION OF DITCHES**



CHARLESTON COUNTY
PUBLIC WORKS DEPARTMENT
STANDARD CONSTRUCTION
DETAIL

SCALE: N.T.S. 6-02-23



**RIPRAP DETAIL
AT BEND IN DITCH**



CHARLESTON COUNTY
PUBLIC WORKS DEPARTMENT
STANDARD CONSTRUCTION
DETAIL

SCALE: N.T.S.

6-02-24

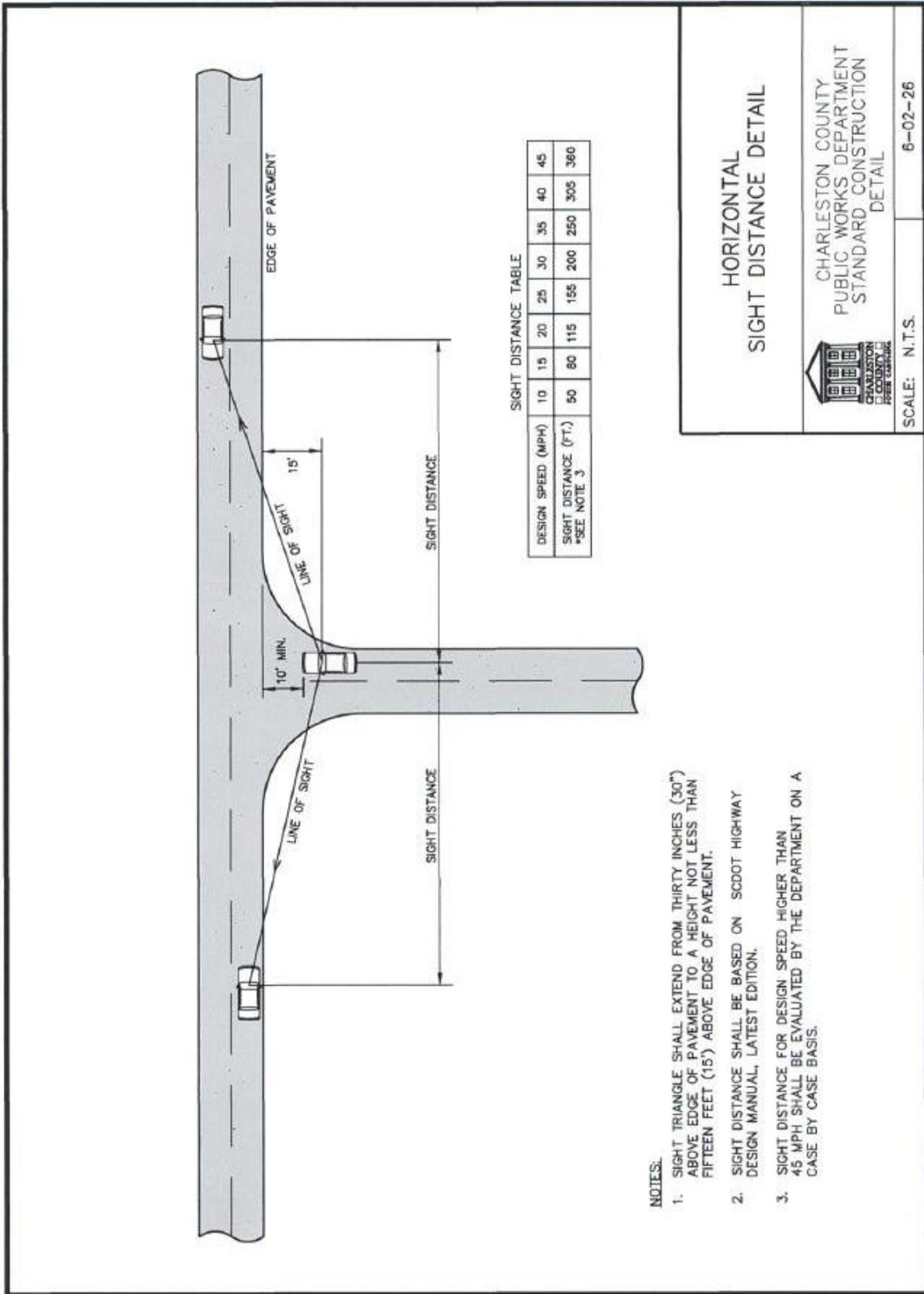
NOTE:

1. STREET NAME SIGNS SHALL BE INSTALLED ACCORDING TO FHWA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (MUTCD) 2003 OR LATEST EDITION SECTION 2D.38 AND 2D.39.
2. SIGNS SHALL BE GREEN ON WHITE UNLESS APPROVED.

TYPICAL STREET NAME SIGN INSTALLATION

CHARLESTON COUNTY
PUBLIC WORKS DEPARTMENT
STANDARD CONSTRUCTION
DETAIL

SCALE: N.T.S. 6-02-25

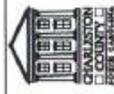


SIGHT DISTANCE TABLE

DESIGN SPEED (MPH)	10	15	20	25	30	35	40	45
SIGHT DISTANCE (FT.) *SEE NOTE 3	50	80	115	155	200	250	305	360

- NOTES:**
1. SIGHT TRIANGLE SHALL EXTEND FROM THIRTY INCHES (30") ABOVE EDGE OF PAVEMENT TO A HEIGHT NOT LESS THAN FIFTEEN FEET (15') ABOVE EDGE OF PAVEMENT.
 2. SIGHT DISTANCE SHALL BE BASED ON SCOOT HIGHWAY DESIGN MANUAL, LATEST EDITION.
 3. SIGHT DISTANCE FOR DESIGN SPEED HIGHER THAN 45 MPH SHALL BE EVALUATED BY THE DEPARTMENT ON A CASE BY CASE BASIS.

**HORIZONTAL
SIGHT DISTANCE DETAIL**



CHARLESTON COUNTY
PUBLIC WORKS DEPARTMENT
STANDARD CONSTRUCTION
DETAIL

SCALE: N.T.S. 6-02-26

Blue Background Sign:
 6" Upper Case (typ) w/4.5" Lower Case (typ) Series C
 3" Upper Case w/ lower case (typ) Series C
 9" height for lettering
 Blue Background
 Varies length

Green Background Sign:
 6" Upper Case (typ) w/4.5" Lower Case (typ) Series C
 3" Upper Case w/ lower case (typ) Series C
 9" height for lettering
 Green Background
 Varies length

STANDARD STREET NAME SIGN SPECIFICATIONS
 FOR PRIVATE AND PUBLIC ROADS WITH SPEED LIMITS 35 MPH OR LESS

All signs shall meet the minimum standards found in the Manual on Uniform Traffic Control Devices (latest version)

Standard sign material and sizes:
 Material – flat aluminum blanks, thickness .808 or Alpollic blanks, thickness 2mm

Sizes –
 9" x 24"
 9" x 30"
 9" x 36"
 9" x 42"
 9" x 48"

Coloring:
 White 3M HIP reflective sheeting #3930
 Green 3M ElectroCut Film #1177 (for Public Road Signs)
 Blue 3M ElectroCut Film #1175 (for Private Road Signs)

Lettering: Font – FHWA Standard Highway Sign Book (latest version) Highway Gothic Series "C" alphabet
 Size – First letter will be 6 inch upper case followed by 4.5 inch lower case
 Prefix (N, S, E, W) and Suffix (St, Av, Ln, etc.) First letter will be 3 inch followed by 2.5 inch letters

Assembly: Letters cut out of green (for Public Roads) or blue (for Private Roads) 3M electrocut film which is overlaid on white 3M sheeting applied to aluminum blank and mounted on 2 inch square post with breakaway system (see detail). Dual name plates will be used for each street name to be mounted on the post.

Installation: See Flat Sheet Sign Mounting Detail

NOTES:

1. ALL SIGNAGE SHALL COMPLY WITH THE FHWA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, PART 2 (LATEST EDITION). IN ADDITION THE COUNTY REQUIRES A "BREAKAWAY" SIGN POST CONFIGURATION WHICH IS FACILITATED BY MOUNTING THE STREET NAME SIGN ON A 10"x2"x2" 14 GAUGE POST WITH A 30"x2.25"x2.5" 14 GAUGE ANCHOR AS SHOWN IN FIGURES 1 AND 2.
2. CHARLESTON COUNTY PUBLIC WORKS SHALL BE NOTIFIED ONCE STREET NAME SIGNS ARE INSTALLED TO ENSURE ALL REQUIREMENTS ARE MET.
3. PROPOSED STREET NAME SHALL BE KEPT TO MINIMUM SIZE SUCH THAT THEY CAN BE SUPPORTED BY A SINGLE BREAK-AWAY POST IN ACCORDANCE WITH SCDOT STANDARD DRAWING & SPECIFICATIONS (LATEST EDITION).

STANDARD STREET NAME SIGN SPECIFICATIONS

CHARLESTON COUNTY
 PUBLIC WORKS DEPARTMENT
 STANDARD DETAIL

SCALE: N.T.S. 6-02-27